# Functional Servicing and Stormwater Management Report

Proposed Commercial/Industrial Development
Claremont North Business Park
5435, 5455 and 5475 Old Brock Road
Pickering, Ontario

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# Executive Summary

This report describes the overall site grading, servicing and SWM strategy to functionally service the proposed development in support of a Zoning By-Law Amendment application with the City of Pickering. It also demonstrates conformity to the relevant sections of the ORMCP.

**Storm -** Existing drainage patterns will be maintained and attenuated in accordance to ORMCP Conservation Polices. Current Old Brock Road major/minor flow conveyance to the wetland southeast of the site will be preserved. Onsite major/minor flows will be captured and controlled by a proposed dry pond to treat and control surface water runoff to rates and volumes prescribed by the Agencies for the Duffins Creek Watershed. The proposed stormwater management and drainage strategy will be resilient towards the future effects of Climate Change.

**Sanitary –** No municipal system exists adjacent to site to serve as an outlet. Site sanitary will drain via a private sewer network to a septic system at the southwest corner of the site sized for a peak load of 17,000 L/day. Carwash output will not contribute to the septic load as it will be stored and regularly hauled offsite.

**Water –** No municipal water system is currently available adjacent to site to service the development. A proposed private well located at the northern most point of the site will service the site for domestic and fire through a private water network. Domestic and fire loads are estimated to be 0.31 L/s (26,980 L/day) and 3000 (USGPM), respectively.

**Grading –** Site slope analysis demonstrates the site is exempt from the Landform Conservation Policy set out by the Oak Ridges Moraine Conservation Plan. Grades are set to maintain much of the existing general topography of the site in keeping with ORMCP Conservation Polices.

The existing 17m vertical drop from north to south along the site necessitates the use of steep driveways at entrances and parking lot interfaces to ensure reasonable gradients within parking areas. Exposed foundations and retaining walls are additionally implemented to maintain workable slopes within site and avoid foundation steps.

# 1.0 INTRODUCTION

This report commissioned by S. Larkin Developments Inc. (Larkin) has been prepared to demonstrate the functional capacity of the subject site to support the proposed development from a grading, private servicing and stormwater management (SWM) perspective for a zoning by-law amendment application for 5435, 5455 and 5475 Old Brock Road in the City of Pickering (the "site"). The purpose of the proposed development is to permit additional industrial type buildings, a retail gas outlet with an accessory restaurant use, associated car wash and to formalize existing employment uses on the site.

## 1.1 SITE LOCATION AND DESCRIPTION

The site, depicted in the aerial figure below, is located south of Uxbridge Pickering Townline between Brock Road and Old Brock Road in the Village of Claremont. The 4.37 hectare lot is mostly undeveloped and contains a residential dwelling, heavy equipment maintenance shop (five bays), barn and various supporting trailers/sheds. The surface makeup is mostly grass, shrubs and soil. Three (3) existing driveways provide access along the western periphery to Old Brock Road.

The subject development resides within the Oak Ridges Moraine, and a wetland is located within the southeast portion of the site. Approaches implemented to conform to the Oak Ridges Moraine Conservation Plan (ORMCP) polices are discussed in relevant sections. This FSR addresses sections 19, 25, 30, 36, 43, 45, 46 and 47 of the ORMCP and is in conjunction with various recommendations provided within two (2) other Stantec documents entitled *Preliminary Geotechnical/Hydrogeological Report*, dated January 17, 2019, and *Natural Heritage Evaluation Report and Oak Ridges Moraine Conformity Evaluation*, dated August 13, 2024.

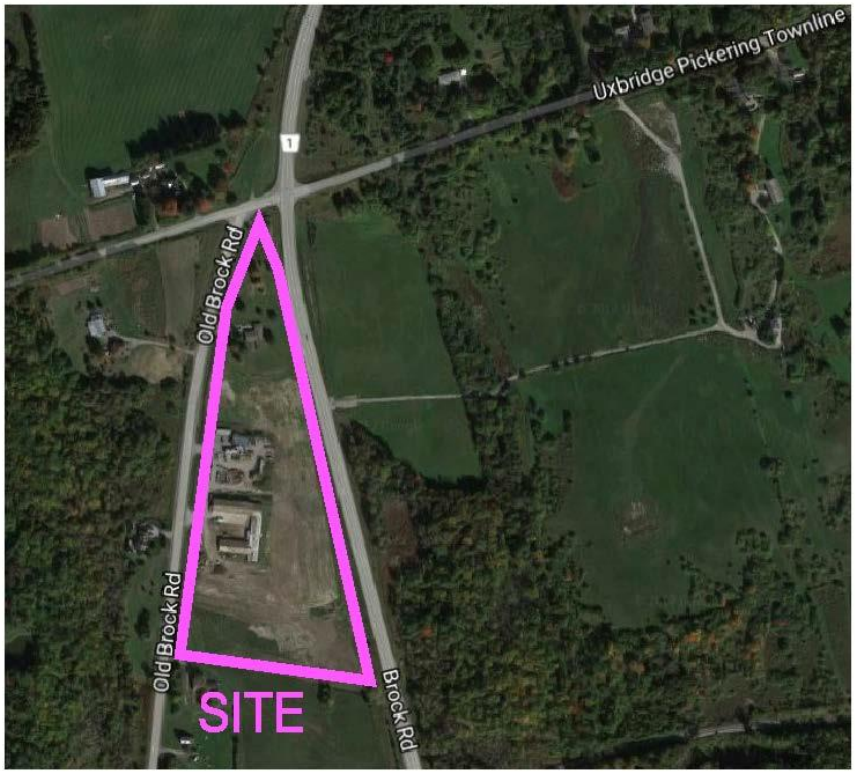



**Figure 1.1 - Site Location**

## 1.2 SITE PROPOSAL

The purpose of the proposed development is to build new infrastructure that will provide services to the community, including three (3) new industrial type buildings, a retail gas outlet with a restaurant and car wash, and associated parking areas for the overall site are proposed. The existing barn structure will be maintained and be incorporated into the proposed development. A third driveway access will be provided along Old Brock Road, and a new access driveway will connect the site to Brock Road. The existing wetland will be maintained. The Development Concept Plan and Pre-Consultation Meeting Minutes, dated January 15, 2016, are provided in **Appendix A.**

# 2.0 FUNCTIONAL SERVICING

The site shall be constructed and serviced in accordance to City of Pickering and Region of Durham design standards and ORMCP polices.

## 2.1 STORM DRAINAGE

Under existing conditions, the site sheet drains south towards the wetland situated at the southeast corner of the site. Additionally, Old Brock Road major flows which enter the site through the southwestern boundary drain easterly across the site and into an existing wetland feature.

Existing drainage patterns will be maintained and attenuated in accordance to ORMCP policies. An overland flow channel south of the proposed dry pond is provided to ensure portions of Old Brock Road major/minor storm conveyance to the wetland is maintained as observed under pre-development conditions.

Onsite minor system flows will be captured via catch basins and directed towards the proposed dry pond located west of the existing wetland. Major flows are directed to the pond via overland relief, which has been accommodated by the proposed grading plan. The storm system throughout the proposed site has been designed to convey 100-year peak flows to prevent localized major storm runoff from spilling onto Brock Road (uncontrolled) and to ensure all onsite major system drainage will be directed toward the proposed stormwater management dry pond.

Stormwater management is discussed in further detail in **Section 3.0**

The Conceptual Grading Plan (C-101) and Servicing Plan (C-102) are provided in **Appendix B.**

## 2.2 SANITARY

Currently no municipal sanitary system exists along roads adjacent to the site and the existing buildings are serviced by onsite septic beds. The proposed development will be supported by a larger septic bed situated at the southwest corner of the site, and all existing onsite septic beds will be decommissioned as part of the future development.

The proposed septic system has been preliminarily sized by FlowSpec Engineering (septic subconsultant) for the peak site sanitary load of 17,000 L/day as per OBC Table 8.2.1.3.B. It is our understanding the carwash output will not contribute to the septic load, as it is anticipated to contain higher concentrations of inorganic Total Suspended Solids (TSS), which has the potential to adversely affect the proposed septic bed. As such, car wash wastewater will be stored, recycled and ultimately hauled offsite, as required.

A private sanitary network will deliver site sanitary flows to the septic bed. Individual services to buildings will be sized at detailed design in coordination with building mechanical engineers.

A supporting engineering design memorandum outlining the conceptual onsite sewage disposal system is provided in **Appendix C**. The Conceptual Servicing Plan (C-102) is provided in **Appendix B**.

## 2.3 WATER

Currently no municipal watermain system exists along roads adjacent to the site and the existing buildings are serviced by onsite supply wells. The proposed development will be supported by a larger well situated in the northernmost portion of the site, and all existing wells will be decommissioned.

Water storage tanks adjacent to the well shall be sized to have capacity for domestic as well as firefighting purposes at the detailed design stage. Buildings and standpipes distributed throughout the site will be serviced for domestic and fire by a private water network. Individual services to buildings will be sized at detailed design in coordination with building mechanical engineers.

The peak site domestic load is estimated to be 0.31 L/s (26,980 L/day) in accordance to the Region of Durham Design Specifications for watermains. Fire Underwriters Survey (FUS) calculation yields a required firefighting flow estimate of 3000 (USGPM) for the development. Although the proposed buildings may be equipped with sprinkler systems, as the existing barn is not equipped with a sprinkler system, no sprinkler protection credit was used to calculate fire flow demand for the site, particularly since the barn is adjacent to the gas station. A more in-depth assessment of necessary firefighting flow estimates can be conducted at the detailed design stage.

Water calculation sheets are provided in **Appendix D**. The Conceptual Servicing Plan (C-102) is provided in **Appendix B**.

## 2.4 GRADING

The site is located within an area of Landform Conservation in the ORMCP. Specifically, MNR technical paper #4 "Landform Conservation on The Oak Ridges Moraine" defines classification. As demonstrated in the Site Slope Analysis in **Appendix A**, 17% of the existing site slopes are steeper than 10%. This falls under the minimum requirement of 20%. This renders the site exempt from the Landform Conservation Policy (section 30) set out by the ORMCP.

The existing site falls southerly at a vertical relief of close to 17 meters over a distance of 450 meters. It is our understanding the last earthworks activity was in the late 1970's when fill from north end of the site was placed at the south end where the current embankment at the southwest corner of the site resides (refer to *Preliminary Geotechnical/Hydrogeological Report*).

Site grading is done in a fashion to avoid major earth moving and alterations to existing general topography, and majority of site elevations are close to existing in keeping with ORMCP Conservation Polices. Preliminary earthworks analysis suggests that there will be approximately 25,760 $m^3$ of cut and 15,900 $m^3$ of fill operation involved, yielding a net export volume of 9,860 $m^3$, to achieve the proposed grading presented herein. This analysis assumes existing fill onsite is suitable for reuse. A more accurate earthworks analysis will be carried out at detailed design, which will account for whether existing fill is suitable for reuse or not and if any surplus materials may be utilized locally, as per ORMCP section 36. As outlined in the Preliminary Geotechnical/Hydrogeological Report, onsite soils toward the south/central portion of the property are loosely compacted and anticipated to contain some organic materials.

The steep site topography has created challenges in matching boundary grades; as such, 8% to 10% driveways have been utilized to ensure gradients within site parking areas remain within reasonable limits. The occasional exposed foundation and retaining walls have also been conceptually applied to maintain workable slopes within site and to avoid foundation steps.

The Conceptual Grading Plan (C-101) is provided in **Appendix B**.

## 2.5 EROSION CONTROL

Prior to the initiation of any construction within the site, a comprehensive Erosion and Sediment Control (ESC) Plan acceptable to the City of Pickering, Region of Durham, and ORMCP policies will be implemented. Appropriate drawings will be prepared at the detailed design stage and submitted to the Agencies for review and approval.

The ESC plans will include all necessary siltation control facilities and will be designed in accordance with the current Agency guidelines.

Below is a list of recommended erosion and sediment control measures that should be further investigated at the detailed design stage for suitability during construction of the Subject Site:

- Temporary sediment control fences, and tree protection fences (if required) installed prior to grading;
- Temporary swales throughout site along with rock check dams;
- Seed temporary topsoil stockpiles to prevent wind erosion (if required);
- All proposed open space areas will be restored/stabilized as per the landscape restoration planting plan(s), to be prepared at the detailed design stage, upon completion of grading; and

- All temporary erosion and sediment control measures should be routinely inspected and repaired during construction. Temporary controls will not be removed until the areas they serve are restored and stable.

An Erosion and Sediment Control Plan should be prepared at the detailed design stage, in accordance with the *Erosion & Sediment Control Guidelines for Urban Construction* (TRCA, 2006).

# 3.0 STORMWATER MANAGMENT

## 3.1 BACKGROUND AND DESIGN CRITERIA

This FSR has been prepared in accordance with or using information from the following reports and documents:

- "*Natural Heritage Evaluation Report and Oak Ridges Moraine Conformity Evaluation*", prepared by Stantec Consulting Ltd., dated August 13, 2024;
- "*Preliminary Geotechnical/Hydrogeological Report*", prepared by Stantec Consulting Ltd., dated January 17, 2019;
- "*Oak Ridges Moraine Conservation Plan", prepared by the Government of Ontario, dated 2017;*
- "*The Living City Policies", prepared by the Toronto and Region Conservation Authority, dated November 28, 2014.*
- "*Addendum: Duffins Creek Hydrology Update – Stormwater Management Criteria for Non-Seaton Development Lands*", prepared by Aquafor Beech for the TRCA, dated May 23, 2013;
- "*2012 Duffins Creek Hydrology Update – Final Report",* prepared by Aquafor Beech for the City of Pickering, dated February 11, 2013;
- "*Stormwater Management Criteria",* prepared by the Toronto and Region Conservation Authority, dated August 2012;
- "*Stormwater Management Planning and Design Manual*" (SWMPDM), prepared by the Ministry of the Environment, dated March, 2003;
- "*Low Impact Development Stormwater Management Planning and Design Guide*" (LID Manual), prepared by the Credit Valley Conservation and Toronto and Region Conservation, dated 2010; and
- "*Stormwater Management Design Guidelines*", prepared by the City of Pickering, July 2019.

In addition to the above noted documents, considerations from Transport Canada with the future potential of a Pickering Airport have also been considered in this conceptual SWM design. The SWM design was updated to address comments from the City of Pickering (dated May 2022) on the original Zoning By-Law Amendment application.

Based on the above noted documents, the required SWM controls for the Site currently include the following:

- Generally maintain existing flow patterns;
- Prevent increases in stream channel erosion by providing erosion control to consist of the 25 mm 4 hour Chicago storm released over a period of 24 hour to 48 hour period. In addition, at a minimum, retain 5 mm onsite;
- Prevent increases in flood risk by controlling post-development flows to pre-development levels for the greater storage requirement of 1) 2-year through 100-year storm events using both 1 hour and 12 hour AES storms with the City of Pickering's rainfall Intensity-Duration-Frequency (IDF) data (City of Pickering); or the unit release rates presented within Table 8.1 of the "Addendum: Duffins Creek Hydrology Update" (TRCA)
- Protect water quality by providing enhanced water quality (80% total suspended solids removal) through a treatment train approach that may include:
    - Lot level controls such as devices and designs that direct roof discharge to ponding areas;
    - Conveyance controls such as grassed swales; and,
    - End-of-pipe controls.
- Maintain a 'water balance' by ensuring post-development runoff volumes will mirror pre-development conditions;
- Due to the site's proximity to a potential future Pickering Airport, the site may not utilize a wet SWM pond due to safety concerns associated with water dwelling birds; and,
- Maintain groundwater quantity and flow by providing onsite retention to match existing stormwater infiltration volumes without the use of rapid infiltration basins or columns.

## 3.2 EXISTING CONDITIONS

### 3.2.1 Drainage

Under existing conditions the site sheet drains south towards the wetland situated at the southeast corner of the site (refer to **Figure 3.1**). Within the site area, there are three existing buildings with a total approximate footprint area of 0.16 ha, the remainder of the site is undeveloped. Under existing conditions, the weighted runoff coefficient is approximately 0.27.

External to the site are three main external drainage areas:

1. Northwest External Drainage Area – 1.55 ha consisting of open land to the north of Uxbridge Pickering Townline, the Old Brock Road/Brock Road/Uxbridge Pickering Townline intersection, and the western side of Brock Road that drains to a roadside ditch;

2. West External Drainage Area – 0.63 ha consisting of the eastern side of Old Brock Road draining to a roadside ditch and through the site; and,

3. South External Drainage Area – 0.76 ha consisting of the lands to the south of the site that sheet drain toward the existing onsite wetland.

Under existing conditions, the total drainage area to the onsite wetland is approximately 7.52 ha with a weighted runoff coefficient of 0.34. The existing release rate at the onsite wetland outlet (1,050 mm diameter CSP culvert underneath Brock Road) was modeled in Visual OTTHYMO (VO6). Peak-flow rates should not increase from pre-development levels under post-development conditions. A summary of flows at the site outlet underneath Brock Road is presented in **Table 3.1**.

### Table 3.1 – Site Outlet Release Rates

| Storm | Release Rate ($m^3/s$) |
|---|---|
| 25mm 4hour | 0.181 |
| 2 Year 1 Hour AES Storm | 0.269 |
| 2 Year 12 Hour AES Storm | 0.273 |
| 5 Year 1 Hour AES Storm | 0.418 |
| 5 Year 12 Hour AES Storm | 0.362 |
| 10 Year 1 Hour AES Storm | 0.515 |
| 10 Year 12 Hour AES Storm | 0.421 |
| 25 Year 1 Hour AES Storm | 0.664 |
| 25 Year 12 Hour AES Storm | 0.499 |
| 50 Year 1 Hour AES Storm | 0.761 |
| 50 Year 12 Hour AES Storm | 0.555 |
| 100 Year 1 Hour AES Storm | 0.857 |
| 100 Year 12 Hour AES Storm | 0.61 |
| Regional | 0.835 |

The maximum headwater elevation at the existing 1,050 mm diameter CSP culvert underneath Brock Road will be approximately 272.14 m during the 1-hour 100-year AES Storm. The resulting 100-year headwater ponding area that would result (neglecting any reservoir storage routing) is illustrated on Conceptual Grading Plan (C-101). For calculations, refer to the summary provided in **Appendix E**.

Under proposed conditions, the two roadside ditches along Old Brock Road and Brock Road will not be re-graded as these are within public right-of-way areas; existing drainage patterns will be maintained in accordance to ORMCP polices. The development area has been graded to

ensure that Brock Road and Old Brock Road major/minor storm conveyance to the onsite wetland is maintained. No changes are proposed to the external drainage areas, patterns or conveyance systems.

Using VO6, the release rates for the external drainage areas leading to a roadside ditch were calculated for both the 1-hour and 12-hour 100-year AES storm events. For both drainage areas, the 1-hour 100-year AES storm had a higher peak runoff rate. This simulated runoff rate compared to the capacity of the roadside ditches, are presented in **Table 3.2**. VO6 modeling and a summary of results are included in **Appendix E**.

**Table 3.2 - Existing Capacity of Roadside Ditches**

| Roadside Ditch | Capacity ($m^3/s$) | Required ($m^3/s$) |
|---|---|---|
| West – Upstream | 1.26 | 0.226 |
| West – Downstream | 0.52 | |
| East – Upstream | 4.97 | 0.223 |
| East – Downstream | 26.38 | |

As noted, the roadside ditches can convey the external drainage around the site. As such, no modifications to the roadside ditches will be necessary to address any existing drainage deficiencies. For an illustration of the existing drainage pattern, refer to **Figure 3.1**.

### 3.2.2 Soils Conditions

Based on the *Preliminary Geotechnical/Hydrogeological Report*, the existing soils consist of topsoil with a base of silty clay fill. The geomean hydraulic conductivity of the soils is $4.3 \times 10^{-7}$ m/s. Per Table 2 "Approximate Relationship of Soil Types to Permeability and Percolation Time" within the 1997 Ontario Building Code, the soils have an approximate infiltration rate of less than 12 mm/hr.

## 3.3 PROPOSED STORMWATER MANAGEMENT PLAN

Under proposed conditions, the site has a development area of 3.20 ha consisting of a 2.89 ha commercial development, 0.27 ha SWM pond and 0.04 ha of uncontrolled drainage. The remainder of the site, 1.85 ha in area, consisting of steeper slopes and the onsite wetland, will remain undeveloped at this time. A breakdown of the development area is presented in **Table 3.3**. For details regarding the drainage areas, refer to **Figure 3.2**.

**Table 3.3 – Proposed Development Area**

| Zone | Area (ha) | Runoff Coefficient |
|---|---|---|
| Commercial | 2.89 | 0.90 |
| SWM Pond | 0.27 | 0.60 |
| Uncontrolled | 0.04 | 0.90 |
| Total Development | 3.20 | 0.87 |

Due to grading constraints, a small 0.04 ha area of the site consisting of a site entrance and drive aisle cannot be controlled by the SWM pond; however, the onsite stormwater management pond will provide the required 'over control' to ensure that post-development controls satisfy pre-development rates at the site outlet underneath Brock Road.

The SWM strategy outlined herein is resilient against the potential future effects of Climate Change, for the following reasons:

- The Site is not immediately adjacent to a regulated watercourse and is positioned at the very upstream limit of the drainage catchment divide. As such, there will be no increased risk of surface flooding from potential future increasing flows along the riverine system since the nearest regulated watercourse is located much further downstream from the property;
- Onsite minor system drainage has been sized using present day municipal design standards. If there is a preference to adopt a higher-level drainage design standard to account for the potential future effects of Climate Change, then this can be further discussed at the detailed design stage. However, it should be noted that the proposed minor system will not collect basement foundation drains (only subdrains along slab-on-grade construction and storm sewer). As such, the onsite minor system drainage is at very low risk to the potential future effects of Climate Change;
- The Site is comprised of moderately sloping terrain (north to south), which provides excess overland (major system) drainage conveyance capacity across the property and toward the site outlet.

### 3.3.1 Stormwater Quality

Quality control for the Site will be provided via a treatment train approach consisting of an Oil/Grit Separator (OGS), dry SWM pond, and vegetated swale, which will cumulatively exceed the MOECC water quality treatment requirements for Level 1 (80% TSS Removal Efficiency). The use of an OGS, dry pond and vegetated swale in combination meets the City of Pickering's requirements that dry ponds shall not be used as a stand-alone treatment system. In addition, an Oil-Water Separator will be installed to pre-treat runoff from surface areas in the immediate vicinity of the proposed gas station location. Preliminary OGS sizing for the site recommends the Stormceptor EFO8. OGS details are provided in **Appendix E**.

The extended detention volume for the dry pond (753 $m^3$) was found by multiplying the runoff volume for the 25 mm 4-hour event by the total area controlled by the pond. This exceeds the 657 $m^3$ of pond storage used during the 25 mm 4-hour event. For details, refer to calculations in **Appendix E**. At the detailed design stage, the use of vegetated filter strip, grass swales with stormwater retention zones, infiltration trenches, rooftop discharge to ponding areas, and sand filters as part of an extended treatment train approach will be further explored.

### 3.3.2 Stormwater Quantity

Stormwater quantity control for the Site will be provided by a dry SWM pond located at the southern edge of the site adjacent to the wetland. The SWM pond will treat/control flows to pre-development conditions at the site outlet underneath Brock Road. The SWM pond has been designed in general accordance with Table 4.8 in the MOECC's SWMPDM. The pond was designed as follows:

- An 825 mm diameter inlet pipe with an invert of 274.10 m;
- A pond forebay bottom of 274.10 m and main cell bottom of 274.60 m
- A top of 276.05 m;
- 3:1 side slopes;
- A maintenance access location to the north of the forebay at a road stub;
- A sediment drying area at the east side of the pond block;
- Erosion control and active storage volume are controlled by a Hickenbottom outlet leading to two orifices plate within an outlet control manhole;
- The control manhole outlets to a pre-cast headwall complete with a level spreader designed to promote sheet flow toward the onsite wetland; and
- Emergency overflow provided by a broad crested weir (4.90 m crest length) with freeboard between the maximum flow depth and the top of the SWM pond berm.

Using VO6, the release rates for each storm event and each catchment were calculated. The 25 mm 4 Hour Chicago storm was used to calculate the required erosion and sediment control volume and release rate. Per VO6, the site requires 657 $m^3$ of storage with a maximum release rate of 0.011 $m^3/s$ (an average release rate of 0.0055 $m^3/s$); resulting in a drawdown time of ~33.2 hours (greater than the minimum 24 hour drawdown time required). This meets the requirement of preventing increases in stream channel erosion. The extended detention water level has an elevation of 274.87 m. A summary of the existing and proposed, 2-year and 100-year storm event runoff rates for the full site area of 4.58 ha (includes the undeveloped lands) is presented in **Table 3.4**.

**Table 3.4 – Site Release Rates**

| Storm | Existing Release Rate ($m^3/s$) | Proposed Release Rate ($m^3/s$) | Difference Runoff ($m^3/s$) |
|---|---|---|---|
| 25mm 4hour | 0.069 | 0.054 | -0.015 |
| 2 Year 1 Hour AES Storm | 0.107 | 0.088 | -0.019 |

| | | | |
|---|---|---|---|
| 2 Year 12 Hour AES Storm | 0.139 | 0.092 | -0.047 |
| 5 Year 1 Hour AES Storm | 0.170 | 0.146 | -0.024 |
| 5 Year 12 Hour AES Storm | 0.187 | 0.139 | -0.048 |
| 10 Year 1 Hour AES Storm | 0.213 | 0.194 | -0.019 |
| 10 Year 12 Hour AES Storm | 0.218 | 0.169 | -0.049 |
| 25 Year 1 Hour AES Storm | 0.266 | 0.255 | -0.011 |
| 25 Year 12 Hour AES Storm | 0.257 | 0.206 | -0.051 |
| 50 Year 1 Hour AES Storm | 0.306 | 0.300 | -0.006 |
| 50 Year 12 Hour AES Storm | 0.287 | 0.235 | -0.052 |
| 100 Year 1 Hour AES Storm | 0.346 | 0.345 | -0.001 |
| 100 Year 12 Hour AES Storm | 0.315 | 0.262 | -0.053 |
| Regional | 0.481 | 0.634 | 0.153 |

As noted in the above table, the proposed site release rate has remained the same as, or decreased from, the existing site conditions through the 100-year storm event. This meets the requirement of preventing increases in downstream flood risk within the watershed.

To achieve the above noted release rates, the dry SWM pond was sized to match existing storm release rates; this was done for all storm events. Following the City of Pickering's requirement that quantity control volume be stacked on extended detention volume, the pond volume shall be greater than 2,399 $m^3$ (the sum of the extended detention volume and the 100-year, 12 hour AES storm volume). Within the site, a total pond volume of 3,172 $m^3$ between an elevation of 274.10 m and 276.05 m, has been provided; this exceeds the total required volume for extended detention and active storage.

### Table 3.5 – Dry Pond Release Rates and Volume

| Storm | Release Rate ($m^3/s$) | Pond Volume ($m^3$) | Water Level (m) |
|---|---|---|---|
| 25mm 4hour | 0.011 | 657 | 274.87 |
| 2 Year 1 Hour AES Storm | 0.012 | 685 | 274.88 |
| 2 Year 12 Hour AES Storm | 0.035 | 941 | 275.02 |
| 5 Year 1 Hour AES Storm | 0.034 | 932 | 275.01 |
| 5 Year 12 Hour AES Storm | 0.057 | 1,132 | 275.12 |
| 10 Year 1 Hour AES Storm | 0.051 | 1,092 | 275.10 |
| 10 Year 12 Hour AES Storm | 0.071 | 1,248 | 275.18 |
| 25 Year 1 Hour AES Storm | 0.074 | 1,286 | 275.20 |
| 25 Year 12 Hour AES Storm | 0.09 | 1,405 | 275.26 |
| 50 Year 1 Hour AES Storm | 0.092 | 1,429 | 275.27 |
| 50 Year 12 Hour AES Storm | 0.105 | 1,526 | 275.32 |
| 100 Year 1 Hour AES Storm | 0.109 | 1,569 | 275.35 |

| | | | |
|---|---|---|---|
| 100 Year 12 Hour AES Storm | 0.119 | 1,646 | 275.39 |
| Regional | 0.432 | 2,079 | 275.62 |

The 100-year water elevation is 275.39 m which allows for 0.66 m of freeboard to the top of pond (276.05 m). For VO6 input/output calculations, refer to the detailed calculations in **Appendix E.**

Conceptual details of the pond access road, sediment drying area, fencing, signage, lining requirements and details of the outlet structure will be provided at detailed design. Emergency spillway sizing calculations for the broad crested weir are provided in **Appendix E**.

Under proposed conditions, the total drainage area to the onsite wetland is 7.52 ha with a weighted runoff coefficient of 0.59; this is the same overall contributing drainage area as observed under the existing (present day) conditions. The proposed release rate from the wetland was modeled in VO6 and was compared to the existing release rates. The results are presented in **Table 3.6.**

**Table 3.6 – Proposed Release Rates at Wetland**

| Storm | Existing Release Rate ($m^3/s$) | Proposed Release Rate ($m^3/s$) | Difference Runoff ($m^3/s$) |
|---|---|---|---|
| 25mm 4hour | 0.181 | 0.169 | -0.012 |
| 2 Year 1 Hour AES Storm | 0.269 | 0.254 | -0.015 |
| 2 Year 12 Hour AES Storm | 0.273 | 0.226 | -0.047 |
| 5 Year 1 Hour AES Storm | 0.418 | 0.392 | -0.026 |
| 5 Year 12 Hour AES Storm | 0.362 | 0.314 | -0.048 |
| 10 Year 1 Hour AES Storm | 0.515 | 0.484 | -0.031 |
| 10 Year 12 Hour AES Storm | 0.421 | 0.371 | -0.050 |
| 25 Year 1 Hour AES Storm | 0.664 | 0.640 | -0.024 |
| 25 Year 12 Hour AES Storm | 0.499 | 0.449 | -0.050 |
| 50 Year 1 Hour AES Storm | 0.761 | 0.742 | -0.019 |
| 50 Year 12 Hour AES Storm | 0.555 | 0.504 | -0.051 |
| 100 Year 1 Hour AES Storm | 0.857 | 0.843 | -0.014 |
| 100 Year 12 Hour AES Storm | 0.610 | 0.557 | -0.053 |
| Regional | 0.835 | 1.028 | 0.193 |

For all storm events through the 100-year event, the release rate from the wetland has not increased. As such, the development meets the requirement of preventing increasing in flood risks within the watershed.

### 3.3.3 TRCA Design Criteria

The site is located in Catchment Number 51 of the TRCA's "Addendum: Duffins Creek Hydrology Update – Stormwater Management Criteria for Non-Seaton Development Lands". Table 8.1 prescribes unit flow release rates based on site and impervious site areas, which are identified as 'TRCA Revised' in the table below. The original TRCA unit-release rate criteria are also provided for reference (TRCA SWM Criteria, 2012). Once scaled to the site, the release rates were found to be much lower than the computed existing release rates for the site (refer to **Table 3.7** below).

**Table 3.7 – TRCA Release Rates**

| Return Period | Release Rate ($m^3/s/ha$) | | | TRCA Release as % of Existing | |
|---|---|---|---|---|---|
| | Stantec Existing | TRCA Original | TRCA Revised | TRCA Original | TRCA Revised |
| 2 Year | 0.030 | 0.009 | 0.008 | 30% | 26% |
| 100 Year | 0.069 | 0.032 | 0.029 | 47% | 42% |

As noted in the above table, the TRCA's Revised release rates range from 26% to 42% of the existing conditions release rates. It should be noted that the existing site is comprised of ~97% pervious cover. As such, the TRCA criteria were not used in support of the conceptual site design as they were deemed to be too conservative and given the conceptual site design already accommodates a post-development to pre-development peak flow reduction for all

the storm events simulated. In the event that the TRCA insists that background unit-rates be abided by, then the onsite dry pond will need to incorporate an additional 1,500 $m^3$ (an increase of 121% from the proposed design concept) of active detention storage at the detailed design stage, which would require the development concept to be modified in/around the dry pond at that time.

### 3.3.4 Water Balance & Erosion Control

In order to address the TRCA's water balance criteria (TRCA SWM Criteria, 2010) and the ORMCP Subsection 24(8)iii, an annual water balance was calculated using the Thornthwaite and Mather (1955) method for both the pre-development and (unmitigated) post-development conditions. The calculations applied Environment Canada's climate normal from Pearson Airport from 1981 to 2010. As the site's impervious area will increase as a result of the proposed development, the unmitigated site runoff volume will increase; with a corresponding decrease in infiltration and evapotranspiration.

The annual reduction in site infiltration as a result of an unmitigated development is approximately 2,132 $m^3$/year across the 4.37 ha site. The total pre-development infiltration volume is approximately equivalent to 10.7% of the total annual precipitation. The moderately sloped existing conditions topography and low permeability soils appear to be cause of the lower existing conditions infiltration fraction. Refer to **Appendix E** for water balance calculations.

As outlined in the City of Toronto's Wet Weather Flow Management Guidelines (Figure 1a), 10.7% of the total annual precipitation would equate to capturing and infiltrating events up to and including a ~ 1mm to 2 mm discrete rainfall event across the 4.37 ha site. However, despite this minimum requirement to satisfy water balance, the TRCA's current minimum erosion control criteria includes the onsite retention of 5 mm, which will exceed the post-development to pre-development water balance target noted above.

Various infiltration practices will be explored at the detailed design stage to satisfy the governing erosion control requirement and ORMCP water conservation. Practices may include but will not necessarily be limited to the use of vegetated filter strips, surface infiltration measures, subsurface infiltration measures, onsite water reuse measures, grass swales with stormwater retention zones. Rapid infiltration basins and columns will not be considered.

Further information related to the characterization of existing underlying groundwater conditions can be found in the separately prepared document entitled, *Preliminary Geotechnical/Hydrogeological Report* (Stantec, January 2019). Further information related to the characterization of existing and proposed surface water systems can be referenced in Subsection 3.2 and Subsection 3.3 herein, respectively.

# 4.0 CLOSURE

This report describes the overall site grading, servicing and SWM strategy to functionally service the proposed development in support of a Zoning By-Law Amendment application with the City of Pickering. It also demonstrates planning, design and construction practices that ensure that no buildings or other site alterations impede hydrological functions etc. as per Section 20 (Supporting Connectivity) of the ORMCP. This report also demonstrates that the site can be developed in conformance with Section 24 (Watershed Plans) of the ORMCP as relevant background, agency-imposed Watershed Planning criteria for Duffins Creek have been fully considered as part of the conceptual SWM design outlined herein.

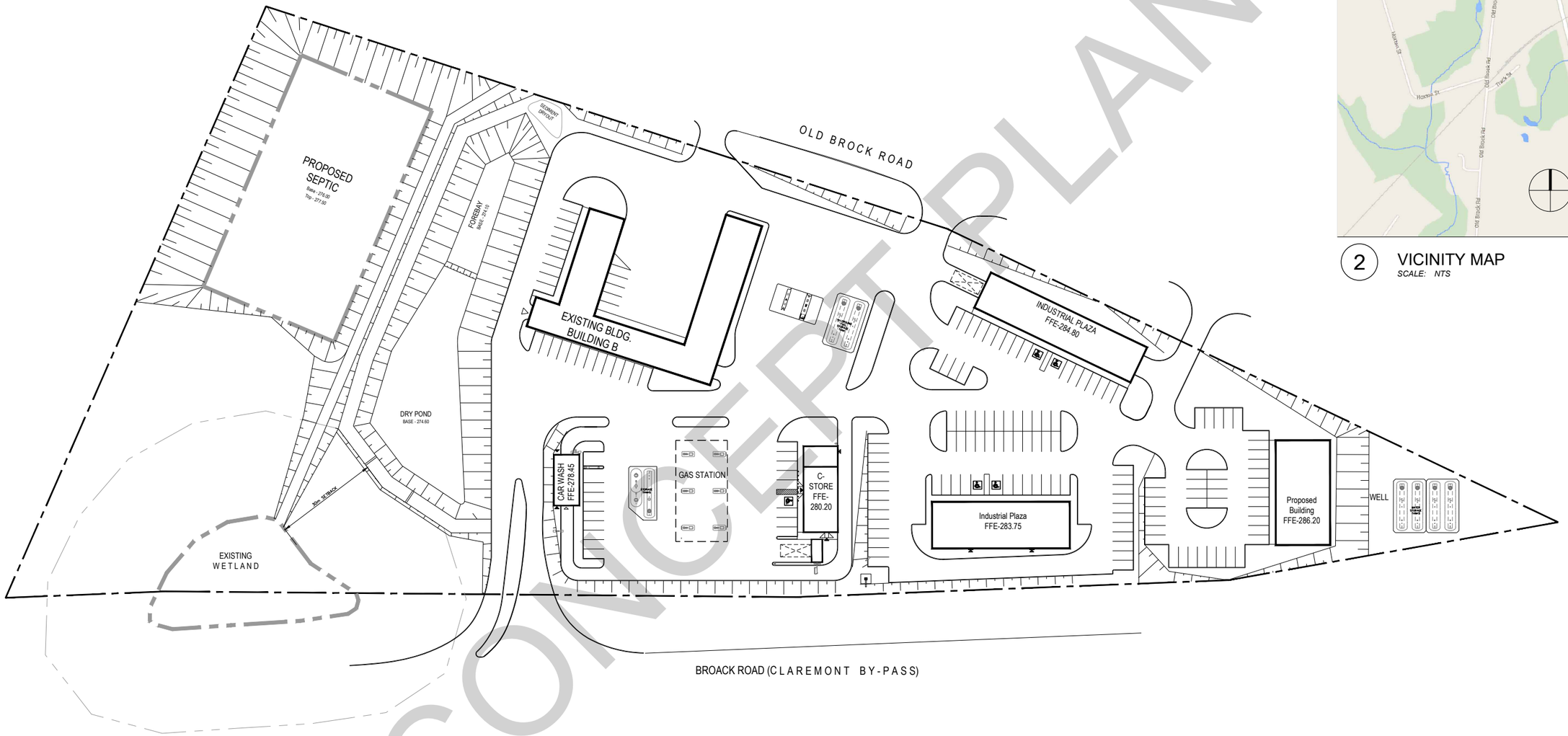
An analysis of the existing site topography demonstrates the site is exempt from the Landform Conservation Policy set out by the ORMCP. Grades under the post-development condition will be set to maintain much of the existing general topography of the site in keeping with ORMCP policies.

No municipal sanitary system exists adjacent to site to serve as an outlet. Site sanitary will drain via a private sewer network to a septic system that is contemplated near the southwest corner of the site. Carwash output will not contribute to the septic load as it will be stored and regularly hauled offsite. Since the site will not discharge treated sanitary effluent to surface water, no assimilative capacity of the downstream watercourse is necessary.

No municipal water system is currently available adjacent to site to service the development. A proposed private well located at the northernmost point of the site will service the site for domestic and fire through a private water network. A separate, *Preliminary Geotechnical/Hydrogeological Report* (Stantec, January 2019), has been prepared which outlines the underlying groundwater conditions on the subject property and provides a recommendation for a future onsite water supply well. Water conservation measures can be explored further at the detailed design stage to potentially reduce groundwater consumption, as desired.

As outlined herein, existing drainage patterns will be maintained and attenuated in accordance to ORMCP polices. Current Old Brock Road major/minor flow conveyance to the wetland southeast of the site will be preserved. Onsite major/minor flows will be captured and controlled in a proposed dry pond. An onsite oil-grit separator in combination with a dry pond and vegetated swale outlet will exceed the minimum requirements for onsite water quality treatment. A proposed dry pond will capture and detain surface water runoff to pre-development levels. A variety of infiltration measures will be explored at the detailed design stage to ensure the onsite retention of a 5 mm storm will be achieved to satisfy and exceed imposed erosion control and water balance criteria, respectively.

# Appendix A BACKGROUND INFORMATION




1 SITE PLAN

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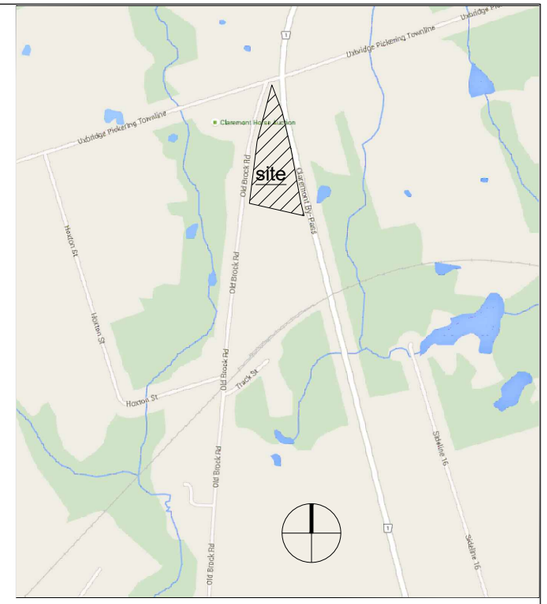



2 VICINITY MAP

*SCALE: NTS*

*TRUE NORTH* *CONSTRUCTION NORTH*



CARICARI LEE ARCHITECTS
113 Miranda Avenue
Toronto, ON M6B 3W8
t/ 416 962 9670
f/ 416 962 9671
e/ info@caricarilee.com

**PROJECT NAME :**
Claremont North Business Park
Old Brock Road & Brock Road, Claremont, ON

**DRAWING TITLE :**
PROPOSED CONCEPT PLAN

| DATE | No. | ISSUE |
|---|---|---|
| 2024 APR 22 | 01 | ISSUED FOR PRELIMINARY REVIEW |

NOTES:

CONTRACTOR TO VERIFY ALL DIMENSIONS ON THE SITE AND REPORT ANY DISCREPANCY TO THE ARCHITECT BEFORE PROCEEDING WITH THE WORK.

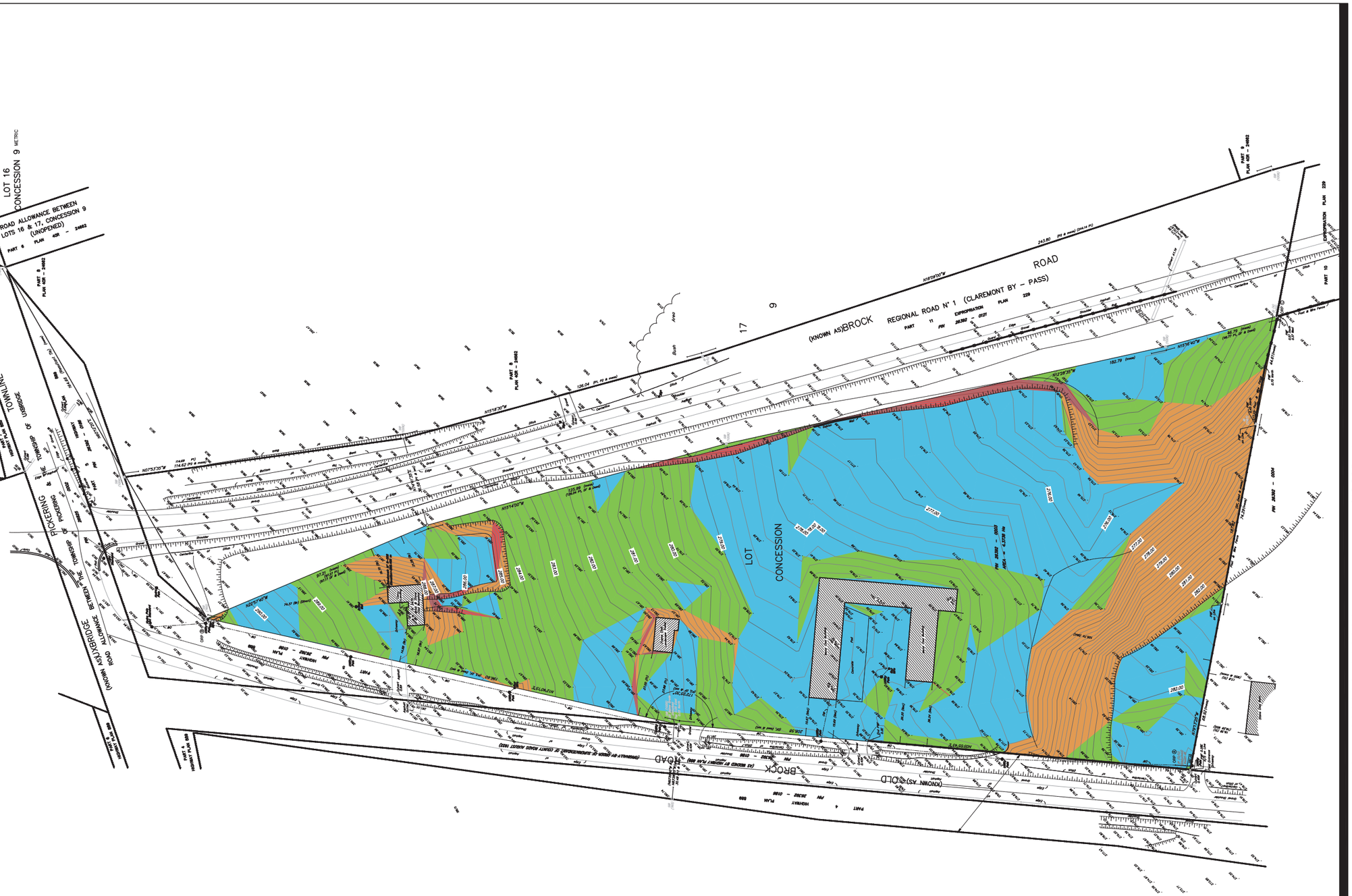
ALL DRAWINGS ARE THE PROPERITY OF THE ARCHITECT AND MUST BE RETURNED AT THE COMPLETION OF WORK.

THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION UNTIL COUNTERSIGNED.

| | |
|---|---|
| **SCALE :** | AS SHOWN |
| **PROJECT NO. :** | 15003 |
| **DATE :** | MAR. 2017 |
| **DRAWN :** | AD |
| **CHECKED :** | JC |

**REVISION NO. :**

**DWG. NO. :**
A1.0


ROAD ALLOWANCE BETWEEN LOTS 16 & 17, CONCESSION 9 (UNOPENED)
LOT 16 CONCESSION 9 METRIC
LOT 17 CONCESSION 9
(KNOWN AS)BROCK REGIONAL ROAD N° 1 (CLAREMONT BY – PASS)
BROCK ROAD (AS WIDENED BY PLAN 369R-0168)
(KNOWN AS) OLD BROCK ROAD
PICKERING TOWNSHIP BOUNDARY
(KNOWN AS) TOWNLINE BETWEEN THE TOWNSHIP OF PICKERING & THE TOWNSHIP OF UXBRIDGE
PART 2 PLAN 40R-24682
PART 8 PLAN 40R – 24682
PART 9 PLAN 40R – 24682
PART 10 PLAN 229
EXPROPRIATION PLAN 229
PART 11 PIN 26382 – 0127
PART 4 PLAN 369R – 0168
PART 5 PLAN 369R – 0168
PART 1 PLAN 369R – 0168
PART 2 PLAN 369R – 0168
PART 3 PLAN 369R – 0168
PART 1 PLAN 40R – 24682
PART 2 PLAN 40R – 24682
PART 3 PLAN 40R – 24682
PART 4 PLAN 40R – 24682
PART 5 PLAN 40R – 24682
PART 6 PLAN 40R – 24682
PART

# Minutes/Meeting Summary

**Pre-consultation Meeting**
January 15, 2016
11:00 am - 12:00 pm
Engineering & Public Works Meeting Room

Subject: 5435, 5455 & 5475 Old Brock Road
Part 1 of Part of Lot 17, Concession 9, City of Pickering

Applicant: Rosemarie L. Humphries
Humphries Planning Group Inc.

Attendees: Karl Kiproff – Region of Durham, Health Department
Rosemarie Humphries – Humphries Planning Group
Shaun Larkin – S. Larkin Developments Inc.
Steven Strong – Toronto and Region Conservation Authority (TRCA)

Nilesh Surti – Manager, Development Review & Urban Design
Déan Jacobs, Principal Planner - Policy
Paal Helgesen – Development Engineer
Irina Marouchko – Water Resources Engineer
Kyle Bentley – Chief Building Official
Adam Fowler – Fire Inspector
Rob Watson – Fire Inspector

| **Item** | **Details & Discussion & Conclusion** (summary of discussion) | **Action Items /Status** |
|---|---|---|
| **Proposal** | To permit a retail gas outlet with an accessory restaurant use and an associated automatic car wash, and to formalize the existing employment uses on the site. | |
| **Type of Applications** | Zoning By-law Amendment (Major)<br>**Note**: A separate pre-consultation meeting will be held for any subsequent application for Site Plan Approval. | |
| **Discussion** | **Humphries Planning & S. Larkin**<br>The site currently contains buildings being used for machinery sales/repair, landscape storage/sales and indoor/outdoor storage, as well as a single detached dwelling and a trailer.<br><br>The current proposal is to apply for a zoning by-law amendment to permit a retail gas outlet with an accessory restaurant use and an associated automatic car wash, and to formalize the existing employment uses on the site. The proposal also includes a truck fill.<br><br>Over time, the intention is to introduce commercial uses on the site also. | |

| Item | Details & Discussion & Conclusion (summary of discussion) | Action Items /Status |
|---|---|---|
| | It was clarified that although the property in question has three municipal addresses, it is legally one property.<br><br>The property was leveled in 1974/1975 and does not reflect any landform conservation characteristics.<br><br>**Steven Strong, Toronto and Region Conservation Authority (TRCA)**<br><br>The subject site is located within the TRCA Regulated Area of the Duffins Creek Watershed. The site is regulated with respect to its location within a wetland/wetland area of interference. As such, any proposed works on the subject site will be subject to the criteria of O.Reg. 166/06 and requires TRCA permit and planning approval.<br><br>As part of a Zoning By-law Amendment application, TRCA will require the following:<br><br>• Planning Rationale Report, demonstrating how the proposed land uses meets the intent of the Oak Ridges Moraine Conservation Plan, the Regional Official Pan, and the Pickering Official Plan<br>  ○ Regarding the identified Category 2 Landform Conservation area identified in the Pickering Official Plan, a short discussion regarding the location and nature of the historical disturbance of the landform and grading on the site needs to be contained in the Planning Rationale Report (If the site has been substantially graded in the past, the extent should be discussed to assist in the determination of conformity to the ORMCP Landform Conservation policies).<br>• Topographic Plan of Survey<br>• Proposed Site Plan<br>• Natural Heritage Evaluation<br>• Hydrogeological Study/ Water Balance Study<br><br>Standard Planning Review Fee: $7,350.00 – please confirm the fee at the time of submission.<br><br>**Paal Helgesen – City of Pickering, Engineering & Public Works (Development Review)**<br><br>The following reports will be required:<br><br>• Functional Servicing and Stormwater Report (FSSR)<br>• A brief regarding construction management, and erosion and sediment controls to be contained within the FSSR | |

| Item | Details & Discussion & Conclusion (summary of discussion) | Action Items /Status |
|---|---|---|
| | • A Geotechnical Report<br>• Traffic Impact Study (in accordance with the Region's Traffic Impact Study Guidelines). The City's Traffic Engineer shall review the proposed Terms of Reference for the Traffic Impact Study.<br><br>Reports are to be signed and stamped by a professional engineer.<br><br>**Irina Marouchko – City of Pickering, Engineering & Public Works (Water Resources)**<br><br>A Stormwater Management study and Functional Grading Plan is required. The stormwater management criteria for the site are as follows:<br>• Quality control – level 1<br>• Quantity control – as outlined in the Duffins Creek Hydrologic Update, 2012 (accessible on-line)<br>• Erosion Control - minimum of 5 millimeters (rainfall) on-site infiltration or retained<br><br>The Stormwater Management Study and Grading Plan are to be signed and stamped by a professional engineer.<br><br>Suggested that the owner investigates the use of stormwater for the proposed car wash use.<br><br>**Rob Watson & Adam Fowler, Pickering Fire Services**<br>• Detailed comments to be provided at Site Plan stage<br>• No on-site holding tank is required for firefighting purposes<br>• The proposed restaurant use will require a fire route – details contingent upon ultimate site and building configuration<br><br>**Karl Kiproff, Region of Durham – Health Department**<br><br>**Sewage Services**<br>• One-site sewage disposal system required<br>• If the sewage flow exceeds 10 000 liters a day, approval of the system is required from the Ministry of Environment and Climate Change<br>• Indicate location of existing sewage system, proposed area of new system, and reserve area in accordance with Regional Health requirements on Site Plan | |

| Item | Details & Discussion & Conclusion (summary of discussion) | Action Items /Status |
|---|---|---|
| | • Noted that it is uncommon to have a car wash facility on private services – waste water must be disposed through on-site sewage system<br><br>**Water Services**<br><br>• Private water supply system required<br><br>• Please indicate location of existing wells and proposed new wells on Site Plan (**note**: any abandoned wells need to be properly decommissioned)<br><br>• The private water supply is classed as a "Small Drinking Water System" under the Health Protection and Promotion Act, which will require regular inspections and reporting on the condition of the system and water quality<br><br>**Food Safety**<br><br>• Inspections regarding food and personal hygiene will be carried out by the Health Inspector of the Region on a regular basis. Detailed provisions regarding permits from the Region's Health Department will form part of the Building Permit stage.<br><br>**Heather Finlay - Region of Durham, Planning & Economic Development Department**<br>**(advised by email on January 14, 2016)**<br><br>Regional Official Plan Conformity: This property is designated "Hamlet" in Schedule 'B' – Map 'B3' of the Regional Official Plan. Hamlets are intended to provide opportunities for minor residential infill and small-scale industrial, commercial and institutional uses, subject to meeting the criteria of the Oak Ridges Moraine Conservation Plan, the Regional Official Plan and the City of Pickering Official Plan. As such, it appears that this proposal is generally in conformity with the Regional Official Plan.<br><br>**Studies**<br><br>• Archaeological Assessment – This property is within the Region's comprehensive archaeological potential model. Therefore, a Stage 1 Archaeological Assessment is to be completed by a Qualified Person (QP) at application submission. This study, and any further studies required by the QP must be completed and submitted to the Ministry of Culture, Tourism and Sport (MTCS) for their clearance letter(s). A copy of this documentation is to be sent to the Region for our records and clearance of the condition. | |

| Item | Details & Discussion & Conclusion (summary of discussion) | Action Items /Status |
|---|---|---|
| | • Site Screening Questionnaire (SSQ) – This form is part of a formal zoning application, and is to be completed by a QP to ensure that there is no potential for site contamination on or adjacent to the property. If there is any potential for contamination, a Record of Site Condition compliant Phase One Environmental Site Assessment (ESA), and any further studies (including a Record of Site Condition) may be required. Please note that all site contamination reports have a stale date of 18 months as per Ontario. Reg. 153/04.<br>• Hydrogeological Study – the Region will require a Hydrogeological Study, and may require the Peer Review of this study coordinated through our office, and the cost of this is solely borne by the applicant, in consultation with the TRCA.<br>**Fees**<br>• Zoning By-law Amendment Review Fee - $1,000.00<br>**Copies**<br>• five copies of the application and any information included in the zoning amendment submission<br>• two copies- Archaeological Assessment<br>• two copies - Site Screening questionnaire/Phase 1 ESA<br>**Peter Castellan - Region of Durham, Public Works Department**<br>**(advised by email on January 13, 2016)**<br>This section of Brock Road is classified as a ROD Type A arterial road with a minimum right-of-way of 36.0 m. It appears there is sufficient right-of-way in this area to meet this criteria.<br>The ultimate site plan configuration indicates two accesses to Old Brock Road and one access to Brock Road. Access to Brock Road will be dependent on the submission of a Traffic Impact Study. Please refer to the Region's Traffic Impact Study (TIS) Guidelines which can be found at durham.ca. The TIS shall also include a sight line analysis at the proposed Brock Road access.<br>Subject to review of the TIS, if access is deemed permissible by the Region, we would require the construction of auxiliary lanes to facilitate the ingress and egress of traffic on Brock Road. | |

| Item | Details & Discussion & Conclusion (summary of discussion) | Action Items /Status |
|---|---|---|
| | A stormwater management report would also be required for this site.<br><br>**Kyle Bentley - City of Pickering, Building Services**<br>• Detailed comments are to be provided at Site Plan and Building Permit stages<br>• Details regarding the existing wells may be required at the Building Permit stage<br><br>**Nilesh Surti & Déan Jacobs, City Development**<br><br>**Preliminary comments on Concept Site Plan**<br>Clarification is required as to whether the existing uses will continue to operate, in which case they need to be shown and included in the rezoning application and shown on the concept site plan (including vehicular access, parking, etc.), or that they will seize to exist and are to be demolished.<br><br>**Pickering Official Plan (POP) schedules and policy sections**<br>• Schedule 1 (Land Use Structure) designates the site "Oak Ridges Moraine Rural Hamlet", and Schedule IV-10 Settlement 10: Claremont – North Section designates the site "Hamlet Employment". Permissible uses within the "Hamlet Employment" designation include, among other things, "automotive uses" – see Table 17 in the POP.<br>• Section 15.38 of the POP states that within the urban area or within a rural hamlet, City Council may approve a site specific zoning by-law with appropriate provisions and restrictions, to permit a retail gasoline outlet in any land use designation except Open Space - Natural Areas, subject to certain criteria.<br>• Schedule III (Resource Management) designates the majority of site "Minimum Area of Influence" with "Minimum Vegetation Protection Zone" in part along the eastern boundary, because of the proximity to "Significant Woodlands (east, north and south of site) and "Wetlands" (west of site). (See requirements in section 15.41)<br>• Schedule VI (ORM Landform Conservation Areas): the lands fall within a Category 2 Landform Conservation Area (see requirements in section 15.40).<br><br>**The Restricted Area Zoning By-law 3037**<br>• Zones the site "Oak Ridges Moraine Agricultural (ORM-A)" Zone. This zone category does not permit a retail gasoline outlet. A rezoning application is therefore required. | |

| Item | Details & Discussion & Conclusion (summary of discussion) | Action Items /Status |
|---|---|---|
| | **Studies**<br>• Planning Rationale (Justification report)<br>  ○ Need to address conformity with the ORMCP and the policies in the Pickering and Regional Official Plans<br>  ○ Need to contain Sustainable Development Brief (See City's Sustainable Development Guidelines (2007)<br>  ○ Need to contain key findings & recommendations from background studies to inform the rationale<br>  ○ In terms of section 15.40 (Landform Conservation), the Planning Rationale Report needs to contain a short brief regarding the location and nature of the historical disturbance of the landform and grading on the site – also see Steven Strong's comments on this matter<br>• Natural Heritage Evaluation – see section 15.41 in the POP<br>• Hydrological Evaluation<br>• Site Suitability Study (See section 15.7 in the POP) – this can form part of the Functional Servicing and Stormwater Report<br>• Archaeological Assessment<br>• Traffic Impact Study (analysis to include Old Brock Road) **Note**: Region to circulate T.O.R. to City<br>• Site Screening and Phase 1 ESA<br>**Application Fee**<br>• Major Zoning By-law Amendment: $ 12,500.00 (subject to increase after April 2016)<br>**Other**<br>• One Digital (to scale) colour drawing of Concept Site Plan in high resolution (minimum dpi of 100)<br>• Survey of property<br>• 20 copies of application form and CD containing all reports and studies<br>To be noted is that community engagement is anticipated to be a key component of the planning process. Staff will consult with Regional and Local Ward Councillors regarding the need for a community open house. | |

| Item | Details & Discussion & Conclusion<br>(summary of discussion) | Action Items /Status |
|---|---|---|
| **Staff Recommendations** | • For more information on the City's Sustainable Development Guidelines Report, visit the website link below: http://www.pickering.ca/en/living/resources/mainreportfinalmay07developmentguidelines.pdf<br>• the Sustainable Development Guidelines for Plans of Subdivision and Zoning Amendment applications are provided below: http://www.pickering.ca/en/living/resources/appendixb-guideline2.pdf | |
| **Technical Reports Required** | • Please see attached Technical Report Checklist | |
| **Fees Requirement** | For the proposed development, the following fees are required (**fees are subject to change pending application submission date**)<br>**City of Pickering** (2015 fee By-law)<br>• Zoning By-law Amendment Application (major) **$12,500.00**<br>**Region of Durham**<br>• Zoning By-law Amendment Application Review Fee **$1,000.00**<br>**TRCA**<br>• Zoning By-law Amendment (standard) **$7,350.00**<br>**Region of Durham Health Department**<br>Zoning By-law Amendment Commenting Fee **$245.00** | |

Meeting Adjourned: 12 noon

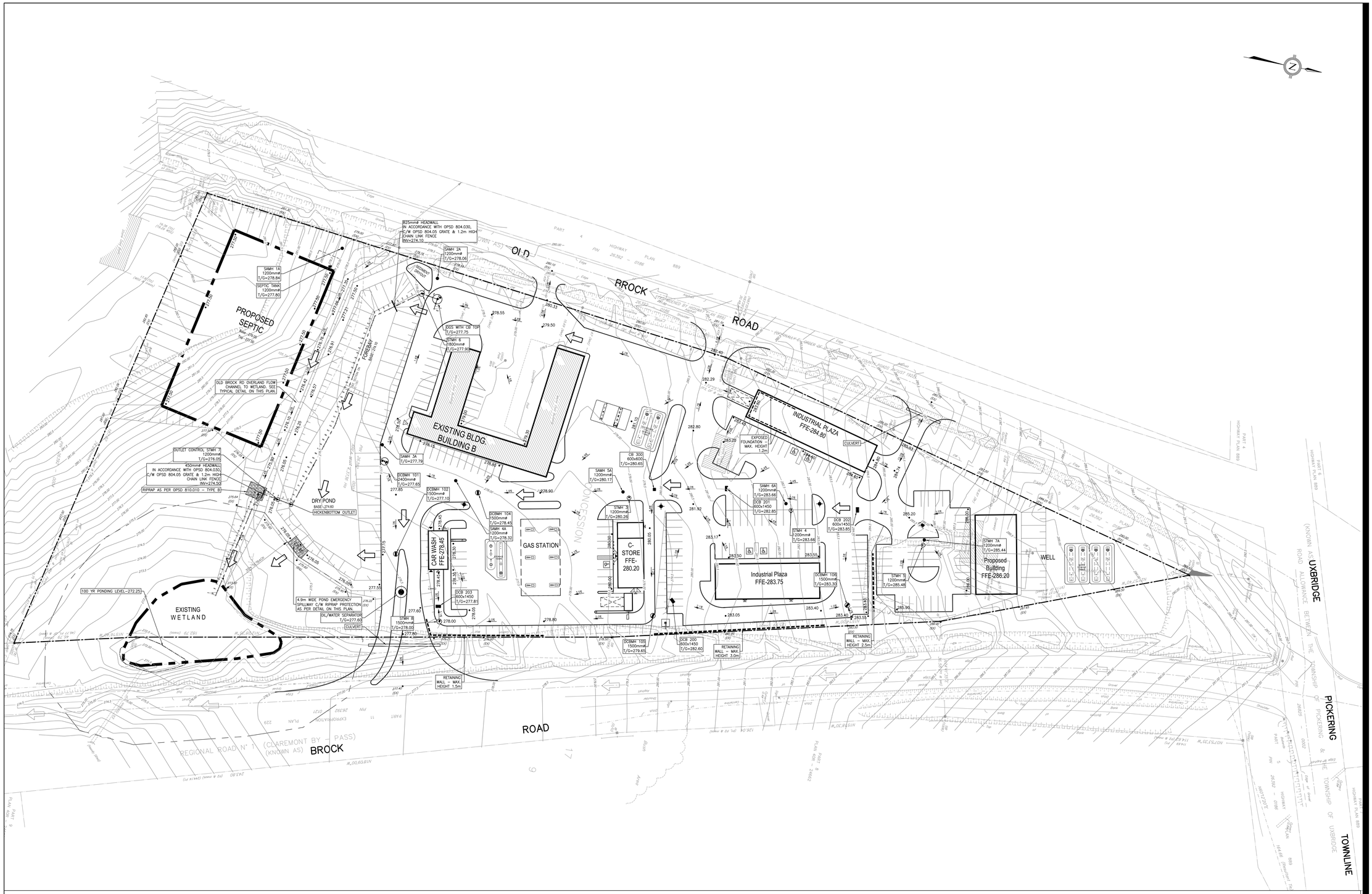


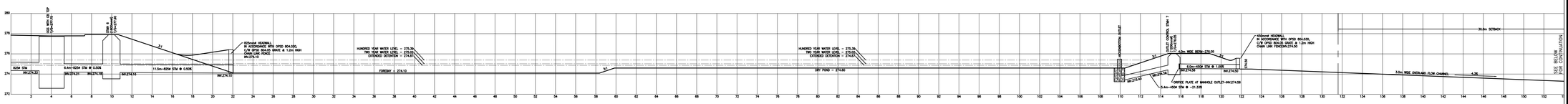
Attachment

Copy: Peter Castellan – Region of Durham, Works Department
Heather Finley, Project Planner – Region of Durham
Karl Kiproff – Region of Durham Health Department
Steven Strong - TRCA
Rosemarie Humphries – Humphries Planning Group
Shaun Larkin – S. Larkin Developments Inc.

Nilesh Surti – Manager, Development Review & Urban Design
Kyle Bentley – Chief Building Official
Paal Helgesen – Development Engineer
Irina Marouchko – Water Resources Engineer
Déan Jacobs, Principal Planner - Policy
Adam Fowler – Fire Inspector
Rob Watson – Fire Inspector

# Appendix B CONCEPTUAL ENGINEERING PLANS




## DRY POND SECTION
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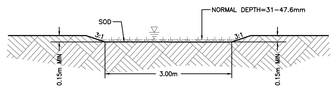


## OVERLAND FLOW CHANNEL DETAIL (TYP.)
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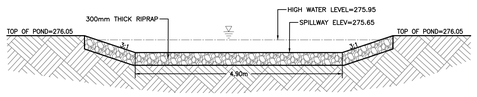


## POND SPILLWAY DETAIL
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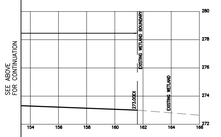

Stantec
300 - 675 Cochrane Drive West Tower
Markham, Ontario L3R 0B8
Tel. 905.944.7777
www.stantec.com



Legend

- 285.00 — PROPOSED ELEVATION
- 276.50 / 276.00 — EXISTING ELEVATIONS
- OVERLAND FLOW
- EXISTING OVERLAND FLOW
- SANITARY MANHOLE
- STORM MANHOLE
- CATCH BASIN
- DOUBLE CATCH BASIN
- CATCH BASIN MANHOLE
- SIAMESE CONNECTION
- VALVE AND VALVE BOX
- HYDRANT AND VALVE
- CONCRETE CURB
- PROPERTY BOUNDARY

Notes

| Revision | By | Appd. | YY.MM.DD |
|---|---|---|---|
| ZONING BY-LAW AMENDMENT APPLICATION | PF | TG | 17.11.27 |
| Issued | By | Appd. | YY.MM.DD |

File Name:

| Dwn. | Chkd. | Dsgn. | YY.MM.DD |
|---|---|---|---|

Permit-Seal

Client/Project
S. LARKIN DEVELOPMENTS INC.

CLAREMONT NORTH BUSINESS PARK
Old Brock Road and Brock Road
Claremont, Ontario

Title
CONCEPTUAL GRADING PLAN

Project No. 160622415
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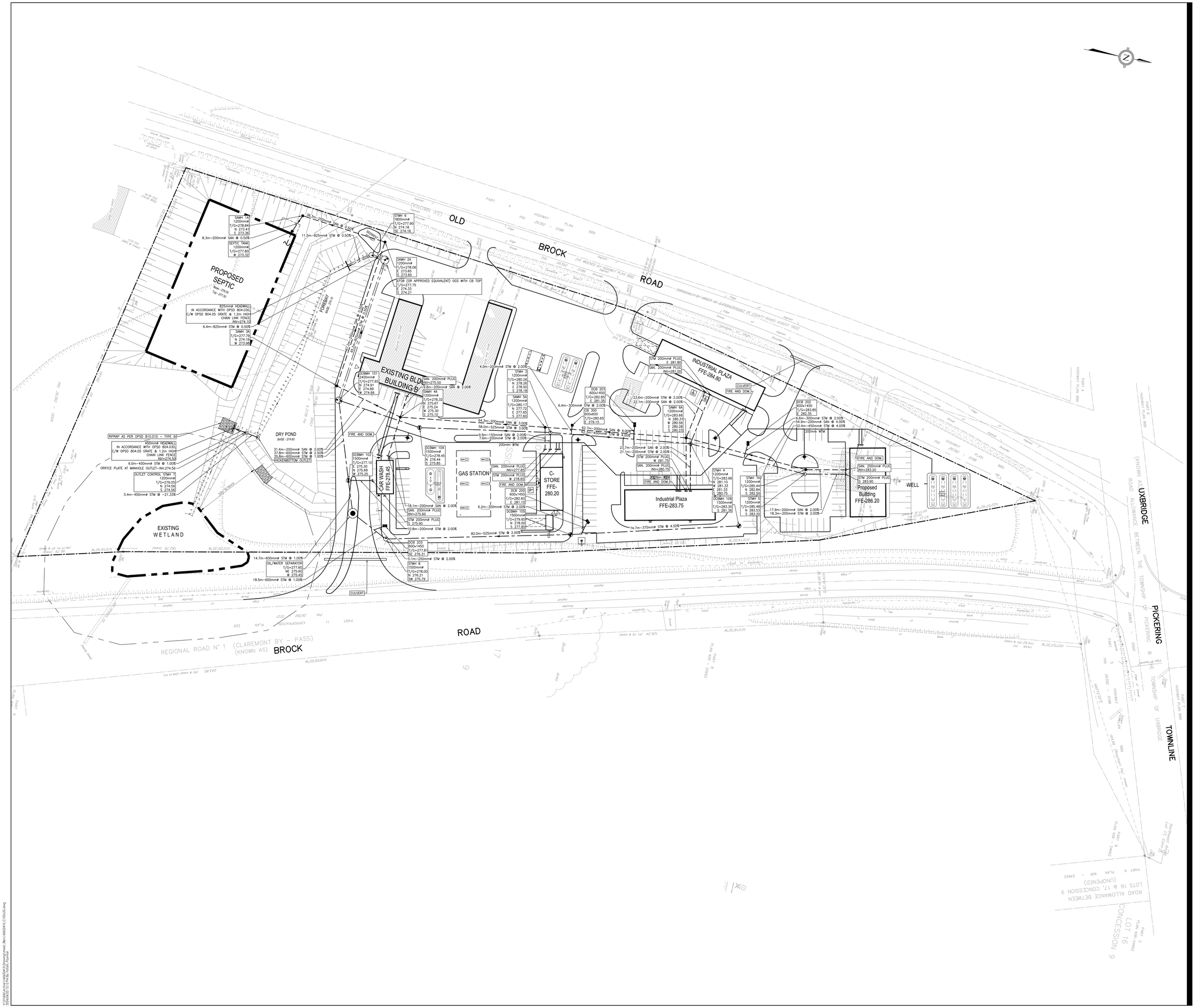
Drawing No. C-101
Sheet of
Revision 0




Stantec

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Markham, Ontario L3R 0B8
Tel. 905.944.7777
www.stantec.com



Legend

- SANITARY MANHOLE
- STORM MANHOLE
- CATCH BASIN
- DOUBLE CATCH BASIN
- CATCH BASIN MANHOLE
- SIAMESE CONNECTION
- VALVE AND VALVE BOX
- HYDRANT AND VALVE
- WATERMAIN
- STORM SEWER
- SANITARY SEWER
- PROPERTY BOUNDARY

Notes

| Revision | By | Appd. | YY.MM.DD |
|---|---|---|---|

| ZONING BY-LAW AMENDMENT APPLICATION | PF | TG | 17.11.27 |
|---|---|---|---|

| Issued | By | Appd. | YY.MM.DD |
|---|---|---|---|

File Name: | Dwn. | Chkd. | Dsgn. | YY.MM.DD

Permit-Seal

Client/Project
S. LARKIN DEVELOPMENTS INC.

CLAREMONT NORTH BUSINESS PARK
Old Brock Road and Brock Road
Claremont, Ontario

Title
CONCEPTUAL
SERVICING PLAN

| Project No. | Scale | |
|---|---|---|
| 160622415 | 1:500 | 0 5 15 25m |

| Drawing No. | Sheet | Revision |
|---|---|---|
| C-102 | of | 0 |



ORIGINAL SHEET - ARCH E

# Appendix C SANITARY

FlowSpec ENGINEERING

November 23, 2017

Mr. Tim Gallagher
Stantec
300W-675 Cochrane Drive
Markham, ON L3R 0B8

File No.: 00026-1
Document No.: 00026-1.02

Dear Mr. Gallagher:

Subject: Proposed Claremont North Business Park
Old Brock Road and Brock Road, Claremont
City of Pickering

This report presents a wastewater servicing assessment for the proposed Claremont North Business Park commercial development on Old Brock Road and Brock Road in Claremont, and is intended to supplement a wider functional servicing assessment for the development by Stantec.

The development is to be comprised of the following: i) a restaurant, ii) a gas station, convenience store, and carwash, and iii) several industrial buildings. Wastewater servicing of the development is to be provided by a new private onsite Class 4 (i.e., leaching bed) wastewater treatment system ("WTS").

The property has an area of about 4.4 ha, and is bounded by Brock Road to the east and Old Brock Road to the west, as shown on the appended development concept prepared by Caricari Lee Architects. The ground-surface topography descends moderately to the south-southeast from the northerly corner of the property, with evidence of previous intermittent filling, to a swale and wetland depression which together traverse the southerly portion of the property. South of these features, the grade ascends sharply to a mildly-sloped area at the southwesterly corner of the property.

Currently contained on the property are a single-family residence, as well as additional buildings used for machinery repair, landscaping storage, and general storage. As part of the proposed development, the residence is to be demolished and the largest of the additional buildings is to be retained.

The purpose of this report is to provide preliminary design criteria and specifications for the WTS, as well as to outline additional information required to prepare a final design. To this end, the following information is contained herein:

- brief characterization of subsurface conditions as they pertain to wastewater servicing, based on exploration by FlowSpec Engineering ("FlowSpec") and hydrogeological assessment by Stantec;
- preliminary assessment of percolation time;
- preliminary calculation of daily wastewater flow;
- estimation of wastewater chemistry;
- discussion of effluent criteria;
- description of preliminary design specifications for the WTS; and
- recommendations for additional information required to prepare a final design and support the Site Plan Approval process.

## Subsurface Characterization

FlowSpec performed a subsurface exploration of the property in June 2016, which consisted of the excavation of test pits on the northerly upland portion of the property and within the above-referenced swale near the wetland depression.

The soil stratigraphy at the northerly upland test pits was generally comprised of fill and/or topsoil, overlying silt and sand till, and underlain by clayey sandy silt till. The soil encountered within the swale was comprised of fill and organic topsoil, overlying saturated silt.

Stantec performed a hydrogeological investigation and assessment of the property in 2016 and 2017 and provided its preliminary report (Project No. 160622415; report dated September 15, 2017) to FlowSpec for use in preparing this report. The investigation involved the advancement and installation of several monitoring wells around the perimeter of the property, which were screened both in the shallow unconfined groundwater regime ("shallow groundwater") and deeper water-supply aquifer. Groundwater levels in the monitoring wells were recorded via data-logger and manual measurement.

The Stantec investigation revealed that shallow groundwater flows in a south-southeasterly direction toward the above-referenced wetland depression, and follows a similar pattern to that of the ground-surface topography. The FlowSpec exploration and Stantec investigation together revealed that the high groundwater table is generally less than 1 m below the ground-surface.

*The WTS leaching bed is currently proposed to be located at the southwesterly corner of the property. It is therefore recommended that the direction of shallow groundwater flow be specifically delineated in this location, in order to determine if the effluent plume is expected to: i) migrate offsite to the south-southeast, or ii) migrate to the east and northeast following ground-surface topography toward the wetland depression. It is also recommended that additional test pits be excavated to specifically characterize subsurface conditions in this location at the final design stage.*

## Percolation Time

Notwithstanding the recommendation made in the previous section for additional subsurface characterization, for the purpose of a preliminary percolation time assessment, the till soils encountered in the upland test pits are presumed to extend across other upland areas of the property and into the proposed leaching bed location.

On this basis, samples of the till soils collected during the FlowSpec exploration underwent laboratory-derived particle-size analysis by Stantec. A preliminary percolation time was then assessed by classifying the soils (based on the Unified Soil Classification System), correlating the classification with a percolation time (based on Ontario Building Code ("OBC") Supplementary Standard SB-6, "Percolation Time and Soil Descriptions"), and compensating appropriately for characteristics observed during the subsurface exploration (i.e., density, consistency, and structure).

The assessment is summarized in the following table:

| Soil Description | Unified Soil Classification | Percolation Time (min/cm) |
|---|---|---|
| Silt and Sand Till, some clay and gravel (upper till) | ML | 50 |
| Clayey Sandy Silt Till, some gravel (lower till) | ML-CL | >50 |

*A preliminary percolation time at or above 50 min/cm was assessed and is to be refined upon completion of the additional subsurface characterization at the final design stage, as recommended in the previous section.*

## Wastewater Flow

A preliminary theoretical peak daily wastewater flow for the proposed development was calculated using maximum projected building occupancy data and the following information supplied to FlowSpec by Stantec:

1. The restaurant is to include the following features: i) 24-hour operation, ii) short-order menu, and iii) a drive-through.
2. A reclamation system is proposed for the carwash to reduce the volume of wastewater. This type of wastewater is not suitable for discharge to a leaching bed, due to its inherent soap and sediment content, such that the carwash is to be serviced by a holding tank. *Since wastewater from the carwash is not to be directed to the WTS, its wastewater flow was not included in the calculation.*
3. The industrial buildings are to be "dry" in operation (i.e., no process wastewater) and are to contain no showers.

The calculation is presented in the following table and is based on flow-rates prescribed in OBC Table 8.2.1.3.B. and experience:

| Occupancy Classification | Occupancy Data | Peak Daily Wastewater Flow (L/day) |
|---|---|---|
| Restaurant (24-hour): 16 seats | 16 seats x 250 L/day/seat | 4,000 |
| Gas Station / Convenience Store: 12 fuel-outlets and 2 water-closets | 12 fuel outlets x 560 L/day/fuel-outlet + 2 water-closets x 950 L/day/water-closet | 8,620 |
| Dry Industrial (with no showers): 32 employees | 32 employees x 75 L/day/employee | 2,400 |
| | **Total** | **15,020** |

*A preliminary theoretical peak daily wastewater flow of 17,000 L/day was assessed, in order to provide a factor of safety for potential alteration as the design progresses.*

Given the theoretical peak daily wastewater flow exceeds 10,000 L/day, approval of the design and construction of the WTS falls under the jurisdiction of Section 53 of the Ontario Water Resources Act, as administered by the Ontario Ministry of the Environment and Climate Change ("MOECC").

## Wastewater Chemistry

The proposed development is expected to generate wastewater with concentrations of grease, biochemical oxygen demand (i.e., organics), solids, and nitrogen which are higher than typical domestic (i.e., household) wastewater. The increased concentrations are attributed to food preparation in the restaurant (higher organics and solids), high urine content from washrooms in commercial buildings (higher nitrogen), and an absence of showers and laundry which would typically dilute concentrations of these constituents in domestic wastewater.

Constituent concentrations estimated for each type of wastewater, as well as a preliminary combined chemistry are presented in the following table:

| Constituent | Concentration (mg/L) | | |
|---|---|---|---|
| | Restaurant | Washrooms | Combined |
| Five-Day Biochemical Oxygen Demand ("$BOD_5$") | 2,200 | 200 | 1,200 |
| Total Nitrogen | 120 | 120 | 120 |

## Effluent Concentration Limits and Objectives

Approval of the design and construction of the WTS falls under the mandate of the MOECC (as described above), which requires consideration for potential nutrient (i.e., nitrogen and phosphorous) impact of the WTS on groundwater (that is or may be used as water-supply) and surface water (generally within approximately 300 m).

The specific direction of shallow groundwater flow in the proposed leaching bed location (i.e., southwest corner of the property) will determine if the effluent plume is expected to: i) migrate offsite to the south-southeast as shallow groundwater, ii) or migrate and outflow to the onsite wetland depression.

Under the former scenario, the MOECC typically stipulates a strict nitrogen concentration limit in groundwater where an effluent plume reaches a property line (i.e., nitrate+nitrite-nitrogen ("nitrate") concentration of 2.5 mg/L). The limit may only be achieved via dilution of the effluent plume in groundwater from precipitation and/or wastewater treatment prior to discharge. Given the leaching bed is to be situated adjacent to the potential downgradient property boundary, reduction of organics, solids, and nitrogen via wastewater treatment would be required to comply with the MOECC property line nitrate concentration limit.

Under the latter scenario, the MOECC and Toronto Region Conservation Authority ("TRCA") may stipulate a strict nitrogen concentration limit at the point where shallow groundwater outflows to the wetland depression, given the depression is hydraulically connected to a designated wetland across Brock Road. Similar to the former scenario described above, reduction of organics, solids, and nitrogen via wastewater treatment may be required to comply with MOECC and TRCA discharge guidelines.

Moreover, under the latter scenario, phosphorous and pathogen reduction is typically required in scenarios where effluent discharges to surface water. Given effluent is to discharge to the subsurface prior to outflow in this case, phosphorous is expected to be removed via adsorption to soil particles and pathogens are expected to be removed via effluent migration through unsaturated soil prior to reaching shallow groundwater. Therefore, additional treatment for phosphorous and pathogen removal is not anticipated.

*Specific effluent criteria is to be derived upon delineation of shallow groundwater flow direction in the proposed leaching bed location. For the purpose of this report, however, a preliminary effluent nitrate concentration limit of 3.0 mg/L was assessed. In order to achieve this limit, a proprietary wastewater treatment unit is required, which is also capable of reducing five-day carbonaceous $BOD_5$ ("$CBOD_5$") and total suspended solids ("TSS") to an effluent concentration objective of 10 mg/L.*

Reduction of $CBOD_5$ and TSS to an effluent concentration of 10 mg/L allows for discharge to a Type A dispersal leaching bed, which provides a permissible reduction in bed area of about 30% when compared to the bed area required when effluent is discharged from a conventional septic tank.

## Design Specifications

On the basis of the preliminary design criteria described above, the WTS is to be comprised of the following key components: i) proprietary treatment unit, and ii) Type A dispersal leaching bed.

*Although specific effluent concentration limits and objectives have yet to be finalized, for preliminary design purposes, the proprietary treatment unit is to be designed to achieve an effluent nitrate concentration limit of 3.0 mg/L and an effluent $CBOD_5$ and TSS concentration objective of 10 mg/L.*

A Type A dispersal leaching bed is comprised of a layer of continuous stone containing a series of gravity distribution pipes, overlying a layer of imported sand fill which extends into a tapered mantle beyond the stone layer. In this case the stone layer would be contained in the mildly sloped southwest corner of the property, and the mantle(s) would extend down the slopes to the north and east.

The minimum leaching bed area required by OBC Sentence 8.7.7.1.(5). is calculated below:

$A = Q \times T \div 400$

where:
$A$ = minimum leaching bed area required ($m^2$)
$Q$ = peak daily wastewater flow (L/day)
$T$ = percolation time (min/cm)

$A = 17{,}000 \text{ L/day} \times 50 \text{ min/cm} \div 400$
$= 2{,}125 \text{ m}^2$

The minimum leaching bed area required by OBC Sentence 8.7.7.1.(5). is based on a maximum percolation time of 50 min/cm, even in scenarios where the percolation time exceeds 50 min/cm. It is the opinion of FlowSpec that a technical limitation exists with this formula, such that it is inappropriate for use in situations where the percolation time is greater than 50 min/cm (as may be the case here, to be confirmed upon excavation of additional test pits in the proposed bed location).

Therefore, the leaching bed area used for these preliminary design specifications was calculated using a maximum hydraulic loading rate of 6 L/day/$m^2$ (considered reasonable for the underlying till soils), as follows:

$A = Q \div L_R$

where:
*A = minimum leaching bed area required ($m^2$)*
*Q = peak daily wastewater flow (L/day)*
*$L_R$ = maximum hydraulic loading rate (L/day/$m^2$)*

$A = 17{,}000 \text{ L/day} \div 6 \text{ L/day/m}^2$
$= 2{,}834 \text{ m}^2$

*A leaching bed area of 3,000 $m^2$ has been accommodated in the development concept, and is to be refined upon excavation of additional test pits in the proposed bed location at the final design stage. A preliminary bed envelope is illustrated on the appended development concept.*

Should you have any questions regarding the above, please do not hesitate to contact the undersigned.

Yours truly,
FlowSpec Engineering Ltd.


David Morlock, P.Eng.
Consulting Engineer

# Appendix D WATER

Project Name - Claremont North Business Park
Project Number - 160622415
Date - Nov-17

Stantec

## DOMESTIC WATER CALCULATION SHEET

| Criteria Used: | Durham Region Standards | | | | | | |
|---|---|---|---|---|---|---|---|
| Function | Population | Units | Flow | Units | Min Hr Factor | Peak Hr Factor | Max Day Factor |
| Single Family Residential | 3.5 | Per House | 4500 | L/min | - | - | - |
| Townhouse | 3.5 | Per House | 4500 | L/min | - | - | - |
| 1 Bdrm Apt | 1.6 | Per Unit | 4500 | L/min | - | - | - |
| 2 Bdrm Apt | 2.7 | Per Unit | 4500 | L/min | - | - | - |
| 3 Bdrm Apt | 2.7 | Per Unit | 4500 | L/min | - | - | - |
| Commercial | - | 1000m$^2$ of GFA | 5,000 | L/Day | - | - | - |
| Office | - | 1000m$^2$ of GFA | 5,000 | L/Day | - | - | - |

### Residential Component

| Location | Unit Type | Number of Units | Population | Average Day (L/d) | Min Hour (L/hr) | Peak Hour (L/hr) | Max Day (L/d) |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | Total Residential | 0 | 0 | 0 | 0 |

### Non-Residential Component

| Location | Function | GFA Area (Ha) | Population | Average Day (L/d) | Min Hour (L/hr) | Peak Hour (L/hr) | Max Day (L/d) |
|---|---|---|---|---|---|---|---|
| Claremont North Business Park | Commercial | 0.32 | - | 16000 | - | - | 16000 |
| | | | Total Commercial | 16000 | 0 | 0 | 16000 |
| *Number obtained from carwash supplier =>* | | | Total Carwash | 10980 | 0 | 0 | 10980 |
| | | | Total Site | 26980 | 0 | 0 | 26980 |

| | |
|---|---|
| Total Peak Flow (L/s) | 0.31 |

Project Name - Claremont North Business Park
Project Number - 160622415
Date - Nov-17

Stantec

## FUS CALCULATION SHEET

| 1. Fire flow estimate | | 3. Sprinkler Protection Factor | |
|---|---|---|---|
| C= | 0.6 | Factor (%)= | 0% |
| | | F (L/min)= | 5796 |
| Largest Floor Area ($m^2$)= | 1234 | **4. Exposure Factor** | |
| Above Floor Area ($m^2$)= | 0 | Distance to Closest Structure | |
| Below Floor Area ($m^2$)= | 0 | Side 1 (m)= | 15 |
| A ($m^2$)= | 1234 | Side 2 (m)= | 20 |
| | | Side 3 (m)= | 20 |
| F (L/min)= | 4637 | Side 4 (m)= | 20 |
| **2. Occupancy Factor** | | Factor (%)= | 60% |
| Factor (%)= | 25% | **F (L/min)=** | **10000** |
| F (L/min)= | 5796 | **F (USGPM)=** | **3000** |

# Appendix E STORMWATER MANAGEMENT

**Project: Claremont Business Park - ESSO**
**Project Number: 160622415**
**Project Location: Claremont, ON**

# Drainage Areas

Existing Development Area

| Zone | Area (ha) | Runoff Coefficient | TIMP |
|---|---|---|---|
| Building | 0.16 | 0.90 | 1 |
| Open Space | 4.42 | 0.25 | 0.07 |
| Total | 4.58 | 0.27 | 0.10 |

Existing Drainage Areas

| Zone | Area (ha) | Runoff Coefficient | TIMP |
|---|---|---|---|
| Northeast External | 1.55 | 0.40 | 0.29 |
| West External | 0.63 | 0.75 | 0.79 |
| South External | 0.76 | 0.25 | 0.07 |
| Site | 4.58 | 0.27 | 0.10 |
| Total | 7.52 | 0.34 | 0.19 |

Proposed Site Area

| Zone | Area (ha) | Runoff Coefficient | TIMP |
|---|---|---|---|
| Commercial | 2.89 | 0.90 | 1.00 |
| SWM Pond | 0.27 | 0.60 | 0.57 |
| Uncontrolled | 0.04 | 0.90 | 1.00 |
| Undeveloped | 1.38 | 0.25 | 0.07 |
| Total Site | 4.58 | 0.69 | 0.70 |

Proposed Development Area

| Zone | Area (ha) | Runoff Coefficient | TIMP |
|---|---|---|---|
| Commercial | 2.89 | 0.90 | 1.00 |
| SWM Pond | 0.27 | 0.60 | 0.57 |
| Uncontrolled | 0.04 | 0.90 | 1.00 |
| Total Development | 3.20 | 0.87 | 0.96 |

Proposed Drainage Areas

| Zone | Area (ha) | Runoff Coefficient | TIMP |
|---|---|---|---|
| Northeast External | 1.55 | 0.40 | 0.29 |
| West External | 0.63 | 0.75 | 0.79 |
| South External | 0.76 | 0.25 | 0.07 |
| Site | 4.58 | 0.69 | 0.70 |
| Total | 7.52 | 0.59 | 0.56 |

**Project: Claremont Business Park - ESSO**

**Project Number: 160622415**

**Project Location: Claremont, ON**

# SWM Pond Sizing

| Elevation (m) | Area ($m^2$) | Incremental Volume ($m^3$) | Total Volume ($m^3$) | |
|---|---|---|---|---|
| 274.10 | 292 | 0 | 0 | |
| 274.20 | 318 | 31 | 31 | |
| 274.30 | 344 | 33 | 64 | |
| 274.40 | 371 | 36 | 99 | |
| 274.50 | 399 | 39 | 138 | |
| 274.60 | 1,500 | 95 | 233 | |
| 274.70 | 1,570 | 154 | 386 | |
| 274.80 | 1,641 | 161 | 547 | |
| 274.90 | 1,712 | 168 | 715 | <-- Ext. Det. Water Level 274.87 m |
| 275.00 | 1,784 | 175 | 889 | <-- 2 Year Water Level 275.02 m |
| 275.10 | 1,856 | 182 | 1,071 | |
| 275.20 | 1,929 | 189 | 1,261 | |
| 275.30 | 2,003 | 197 | 1,457 | |
| 275.40 | 2,078 | 204 | 1,661 | <-- 100 Year Water Level 275.39 m |
| 275.50 | 2,153 | 212 | 1,873 | |
| 275.60 | 2,228 | 219 | 2,092 | |
| 275.7 | 2304 | 227 | 2,318 | <-- Weir Crest Elevation 275.65 m |

**Project: Claremont Business Park - ESSO**
**Project Number: 160622415**
**Project Location: Claremont, ON**

# Stormwater Quality

## Dry SWM Pond Extended Detention Volume

| | |
|---|---|
| Controlled Development Drainage Area (ha) = | 3.16 |
| 25 mm Storm Event Runoff Volume (mm) = | 23.83 |
| Extended Detention Volume ($m^3$) = | 753 |
| Estimated release rate ($m^3/s$) = | 0.013 |

(For minimum of 24 hr extended detention)

| | |
|---|---|
| Pond Volume Utilized by 25 mm Event ($m^3$) = | 657 |

**Project: Claremont Business Park - ESSO**
**Project Number: 160622415**
**Project Location: Claremont, ON**

# Stormwater Release Rates

## Existing

Existing Site Area Release Rates

Area (ha) = 4.58

| Storm | Release Rate ($m^3/s$) | Total Rainfall (mm) | Runoff Volume (mm) |
|---|---|---|---|
| 25mm 4hour | 0.069 | 25.0 | 16.16 |
| 2 Year 1 Hour AES Storm | 0.107 | 23.8 | 15.00 |
| 2 Year 12 Hour AES Storm | 0.139 | 43.2 | 33.89 |
| 5 Year 1 Hour AES Storm | 0.17 | 32.6 | 23.49 |
| 5 Year 12 Hour AES Storm | 0.187 | 55.5 | 46.04 |
| 10 Year 1 Hour AES Storm | 0.213 | 38.5 | 29.26 |
| 10 Year 12 Hour AES Storm | 0.218 | 62.9 | 53.37 |
| 25 Year 1 Hour AES Storm | 0.266 | 45.9 | 36.55 |
| 25 Year 12 Hour AES Storm | 0.257 | 72.8 | 63.20 |
| 50 Year 1 Hour AES Storm | 0.306 | 51.4 | 41.98 |
| 50 Year 12 Hour AES Storm | 0.287 | 80.1 | 70.46 |
| 100 Year 1 Hour AES Storm | 0.346 | 56.8 | 47.33 |
| 100 Year 12 Hour AES Storm | 0.315 | 87.5 | 77.82 |
| Regional | 0.481 | 212.0 | 201.98 |

Existing Drainage Area Release Rates

Area (ha) = 7.52

| Storm | Release Rate ($m^3/s$) |
|---|---|
| 25mm 4hour | 0.181 |
| 2 Year 1 Hour AES Storm | 0.269 |
| 2 Year 12 Hour AES Storm | 0.273 |
| 5 Year 1 Hour AES Storm | 0.418 |
| 5 Year 12 Hour AES Storm | 0.362 |
| 10 Year 1 Hour AES Storm | 0.515 |
| 10 Year 12 Hour AES Storm | 0.421 |
| 25 Year 1 Hour AES Storm | 0.664 |
| 25 Year 12 Hour AES Storm | 0.499 |
| 50 Year 1 Hour AES Storm | 0.761 |
| 50 Year 12 Hour AES Storm | 0.555 |
| 100 Year 1 Hour AES Storm | 0.857 |
| 100 Year 12 Hour AES Storm | 0.61 |
| Regional | 0.835 |

Existing External Drainage Areas

| Storm | Drainage Area | Release Rate ($m^3/s$) |
|---|---|---|
| 100 Year 1 Hour AES Storm | Northeast - 1.55 ha | 0.223 |
| 100 Year 12 Hour AES Storm | | 0.144 |
| 100 Year 1 Hour AES Storm | West - 0.63 ha | 0.226 |
| 100 Year 12 Hour AES Storm | | 0.07 |

Existing Roadside Ditch Capacity

| Roadside Ditch | Capacity ($m^3/s$) | Required ($m^3/s$) |
|---|---|---|
| West - Upstream | 1.26 | 0.223 |
| West - Downstream | 0.52 | |
| East - Upstream | 4.97 | 0.226 |
| East - Downstream | 26.38 | |

## Proposed

Proposed Controlled Development Area Release Rates

Area (ha) = 3.16

| Storm | Release Rate ($m^3/s$) | Total Rainfall (mm) | Runoff Volume (mm) [1] |
|---|---|---|---|
| 25mm 4hour | 0.322 | 25.02 | 23.83 |
| 2 Year 1 Hour AES Storm | 0.495 | 23.80 | 22.61 |
| 2 Year 12 Hour AES Storm | 0.175 | 43.20 | 41.99 |
| 5 Year 1 Hour AES Storm | 0.692 | 32.60 | 31.40 |
| 5 Year 12 Hour AES Storm | 0.222 | 55.50 | 54.29 |
| 10 Year 1 Hour AES Storm | 0.824 | 38.50 | 37.30 |
| 10 Year 12 Hour AES Storm | 0.254 | 62.90 | 61.69 |
| 25 Year 1 Hour AES Storm | 1.003 | 45.90 | 44.69 |
| 25 Year 12 Hour AES Storm | 0.294 | 72.80 | 71.58 |
| 50 Year 1 Hour AES Storm | 1.128 | 51.40 | 50.19 |
| 50 Year 12 Hour AES Storm | 0.324 | 80.10 | 78.88 |
| 100 Year 1 Hour AES Storm | 1.251 | 56.80 | 55.59 |
| 100 Year 12 Hour AES Storm | 0.352 | 87.50 | 86.28 |
| Regional | 0.465 | 212.00 | 210.77 |

Proposed SWM Pond Release Rates

| Storm | Release Rate ($m^3/s$) | Pond Volume ($m^3$) | Water Level (m) |
|---|---|---|---|
| 25mm 4hour | 0.011 | 657 | 274.87 |
| 2 Year 1 Hour AES Storm | 0.012 | 685 | 274.88 |
| 2 Year 12 Hour AES Storm | 0.035 | 941 | 275.02 |
| 5 Year 1 Hour AES Storm | 0.034 | 932 | 275.01 |
| 5 Year 12 Hour AES Storm | 0.057 | 1,132 | 275.12 |
| 10 Year 1 Hour AES Storm | 0.051 | 1,092 | 275.10 |
| 10 Year 12 Hour AES Storm | 0.071 | 1,248 | 275.18 |
| 25 Year 1 Hour AES Storm | 0.074 | 1,286 | 275.20 |
| 25 Year 12 Hour AES Storm | 0.09 | 1,405 | 275.26 |
| 50 Year 1 Hour AES Storm | 0.092 | 1,429 | 275.27 |
| 50 Year 12 Hour AES Storm | 0.105 | 1,526 | 275.32 |
| 100 Year 1 Hour AES Storm | 0.109 | 1,569 | 275.35 |

33.2 hours ← Expected drawdown time. Assumed average release rate is half of the maximum.

Drawdown time was calculated by dividing the 25 mm storm pond volume by half of the associated release rate and converting the resulting value (in seconds) to hours.

| | | | |
|---|---|---|---|
| 100 Year 12 Hour AES Storm | 0.119 | 1,646 | 275.39 |
| Regional | 0.432 | 2,079 | 275.62 |

Proposed Site Release Rates

Area (ha) = 4.58

| Storm | Release Rate ($m^3/s$) | Total Rainfall (mm) | Runoff Volume (mm) [1] |
|---|---|---|---|
| 25mm 4hour | 0.054 | 25.0 | 21.10 |
| 2 Year 1 Hour AES Storm | 0.088 | 23.8 | 19.90 |
| 2 Year 12 Hour AES Storm | 0.092 | 43.2 | 39.10 |
| 5 Year 1 Hour AES Storm | 0.146 | 32.6 | 28.59 |
| 5 Year 12 Hour AES Storm | 0.139 | 55.5 | 51.34 |
| 10 Year 1 Hour AES Storm | 0.194 | 38.5 | 34.44 |
| 10 Year 12 Hour AES Storm | 0.169 | 62.9 | 58.70 |
| 25 Year 1 Hour AES Storm | 0.255 | 45.9 | 41.80 |
| 25 Year 12 Hour AES Storm | 0.206 | 72.8 | 68.57 |
| 50 Year 1 Hour AES Storm | 0.3 | 51.4 | 47.27 |
| 50 Year 12 Hour AES Storm | 0.235 | 80.1 | 75.85 |
| 100 Year 1 Hour AES Storm | 0.345 | 56.8 | 52.65 |
| 100 Year 12 Hour AES Storm | 0.262 | 87.5 | 83.25 |
| Regional | 0.634 | 212.0 | 207.52 |

[1] Unmitigated runoff volume - no runoff reduction techniques applied.

Proposed Drainage Area Release Rates

Area (ha) = 7.52

| Storm | Release Rate ($m^3/s$) |
|---|---|
| 25mm 4hour | 0.169 |
| 2 Year 1 Hour AES Storm | 0.254 |
| 2 Year 12 Hour AES Storm | 0.226 |
| 5 Year 1 Hour AES Storm | 0.392 |
| 5 Year 12 Hour AES Storm | 0.314 |
| 10 Year 1 Hour AES Storm | 0.484 |
| 10 Year 12 Hour AES Storm | 0.371 |
| 25 Year 1 Hour AES Storm | 0.64 |
| 25 Year 12 Hour AES Storm | 0.449 |
| 50 Year 1 Hour AES Storm | 0.742 |
| 50 Year 12 Hour AES Storm | 0.504 |
| 100 Year 1 Hour AES Storm | 0.843 |
| 100 Year 12 Hour AES Storm | 0.557 |
| Regional | 1.028 |

## TRCA

TRCA Unit Flow Relationship per Table 8.1
Addendum: Duffins Creek Hydrology Update
Stormwater Management Criteria for Non-Seaton Development Lands
Published by Aquafor Beech for the TRCA, dated May 23, 2013

**TABLE 8.1:**
**Stormwater Management Target Criteria: Future Development Lands (Non-Seaton Lands)**

| Catchment No. | Tributary Name | Model Catchment ID | | Existing Pre-development (rural) Area (ha) | Future Development Area | | 2012 Unit Flow Stormwater Management * | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Rural | Urban | | Area (ha) | % Impervious | Storm Event | Unit Flow Release Rate Target | | Storage Requirements | |
| | | | | | | | | (L/s/ha) | (L/s/imp-ha) | (m3/ha) | (m3/imp-ha) |
| 51 | Michell Creek near Claremont | 5101 | 5104 | 716 | 18.7 | 39 | 2-year | 2.42 | 6.21 | 153 | 392 |
| | | | | | | | 5-year | 3.94 | 10.11 | 213 | 547 |
| | | | | | | | 10-year | 5.03 | 12.90 | 253 | 649 |
| | | | | | | | 25-year | 6.58 | 16.88 | 306 | 786 |
| | | | | | | | 50-year | 7.81 | 20.02 | 346 | 887 |
| | | | | | | | 100-year | 9.11 | 23.37 | 387 | 993 |

Development Drainage Area (ha) = 3.20
Development Drainage Impervious Percent[1] = 96%
Development Drainage Impervious Area (ha) = 3.08

| Return Period | Release Rate (L/s/ha) | | Release Rate ($m^3/s/ha$) | |
|---|---|---|---|---|
| | Based on Area | Based on Imp. Area | Based on Area | Based on Imp. Area |
| 2 Year | 7.7 | 19.2 | 0.008 | 0.019 |
| 100 Year | 29.2 | 72.1 | 0.029 | 0.072 |

Existing Conditions Unit Release Rates vs TRCA Unit Release Rates

| Return Period | Release Rate ($m^3/s/ha$) | | TRCA Relase as a Percentage of Existing |
|---|---|---|---|
| | Existing | TRCA | |
| 2 Year | 0.030 | 0.008 | 26% |
| 100 Year | 0.069 | 0.029 | 42% |

## Brock Road Culvert

| | | |
|---|---|---|
| Upstream Invert = | 271.2 | m |
| Downstream Invert = | 270.87 | m |
| Length = | 34.75 | m |
| Slope = | 0.0095 | m/m |
| Diameter = | 1.05 | m |
| Tailwater Elevation = | 271.92 | m (obvert of culvert) |
| Max Allowable Headwater Elevation = | 272.25 | m |
| Computed Headwater Elevation = | 272.14 | m |

**Project: Claremont Business Park - ESSO**
**Project Number: 160622415**
**Project Location: Claremont, ON**

# Stormwater Release Rates Summary

Site Area Release Rates

Area (ha) = 4.58

| Storm | Existing Release Rate ($m^3/s$) | Proposed Release Rate ($m^3/s$) | Difference Runoff ($m^3/s$) |
|---|---|---|---|
| 25mm 4hour | 0.069 | 0.054 | -0.015 |
| 2 Year 1 Hour AES Storm | 0.107 | 0.088 | -0.019 |
| 2 Year 12 Hour AES Storm | 0.139 | 0.092 | -0.047 |
| 5 Year 1 Hour AES Storm | 0.170 | 0.146 | -0.024 |
| 5 Year 12 Hour AES Storm | 0.187 | 0.139 | -0.048 |
| 10 Year 1 Hour AES Storm | 0.213 | 0.194 | -0.019 |
| 10 Year 12 Hour AES Storm | 0.218 | 0.169 | -0.049 |
| 25 Year 1 Hour AES Storm | 0.266 | 0.255 | -0.011 |
| 25 Year 12 Hour AES Storm | 0.257 | 0.206 | -0.051 |
| 50 Year 1 Hour AES Storm | 0.306 | 0.300 | -0.006 |
| 50 Year 12 Hour AES Storm | 0.287 | 0.235 | -0.052 |
| 100 Year 1 Hour AES Storm | 0.346 | 0.345 | -0.001 |
| 100 Year 12 Hour AES Storm | 0.315 | 0.262 | -0.053 |
| Regional | 0.481 | 0.634 | 0.153 |

Drainage Area Release Rates

Area (ha) = 7.52

| Storm | Existing Release Rate ($m^3/s$) | Proposed Release Rate ($m^3/s$) | Difference Runoff ($m^3/s$) |
|---|---|---|---|
| 25mm 4hour | 0.181 | 0.169 | -0.012 |
| 2 Year 1 Hour AES Storm | 0.269 | 0.254 | -0.015 |
| 2 Year 12 Hour AES Storm | 0.273 | 0.226 | -0.047 |
| 5 Year 1 Hour AES Storm | 0.418 | 0.392 | -0.026 |
| 5 Year 12 Hour AES Storm | 0.362 | 0.314 | -0.048 |
| 10 Year 1 Hour AES Storm | 0.515 | 0.484 | -0.031 |
| 10 Year 12 Hour AES Storm | 0.421 | 0.371 | -0.050 |
| 25 Year 1 Hour AES Storm | 0.664 | 0.640 | -0.024 |
| 25 Year 12 Hour AES Storm | 0.499 | 0.449 | -0.050 |
| 50 Year 1 Hour AES Storm | 0.761 | 0.742 | -0.019 |
| 50 Year 12 Hour AES Storm | 0.555 | 0.504 | -0.051 |
| 100 Year 1 Hour AES Storm | 0.857 | 0.843 | -0.014 |
| 100 Year 12 Hour AES Storm | 0.610 | 0.557 | -0.053 |
| Regional | 0.835 | 1.028 | 0.193 |

# Stormwater Runoff Volume Summary

Development Area Runoff Volumes

Area (ha) = 3.20

| Storm | Existing Runoff Volume (mm) [1] | Proposed Runoff Volume (mm) | Change in Runoff Volume (mm) [2] |
|---|---|---|---|
| 25mm 4hour | 16.2 | 23.8 | 7.7 |
| 2 Year 1 Hour AES Storm | 15.0 | 22.6 | 7.6 |
| 2 Year 12 Hour AES Storm | 33.9 | 42.0 | 8.1 |
| 5 Year 1 Hour AES Storm | 23.5 | 31.4 | 7.9 |
| 5 Year 12 Hour AES Storm | 46.0 | 54.3 | 8.3 |
| 10 Year 1 Hour AES Storm | 29.3 | 37.3 | 8.0 |
| 10 Year 12 Hour AES Storm | 53.4 | 61.7 | 8.3 |
| 25 Year 1 Hour AES Storm | 36.6 | 44.7 | 8.1 |
| 25 Year 12 Hour AES Storm | 63.2 | 71.6 | 8.4 |
| 50 Year 1 Hour AES Storm | 42.0 | 50.2 | 8.2 |
| 50 Year 12 Hour AES Storm | 70.5 | 78.9 | 8.4 |
| 100 Year 1 Hour AES Storm | 47.3 | 55.6 | 8.3 |
| 100 Year 12 Hour AES Storm | 77.8 | 86.3 | 8.5 |

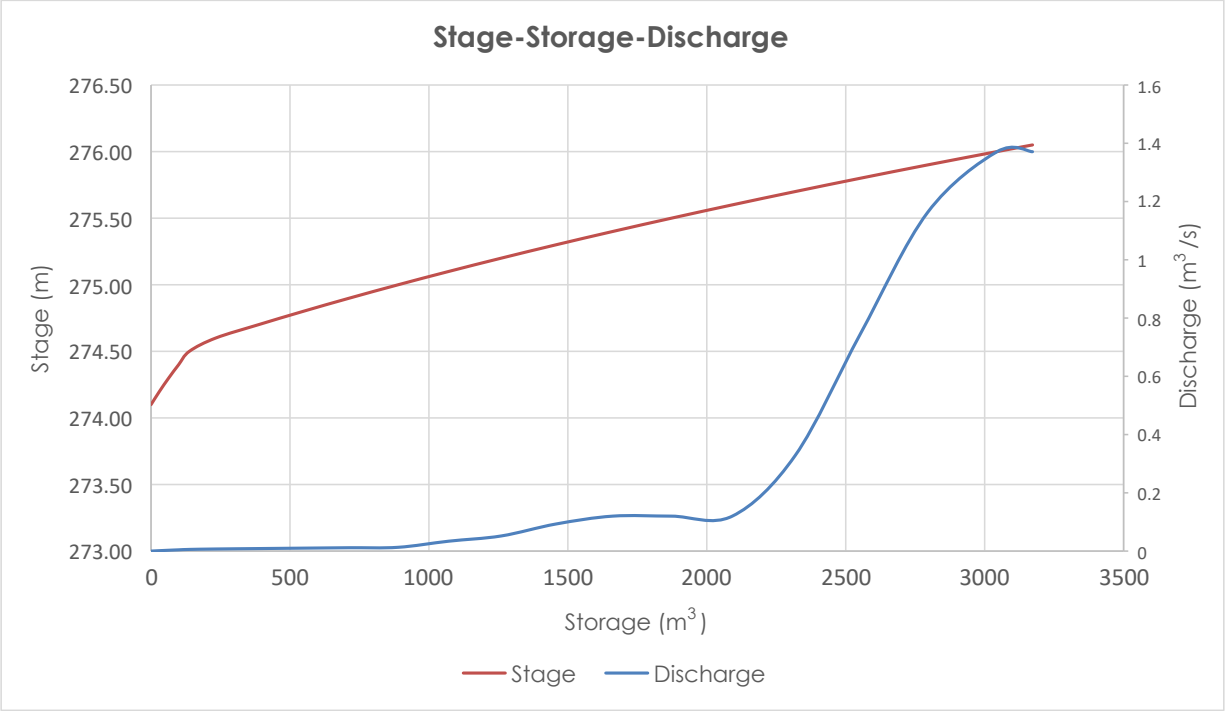
[1] From the existing conditions site area model

[2] Unmitigated runoff volume - no runoff reduction techniques applied.

**Project: Claremont Business Park - ESSO**
**Project Number: 160622415**
**Project Location: Claremont, ON**

## Stage-Storage-Discharge

| Stage (m) | Storage ($m^3$) | Discharge ($m^3/s$) |
|---|---|---|
| 274.10 | 0 | 0.000 |
| 274.20 | 31 | 0.001 |
| 274.30 | 64 | 0.003 |
| 274.40 | 99 | 0.004 |
| 274.50 | 138 | 0.006 |
| 274.60 | 233 | 0.007 |
| 274.70 | 386 | 0.009 |
| 274.80 | 547 | 0.010 |
| 274.90 | 715 | 0.012 |
| 275.00 | 889 | 0.013 |
| 275.10 | 1071 | 0.034 |
| 275.20 | 1261 | 0.052 |
| 275.30 | 1457 | 0.093 |
| 275.40 | 1661 | 0.120 |
| 275.50 | 1873 | 0.120 |
| 275.60 | 2092 | 0.120 |
| 275.70 | 2318 | 0.329 |
| 275.80 | 2553 | 0.746 |
| 275.90 | 2795 | 1.163 |
| 276.00 | 3044 | 1.371 |
| 276.05 | 3172 | 1.371 |



**Project: Claremont Business Park - ESSO**
**Project Number: 160622415**
**Project Location: Claremont, ON**

## Time to Concentration Calculations (Shallow Concentrated Flow)

| Drainage Area | k | Slope | Velocity (m/s) | Flow length (m) | tc (min) | TP (min) | TP (hr) |
|---|---|---|---|---|---|---|---|
| S External | 0.213 | 0.11 | 0.071 | 70 | 16.5 | 11.0 | 0.18 |
| Existing Development Area (4.42 ha) | 0.213 | 0.10 | 0.067 | 395 | 98.1 | 65.7 | 1.10 |
| Site Non-Develop DA (1.38 ha) | 0.213 | 0.09 | 0.064 | 110 | 28.5 | 19.1 | 0.32 |
| W External (Old Brock Rd Catchment) | 0.619 | 0.03 | 0.109 | 405 | 62.1 | 41.6 | 0.69 |

Formulas, k values from the City of Pickering's SWM Design Guidelines (2019).
Slope and flow length estimated from drainage plan (Fig 3.1 and 3.2) and site slope analysis (see Appendix A).

# Culvert Calculator Report
# Brock Road Culvert

Solve For: Headwater Elevation

| Culvert Summary | | | | | |
|---|---|---|---|---|---|
| Allowable HW Elevation | 272.25 | m | Headwater Depth/Height | 0.88 | |
| Computed Headwater Eleva | 272.14 | m | Discharge | 0.8570 | m³/s |
| Inlet Control HW Elev. | 271.99 | m | Tailwater Elevation | 271.92 | m |
| Outlet Control HW Elev. | 272.14 | m | Control Type | Outlet Control | |

| Grades | | | | | |
|---|---|---|---|---|---|
| Upstream Invert | 271.20 | m | Downstream Invert | 270.87 | m |
| Length | 34.75 | m | Constructed Slope | 0.009496 | m/m |

| Hydraulic Profile | | | | | |
|---|---|---|---|---|---|
| Profile | M1 | | Depth, Downstream | 1.05 | m |
| Slope Type | Mild | | Normal Depth | 0.58 | m |
| Flow Regime | Subcritical | | Critical Depth | 0.52 | m |
| Velocity Downstream | 0.96 | m/s | Critical Slope | 0.013623 | m/m |

| Section | | | | | |
|---|---|---|---|---|---|
| Section Shape | Circular | | Mannings Coefficient | 0.024 | |
| Section Material | Aluminum | | Span | 1.07 | m |
| Section Size | 1050 mm | | Rise | 1.07 | m |
| Number Sections | 1 | | | | |

| Outlet Control Properties | | | | | |
|---|---|---|---|---|---|
| Outlet Control HW Elev. | 272.14 | m | Upstream Velocity Head | 0.07 | m |
| Ke | 0.90 | | Entrance Loss | 0.07 | m |

| Inlet Control Properties | | | | | |
|---|---|---|---|---|---|
| Inlet Control HW Elev. | 271.99 | m | Flow Control | N/A | |
| Inlet Type | Projecting | | Area Full | 0.9 | m² |
| K | 0.03400 | | HDS 5 Chart | 2 | |
| M | 1.50000 | | HDS 5 Scale | 3 | |
| C | 0.05530 | | Equation Form | 1 | |
| Y | 0.54000 | | | | |

# Emergency Spillway Sizing

| Project Description | |
|---|---|
| Solve For | Crest Length |

| Input Data | | |
|---|---|---|
| Discharge | 1,251.00 | L/s |
| Headwater Elevation | 275.95 | m |
| Crest Elevation | 275.65 | m |
| Tailwater Elevation | 275.60 | m |
| Crest Surface Type | Gravel | |
| Crest Breadth | 4.00 | m |

| Results | | |
|---|---|---|
| Crest Length | 4.9 | m |
| Headwater Height Above Crest | 0.30 | m |
| Tailwater Height Above Crest | -0.05 | m |
| Weir Coefficient | 1.56 | m^(1/2)/s |
| Submergence Factor | 1.000 | |
| Adjusted Weir Coefficient | 1.56 | m^(1/2)/s |
| Flow Area | 1.5 | m² |
| Velocity | 0.85 | m/s |
| Wetted Perimeter | 5.5 | m |
| Top Width | 4.88 | m |

# Old Brock Rd Channel 2% Slope

| Project Description | |
|---|---|
| Friction Method | Manning Formula |
| Solve For | Normal Depth |

| Input Data | | |
|---|---|---|
| Roughness Coefficient | 0.030 | |
| Channel Slope | 0.020 | m/m |
| Left Side Slope | 3.000 | H:V |
| Right Side Slope | 3.000 | H:V |
| Bottom Width | 3.00 | m |
| Discharge | 89.57 | L/s |

| Results | | |
|---|---|---|
| Normal Depth | 47.6 | mm |
| Flow Area | 0.1 | m² |
| Wetted Perimeter | 3.3 | m |
| Hydraulic Radius | 45.3 | mm |
| Top Width | 3.29 | m |
| Critical Depth | 44.3 | mm |
| Critical Slope | 0.025 | m/m |
| Velocity | 0.60 | m/s |
| Velocity Head | 0.02 | m |
| Specific Energy | 0.07 | m |
| Froude Number | 0.897 | |
| Flow Type | Subcritical | |

| GVF Input Data | | |
|---|---|---|
| Downstream Depth | 0.0 | mm |
| Length | 0.0 | m |
| Number Of Steps | 0 | |

| GVF Output Data | | |
|---|---|---|
| Upstream Depth | 0.0 | mm |
| Profile Description | N/A | |
| Profile Headloss | 0.00 | m |
| Downstream Velocity | Infinity | m/s |
| Upstream Velocity | Infinity | m/s |
| Normal Depth | 47.6 | mm |
| Critical Depth | 44.3 | mm |
| Channel Slope | 0.020 | m/m |
| Critical Slope | 0.025 | m/m |

# Old Brock Rd Channel 8.4% Slope

| Project Description | |
|---|---|
| Friction Method | Manning Formula |
| Solve For | Normal Depth |

| Input Data | | |
|---|---|---|
| Roughness Coefficient | 0.030 | |
| Channel Slope | 0.084 | m/m |
| Left Side Slope | 3.000 | H:V |
| Right Side Slope | 3.000 | H:V |
| Bottom Width | 3.00 | m |
| Discharge | 89.57 | L/s |

| Results | | |
|---|---|---|
| Normal Depth | 31.0 | mm |
| Flow Area | 0.1 | m² |
| Wetted Perimeter | 3.2 | m |
| Hydraulic Radius | 30.0 | mm |
| Top Width | 3.19 | m |
| Critical Depth | 44.3 | mm |
| Critical Slope | 0.025 | m/m |
| Velocity | 0.94 | m/s |
| Velocity Head | 0.04 | m |
| Specific Energy | 0.08 | m |
| Froude Number | 1.723 | |
| Flow Type | Supercritical | |

| GVF Input Data | | |
|---|---|---|
| Downstream Depth | 0.0 | mm |
| Length | 0.0 | m |
| Number Of Steps | 0 | |

| GVF Output Data | | |
|---|---|---|
| Upstream Depth | 0.0 | mm |
| Profile Description | N/A | |
| Profile Headloss | 0.00 | m |
| Downstream Velocity | Infinity | m/s |
| Upstream Velocity | Infinity | m/s |
| Normal Depth | 31.0 | mm |
| Critical Depth | 44.3 | mm |
| Channel Slope | 0.084 | m/m |
| Critical Slope | 0.025 | m/m |

Stormceptor®

Rinker MATERIALS™

# Stormceptor® EF Sizing Report

## Imbrium® Systems
## ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

04/17/2024

| | |
|---|---|
| Province: | Ontario |
| City: | Pickering |
| Nearest Rainfall Station: | TORONTO INTL AP |
| Climate Station Id: | 6158731 |
| Years of Rainfall Data: | 20 |

| | |
|---|---|
| Site Name: | Claremont North Business Park |

| | |
|---|---|
| Drainage Area (ha): | 3.2 |
| % Imperviousness: | 96.00 |

Runoff Coefficient 'c': 0.87

| | |
|---|---|
| Particle Size Distribution: | CA ETV |
| Target TSS Removal (%): | 50.0 |

| | |
|---|---|
| Required Water Quality Runoff Volume Capture (%): | 90.00 |
| Estimated Water Quality Flow Rate (L/s): | 87.17 |
| Oil / Fuel Spill Risk Site? | Yes |
| Upstream Flow Control? | No |
| Peak Conveyance (maximum) Flow Rate (L/s): | |
| Influent TSS Concentration (mg/L): | |
| Estimated Average Annual Sediment Volume (L/yr): | 1564 |

| | |
|---|---|
| Project Name: | Claremont ZBA |
| Project Number: | 64432 |
| Designer Name: | Qurat Dar |
| Designer Company: | Stantec |
| Designer Email: | qurat.dar@stantec.com |
| Designer Phone: | 905-369-1031 |
| EOR Name: | |
| EOR Company: | |
| EOR Email: | |
| EOR Phone: | |

**Net Annual Sediment (TSS) Load Reduction Sizing Summary**

| Stormceptor Model | TSS Removal Provided (%) |
|---|---|
| EFO4 | 34 |
| EFO6 | 44 |
| EFO8 | 51 |
| EFO10 | 56 |
| EFO12 | 59 |

**Recommended Stormceptor EFO Model: EFO8**

**Estimated Net Annual Sediment (TSS) Load Reduction (%): 51**

**Water Quality Runoff Volume Capture (%): > 90**

imbrium

## THIRD-PARTY TESTING AND VERIFICATION

►**Stormceptor® EF and Stormceptor® EFO** are the latest evolutions in the Stormceptor® oil-grit separator (OGS) technology series, and are designed to remove a wide variety of pollutants from stormwater and snowmelt runoff. These technologies have been third-party tested in accordance with the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators** and performance has been third-party verified in accordance with the **ISO 14034 Environmental Technology Verification (ETV)** protocol.

## PERFORMANCE

►**Stormceptor® EF and EFO** remove stormwater pollutants through gravity separation and floatation, and feature a patent-pending design that generates positive removal of total suspended solids (TSS) throughout each storm event, including high-intensity storms. Captured pollutants include sediment, free oils, and sediment-bound pollutants such as nutrients, heavy metals, and petroleum hydrocarbons. Stormceptor is sized to remove a high level of TSS from the frequent rainfall events that contribute the vast majority of annual runoff volume and pollutant load. The technology incorporates an internal bypass to convey excessive stormwater flows from high-intensity storms through the device without resuspension and washout (scour) of previously captured pollutants. Proper routine maintenance ensures high pollutant removal performance and protection of downstream waterwavs.

## PARTICLE SIZE DISTRIBUTION (PSD)

►The **Canadian ETV PSD** shown in the table below was used, or in part, for this sizing. This is the identical PSD that is referenced in the Canadian ETV ***Procedure for Laboratory Testing of Oil-Grit Separators*** for both sediment removal testing and scour testing. The Canadian ETV PSD contains a wide range of particle sizes in the sand and silt fractions, and is considered reasonably representative of the particle size fractions found in typical urban stormwater runoff.

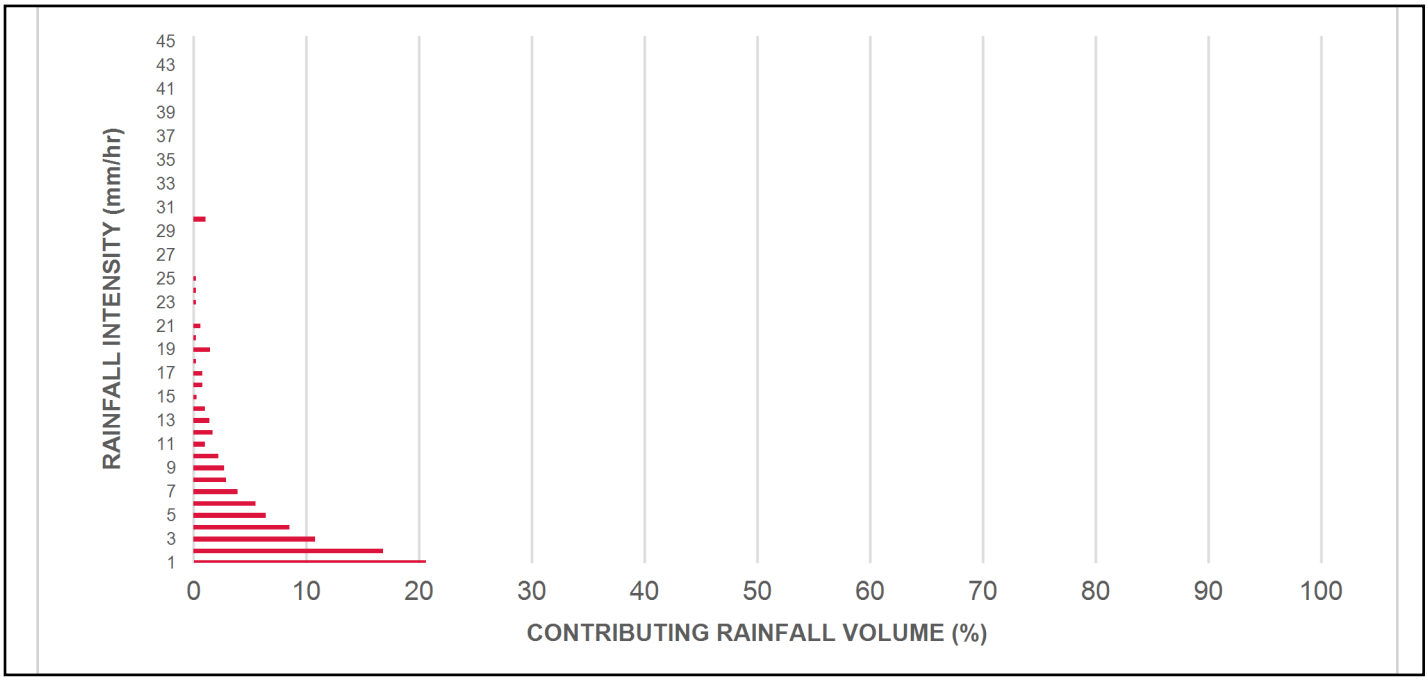
| Particle Size (µm) | Percent Less Than | Particle Size Fraction (µm) | Percent |
|---|---|---|---|
| 1000 | 100 | 500-1000 | 5 |
| 500 | 95 | 250-500 | 5 |
| 250 | 90 | 150-250 | 15 |
| 150 | 75 | 100-150 | 15 |
| 100 | 60 | 75-100 | 10 |
| 75 | 50 | 50-75 | 5 |
| 50 | 45 | 20-50 | 10 |
| 20 | 35 | 8-20 | 15 |
| 8 | 20 | 5-8 | 10 |
| 5 | 10 | 2-5 | 5 |
| 2 | 5 | <2 | 5 |

# Stormceptor® EF Sizing Report

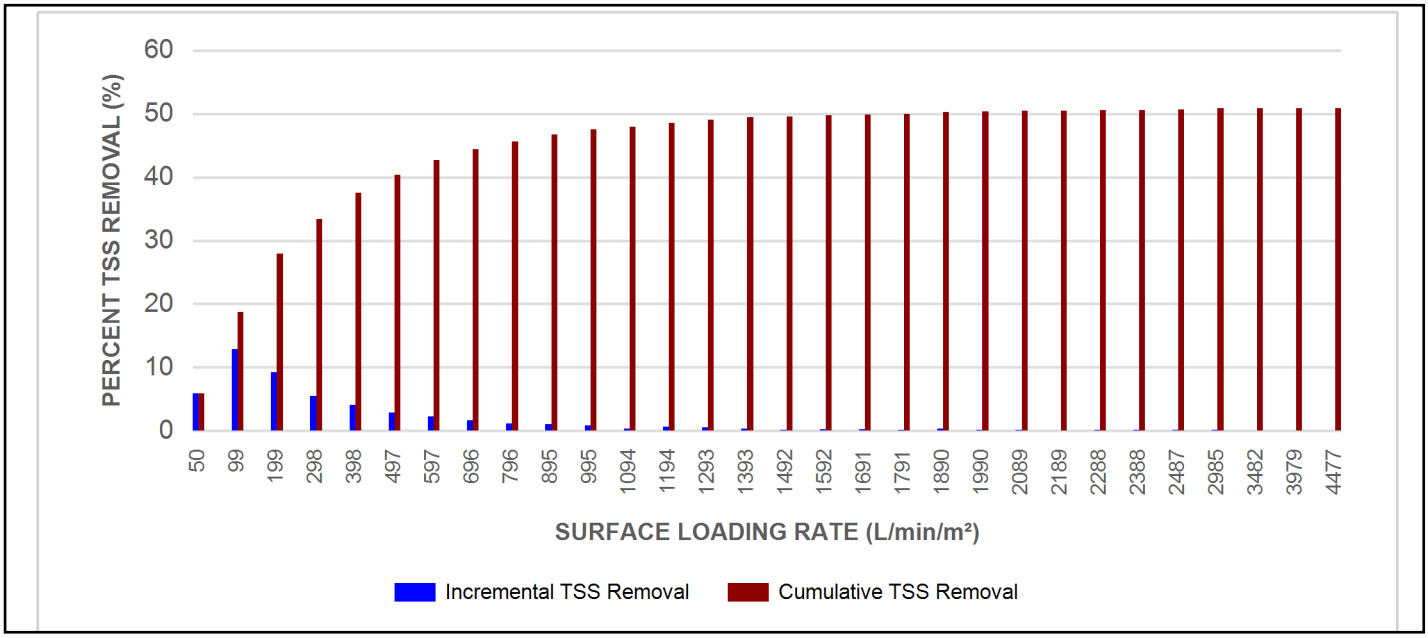
| Rainfall Intensity (mm / hr) | Percent Rainfall Volume (%) | Cumulative Rainfall Volume (%) | Flow Rate (L/s) | Flow Rate (L/min) | Surface Loading Rate (L/min/m²) | Removal Efficiency (%) | Incremental Removal (%) | Cumulative Removal (%) |
|---|---|---|---|---|---|---|---|---|
| 0.50 | 8.5 | 8.5 | 3.90 | 234.0 | 50.0 | 69 | 5.9 | 5.9 |
| 1.00 | 20.6 | 29.1 | 7.79 | 468.0 | 99.0 | 62 | 12.9 | 18.7 |
| 2.00 | 16.8 | 45.9 | 15.59 | 935.0 | 199.0 | 55 | 9.2 | 27.9 |
| 3.00 | 10.8 | 56.7 | 23.38 | 1403.0 | 298.0 | 51 | 5.5 | 33.4 |
| 4.00 | 8.5 | 65.2 | 31.17 | 1870.0 | 398.0 | 48 | 4.1 | 37.5 |
| 5.00 | 6.4 | 71.6 | 38.96 | 2338.0 | 497.0 | 45 | 2.9 | 40.4 |
| 6.00 | 5.5 | 77.0 | 46.76 | 2805.0 | 597.0 | 42 | 2.3 | 42.7 |
| 7.00 | 3.9 | 81.0 | 54.55 | 3273.0 | 696.0 | 42 | 1.6 | 44.4 |
| 8.00 | 2.9 | 83.9 | 62.34 | 3741.0 | 796.0 | 41 | 1.2 | 45.6 |
| 9.00 | 2.7 | 86.5 | 70.14 | 4208.0 | 895.0 | 41 | 1.1 | 46.7 |
| 10.00 | 2.2 | 88.7 | 77.93 | 4676.0 | 995.0 | 40 | 0.9 | 47.5 |
| 11.00 | 1.0 | 89.7 | 85.72 | 5143.0 | 1094.0 | 39 | 0.4 | 47.9 |
| 12.00 | 1.7 | 91.3 | 93.51 | 5611.0 | 1194.0 | 37 | 0.6 | 48.5 |
| 13.00 | 1.4 | 92.8 | 101.31 | 6078.0 | 1293.0 | 36 | 0.5 | 49.0 |
| 14.00 | 1.0 | 93.7 | 109.10 | 6546.0 | 1393.0 | 34 | 0.3 | 49.4 |
| 15.00 | 0.3 | 94.0 | 116.89 | 7014.0 | 1492.0 | 32 | 0.1 | 49.5 |
| 16.00 | 0.8 | 94.8 | 124.69 | 7481.0 | 1592.0 | 30 | 0.2 | 49.7 |
| 17.00 | 0.8 | 95.7 | 132.48 | 7949.0 | 1691.0 | 28 | 0.2 | 49.9 |
| 18.00 | 0.2 | 95.8 | 140.27 | 8416.0 | 1791.0 | 27 | 0.0 | 50.0 |
| 19.00 | 1.5 | 97.3 | 148.07 | 8884.0 | 1890.0 | 25 | 0.4 | 50.3 |
| 20.00 | 0.2 | 97.5 | 155.86 | 9351.0 | 1990.0 | 24 | 0.0 | 50.4 |
| 21.00 | 0.6 | 98.2 | 163.65 | 9819.0 | 2089.0 | 23 | 0.1 | 50.5 |
| 22.00 | 0.0 | 98.2 | 171.44 | 10287.0 | 2189.0 | 22 | 0.0 | 50.5 |
| 23.00 | 0.2 | 98.4 | 179.24 | 10754.0 | 2288.0 | 21 | 0.0 | 50.6 |
| 24.00 | 0.2 | 98.6 | 187.03 | 11222.0 | 2388.0 | 20 | 0.0 | 50.6 |
| 25.00 | 0.2 | 98.9 | 194.82 | 11689.0 | 2487.0 | 19 | 0.0 | 50.7 |
| 30.00 | 1.1 | 100.0 | 233.79 | 14027.0 | 2985.0 | 16 | 0.2 | 50.9 |
| 35.00 | 0.0 | 100.0 | 272.75 | 16365.0 | 3482.0 | 14 | 0.0 | 50.9 |
| 40.00 | 0.0 | 100.0 | 311.72 | 18703.0 | 3979.0 | 12 | 0.0 | 50.9 |
| 45.00 | 0.0 | 100.0 | 350.68 | 21041.0 | 4477.0 | 11 | 0.0 | 50.9 |
| **Estimated Net Annual Sediment (TSS) Load Reduction =** | | | | | | | | **51 %** |

*Climate Station ID*: 6158731 *Years of Rainfall Data*: 20

## RAINFALL DATA FROM TORONTO INTL AP RAINFALL STATION




## INCREMENTAL AND CUMULATIVE TSS REMOVAL FOR THE RECOMMENDED STORMCEPTOR® MODEL



**Maximum Pipe Diameter / Peak Conveyance**

| Stormceptor EF / EFO | Model Diameter | | Min Angle Inlet / Outlet Pipes | Max Inlet Pipe Diameter | | Max Outlet Pipe Diameter | | Peak Conveyance Flow Rate | |
|---|---|---|---|---|---|---|---|---|---|
| | (m) | (ft) | | (mm) | (in) | (mm) | (in) | (L/s) | (cfs) |
| EF4 / EFO4 | 1.2 | 4 | 90 | 609 | 24 | 609 | 24 | 425 | 15 |
| EF6 / EFO6 | 1.8 | 6 | 90 | 914 | 36 | 914 | 36 | 990 | 35 |
| EF8 / EFO8 | 2.4 | 8 | 90 | 1219 | 48 | 1219 | 48 | 1700 | 60 |
| EF10 / EFO10 | 3.0 | 10 | 90 | 1828 | 72 | 1828 | 72 | 2830 | 100 |
| EF12 / EFO12 | 3.6 | 12 | 90 | 1828 | 72 | 1828 | 72 | 2830 | 100 |

## SCOUR PREVENTION AND ONLINE CONFIGURATION

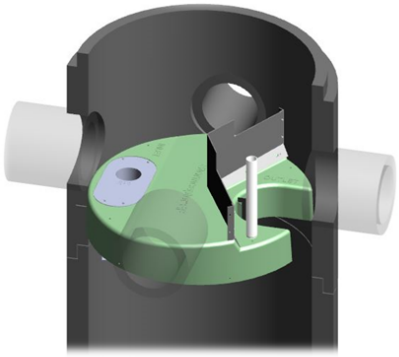
►**Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test performance has been third-party verified in accordance with the ISO 14034 ETV protocol. As a result, Stormceptor EF and EFO are approved for online installation, eliminating the need for costly additional bypass structures, piping, and installation expense.

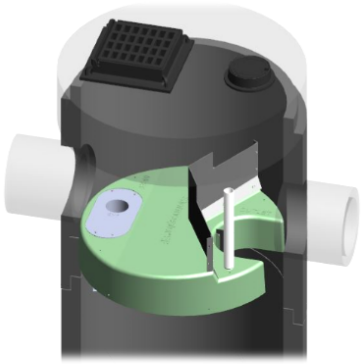
## DESIGN FLEXIBILITY

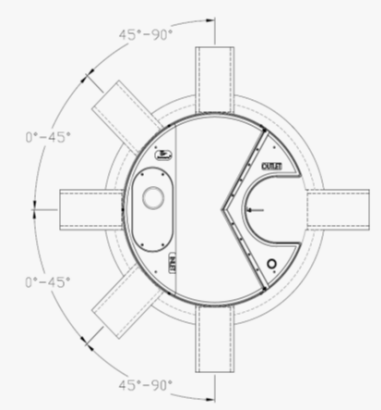
►**Stormceptor® EF** and **EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend angle, and can be modified to ensure performance in submerged conditions.

## OIL CAPTURE AND RETENTION

►While Stormceptor® EF will capture and retain oil from dry weather spills and low intensity runoff, **Stormceptor® EFO** has demonstrated superior oil capture and greater than 99% oil retention in third-party testing according to the light liquid re-entrainment testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**. Stormceptor EFO is recommended for sites where oil capture and retention is a requirement.








**INLET-TO-OUTLET DROP**

Elevation differential between inlet and outlet pipe inverts is dictated by the angle at which the inlet pipe(s) enters the unit.
0° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.
45° - 90° : The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

**HEAD LOSS**

The head loss through Stormceptor EF is similar to that of a 60-degree bend structure. The applicable K value for calculating minor losses through the unit is 1.1. For submerged conditions the applicable K value is 3.0.

**Pollutant Capacity**

| Stormceptor EF / EFO | Model Diameter | | Depth (Outlet Pipe Invert to Sump Floor) | | Oil Volume | | Recommended Sediment Maintenance Depth * | | Maximum Sediment Volume * | | Maximum Sediment Mass ** | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (m) | (ft) | (m) | (ft) | (L) | (Gal) | (mm) | (in) | (L) | ($ft^3$) | (kg) | (lb) |
| EF4 / EFO4 | 1.2 | 4 | 1.52 | 5.0 | 265 | 70 | 203 | 8 | 1190 | 42 | 1904 | 5250 |
| EF6 / EFO6 | 1.8 | 6 | 1.93 | 6.3 | 610 | 160 | 305 | 12 | 3470 | 123 | 5552 | 15375 |
| EF8 / EFO8 | 2.4 | 8 | 2.59 | 8.5 | 1070 | 280 | 610 | 24 | 8780 | 310 | 14048 | 38750 |
| EF10 / EFO10 | 3.0 | 10 | 3.25 | 10.7 | 1670 | 440 | 610 | 24 | 17790 | 628 | 28464 | 78500 |
| EF12 / EFO12 | 3.6 | 12 | 3.89 | 12.8 | 2475 | 655 | 610 | 24 | 31220 | 1103 | 49952 | 137875 |

*Increased sump depth may be added to increase sediment storage capacity
** Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/$ft^3$ )

| Feature | Benefit | Feature Appeals To |
|---|---|---|
| Patent-pending enhanced flow treatment and scour prevention technology | Superior, verified third-party performance | Regulator, Specifying & Design Engineer |
| Third-party verified light liquid capture and retention for EFO version | Proven performance for fuel/oil hotspot locations | Regulator, Specifying & Design Engineer, Site Owner |
| Functions as bend, junction or inlet structure | Design flexibility | Specifying & Design Engineer |
| Minimal drop between inlet and outlet | Site installation ease | Contractor |
| Large diameter outlet riser for inspection and maintenance | Easy maintenance access from grade | Maintenance Contractor & Site Owner |

**STANDARD STORMCEPTOR EF/EFO DRAWINGS**

For standard details, please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef

**STANDARD STORMCEPTOR EF/EFO SPECIFICATION**

For specifications, please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef

**Table of TSS Removal vs Surface Loading Rate Based on Third-Party Test Results**
**Stormceptor® EFO**

| SLR (L/min/m²) | TSS % REMOVAL | SLR (L/min/m²) | TSS % REMOVAL | SLR (L/min/m²) | TSS % REMOVAL | SLR (L/min/m²) | TSS % REMOVAL |
|---|---|---|---|---|---|---|---|
| 1 | 70 | 660 | 42 | 1320 | 35 | 1980 | 24 |
| 30 | 70 | 690 | 42 | 1350 | 35 | 2010 | 24 |
| 60 | 67 | 720 | 41 | 1380 | 34 | 2040 | 23 |
| 90 | 63 | 750 | 41 | 1410 | 34 | 2070 | 23 |
| 120 | 61 | 780 | 41 | 1440 | 33 | 2100 | 23 |
| 150 | 58 | 810 | 41 | 1470 | 32 | 2130 | 22 |
| 180 | 56 | 840 | 41 | 1500 | 32 | 2160 | 22 |
| 210 | 54 | 870 | 41 | 1530 | 31 | 2190 | 22 |
| 240 | 53 | 900 | 41 | 1560 | 31 | 2220 | 21 |
| 270 | 52 | 930 | 40 | 1590 | 30 | 2250 | 21 |
| 300 | 51 | 960 | 40 | 1620 | 29 | 2280 | 21 |
| 330 | 50 | 990 | 40 | 1650 | 29 | 2310 | 21 |
| 360 | 49 | 1020 | 40 | 1680 | 28 | 2340 | 20 |
| 390 | 48 | 1050 | 39 | 1710 | 28 | 2370 | 20 |
| 420 | 47 | 1080 | 39 | 1740 | 27 | 2400 | 20 |
| 450 | 47 | 1110 | 38 | 1770 | 27 | 2430 | 20 |
| 480 | 46 | 1140 | 38 | 1800 | 26 | 2460 | 19 |
| 510 | 45 | 1170 | 37 | 1830 | 26 | 2490 | 19 |
| 540 | 44 | 1200 | 37 | 1860 | 26 | 2520 | 19 |
| 570 | 43 | 1230 | 37 | 1890 | 25 | 2550 | 19 |
| 600 | 42 | 1260 | 36 | 1920 | 25 | 2580 | 18 |
| 630 | 42 | 1290 | 36 | 1950 | 24 | 2600 | 26 |

# STANDARD PERFORMANCE SPECIFICATION FOR "OIL GRIT SEPARATOR" (OGS) STORMWATER QUALITY TREATMENT DEVICE

## PART 1 – GENERAL

1.1 WORK INCLUDED

This section specifies requirements for selecting, sizing, and designing an underground Oil Grit Separator (OGS) device for stormwater quality treatment, with third-party testing results and a Statement of Verification in accordance with ISO 14034 Environmental Management – Environmental Technology Verification (ETV).

1.2 REFERENCE STANDARDS & PROCEDURES

ISO 14034:2016 Environmental management – Environmental technology verification (ETV)

Canadian Environmental Technology Verification (ETV) Program's **Procedure for Laboratory Testing of Oil-Grit** S**eparators**

1.3 SUBMITTALS

1.3.1 All submittals, including sizing reports & shop drawings, shall be submitted upon request with each order to the contractor then forwarded to the Engineer of Record for review and acceptance. Shop drawings shall detail all OGS components, elevations, and sequence of construction.

1.3.2 Alternative devices shall have features identical to or greater than the specified device, including: treatment chamber diameter, treatment chamber wet volume, sediment storage volume, and oil storage volume.

1.3.3 Unless directed otherwise by the Engineer of Record, OGS stormwater quality treatment product substitutions or alternatives submitted within ten days prior to project bid shall not be accepted. All alternatives or substitutions submitted shall be signed and sealed by a local registered Professional Engineer, based on the exact same criteria detailed in Section 3, in entirety, subject to review and approval by the Engineer of Record.

## PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

The OGS device shall include a sump for sediment storage, and a protected volume for the capture and storage of petroleum hydrocarbons and buoyant gross pollutants. The minimum sediment & petroleum hydrocarbon storage capacity shall be as follows:

| | | |
|---|---|---|
| 2.1.1 | 4 ft (1219 mm) Diameter OGS Units: | 1.19 $m^3$ sediment / 265 L oil |
| | 6 ft (1829 mm) Diameter OGS Units: | 3.48 $m^3$ sediment / 609 L oil |
| | 8 ft (2438 mm) Diameter OGS Units: | 8.78 $m^3$ sediment / 1,071 L oil |
| | 10 ft (3048 mm) Diameter OGS Units: | 17.78 $m^3$ sediment / 1,673 L oil |
| | 12 ft (3657 mm) Diameter OGS Units: | 31.23 $m^3$ sediment / 2,476 L oil |

## PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall

remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing of the OGS shall be determined by use of a minimum ten (10) years of local historical rainfall data provided by Environment Canada. Sizing shall also be determined by use of the sediment removal performance data derived from the ISO 14034 ETV third-party verified laboratory testing data from testing conducted in accordance with the Canadian ETV protocol Procedure for Laboratory Testing of Oil-Grit Separators, as follows:

3.2.1 Sediment removal efficiency for a given surface loading rate and its associated flow rate shall be based on sediment removal efficiency demonstrated at the seven (7) tested surface loading rates specified in the protocol, ranging 40 L/min/$m^2$ to 1400 L/min/$m^2$, and as stated in the ISO 14034 ETV Verification Statement for the OGS device.

3.2.2 Sediment removal efficiency for surface loading rates between 40 L/min/$m^2$ and 1400 L/min/$m^2$ shall be based on linear interpolation of data between consecutive tested surface loading rates.

3.2.3 Sediment removal efficiency for surface loading rates less than the lowest tested surface loading rate of 40 L/min/$m^2$ shall be assumed to be identical to the sediment removal efficiency at 40 L/min/$m^2$. No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/$m^2$.

3.2.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/$m^2$ shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/$m^2$, and shall be calculated using a simple proportioning formula, with 1400 L/min/$m^2$ in the numerator and the higher surface loading rate in the denominator, and multiplying the resulting fraction times the sediment removal efficiency at 1400 L/min/$m^2$.

The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of third-party scour testing conducted in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.**

3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/$m^2$.

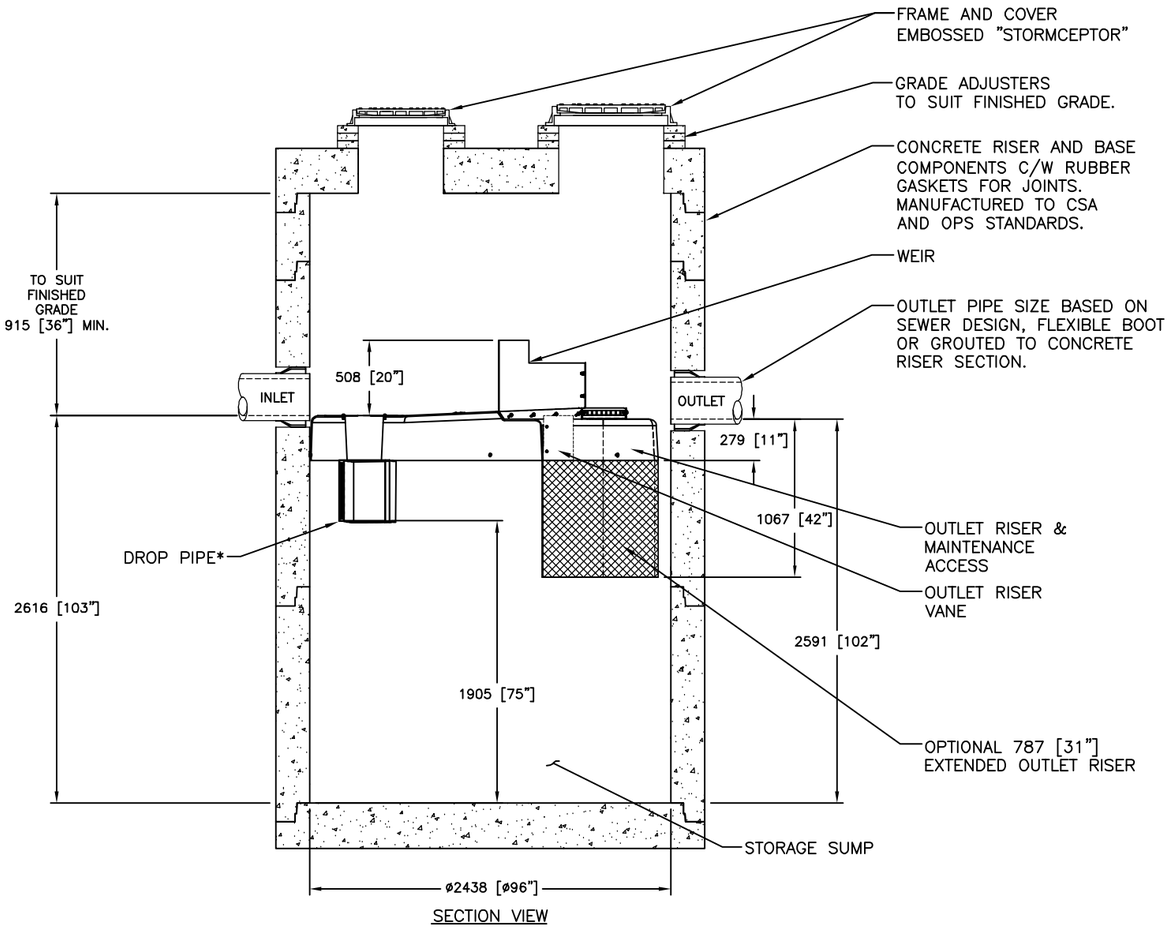
3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid Re-entrainment Simulation Testing in accordance with the Canadian ETV **Program's Procedure for Laboratory Testing of Oil-Grit Separators,** with results reported within the Canadian ETV or ISO 14034 ETV verification. This re-entrainment testing is conducted with the device pre-loaded with low density polyethylene (LDPE) plastic beads as a surrogate for light liquids such as oil and fuel. Testing is conducted on the same OGS unit tested for sediment removal to

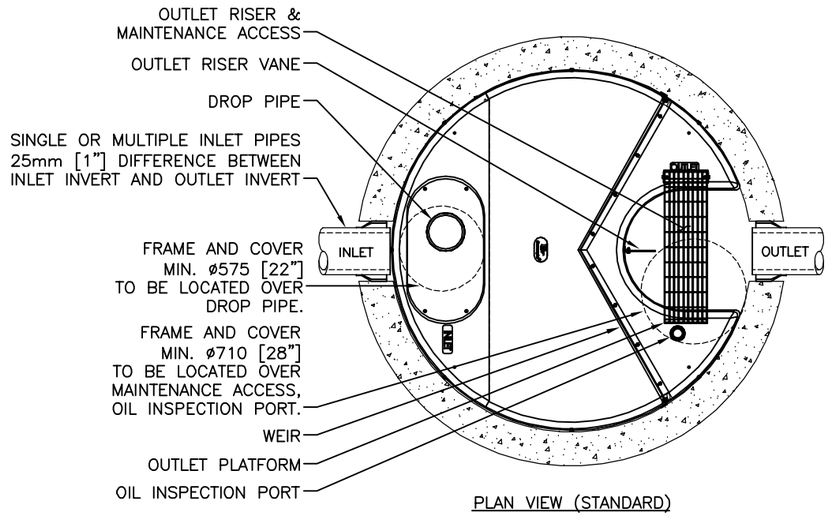
assess whether light liquids captured after a spill are effectively retained at high flow rates.

3.4.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five specified surface loading rates (ranging 200 L/min/$m^2$ to 2600 L/min/$m^2$) in accordance with the Light Liquid Re-entrainment Simulation Testing within the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.** However, an OGS device shall not be allowed if the Light Liquid Re-entrainment Simulation Testing was performed with screening components within the OGS device that are effective at retaining the LDPE plastic beads, but would not be expected to retain light liquids such as oil and fuel.

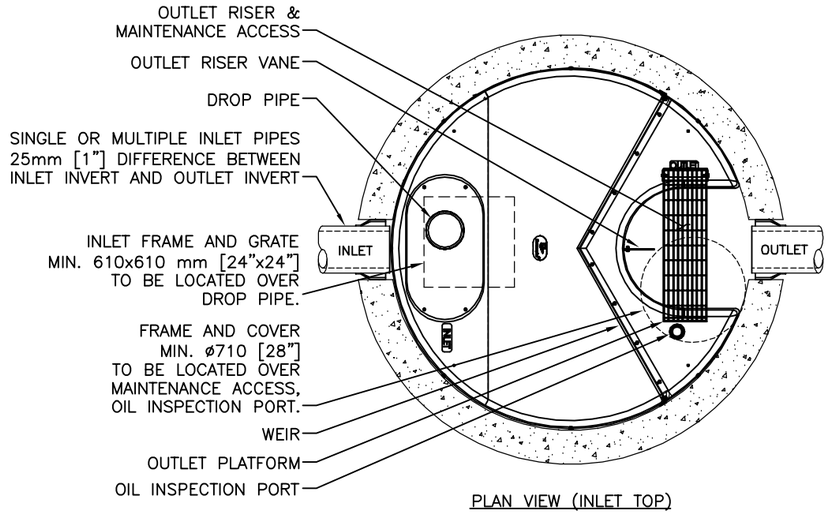
# DRAWING NOT TO BE USED FOR CONSTRUCTION




SECTION VIEW




PLAN VIEW (STANDARD)




PLAN VIEW (INLET TOP)

**GENERAL NOTES:**

* MAXIMUM SURFACE LOADING RATE (SLR) INTO LOWER CHAMBER THROUGH DROP PIPE IS 1135 L/min/m$^2$ (27.9 gpm/ft$^2$) FOR STORMCEPTOR EF8 AND 535 L/min/m$^2$ (13.1 gpm/ft$^2$) FOR STORMCEPTOR EFO8 (OIL CAPTURE CONFIGURATION).

1. ALL DIMENSIONS INDICATED ARE IN MILLIMETERS (INCHES) UNLESS OTHERWISE SPECIFIED.
2. STORMCEPTOR STRUCTURE INLET AND OUTLET PIPE SIZE AND ORIENTATION SHOWN FOR INFORMATIONAL PURPOSES ONLY.
3. UNLESS OTHERWISE NOTED, BYPASS INFRASTRUCTURE, SUCH AS ALL UPSTREAM DIVERSION STRUCTURES, CONNECTING STRUCTURES, OR PIPE CONDUITS CONNECTING TO COMPLETE THE STORMCEPTOR SYSTEM SHALL BE PROVIDED AND ADDRESSED SEPARATELY.
4. DRAWING FOR INFORMATION PURPOSES ONLY. REFER TO ENGINEER'S SITE/UTILITY PLAN FOR STRUCTURE ORIENTATION.
5. NO PRODUCT SUBSTITUTIONS SHALL BE ACCEPTED UNLESS SUBMITTED 10 DAYS PRIOR TO PROJECT BID DATE, OR AS DIRECTED BY THE ENGINEER OF RECORD.

**INSTALLATION NOTES**

A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE (LIFTING CLUTCHES PROVIDED)
C. CONTRACTOR WILL INSTALL AND LEVEL THE STRUCTURE, SEALING THE JOINTS, LINE ENTRY AND EXIT POINTS (NON-SHRINK GROUT WITH APPROVED WATERSTOP OR FLEXIBLE BOOT)
D. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT THE DEVICE FROM CONSTRUCTION-RELATED EROSION RUNOFF.
E. DEVICE ACTIVATION, BY CONTRACTOR, SHALL OCCUR ONLY AFTER SITE HAS BEEN STABILIZED AND THE STORMCEPTOR UNIT IS CLEAN AND FREE OF DEBRIS.

FOR SITE SPECIFIC DRAWINGS PLEASE CONTACT YOUR LOCAL STORMCEPTOR REPRESENTATIVE. SITE SPECIFIC DRAWINGS ARE BASED ON THE BEST AVAILABLE INFORMATION AT THE TIME. SOME FIELD REVISIONS TO THE SYSTEM LOCATION OR CONNECTION PIPING MAY BE NECESSARY BASED ON AVAILABLE SPACE OR SITE CONFIGURATION REVISIONS. ELEVATIONS SHOULD BE MAINTAINED EXCEPT WHERE NOTED ON BYPASS STRUCTURE (IF REQUIRED).

# STANDARD DETAIL
# NOT FOR CONSTRUCTION

## SITE SPECIFIC DATA REQUIREMENTS

| | | | | | |
|---|---|---|---|---|---|
| STORMCEPTOR MODEL | EFO8 | | | | |
| STRUCTURE ID | | | | | * |
| HYDROCARBON STORAGE REQ'D (L) | | | | | * |
| WATER QUALITY FLOW RATE (L/s) | | | | | * |
| PEAK FLOW RATE (L/s) | | | | | * |
| RETURN PERIOD OF PEAK FLOW (yrs) | | | | | * |
| DRAINAGE AREA (HA) | | | | | * |
| DRAINAGE AREA IMPERVIOUSNESS (%) | | | | | * |
| PIPE DATA: | I.E. | MAT'L | DIA | SLOPE % | HGL |
| INLET #1 | * | * | * | * | * |
| INLET #2 | * | * | * | * | * |
| OUTLET | * | * | * | * | * |

* PER ENGINEER OF RECORD



| MARK | DATE | REVISION DESCRIPTION | BY |
|---|---|---|---|
| 0 | 5/26/17 | INITIAL RELEASE | JSK |
| 1 | 6/8/18 | OUTLET PLATFORM | JSK |
| #### | ##### | #### | ### |

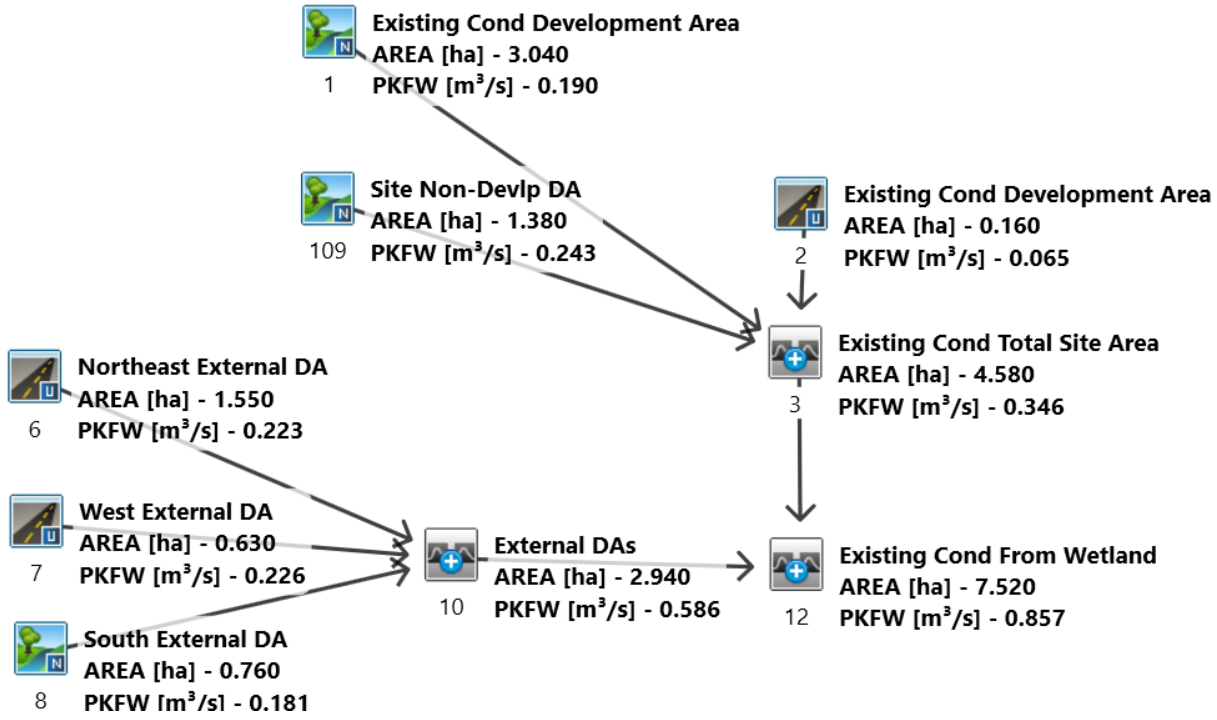
Stormceptor® EF

SCALE = NTS

imbrium®
407 FAIRVIEW DRIVE, WHITBY, ON L1N 9A9
TF 800-565-6801 CA 416-665-8600 INTL +1-416-665-8600

| | |
|---|---|
| DATE: | 10/13/2017 |
| DESIGNED: JSK | DRAWN: JSK |
| CHECKED: BSF | APPROVED: * |
| PROJECT No.: EFO8 | SEQUENCE No.: * |
| SHEET: | 1 OF 1 |

## Existing Conditions – VO6 Output




**Simulation A – 25 mm 4 Hour AES**
**Simulation B – 2 Year – 1 Hour AES**
**Simulation C – 2 Year – 12 Hour AES**
**Simulation D – 5 Year – 1 Hour AES**
**Simulation E – 5 Year – 12 Hour AES**
**Simulation F – 10 Year – 1 Hour AES**
**Simulation G – 10 Year – 12 Hour AES**
**Simulation H – 25 Year – 1 Hour AES**
**Simulation I – 25 Year – 12 Hour AES**
**Simulation J – 50 Year – 1 Hour AES**
**Simulation K – 50 Year – 12 Hour AES**
**Simulation L – 100 Year – 1 Hour AES**
**Simulation M – 100 Year – 12 Hour AES**
**Simulation N – Regional (Hazel)**

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

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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


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6.2\VO2\voin.dat
  Output  filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-
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  Summary filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-
33eb-4790-b5ab-2fe711ab4c1b\7126e548-f785-44c1-b526-748098a8fc43\scenari


DATE: 04/22/2024                          TIME: 11:35:03

USER:


COMMENTS: _____________________________________________________________


--------------------------------------------------------------------------------
-----------------------------------
  ********************************************
  ** SIMULATION : A - 25 mm 4 Hour           **
  ********************************************


--------------------
|    READ STORM    |    Filename: C:\Users\qdar\AppD
|                  |              ata\Local\Temp\
|                  |              b014d45b-6f58-45eb-8754-
25dd5b7e6eb9\8614c09d
| Ptotal= 25.02 mm |    Comments: 25MM4HR
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME
RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs
mm/hr
                0.00    2.17 |  1.00    6.20 |  2.00    5.62 |  3.00
2.95
                0.17    2.38 |  1.17   12.18 |  2.17    4.80 |  3.17
2.76
                0.33    2.66 |  1.33   41.67 |  2.33    4.21 |  3.33
2.62
                0.50    3.03 |  1.50   15.28 |  2.50    3.78 |  3.50
2.47
                0.67    3.58 |  1.67    9.22 |  2.67    3.45 |  3.67
2.35
                0.83    4.47 |  1.83    6.88 |  2.83    3.18 |  3.83
2.23

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

--------------------
| CALIB            |
| NASHYD   (  0001)|   Area    (ha)=   3.04   Curve Number   (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.10

     Unit Hyd Qpeak  (cms)=   0.106

     PEAK FLOW       (cms)=   0.046 (i)
     TIME TO PEAK    (hrs)=   3.000
     RUNOFF VOLUME    (mm)=  15.904
     TOTAL RAINFALL   (mm)=  25.023
     RUNOFF COEFFICIENT   =   0.636

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

--------------------------------------------------------------------------------
-------
--------------------
| CALIB            |
| NASHYD   (  0109)|   Area    (ha)=   1.38   Curve Number   (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.32

     Unit Hyd Qpeak  (cms)=   0.165

     PEAK FLOW       (cms)=   0.046 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  15.834
     TOTAL RAINFALL   (mm)=  25.023
     RUNOFF COEFFICIENT   =   0.633

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

--------------------------------------------------------------------------------
-------
--------------------
| CALIB            |
| STANDHYD (  0002)|   Area    (ha)=   0.16
|ID= 1 DT=10.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.16          0.00
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       1.00          2.00
```

| | | | | |
|---|---|---|---|---|
| Length | (m)= | 32.66 | 40.00 | |
| Mannings n | = | 0.013 | 0.250 | |
| Max.Eff.Inten. | (mm/hr)= | 41.67 | 24.43 | |
| over | (min) | 10.00 | 20.00 | |
| Storage Coeff. | (min)= | 1.85 (ii) | 14.26 (ii) | |
| Unit Hyd. Tpeak | (min)= | 10.00 | 20.00 | |
| Unit Hyd. peak | (cms)= | 0.17 | 0.07 | |
| | | | | *TOTALS* |
| PEAK FLOW | (cms)= | 0.02 | 0.00 | 0.018 (iii) |
| TIME TO PEAK | (hrs)= | 1.50 | 1.67 | 1.50 |
| RUNOFF VOLUME | (mm)= | 24.02 | 19.28 | 23.97 |
| TOTAL RAINFALL | (mm)= | 25.02 | 25.02 | 25.02 |
| RUNOFF COEFFICIENT | = | 0.96 | 0.77 | 0.96 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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 ( 0003) | | | | | |
|---|---|---|---|---|---|
| 1 + 2 = 3 | | AREA | QPEAK | TPEAK | R.V. |
| | | (ha) | (cms) | (hrs) | (mm) |
| ID1= 1 ( 0001): | | 3.04 | 0.046 | 3.00 | 15.90 |
| + ID2= 2 ( 0109): | | 1.38 | 0.046 | 1.83 | 15.83 |
| ID = 3 ( 0003): | | 4.42 | 0.066 | 2.17 | 15.88 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| ADD HYD ( 0003) | | | | | |
|---|---|---|---|---|---|
| 3 + 2 = 1 | | AREA | QPEAK | TPEAK | R.V. |
| | | (ha) | (cms) | (hrs) | (mm) |
| ID1= 3 ( 0003): | | 4.42 | 0.066 | 2.17 | 15.88 |
| + ID2= 2 ( 0002): | | 0.16 | 0.018 | 1.50 | 23.97 |
| ID = 1 ( 0003): | | 4.58 | 0.069 | 2.00 | 16.16 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| CALIB | | | | | |
|---|---|---|---|---|---|
| NASHYD ( 0008) | Area | (ha)= | 0.76 | Curve Number | (CN)= 98.0 |
| ID= 1 DT=10.0 min | Ia | (mm)= | 5.00 | # of Linear Res. | (N)= 3.00 |
| | U.H. Tp | (hrs)= | 0.18 | | |

Unit Hyd Qpeak (cms)= 0.161

PEAK FLOW (cms)= 0.033 (i)
TIME TO PEAK (hrs)= 1.667
RUNOFF VOLUME (mm)= 15.304
TOTAL RAINFALL (mm)= 25.023
RUNOFF COEFFICIENT = 0.612

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

---

| CALIB | | | | | |
|---|---|---|---|---|---|
| STANDHYD ( 0006) | Area | (ha)= | 1.55 | | |
| ID= 1 DT=10.0 min | Total Imp | (%)= | 29.00 | Dir. Conn. | (%)= 29.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.45 | 1.10 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 1.00 | 4.00 |
| Length | (m)= | 101.65 | 385.00 |
| Mannings n | = | 0.013 | 0.250 |
| Max.Eff.Inten. | (mm/hr)= | 41.67 | 14.36 |
| over | (min) | 10.00 | 60.00 |
| Storage Coeff. | (min)= | 3.66 (ii) | 52.14 (ii) |
| Unit Hyd. Tpeak | (min)= | 10.00 | 60.00 |
| Unit Hyd. peak | (cms)= | 0.16 | 0.02 |

| | | | | *TOTALS* |
|---|---|---|---|---|
| PEAK FLOW | (cms)= | 0.05 | 0.03 | 0.054 (iii) |
| TIME TO PEAK | (hrs)= | 1.50 | 2.33 | 1.50 |
| RUNOFF VOLUME | (mm)= | 24.02 | 19.28 | 20.64 |
| TOTAL RAINFALL | (mm)= | 25.02 | 25.02 | 25.02 |
| RUNOFF COEFFICIENT | = | 0.96 | 0.77 | 0.82 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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 ( 0007) | Area | (ha)= | 0.63 | | |
| ID= 1 DT=10.0 min | Total Imp | (%)= | 79.00 | Dir. Conn. | (%)= 79.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.50 | 0.13 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 3.00 | 2.00 |
| Length | (m)= | 405.00 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |
| Max.Eff.Inten. | (mm/hr)= | 41.67 | 24.43 |
| over | (min) | 10.00 | 20.00 |
| Storage Coeff. | (min)= | 6.04 (ii) | 18.44 (ii) |

```
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.14         0.06
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.05         0.01          0.053 (iii)
     TIME TO PEAK    (hrs)=       1.50         1.67           1.50
     RUNOFF VOLUME    (mm)=      24.02        19.28          23.01
     TOTAL RAINFALL   (mm)=      25.02        25.02          25.02
     RUNOFF COEFFICIENT   =       0.96         0.77           0.92

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0006):     1.55   0.054     1.50    20.64
     + ID2= 2 (  0007):     0.63   0.053     1.50    23.01
       ================================================
       ID = 3 (  0010):     2.18   0.107     1.50    21.32

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

--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0010):     2.18   0.107     1.50    21.32
     + ID2= 2 (  0008):     0.76   0.033     1.67    15.30
       ================================================
       ID = 1 (  0010):     2.94   0.137     1.50    19.77

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ADD HYD  (  0012)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0010):     2.94   0.137     1.50    19.77
     + ID2= 2 (  0003):     4.58   0.069     2.00    16.16
       ================================================
       ID = 3 (  0012):     7.52   0.181     1.50    17.57

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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 FINISH
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       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO
6.2\VO2\voin.dat
  Output  filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-
33eb-4790-b5ab-2fe711ab4c1b\2d09d282-7c38-442f-8688-be45c8d51610\scenari
  Summary filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-
33eb-4790-b5ab-2fe711ab4c1b\2d09d282-7c38-442f-8688-be45c8d51610\scenari


DATE: 04/22/2024                          TIME: 11:35:02

USER:



COMMENTS: _____________________________________________________________

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  ********************************************
  ** SIMULATION : B - 2Y1                    **
  ********************************************


--------------------
|    READ STORM    |    Filename: C:\Users\qdar\AppD
|                  |              ata\Local\Temp\
|                  |              b014d45b-6f58-45eb-8754-
25dd5b7e6eb9\0692a473
| Ptotal= 23.80 mm |    Comments: 2Y1
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME
RAIN
```

| TIME | RAIN | TIME | RAIN | TIME | RAIN | TIME | RAIN |
|---|---|---|---|---|---|---|---|
| hrs | mm/hr | hrs | mm/hr | hrs | mm/hr | hrs | mm/hr |
| 0.00 | 0.00 | 0.33 | 42.84 | 0.67 | 22.85 | 1.00 | 2.86 |
| 0.08 | 2.86 | 0.42 | 79.97 | 0.75 | 14.28 | | |
| 0.17 | 8.57 | 0.50 | 42.84 | 0.83 | 8.57 | | |
| 0.25 | 22.85 | 0.58 | 34.27 | 0.92 | 2.86 | | |

---

| CALIB | | | | | |
|---|---|---|---|---|---|
| NASHYD ( 0001) | Area (ha)= | 3.04 | Curve Number (CN)= | 98.0 | |
| ID= 1 DT=10.0 min | Ia (mm)= | 5.00 | # of Linear Res.(N)= | 3.00 | |
| | U.H. Tp(hrs)= | 1.10 | | | |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 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 |
| 0.167 | 1.43 | 0.500 | 61.40 | 0.833 | 18.56 | 1.17 | 1.43 |
| 0.333 | 15.71 | 0.667 | 38.56 | 1.000 | 5.71 | | |

Unit Hyd Qpeak (cms)= 0.106

PEAK FLOW (cms)= 0.060 (i)
TIME TO PEAK (hrs)= 1.667
RUNOFF VOLUME (mm)= 14.737
TOTAL RAINFALL (mm)= 23.802
RUNOFF COEFFICIENT = 0.619

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

---

| CALIB | | | | | |
|---|---|---|---|---|---|
| NASHYD ( 0109) | Area (ha)= | 1.38 | Curve Number (CN)= | 98.0 | |
| ID= 1 DT=10.0 min | Ia (mm)= | 5.00 | # of Linear Res.(N)= | 3.00 | |
| | U.H. Tp(hrs)= | 0.32 | | | |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 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 |
| 0.167 | 1.43 | 0.500 | 61.40 | 0.833 | 18.56 | 1.17 | 1.43 |
| 0.333 | 15.71 | 0.667 | 38.56 | 1.000 | 5.71 | | |

Unit Hyd Qpeak (cms)= 0.165

PEAK FLOW (cms)= 0.076 (i)
TIME TO PEAK (hrs)= 0.833
RUNOFF VOLUME (mm)= 14.672
TOTAL RAINFALL (mm)= 23.802
RUNOFF COEFFICIENT = 0.616

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

---

| CALIB | | | | | |
|---|---|---|---|---|---|
| STANDHYD ( 0002) | Area (ha)= | 0.16 | | | |
| ID= 1 DT=10.0 min | Total Imp(%)= | 99.00 | Dir. Conn.(%)= | 99.00 | |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.16 | 0.00 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 1.00 | 2.00 |
| Length | (m)= | 32.66 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 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 |
| 0.167 | 1.43 | 0.500 | 61.40 | 0.833 | 18.56 | 1.17 | 1.43 |
| 0.333 | 15.71 | 0.667 | 38.56 | 1.000 | 5.71 | | |

| | | | | *TOTALS* |
|---|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 61.40 | 46.37 | | |
| over (min) | 10.00 | 20.00 | | |
| Storage Coeff. (min)= | 1.59 (ii) | 11.18 (ii) | | |
| Unit Hyd. Tpeak (min)= | 10.00 | 20.00 | | |
| Unit Hyd. peak (cms)= | 0.17 | 0.08 | | |
| PEAK FLOW (cms)= | 0.03 | 0.00 | | 0.027 (iii) |
| TIME TO PEAK (hrs)= | 0.50 | 0.67 | | 0.50 |
| RUNOFF VOLUME (mm)= | 22.80 | 18.10 | | 22.74 |
| TOTAL RAINFALL (mm)= | 23.80 | 23.80 | | 23.80 |
| RUNOFF COEFFICIENT = | 0.96 | 0.76 | | 0.96 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| ADD HYD  (  0003)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     3.04   0.060     1.67    14.74
      + ID2= 2 (  0109):     1.38   0.076     0.83    14.67
        ================================================
        ID = 3 (  0003):     4.42   0.105     1.00    14.72

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ADD HYD  (  0003)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0003):     4.42   0.105     1.00    14.72
      + ID2= 2 (  0002):     0.16   0.027     0.50    22.74
        ================================================
        ID = 1 (  0003):     4.58   0.107     1.00    15.00

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------
--------------------
| CALIB            |
| NASHYD   (  0008)|   Area     (ha)=   0.76   Curve Number    (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

         NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
               0.167    1.43 | 0.500   61.40 | 0.833   18.56 |  1.17
1.43
               0.333   15.71 | 0.667   38.56 | 1.000    5.71 |

     Unit Hyd Qpeak  (cms)=   0.161

     PEAK FLOW       (cms)=   0.056 (i)
     TIME TO PEAK    (hrs)=   0.667
     RUNOFF VOLUME    (mm)=  14.182
     TOTAL RAINFALL   (mm)=  23.802
     RUNOFF COEFFICIENT   =   0.596

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

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-------
--------------------
| CALIB            |
| STANDHYD (  0006)|   Area     (ha)=   1.55
|ID= 1 DT=10.0 min |   Total Imp(%)=  29.00   Dir. Conn.(%)=  29.00

--------------------
                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.45         1.10
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         4.00
     Length            (m)=     101.65       385.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
               0.167    1.43 | 0.500   61.40 | 0.833   18.56 |  1.17
1.43
               0.333   15.71 | 0.667   38.56 | 1.000    5.71 |

     Max.Eff.Inten.(mm/hr)=      61.40        26.38
               over (min)        10.00        50.00
     Storage Coeff.  (min)=       3.14 (ii)   41.15 (ii)
     Unit Hyd. Tpeak (min)=      10.00        50.00
     Unit Hyd. peak  (cms)=       0.16         0.03
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.07         0.04        0.079 (iii)
     TIME TO PEAK    (hrs)=       0.50         1.33         0.50
     RUNOFF VOLUME    (mm)=      22.80        18.10        19.45
     TOTAL RAINFALL   (mm)=      23.80        23.80        23.80
     RUNOFF COEFFICIENT   =       0.96         0.76         0.82

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD (  0007)|   Area     (ha)=   0.63
|ID= 1 DT=10.0 min |   Total Imp(%)=  79.00   Dir. Conn.(%)=  79.00
--------------------
                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.50         0.13
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       3.00         2.00
     Length            (m)=     405.00        40.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
               0.167    1.43 | 0.500   61.40 | 0.833   18.56 |  1.17
1.43
               0.333   15.71 | 0.667   38.56 | 1.000    5.71 |

     Max.Eff.Inten.(mm/hr)=      61.40        46.37
               over (min)        10.00        20.00
     Storage Coeff.  (min)=       5.17 (ii)   14.77 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.15         0.07
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.07         0.01          0.078 (iii)
     TIME TO PEAK    (hrs)=       0.50         0.83           0.50
     RUNOFF VOLUME    (mm)=      22.80        18.10          21.80
     TOTAL RAINFALL   (mm)=      23.80        23.80          23.80
     RUNOFF COEFFICIENT   =       0.96         0.76           0.92

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  98.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0006):     1.55   0.079     0.50    19.45
      + ID2= 2 (  0007):     0.63   0.078     0.50    21.80
        ================================================
        ID = 3 (  0010):     2.18   0.157     0.50    20.13

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

--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0010):     2.18   0.157     0.50    20.13
      + ID2= 2 (  0008):     0.76   0.056     0.67    14.18
        ================================================
        ID = 1 (  0010):     2.94   0.188     0.50    18.59

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ADD HYD  (  0012)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0010):     2.94   0.188     0.50    18.59
      + ID2= 2 (  0003):     4.58   0.107     1.00    15.00
        ================================================
        ID = 3 (  0012):     7.52   0.269     0.67    16.40

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO
6.2\VO2\voin.dat
  Output  filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-
33eb-4790-b5ab-2fe711ab4c1b\4724348c-e68c-4e6d-b68c-9eff767ac442\scenari
  Summary filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-
33eb-4790-b5ab-2fe711ab4c1b\4724348c-e68c-4e6d-b68c-9eff767ac442\scenari

DATE: 04/22/2024                          TIME: 11:35:02

USER:

COMMENTS: _____

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  **********************************************
  ** SIMULATION : C - 2Y12                     **
  **********************************************

--------------------
|    READ STORM    |    Filename: C:\Users\qdar\AppD
|                  |              ata\Local\Temp\
```

| | b014d45b-6f58-45eb-8754-25dd5b7e6eb9\db555cbc
| Ptotal= 43.20 mm | Comments: 2Y12 UPDATED

| TIME | RAIN | TIME | RAIN | TIME | RAIN | TIME | RAIN |
|---|---|---|---|---|---|---|---|
| hrs | mm/hr | hrs | mm/hr | hrs | mm/hr | hrs | mm/hr |
| 0.00 | 0.40 | 3.00 | 7.40 | 6.00 | 3.00 | 9.00 | 0.40 |
| 0.25 | 0.40 | 3.25 | 7.40 | 6.25 | 3.00 | 9.25 | 0.40 |
| 0.50 | 0.40 | 3.50 | 7.40 | 6.50 | 3.00 | 9.50 | 0.40 |
| 0.75 | 0.40 | 3.75 | 7.40 | 6.75 | 3.00 | 9.75 | 0.40 |
| 1.00 | 0.40 | 4.00 | 20.00 | 7.00 | 1.70 | 10.00 | 0.40 |
| 1.25 | 0.40 | 4.25 | 20.00 | 7.25 | 1.70 | 10.25 | 0.40 |
| 1.50 | 0.40 | 4.50 | 20.00 | 7.50 | 1.70 | 10.50 | 0.40 |
| 1.75 | 0.40 | 4.75 | 20.00 | 7.75 | 1.70 | 10.75 | 0.40 |
| 2.00 | 2.60 | 5.00 | 5.60 | 8.00 | 0.90 | 11.00 | 0.40 |
| 2.25 | 2.60 | 5.25 | 5.60 | 8.25 | 0.90 | 11.25 | 0.40 |
| 2.50 | 2.60 | 5.50 | 5.60 | 8.50 | 0.90 | 11.50 | 0.40 |
| 2.75 | 2.60 | 5.75 | 5.60 | 8.75 | 0.90 | 11.75 | 0.40 |

---

| CALIB | NASHYD ( 0001) | ID= 1 DT=10.0 min |
|---|---|---|

Area (ha)= 3.04 Curve Number (CN)= 98.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 1.10

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 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 |
| 0.167 | 0.40 | 3.167 | 7.40 | 6.167 | 3.00 | 9.17 | 0.40 |
| 0.333 | 0.40 | 3.333 | 7.40 | 6.333 | 3.00 | 9.33 | 0.40 |
| 0.500 | 0.40 | 3.500 | 7.40 | 6.500 | 3.00 | 9.50 | 0.40 |
| 0.667 | 0.40 | 3.667 | 7.40 | 6.667 | 3.00 | 9.67 | 0.40 |
| 0.833 | 0.40 | 3.833 | 7.40 | 6.833 | 3.00 | 9.83 | 0.40 |
| 1.000 | 0.40 | 4.000 | 7.40 | 7.000 | 3.00 | 10.00 | 0.40 |
| 1.167 | 0.40 | 4.167 | 20.00 | 7.167 | 1.70 | 10.17 | 0.40 |
| 1.333 | 0.40 | 4.333 | 20.00 | 7.333 | 1.70 | 10.33 | 0.40 |
| 1.500 | 0.40 | 4.500 | 20.00 | 7.500 | 1.70 | 10.50 | 0.40 |
| 1.667 | 0.40 | 4.667 | 20.00 | 7.667 | 1.70 | 10.67 | 0.40 |
| 1.833 | 0.40 | 4.833 | 20.00 | 7.833 | 1.70 | 10.83 | 0.40 |
| 2.000 | 0.40 | 5.000 | 20.00 | 8.000 | 1.70 | 11.00 | 0.40 |
| 2.167 | 2.60 | 5.167 | 5.60 | 8.167 | 0.90 | 11.17 | 0.40 |
| 2.333 | 2.60 | 5.333 | 5.60 | 8.333 | 0.90 | 11.33 | 0.40 |
| 2.500 | 2.60 | 5.500 | 5.60 | 8.500 | 0.90 | 11.50 | 0.40 |
| 2.667 | 2.60 | 5.667 | 5.60 | 8.667 | 0.90 | 11.67 | 0.40 |
| 2.833 | 2.60 | 5.833 | 5.60 | 8.833 | 0.90 | 11.83 | 0.40 |
| 3.000 | 2.60 | 6.000 | 5.60 | 9.000 | 0.90 | 12.00 | 0.40 |

Unit Hyd Qpeak (cms)= 0.106

PEAK FLOW (cms)= 0.087 (i)
TIME TO PEAK (hrs)= 5.833
RUNOFF VOLUME (mm)= 33.634
TOTAL RAINFALL (mm)= 43.200
RUNOFF COEFFICIENT = 0.779

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

---

| CALIB | NASHYD ( 0109) | ID= 1 DT=10.0 min |
|---|---|---|

Area (ha)= 1.38 Curve Number (CN)= 98.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.32

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 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 |
| 0.167 | 0.40 | 3.167 | 7.40 | 6.167 | 3.00 | 9.17 | 0.40 |
| 0.333 | 0.40 | 3.333 | 7.40 | 6.333 | 3.00 | 9.33 | 0.40 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 0.500 | 0.40 | 3.500 | 7.40 | 6.500 | 3.00 | 9.50 | |
| 0.40 | | | | | | | | |
| | 0.667 | 0.40 | 3.667 | 7.40 | 6.667 | 3.00 | 9.67 | |
| 0.40 | | | | | | | | |
| | 0.833 | 0.40 | 3.833 | 7.40 | 6.833 | 3.00 | 9.83 | |
| 0.40 | | | | | | | | |
| | 1.000 | 0.40 | 4.000 | 7.40 | 7.000 | 3.00 | 10.00 | |
| 0.40 | | | | | | | | |
| | 1.167 | 0.40 | 4.167 | 20.00 | 7.167 | 1.70 | 10.17 | |
| 0.40 | | | | | | | | |
| | 1.333 | 0.40 | 4.333 | 20.00 | 7.333 | 1.70 | 10.33 | |
| 0.40 | | | | | | | | |
| | 1.500 | 0.40 | 4.500 | 20.00 | 7.500 | 1.70 | 10.50 | |
| 0.40 | | | | | | | | |
| | 1.667 | 0.40 | 4.667 | 20.00 | 7.667 | 1.70 | 10.67 | |
| 0.40 | | | | | | | | |
| | 1.833 | 0.40 | 4.833 | 20.00 | 7.833 | 1.70 | 10.83 | |
| 0.40 | | | | | | | | |
| | 2.000 | 0.40 | 5.000 | 20.00 | 8.000 | 1.70 | 11.00 | |
| 0.40 | | | | | | | | |
| | 2.167 | 2.60 | 5.167 | 5.60 | 8.167 | 0.90 | 11.17 | |
| 0.40 | | | | | | | | |
| | 2.333 | 2.60 | 5.333 | 5.60 | 8.333 | 0.90 | 11.33 | |
| 0.40 | | | | | | | | |
| | 2.500 | 2.60 | 5.500 | 5.60 | 8.500 | 0.90 | 11.50 | |
| 0.40 | | | | | | | | |
| | 2.667 | 2.60 | 5.667 | 5.60 | 8.667 | 0.90 | 11.67 | |
| 0.40 | | | | | | | | |
| | 2.833 | 2.60 | 5.833 | 5.60 | 8.833 | 0.90 | 11.83 | |
| 0.40 | | | | | | | | |
| | 3.000 | 2.60 | 6.000 | 5.60 | 9.000 | 0.90 | 12.00 | |
| 0.40 | | | | | | | | |

Unit Hyd Qpeak (cms)= 0.165

PEAK FLOW (cms)= 0.070 (i)
TIME TO PEAK (hrs)= 5.000
RUNOFF VOLUME (mm)= 33.484
TOTAL RAINFALL (mm)= 43.200
RUNOFF COEFFICIENT = 0.775

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

---

| CALIB | | | | | |
|---|---|---|---|---|---|
| STANDHYD ( 0002) | Area (ha)= | 0.16 | | | |
| ID= 1 DT=10.0 min | Total Imp(%)= | 99.00 | Dir. Conn.(%)= | 99.00 | |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.16 | 0.00 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 1.00 | 2.00 |
| Length | (m)= | 32.66 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 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 |
| 0.167 | 0.40 | 3.167 | 7.40 | 6.167 | 3.00 | 9.17 | 0.40 |
| 0.333 | 0.40 | 3.333 | 7.40 | 6.333 | 3.00 | 9.33 | 0.40 |
| 0.500 | 0.40 | 3.500 | 7.40 | 6.500 | 3.00 | 9.50 | 0.40 |
| 0.667 | 0.40 | 3.667 | 7.40 | 6.667 | 3.00 | 9.67 | 0.40 |
| 0.833 | 0.40 | 3.833 | 7.40 | 6.833 | 3.00 | 9.83 | 0.40 |
| 1.000 | 0.40 | 4.000 | 7.40 | 7.000 | 3.00 | 10.00 | 0.40 |
| 1.167 | 0.40 | 4.167 | 20.00 | 7.167 | 1.70 | 10.17 | 0.40 |
| 1.333 | 0.40 | 4.333 | 20.00 | 7.333 | 1.70 | 10.33 | 0.40 |
| 1.500 | 0.40 | 4.500 | 20.00 | 7.500 | 1.70 | 10.50 | 0.40 |
| 1.667 | 0.40 | 4.667 | 20.00 | 7.667 | 1.70 | 10.67 | 0.40 |
| 1.833 | 0.40 | 4.833 | 20.00 | 7.833 | 1.70 | 10.83 | 0.40 |
| 2.000 | 0.40 | 5.000 | 20.00 | 8.000 | 1.70 | 11.00 | 0.40 |
| 2.167 | 2.60 | 5.167 | 5.60 | 8.167 | 0.90 | 11.17 | 0.40 |
| 2.333 | 2.60 | 5.333 | 5.60 | 8.333 | 0.90 | 11.33 | 0.40 |
| 2.500 | 2.60 | 5.500 | 5.60 | 8.500 | 0.90 | 11.50 | 0.40 |
| 2.667 | 2.60 | 5.667 | 5.60 | 8.667 | 0.90 | 11.67 | 0.40 |
| 2.833 | 2.60 | 5.833 | 5.60 | 8.833 | 0.90 | 11.83 | 0.40 |
| 3.000 | 2.60 | 6.000 | 5.60 | 9.000 | 0.90 | 12.00 | 0.40 |

| | | | | |
|---|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 20.00 | 19.44 | | |
| over (min) | 10.00 | 20.00 | | |
| Storage Coeff. (min)= | 2.49 (ii) | 16.07 (ii) | | |
| Unit Hyd. Tpeak (min)= | 10.00 | 20.00 | | |
| Unit Hyd. peak (cms)= | 0.17 | 0.06 | | |
| | | | | *TOTALS* |
| PEAK FLOW (cms)= | 0.01 | 0.00 | | 0.009 (iii) |
| TIME TO PEAK (hrs)= | 5.00 | 5.00 | | 5.00 |
| RUNOFF VOLUME (mm)= | 42.20 | 37.09 | | 42.15 |
| TOTAL RAINFALL (mm)= | 43.20 | 43.20 | | 43.20 |
| RUNOFF COEFFICIENT = | 0.98 | 0.86 | | 0.98 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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 ( 0003)| | | | | |
|---|---|---|---|---|---|
| 1 + 2 = 3 | | AREA | QPEAK | TPEAK | R.V. |
| | | (ha) | (cms) | (hrs) | (mm) |
| ID1= 1 ( 0001): | | 3.04 | 0.087 | 5.83 | 33.63 |
| + ID2= 2 ( 0109): | | 1.38 | 0.070 | 5.00 | 33.48 |
| ID = 3 ( 0003): | | 4.42 | 0.132 | 5.17 | 33.59 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| ADD HYD ( 0003)| | | | | |
|---|---|---|---|---|---|
| 3 + 2 = 1 | | AREA | QPEAK | TPEAK | R.V. |
| | | (ha) | (cms) | (hrs) | (mm) |
| ID1= 3 ( 0003): | | 4.42 | 0.132 | 5.17 | 33.59 |
| + ID2= 2 ( 0002): | | 0.16 | 0.009 | 5.00 | 42.15 |
| ID = 1 ( 0003): | | 4.58 | 0.139 | 5.00 | 33.89 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| CALIB | | | |
|---|---|---|---|
| NASHYD ( 0008) | Area (ha)= 0.76 | Curve Number (CN)= 98.0 | |
| ID= 1 DT=10.0 min | Ia (mm)= 5.00 | # of Linear Res.(N)= 3.00 | |
| | U.H. Tp(hrs)= 0.18 | | |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.40 | 3.167 | 7.40 | 6.167 | 3.00 | 9.17 | 0.40 |
| 0.333 | 0.40 | 3.333 | 7.40 | 6.333 | 3.00 | 9.33 | 0.40 |
| 0.500 | 0.40 | 3.500 | 7.40 | 6.500 | 3.00 | 9.50 | 0.40 |
| 0.667 | 0.40 | 3.667 | 7.40 | 6.667 | 3.00 | 9.67 | 0.40 |
| 0.833 | 0.40 | 3.833 | 7.40 | 6.833 | 3.00 | 9.83 | 0.40 |
| 1.000 | 0.40 | 4.000 | 7.40 | 7.000 | 3.00 | 10.00 | 0.40 |
| 1.167 | 0.40 | 4.167 | 20.00 | 7.167 | 1.70 | 10.17 | 0.40 |
| 1.333 | 0.40 | 4.333 | 20.00 | 7.333 | 1.70 | 10.33 | 0.40 |
| 1.500 | 0.40 | 4.500 | 20.00 | 7.500 | 1.70 | 10.50 | 0.40 |
| 1.667 | 0.40 | 4.667 | 20.00 | 7.667 | 1.70 | 10.67 | 0.40 |
| 1.833 | 0.40 | 4.833 | 20.00 | 7.833 | 1.70 | 10.83 | 0.40 |
| 2.000 | 0.40 | 5.000 | 20.00 | 8.000 | 1.70 | 11.00 | 0.40 |
| 2.167 | 2.60 | 5.167 | 5.60 | 8.167 | 0.90 | 11.17 | 0.40 |
| 2.333 | 2.60 | 5.333 | 5.60 | 8.333 | 0.90 | 11.33 | 0.40 |
| 2.500 | 2.60 | 5.500 | 5.60 | 8.500 | 0.90 | 11.50 | 0.40 |
| 2.667 | 2.60 | 5.667 | 5.60 | 8.667 | 0.90 | 11.67 | 0.40 |
| 2.833 | 2.60 | 5.833 | 5.60 | 8.833 | 0.90 | 11.83 | 0.40 |
| 3.000 | 2.60 | 6.000 | 5.60 | 9.000 | 0.90 | 12.00 | 0.40 |

Unit Hyd Qpeak (cms)= 0.161

PEAK FLOW (cms)= 0.039 (i)
TIME TO PEAK (hrs)= 5.000
RUNOFF VOLUME (mm)= 32.365
TOTAL RAINFALL (mm)= 43.200
RUNOFF COEFFICIENT = 0.749

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

---

| CALIB | | |
|---|---|---|
| STANDHYD ( 0006) | Area (ha)= 1.55 | |
| ID= 1 DT=10.0 min | Total Imp(%)= 29.00 | Dir. Conn.(%)= 29.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.45 | 1.10 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 1.00 | 4.00 |
| Length | (m)= | 101.65 | 385.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.40 | 3.167 | 7.40 | 6.167 | 3.00 | 9.17 | 0.40 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 0.333 | 0.40 | 3.333 | 7.40 | 6.333 | 3.00 | 9.33 | 0.40 |
| 0.500 | 0.40 | 3.500 | 7.40 | 6.500 | 3.00 | 9.50 | 0.40 |
| 0.667 | 0.40 | 3.667 | 7.40 | 6.667 | 3.00 | 9.67 | 0.40 |
| 0.833 | 0.40 | 3.833 | 7.40 | 6.833 | 3.00 | 9.83 | 0.40 |
| 1.000 | 0.40 | 4.000 | 7.40 | 7.000 | 3.00 | 10.00 | 0.40 |
| 1.167 | 0.40 | 4.167 | 20.00 | 7.167 | 1.70 | 10.17 | 0.40 |
| 1.333 | 0.40 | 4.333 | 20.00 | 7.333 | 1.70 | 10.33 | 0.40 |
| 1.500 | 0.40 | 4.500 | 20.00 | 7.500 | 1.70 | 10.50 | 0.40 |
| 1.667 | 0.40 | 4.667 | 20.00 | 7.667 | 1.70 | 10.67 | 0.40 |
| 1.833 | 0.40 | 4.833 | 20.00 | 7.833 | 1.70 | 10.83 | 0.40 |
| 2.000 | 0.40 | 5.000 | 20.00 | 8.000 | 1.70 | 11.00 | 0.40 |
| 2.167 | 2.60 | 5.167 | 5.60 | 8.167 | 0.90 | 11.17 | 0.40 |
| 2.333 | 2.60 | 5.333 | 5.60 | 8.333 | 0.90 | 11.33 | 0.40 |
| 2.500 | 2.60 | 5.500 | 5.60 | 8.500 | 0.90 | 11.50 | 0.40 |
| 2.667 | 2.60 | 5.667 | 5.60 | 8.667 | 0.90 | 11.67 | 0.40 |
| 2.833 | 2.60 | 5.833 | 5.60 | 8.833 | 0.90 | 11.83 | 0.40 |
| 3.000 | 2.60 | 6.000 | 5.60 | 9.000 | 0.90 | 12.00 | 0.40 |

| | | | |
|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 20.00 | 19.13 | |
| over (min) | 10.00 | 50.00 | |
| Storage Coeff. (min)= | 4.91 (ii) | 48.14 (ii) | |
| Unit Hyd. Tpeak (min)= | 10.00 | 50.00 | |
| Unit Hyd. peak (cms)= | 0.15 | 0.02 | |
| | | | *TOTALS* |
| PEAK FLOW (cms)= | 0.02 | 0.04 | 0.061 (iii) |
| TIME TO PEAK (hrs)= | 5.00 | 5.33 | 5.00 |
| RUNOFF VOLUME (mm)= | 42.20 | 37.09 | 38.55 |
| TOTAL RAINFALL (mm)= | 43.20 | 43.20 | 43.20 |
| RUNOFF COEFFICIENT = | 0.98 | 0.86 | 0.89 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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 ( 0007)| Area (ha)= 0.63
|ID= 1 DT=10.0 min | Total Imp(%)= 79.00 Dir. Conn.(%)= 79.00

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.50 | 0.13 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 3.00 | 2.00 |
| Length | (m)= | 405.00 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 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 |
| 0.167 | 0.40 | 3.167 | 7.40 | 6.167 | 3.00 | 9.17 | 0.40 |
| 0.333 | 0.40 | 3.333 | 7.40 | 6.333 | 3.00 | 9.33 | 0.40 |
| 0.500 | 0.40 | 3.500 | 7.40 | 6.500 | 3.00 | 9.50 | 0.40 |
| 0.667 | 0.40 | 3.667 | 7.40 | 6.667 | 3.00 | 9.67 | 0.40 |
| 0.833 | 0.40 | 3.833 | 7.40 | 6.833 | 3.00 | 9.83 | 0.40 |
| 1.000 | 0.40 | 4.000 | 7.40 | 7.000 | 3.00 | 10.00 | 0.40 |
| 1.167 | 0.40 | 4.167 | 20.00 | 7.167 | 1.70 | 10.17 | 0.40 |
| 1.333 | 0.40 | 4.333 | 20.00 | 7.333 | 1.70 | 10.33 | 0.40 |
| 1.500 | 0.40 | 4.500 | 20.00 | 7.500 | 1.70 | 10.50 | 0.40 |
| 1.667 | 0.40 | 4.667 | 20.00 | 7.667 | 1.70 | 10.67 | 0.40 |
| 1.833 | 0.40 | 4.833 | 20.00 | 7.833 | 1.70 | 10.83 | 0.40 |
| 2.000 | 0.40 | 5.000 | 20.00 | 8.000 | 1.70 | 11.00 | 0.40 |
| 2.167 | 2.60 | 5.167 | 5.60 | 8.167 | 0.90 | 11.17 | 0.40 |
| 2.333 | 2.60 | 5.333 | 5.60 | 8.333 | 0.90 | 11.33 | 0.40 |
| 2.500 | 2.60 | 5.500 | 5.60 | 8.500 | 0.90 | 11.50 | 0.40 |
| 2.667 | 2.60 | 5.667 | 5.60 | 8.667 | 0.90 | 11.67 | 0.40 |
| 2.833 | 2.60 | 5.833 | 5.60 | 8.833 | 0.90 | 11.83 | 0.40 |
| 3.000 | 2.60 | 6.000 | 5.60 | 9.000 | 0.90 | 12.00 | 0.40 |

| | | |
|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 20.00 | 19.44 |
| over (min) | 10.00 | 30.00 |
| Storage Coeff. (min)= | 8.10 (ii) | 21.68 (ii) |
| Unit Hyd. Tpeak (min)= | 10.00 | 30.00 |

```
     Unit Hyd. peak  (cms)=       0.12         0.05
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.01          0.034 (iii)
     TIME TO PEAK    (hrs)=       5.00         5.00           5.00
     RUNOFF VOLUME    (mm)=      42.20        37.09          41.11
     TOTAL RAINFALL   (mm)=      43.20        43.20          43.20
     RUNOFF COEFFICIENT   =       0.98         0.86           0.95

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  98.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
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--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0006):     1.55   0.061     5.00    38.55
     + ID2= 2 (  0007):     0.63   0.034     5.00    41.11
       ================================================
       ID = 3 (  0010):     2.18   0.095     5.00    39.29

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

--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0010):     2.18   0.095     5.00    39.29
     + ID2= 2 (  0008):     0.76   0.039     5.00    32.37
       ================================================
       ID = 1 (  0010):     2.94   0.134     5.00    37.50

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

--------------------
| ADD HYD  (  0012)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0010):     2.94   0.134     5.00    37.50
     + ID2= 2 (  0003):     4.58   0.139     5.00    33.89
       ================================================
       ID = 3 (  0012):     7.52   0.273     5.00    35.30

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

```
       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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```

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

```
  Input   filename: C:\Program Files (x86)\Visual OTTHYMO
6.2\VO2\voin.dat
  Output  filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-
33eb-4790-b5ab-2fe711ab4c1b\a69e5424-c32f-489d-9a77-1a90c1b8718f\scenari
  Summary filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-
33eb-4790-b5ab-2fe711ab4c1b\a69e5424-c32f-489d-9a77-1a90c1b8718f\scenari

DATE: 04/22/2024                          TIME: 11:35:03

USER:


COMMENTS: _____________________________________________________________

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  ***********************************************
  ** SIMULATION : D - 5Y1                      **
  ***********************************************


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|    READ STORM    |    Filename: C:\Users\qdar\AppD
|                  |              ata\Local\Temp\
|                  |              b014d45b-6f58-45eb-8754-
25dd5b7e6eb9\e8091281
| Ptotal= 32.60 mm |    Comments: 5Y1
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME
RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs
mm/hr
                0.00    0.00 |  0.33   58.68 |  0.67   31.30 |  1.00
3.91
                0.08    3.91 |  0.42  109.54 |  0.75   19.56 |
                0.17   11.74 |  0.50   58.68 |  0.83   11.74 |
                0.25   31.30 |  0.58   46.94 |  0.92    3.91 |
```

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--------------------------------------------------------------------------
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--------------------
| CALIB            |
| NASHYD   (  0001)|   Area     (ha)=   3.04   Curve Number    (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.10

        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
               0.167    1.95 | 0.500   84.11 | 0.833   25.43 |  1.17
1.95
               0.333   21.52 | 0.667   52.81 | 1.000    7.82 |

     Unit Hyd Qpeak  (cms)=   0.106

     PEAK FLOW       (cms)=   0.094 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=  23.235
     TOTAL RAINFALL   (mm)=  32.601
     RUNOFF COEFFICIENT   =   0.713

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

--------------------------------------------------------------------------
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--------------------
| CALIB            |
| NASHYD   (  0109)|   Area     (ha)=   1.38   Curve Number    (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.32

        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
               0.167    1.95 | 0.500   84.11 | 0.833   25.43 |  1.17
1.95
               0.333   21.52 | 0.667   52.81 | 1.000    7.82 |

     Unit Hyd Qpeak  (cms)=   0.165

     PEAK FLOW       (cms)=   0.120 (i)
     TIME TO PEAK    (hrs)=   0.833
     RUNOFF VOLUME    (mm)=  23.132
     TOTAL RAINFALL   (mm)=  32.601
     RUNOFF COEFFICIENT   =   0.710

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

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--------------------
| CALIB            |
| STANDHYD (  0002)|   Area     (ha)=   0.16
|ID= 1 DT=10.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------

                               IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.16         0.00
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      32.66        40.00
     Mannings n           =      0.013        0.250

        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
               0.167    1.95 | 0.500   84.11 | 0.833   25.43 |  1.17
1.95
               0.333   21.52 | 0.667   52.81 | 1.000    7.82 |

     Max.Eff.Inten.(mm/hr)=      84.11        70.34
               over (min)        10.00        10.00
     Storage Coeff.  (min)=       1.40 (ii)    9.52 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.11
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.04         0.00         0.037 (iii)
     TIME TO PEAK    (hrs)=       0.50         0.67          0.50
     RUNOFF VOLUME    (mm)=      31.60        26.66         31.55
     TOTAL RAINFALL   (mm)=      32.60        32.60         32.60
     RUNOFF COEFFICIENT   =       0.97         0.82          0.97

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  98.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| ADD HYD  (  0003)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     3.04    0.094     1.67    23.24
      + ID2= 2 (  0109):     1.38    0.120     0.83    23.13
        ==========================================================
```

```
        ID = 3 (  0003):     4.42   0.164     1.00    23.20

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ADD HYD  (  0003)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0003):     4.42   0.164     1.00    23.20
      + ID2= 2 (  0002):     0.16   0.037     0.50    31.55
        ================================================
        ID = 1 (  0003):     4.58   0.170     0.83    23.49

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------
--------------------
| CALIB            |
| NASHYD   (  0008)|   Area     (ha)=   0.76   Curve Number   (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

         NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
               0.167    1.95 | 0.500   84.11 | 0.833   25.43 |  1.17
1.95
               0.333   21.52 | 0.667   52.81 | 1.000    7.82 |

     Unit Hyd Qpeak  (cms)=   0.161

     PEAK FLOW       (cms)=   0.089 (i)
     TIME TO PEAK    (hrs)=   0.667
     RUNOFF VOLUME    (mm)=  22.359
     TOTAL RAINFALL   (mm)=  32.601
     RUNOFF COEFFICIENT   =   0.686

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

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--------------------
| CALIB            |
| STANDHYD (  0006)|   Area     (ha)=   1.55
|ID= 1 DT=10.0 min |   Total Imp(%)=  29.00   Dir. Conn.(%)=  29.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.45         1.10
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         4.00
     Length            (m)=     101.65       385.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
               0.167    1.95 | 0.500   84.11 | 0.833   25.43 |  1.17
1.95
               0.333   21.52 | 0.667   52.81 | 1.000    7.82 |

     Max.Eff.Inten.(mm/hr)=      84.11         48.59
                over (min)       10.00         40.00
     Storage Coeff.  (min)=       2.76 (ii)    32.53 (ii)
     Unit Hyd. Tpeak (min)=      10.00         40.00
     Unit Hyd. peak  (cms)=       0.17          0.03
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.10          0.07          0.114 (iii)
     TIME TO PEAK    (hrs)=       0.50          1.17           0.50
     RUNOFF VOLUME    (mm)=      31.60         26.66          28.08
     TOTAL RAINFALL   (mm)=      32.60         32.60          32.60
     RUNOFF COEFFICIENT   =       0.97          0.82           0.86

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD (  0007)|   Area     (ha)=   0.63
|ID= 1 DT=10.0 min |   Total Imp(%)=  79.00   Dir. Conn.(%)=  79.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.50         0.13
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       3.00         2.00
     Length            (m)=     405.00        40.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
               0.167    1.95 | 0.500   84.11 | 0.833   25.43 |  1.17
1.95
               0.333   21.52 | 0.667   52.81 | 1.000    7.82 |
```

```
     Max.Eff.Inten.(mm/hr)=      84.11        70.34
               over (min)       10.00        20.00
     Storage Coeff.  (min)=      4.56 (ii)   12.68 (ii)
     Unit Hyd. Tpeak (min)=     10.00        20.00
     Unit Hyd. peak  (cms)=      0.15         0.07
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.11         0.02          0.112 (iii)
     TIME TO PEAK    (hrs)=      0.50         0.67           0.50
     RUNOFF VOLUME    (mm)=     31.60        26.66          30.55
     TOTAL RAINFALL   (mm)=     32.60        32.60          32.60
     RUNOFF COEFFICIENT   =      0.97         0.82           0.94

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  98.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0006):     1.55   0.114     0.50    28.08
      + ID2= 2 (  0007):     0.63   0.112     0.50    30.55
        ==================================================
        ID = 3 (  0010):     2.18   0.226     0.50    28.80

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

--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0010):     2.18   0.226     0.50    28.80
      + ID2= 2 (  0008):     0.76   0.089     0.67    22.36
        ==================================================
        ID = 1 (  0010):     2.94   0.285     0.50    27.13

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ADD HYD  (  0012)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0010):     2.94   0.285     0.50    27.13
      + ID2= 2 (  0003):     4.58   0.170     0.83    23.49
        ==================================================
        ID = 3 (  0012):     7.52   0.418     0.67    24.92

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO
6.2\VO2\voin.dat
  Output  filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-
33eb-4790-b5ab-2fe711ab4c1b\1ddf5c81-e568-486b-898a-61163531e940\scenari
  Summary filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-
33eb-4790-b5ab-2fe711ab4c1b\1ddf5c81-e568-486b-898a-61163531e940\scenari

DATE: 04/22/2024                          TIME: 11:35:02

USER:

COMMENTS: _____

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  ********************************************
  ** SIMULATION : E - 5Y12                   **
  ********************************************

--------------------
|    READ STORM    |    Filename: C:\Users\qdar\AppD
|                  |              ata\Local\Temp\
|                  |              b014d45b-6f58-45eb-8754-
25dd5b7e6eb9\901f9b64
| Ptotal= 55.50 mm |    Comments: 5Y12 UPDATED
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME
RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs
mm/hr
```

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.60 | 3.00 | 9.40 | 6.00 | 3.90 | 9.00 | 0.60 |
| 0.25 | 0.60 | 3.25 | 9.40 | 6.25 | 3.90 | 9.25 | 0.60 |
| 0.50 | 0.60 | 3.50 | 9.40 | 6.50 | 3.90 | 9.50 | 0.60 |
| 0.75 | 0.60 | 3.75 | 9.40 | 6.75 | 3.90 | 9.75 | 0.60 |
| 1.00 | 0.60 | 4.00 | 25.40 | 7.00 | 2.20 | 10.00 | 0.60 |
| 1.25 | 0.60 | 4.25 | 25.40 | 7.25 | 2.20 | 10.25 | 0.60 |
| 1.50 | 0.60 | 4.50 | 25.40 | 7.50 | 2.20 | 10.50 | 0.60 |
| 1.75 | 0.60 | 4.75 | 25.40 | 7.75 | 2.20 | 10.75 | 0.60 |
| 2.00 | 3.30 | 5.00 | 7.20 | 8.00 | 1.10 | 11.00 | 0.60 |
| 2.25 | 3.30 | 5.25 | 7.20 | 8.25 | 1.10 | 11.25 | 0.60 |
| 2.50 | 3.30 | 5.50 | 7.20 | 8.50 | 1.10 | 11.50 | 0.60 |
| 2.75 | 3.30 | 5.75 | 7.20 | 8.75 | 1.10 | 11.75 | 0.60 |

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| CALIB | | | |
|---|---|---|---|
| NASHYD ( 0001) | Area (ha)= | 3.04 | Curve Number (CN)= 98.0 |
| ID= 1 DT=10.0 min | Ia (mm)= | 5.00 | # of Linear Res.(N)= 3.00 |
| | U.H. Tp(hrs)= | 1.10 | |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 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 |
| 0.167 | 0.60 | 3.167 | 9.40 | 6.167 | 3.90 | 9.17 | 0.60 |
| 0.333 | 0.60 | 3.333 | 9.40 | 6.333 | 3.90 | 9.33 | 0.60 |
| 0.500 | 0.60 | 3.500 | 9.40 | 6.500 | 3.90 | 9.50 | 0.60 |
| 0.667 | 0.60 | 3.667 | 9.40 | 6.667 | 3.90 | 9.67 | 0.60 |
| 0.833 | 0.60 | 3.833 | 9.40 | 6.833 | 3.90 | 9.83 | 0.60 |
| 1.000 | 0.60 | 4.000 | 9.40 | 7.000 | 3.90 | 10.00 | 0.60 |
| 1.167 | 0.60 | 4.167 | 25.40 | 7.167 | 2.20 | 10.17 | 0.60 |
| 1.333 | 0.60 | 4.333 | 25.40 | 7.333 | 2.20 | 10.33 | 0.60 |
| 1.500 | 0.60 | 4.500 | 25.40 | 7.500 | 2.20 | 10.50 | 0.60 |
| 1.667 | 0.60 | 4.667 | 25.40 | 7.667 | 2.20 | 10.67 | 0.60 |
| 1.833 | 0.60 | 4.833 | 25.40 | 7.833 | 2.20 | 10.83 | 0.60 |
| 2.000 | 0.60 | 5.000 | 25.40 | 8.000 | 2.20 | 11.00 | 0.60 |
| 2.167 | 3.30 | 5.167 | 7.20 | 8.167 | 1.10 | 11.17 | 0.60 |
| 2.333 | 3.30 | 5.333 | 7.20 | 8.333 | 1.10 | 11.33 | 0.60 |
| 2.500 | 3.30 | 5.500 | 7.20 | 8.500 | 1.10 | 11.50 | 0.60 |
| 2.667 | 3.30 | 5.667 | 7.20 | 8.667 | 1.10 | 11.67 | 0.60 |
| 2.833 | 3.30 | 5.833 | 7.20 | 8.833 | 1.10 | 11.83 | 0.60 |
| 3.000 | 3.30 | 6.000 | 7.20 | 9.000 | 1.10 | 12.00 | 0.60 |

Unit Hyd Qpeak (cms)= 0.106

PEAK FLOW (cms)= 0.117 (i)
TIME TO PEAK (hrs)= 5.667
RUNOFF VOLUME (mm)= 45.796
TOTAL RAINFALL (mm)= 55.500
RUNOFF COEFFICIENT = 0.825

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

---

| CALIB | | | |
|---|---|---|---|
| NASHYD ( 0109) | Area (ha)= | 1.38 | Curve Number (CN)= 98.0 |
| ID= 1 DT=10.0 min | Ia (mm)= | 5.00 | # of Linear Res.(N)= 3.00 |
| | U.H. Tp(hrs)= | 0.32 | |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 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 |
| 0.167 | 0.60 | 3.167 | 9.40 | 6.167 | 3.90 | 9.17 | 0.60 |
| 0.333 | 0.60 | 3.333 | 9.40 | 6.333 | 3.90 | 9.33 | 0.60 |
| 0.500 | 0.60 | 3.500 | 9.40 | 6.500 | 3.90 | 9.50 | 0.60 |
| 0.667 | 0.60 | 3.667 | 9.40 | 6.667 | 3.90 | 9.67 | 0.60 |
| 0.833 | 0.60 | 3.833 | 9.40 | 6.833 | 3.90 | 9.83 | 0.60 |
| 1.000 | 0.60 | 4.000 | 9.40 | 7.000 | 3.90 | 10.00 | 0.60 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1.167 | 0.60 | 4.167 | 25.40 | 7.167 | 2.20 | 10.17 | 0.60 |
| 1.333 | 0.60 | 4.333 | 25.40 | 7.333 | 2.20 | 10.33 | 0.60 |
| 1.500 | 0.60 | 4.500 | 25.40 | 7.500 | 2.20 | 10.50 | 0.60 |
| 1.667 | 0.60 | 4.667 | 25.40 | 7.667 | 2.20 | 10.67 | 0.60 |
| 1.833 | 0.60 | 4.833 | 25.40 | 7.833 | 2.20 | 10.83 | 0.60 |
| 2.000 | 0.60 | 5.000 | 25.40 | 8.000 | 2.20 | 11.00 | 0.60 |
| 2.167 | 3.30 | 5.167 | 7.20 | 8.167 | 1.10 | 11.17 | 0.60 |
| 2.333 | 3.30 | 5.333 | 7.20 | 8.333 | 1.10 | 11.33 | 0.60 |
| 2.500 | 3.30 | 5.500 | 7.20 | 8.500 | 1.10 | 11.50 | 0.60 |
| 2.667 | 3.30 | 5.667 | 7.20 | 8.667 | 1.10 | 11.67 | 0.60 |
| 2.833 | 3.30 | 5.833 | 7.20 | 8.833 | 1.10 | 11.83 | 0.60 |
| 3.000 | 3.30 | 6.000 | 7.20 | 9.000 | 1.10 | 12.00 | 0.60 |

Unit Hyd Qpeak (cms)= 0.165

PEAK FLOW (cms)= 0.091 (i)
TIME TO PEAK (hrs)= 5.000
RUNOFF VOLUME (mm)= 45.592
TOTAL RAINFALL (mm)= 55.500
RUNOFF COEFFICIENT = 0.821

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

---

| CALIB | |
|---|---|
| STANDHYD ( 0002) | Area (ha)= 0.16 |
| ID= 1 DT=10.0 min | Total Imp(%)= 99.00 Dir. Conn.(%)= 99.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.16 | 0.00 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 1.00 | 2.00 |
| Length | (m)= | 32.66 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.60 | 3.167 | 9.40 | 6.167 | 3.90 | 9.17 | 0.60 |
| 0.333 | 0.60 | 3.333 | 9.40 | 6.333 | 3.90 | 9.33 | 0.60 |
| 0.500 | 0.60 | 3.500 | 9.40 | 6.500 | 3.90 | 9.50 | 0.60 |
| 0.667 | 0.60 | 3.667 | 9.40 | 6.667 | 3.90 | 9.67 | 0.60 |
| 0.833 | 0.60 | 3.833 | 9.40 | 6.833 | 3.90 | 9.83 | 0.60 |
| 1.000 | 0.60 | 4.000 | 9.40 | 7.000 | 3.90 | 10.00 | 0.60 |
| 1.167 | 0.60 | 4.167 | 25.40 | 7.167 | 2.20 | 10.17 | 0.60 |
| 1.333 | 0.60 | 4.333 | 25.40 | 7.333 | 2.20 | 10.33 | 0.60 |
| 1.500 | 0.60 | 4.500 | 25.40 | 7.500 | 2.20 | 10.50 | 0.60 |
| 1.667 | 0.60 | 4.667 | 25.40 | 7.667 | 2.20 | 10.67 | 0.60 |
| 1.833 | 0.60 | 4.833 | 25.40 | 7.833 | 2.20 | 10.83 | 0.60 |
| 2.000 | 0.60 | 5.000 | 25.40 | 8.000 | 2.20 | 11.00 | 0.60 |
| 2.167 | 3.30 | 5.167 | 7.20 | 8.167 | 1.10 | 11.17 | 0.60 |
| 2.333 | 3.30 | 5.333 | 7.20 | 8.333 | 1.10 | 11.33 | 0.60 |
| 2.500 | 3.30 | 5.500 | 7.20 | 8.500 | 1.10 | 11.50 | 0.60 |
| 2.667 | 3.30 | 5.667 | 7.20 | 8.667 | 1.10 | 11.67 | 0.60 |
| 2.833 | 3.30 | 5.833 | 7.20 | 8.833 | 1.10 | 11.83 | 0.60 |
| 3.000 | 3.30 | 6.000 | 7.20 | 9.000 | 1.10 | 12.00 | 0.60 |

| | | | | |
|---|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 25.40 | 24.94 | | |
| over (min) | 10.00 | 20.00 | | |
| Storage Coeff. (min)= | 2.26 (ii) | 14.56 (ii) | | |
| Unit Hyd. Tpeak (min)= | 10.00 | 20.00 | | |
| Unit Hyd. peak (cms)= | 0.17 | 0.07 | | |
| | | | | *TOTALS* |
| PEAK FLOW (cms)= | 0.01 | 0.00 | | 0.011 (iii) |
| TIME TO PEAK (hrs)= | 5.00 | 5.00 | | 5.00 |
| RUNOFF VOLUME (mm)= | 54.50 | 49.27 | | 54.44 |
| TOTAL RAINFALL (mm)= | 55.50 | 55.50 | | 55.50 |
| RUNOFF COEFFICIENT = | 0.98 | 0.89 | | 0.98 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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  (  0003)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     3.04   0.117     5.67    45.80
      + ID2= 2 (  0109):     1.38   0.091     5.00    45.59
        ================================================
        ID = 3 (  0003):     4.42   0.178     5.17    45.73

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ADD HYD  (  0003)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0003):     4.42   0.178     5.17    45.73
      + ID2= 2 (  0002):     0.16   0.011     5.00    54.44
        ================================================
        ID = 1 (  0003):     4.58   0.187     5.00    46.04

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

---

```
--------------------
| CALIB            |
| NASHYD   (  0008)|   Area     (ha)=   0.76   Curve Number    (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
               0.167    0.60 | 3.167    9.40 | 6.167    3.90 |  9.17
0.60
               0.333    0.60 | 3.333    9.40 | 6.333    3.90 |  9.33
0.60
               0.500    0.60 | 3.500    9.40 | 6.500    3.90 |  9.50
0.60
               0.667    0.60 | 3.667    9.40 | 6.667    3.90 |  9.67
0.60
               0.833    0.60 | 3.833    9.40 | 6.833    3.90 |  9.83
0.60
               1.000    0.60 | 4.000    9.40 | 7.000    3.90 | 10.00
0.60
               1.167    0.60 | 4.167   25.40 | 7.167    2.20 | 10.17
0.60
               1.333    0.60 | 4.333   25.40 | 7.333    2.20 | 10.33
0.60
               1.500    0.60 | 4.500   25.40 | 7.500    2.20 | 10.50
0.60
               1.667    0.60 | 4.667   25.40 | 7.667    2.20 | 10.67
0.60
               1.833    0.60 | 4.833   25.40 | 7.833    2.20 | 10.83
0.60
               2.000    0.60 | 5.000   25.40 | 8.000    2.20 | 11.00
0.60
               2.167    3.30 | 5.167    7.20 | 8.167    1.10 | 11.17
0.60
               2.333    3.30 | 5.333    7.20 | 8.333    1.10 | 11.33
0.60
               2.500    3.30 | 5.500    7.20 | 8.500    1.10 | 11.50
0.60
               2.667    3.30 | 5.667    7.20 | 8.667    1.10 | 11.67
0.60
               2.833    3.30 | 5.833    7.20 | 8.833    1.10 | 11.83
0.60
               3.000    3.30 | 6.000    7.20 | 9.000    1.10 | 12.00
0.60

     Unit Hyd Qpeak  (cms)=   0.161

     PEAK FLOW       (cms)=   0.050 (i)
     TIME TO PEAK    (hrs)=   5.000
     RUNOFF VOLUME    (mm)=  44.070
     TOTAL RAINFALL   (mm)=  55.500
     RUNOFF COEFFICIENT   =   0.794

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

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```
--------------------
| CALIB            |
| STANDHYD (  0006)|   Area     (ha)=   1.55
|ID= 1 DT=10.0 min |   Total Imp(%)=  29.00   Dir. Conn.(%)=  29.00
--------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.45         1.10
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         4.00
     Length            (m)=     101.65       385.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
               0.167    0.60 | 3.167    9.40 | 6.167    3.90 |  9.17
0.60
               0.333    0.60 | 3.333    9.40 | 6.333    3.90 |  9.33
0.60
               0.500    0.60 | 3.500    9.40 | 6.500    3.90 |  9.50
0.60
               0.667    0.60 | 3.667    9.40 | 6.667    3.90 |  9.67
0.60
               0.833    0.60 | 3.833    9.40 | 6.833    3.90 |  9.83
0.60
```

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1.000 | 0.60 | 4.000 | 9.40 | 7.000 | 3.90 | 10.00 | 0.60 |
| 1.167 | 0.60 | 4.167 | 25.40 | 7.167 | 2.20 | 10.17 | 0.60 |
| 1.333 | 0.60 | 4.333 | 25.40 | 7.333 | 2.20 | 10.33 | 0.60 |
| 1.500 | 0.60 | 4.500 | 25.40 | 7.500 | 2.20 | 10.50 | 0.60 |
| 1.667 | 0.60 | 4.667 | 25.40 | 7.667 | 2.20 | 10.67 | 0.60 |
| 1.833 | 0.60 | 4.833 | 25.40 | 7.833 | 2.20 | 10.83 | 0.60 |
| 2.000 | 0.60 | 5.000 | 25.40 | 8.000 | 2.20 | 11.00 | 0.60 |
| 2.167 | 3.30 | 5.167 | 7.20 | 8.167 | 1.10 | 11.17 | 0.60 |
| 2.333 | 3.30 | 5.333 | 7.20 | 8.333 | 1.10 | 11.33 | 0.60 |
| 2.500 | 3.30 | 5.500 | 7.20 | 8.500 | 1.10 | 11.50 | 0.60 |
| 2.667 | 3.30 | 5.667 | 7.20 | 8.667 | 1.10 | 11.67 | 0.60 |
| 2.833 | 3.30 | 5.833 | 7.20 | 8.833 | 1.10 | 11.83 | 0.60 |
| 3.000 | 3.30 | 6.000 | 7.20 | 9.000 | 1.10 | 12.00 | 0.60 |

| | | | |
|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 25.40 | 24.79 | |
| over (min) | 10.00 | 50.00 | |
| Storage Coeff. (min)= | 4.46 (ii) | 43.43 (ii) | |
| Unit Hyd. Tpeak (min)= | 10.00 | 50.00 | |
| Unit Hyd. peak (cms)= | 0.15 | 0.02 | |
| | | | *TOTALS* |
| PEAK FLOW (cms)= | 0.03 | 0.05 | 0.081 (iii) |
| TIME TO PEAK (hrs)= | 5.00 | 5.33 | 5.00 |
| RUNOFF VOLUME (mm)= | 54.50 | 49.27 | 50.77 |
| TOTAL RAINFALL (mm)= | 55.50 | 55.50 | 55.50 |
| RUNOFF COEFFICIENT = | 0.98 | 0.89 | 0.91 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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 ( 0007) | Area (ha)= 0.63 |
| ID= 1 DT=10.0 min | Total Imp(%)= 79.00 Dir. Conn.(%)= 79.00 |

| | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|
| Surface Area (ha)= | 0.50 | 0.13 |
| Dep. Storage (mm)= | 1.00 | 1.50 |
| Average Slope (%)= | 3.00 | 2.00 |
| Length (m)= | 405.00 | 40.00 |
| Mannings n = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.60 | 3.167 | 9.40 | 6.167 | 3.90 | 9.17 | 0.60 |
| 0.333 | 0.60 | 3.333 | 9.40 | 6.333 | 3.90 | 9.33 | 0.60 |
| 0.500 | 0.60 | 3.500 | 9.40 | 6.500 | 3.90 | 9.50 | 0.60 |
| 0.667 | 0.60 | 3.667 | 9.40 | 6.667 | 3.90 | 9.67 | 0.60 |
| 0.833 | 0.60 | 3.833 | 9.40 | 6.833 | 3.90 | 9.83 | 0.60 |
| 1.000 | 0.60 | 4.000 | 9.40 | 7.000 | 3.90 | 10.00 | 0.60 |
| 1.167 | 0.60 | 4.167 | 25.40 | 7.167 | 2.20 | 10.17 | 0.60 |
| 1.333 | 0.60 | 4.333 | 25.40 | 7.333 | 2.20 | 10.33 | 0.60 |
| 1.500 | 0.60 | 4.500 | 25.40 | 7.500 | 2.20 | 10.50 | 0.60 |
| 1.667 | 0.60 | 4.667 | 25.40 | 7.667 | 2.20 | 10.67 | 0.60 |
| 1.833 | 0.60 | 4.833 | 25.40 | 7.833 | 2.20 | 10.83 | 0.60 |
| 2.000 | 0.60 | 5.000 | 25.40 | 8.000 | 2.20 | 11.00 | 0.60 |
| 2.167 | 3.30 | 5.167 | 7.20 | 8.167 | 1.10 | 11.17 | 0.60 |
| 2.333 | 3.30 | 5.333 | 7.20 | 8.333 | 1.10 | 11.33 | 0.60 |
| 2.500 | 3.30 | 5.500 | 7.20 | 8.500 | 1.10 | 11.50 | 0.60 |
| 2.667 | 3.30 | 5.667 | 7.20 | 8.667 | 1.10 | 11.67 | 0.60 |
| 2.833 | 3.30 | 5.833 | 7.20 | 8.833 | 1.10 | 11.83 | 0.60 |
| 3.000 | 3.30 | 6.000 | 7.20 | 9.000 | 1.10 | 12.00 | 0.60 |

| | | | |
|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 25.40 | 24.94 | |
| over (min) | 10.00 | 20.00 | |
| Storage Coeff. (min)= | 7.36 (ii) | 19.66 (ii) | |
| Unit Hyd. Tpeak (min)= | 10.00 | 20.00 | |
| Unit Hyd. peak (cms)= | 0.13 | 0.06 | |
| | | | *TOTALS* |
| PEAK FLOW (cms)= | 0.04 | 0.01 | 0.044 (iii) |
| TIME TO PEAK (hrs)= | 5.00 | 5.00 | 5.00 |
| RUNOFF VOLUME (mm)= | 54.50 | 49.27 | 53.38 |
| TOTAL RAINFALL (mm)= | 55.50 | 55.50 | 55.50 |
| RUNOFF COEFFICIENT = | 0.98 | 0.89 | 0.96 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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 ( 0010)| | | | | |
|---|---|---|---|---|---|
| 1 + 2 = 3 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
| ID1= 1 ( 0006): | 1.55 | 0.081 | 5.00 | 50.77 |
| + ID2= 2 ( 0007): | 0.63 | 0.044 | 5.00 | 53.38 |
| ID = 3 ( 0010): | 2.18 | 0.125 | 5.00 | 51.53 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| ADD HYD ( 0010)| | | | | |
|---|---|---|---|---|---|
| 3 + 2 = 1 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
| ID1= 3 ( 0010): | 2.18 | 0.125 | 5.00 | 51.53 |
| + ID2= 2 ( 0008): | 0.76 | 0.050 | 5.00 | 44.07 |
| ID = 1 ( 0010): | 2.94 | 0.175 | 5.00 | 49.60 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| ADD HYD ( 0012)| | | | | |
|---|---|---|---|---|---|
| 1 + 2 = 3 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
| ID1= 1 ( 0010): | 2.94 | 0.175 | 5.00 | 49.60 |
| + ID2= 2 ( 0003): | 4.58 | 0.187 | 5.00 | 46.04 |
| ID = 3 ( 0012): | 7.52 | 0.362 | 5.00 | 47.43 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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```
V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
V    V   I    SS     U   U   A A   L
 V  V    I     SS    U   U  AAAAA  L
 V  V    I      SS   U   U  A   A  L
  VV     I    SSSSS  UUUUU  A   A  LLLLL

OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
O   O    T      T    H   H   Y Y   MM MM  O   O
O   O    T      T    H   H    Y    M   M  O   O
 OOO     T      T    H   H    Y    M   M   OOO
```

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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
Output filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-33eb-4790-b5ab-2fe711ab4c1b\9fe864e9-49a4-4761-9250-87a3327f6d34\scenari
Summary filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-33eb-4790-b5ab-2fe711ab4c1b\9fe864e9-49a4-4761-9250-87a3327f6d34\scenari

DATE: 04/22/2024 TIME: 11:35:03

USER:

COMMENTS: _____

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```
**********************************************
** SIMULATION : F - 10Y1                     **
**********************************************
```

| READ STORM | Filename: C:\Users\qdar\AppData\Local\Temp\b014d45b-6f58-45eb-8754-25dd5b7e6eb9\6547ab38 |
|---|---|
| Ptotal= 38.50 mm | Comments: 10Y1 |

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.33 | 69.30 | 0.67 | 36.96 | 1.00 | 4.62 |
| 0.08 | 4.62 | 0.42 | 129.36 | 0.75 | 23.10 | | |
| 0.17 | 13.86 | 0.50 | 69.30 | 0.83 | 13.86 | | |
| 0.25 | 36.96 | 0.58 | 55.44 | 0.92 | 4.62 | | |

---

| CALIB | | | | | |
|---|---|---|---|---|---|
| NASHYD ( 0001)\| | Area | (ha)= | 3.04 | Curve Number | (CN)= 98.0 |
| ID= 1 DT=10.0 min | Ia | (mm)= | 5.00 | # of Linear Res.(N)= | 3.00 |

```
--------------------   U.H. Tp(hrs)=   1.10

         NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
                0.167    2.31 | 0.500   99.33 | 0.833   30.03 |  1.17
2.31
                0.333   25.41 | 0.667   62.37 | 1.000    9.24 |

     Unit Hyd Qpeak  (cms)=   0.106

     PEAK FLOW       (cms)=   0.118 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=  29.009
     TOTAL RAINFALL   (mm)=  38.500
     RUNOFF COEFFICIENT   =   0.753

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

------------------------------------------------------------------------------
-------
--------------------
| CALIB            |
| NASHYD   (  0109)|   Area    (ha)=   1.38   Curve Number    (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.32

         NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
                0.167    2.31 | 0.500   99.33 | 0.833   30.03 |  1.17
2.31
                0.333   25.41 | 0.667   62.37 | 1.000    9.24 |

     Unit Hyd Qpeak  (cms)=   0.165

     PEAK FLOW       (cms)=   0.150 (i)
     TIME TO PEAK    (hrs)=   0.833
     RUNOFF VOLUME    (mm)=  28.880
     TOTAL RAINFALL   (mm)=  38.500
     RUNOFF COEFFICIENT   =   0.750

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

------------------------------------------------------------------------------
-------
--------------------
| CALIB            |
| STANDHYD (  0002)|   Area    (ha)=   0.16
|ID= 1 DT=10.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.16         0.00
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      32.66        40.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
                0.167    2.31 | 0.500   99.33 | 0.833   30.03 |  1.17
2.31
                0.333   25.41 | 0.667   62.37 | 1.000    9.24 |

     Max.Eff.Inten.(mm/hr)=      99.33        86.40
               over (min)        10.00        10.00
     Storage Coeff.  (min)=       1.31 (ii)    8.79 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.04         0.00          0.044 (iii)
     TIME TO PEAK    (hrs)=       0.50         0.67          0.50
     RUNOFF VOLUME    (mm)=      37.50        32.45         37.44
     TOTAL RAINFALL   (mm)=      38.50        38.50         38.50
     RUNOFF COEFFICIENT   =       0.97         0.84          0.97

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------
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--------------------
| ADD HYD  (  0003)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     3.04    0.118     1.67    29.01
      + ID2= 2 (  0109):     1.38    0.150     0.83    28.88
        ================================================
        ID = 3 (  0003):     4.42    0.204     1.00    28.97

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
------------------------------------------------------------------------------
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--------------------
| ADD HYD  (  0003)|
```

```
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0003):     4.42   0.204     1.00    28.97
      + ID2= 2 (  0002):     0.16   0.044     0.50    37.44
        ================================================
        ID = 1 (  0003):     4.58   0.213     0.83    29.26

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------
--------------------
| CALIB            |
| NASHYD   (  0008)|   Area     (ha)=   0.76   Curve Number    (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

         NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
                0.167    2.31 | 0.500   99.33 | 0.833   30.03 |  1.17
2.31
                0.333   25.41 | 0.667   62.37 | 1.000    9.24 |

     Unit Hyd Qpeak  (cms)=   0.161

     PEAK FLOW       (cms)=   0.112 (i)
     TIME TO PEAK    (hrs)=   0.667
     RUNOFF VOLUME    (mm)=  27.915
     TOTAL RAINFALL   (mm)=  38.500
     RUNOFF COEFFICIENT   =   0.725

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

--------------------------------------------------------------------------------
-------
--------------------
| CALIB            |
| STANDHYD (  0006)|   Area     (ha)=   1.55
|ID= 1 DT=10.0 min |   Total Imp(%)=  29.00   Dir. Conn.(%)=  29.00
--------------------

                               IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.45         1.10
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         4.00
     Length            (m)=     101.65       385.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
                0.167    2.31 | 0.500   99.33 | 0.833   30.03 |  1.17
2.31
                0.333   25.41 | 0.667   62.37 | 1.000    9.24 |

     Max.Eff.Inten.(mm/hr)=      99.33        58.77
               over (min)        10.00        40.00
     Storage Coeff.  (min)=       2.59 (ii)   30.18 (ii)
     Unit Hyd. Tpeak (min)=      10.00        40.00
     Unit Hyd. peak  (cms)=       0.17         0.03
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.12         0.09          0.137 (iii)
     TIME TO PEAK    (hrs)=       0.50         1.00           0.50
     RUNOFF VOLUME    (mm)=      37.50        32.45          33.91
     TOTAL RAINFALL   (mm)=      38.50        38.50          38.50
     RUNOFF COEFFICIENT   =       0.97         0.84           0.88

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    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 (  0007)|   Area     (ha)=   0.63
|ID= 1 DT=10.0 min |   Total Imp(%)=  79.00   Dir. Conn.(%)=  79.00
--------------------

                               IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.50         0.13
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       3.00         2.00
     Length            (m)=     405.00        40.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
                0.167    2.31 | 0.500   99.33 | 0.833   30.03 |  1.17
2.31
                0.333   25.41 | 0.667   62.37 | 1.000    9.24 |

     Max.Eff.Inten.(mm/hr)=      99.33        86.40
               over (min)        10.00        20.00
     Storage Coeff.  (min)=       4.26 (ii)   11.75 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.15         0.08
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.13         0.02          0.135 (iii)
```

```
     TIME TO PEAK     (hrs)=       0.50         0.67          0.50
     RUNOFF VOLUME     (mm)=      37.50        32.45         36.43
     TOTAL RAINFALL    (mm)=      38.50        38.50         38.50
     RUNOFF COEFFICIENT   =       0.97         0.84          0.95

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0006):     1.55   0.137     0.50    33.91
     + ID2= 2 (  0007):     0.63   0.135     0.50    36.43
       ==================================================
       ID = 3 (  0010):     2.18   0.272     0.50    34.64

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

--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0010):     2.18   0.272     0.50    34.64
     + ID2= 2 (  0008):     0.76   0.112     0.67    27.92
       ==================================================
       ID = 1 (  0010):     2.94   0.350     0.50    32.90

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
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--------------------
| ADD HYD  (  0012)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0010):     2.94   0.350     0.50    32.90
     + ID2= 2 (  0003):     4.58   0.213     0.83    29.26
       ==================================================
       ID = 3 (  0012):     7.52   0.515     0.67    30.69

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

      V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
      V    V   I    SS     U   U   A A   L
       V  V    I     SS    U   U  AAAAA  L
       V  V    I      SS   U   U  A   A  L
        VV     I    SSSSS  UUUUU  A   A  LLLLL

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

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO
6.2\VO2\voin.dat
  Output  filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-
33eb-4790-b5ab-2fe711ab4c1b\3d946c41-6023-432b-a192-102886bf9760\scenari
  Summary filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-
33eb-4790-b5ab-2fe711ab4c1b\3d946c41-6023-432b-a192-102886bf9760\scenari

DATE: 04/22/2024                          TIME: 11:35:02

USER:


COMMENTS: _____________________________________________________

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  ********************************************
  ** SIMULATION : G - 10Y12                  **
  ********************************************

--------------------
|    READ STORM    |    Filename: C:\Users\qdar\AppD
|                  |              ata\Local\Temp\
|                  |              b014d45b-6f58-45eb-8754-
25dd5b7e6eb9\94fd42c2
| Ptotal= 62.90 mm |    Comments: 10Y12 UPDATED
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME
RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs
mm/hr
                0.00    0.60 |  3.00   10.70 |  6.00    4.40 |  9.00
0.60
                0.25    0.60 |  3.25   10.70 |  6.25    4.40 |  9.25
0.60
                0.50    0.60 |  3.50   10.70 |  6.50    4.40 |  9.50
0.60
                0.75    0.60 |  3.75   10.70 |  6.75    4.40 |  9.75
0.60
```

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1.00 | 0.60 | 4.00 | 29.00 | 7.00 | 2.50 | 10.00 | 0.60 |
| 1.25 | 0.60 | 4.25 | 29.00 | 7.25 | 2.50 | 10.25 | 0.60 |
| 1.50 | 0.60 | 4.50 | 29.00 | 7.50 | 2.50 | 10.50 | 0.60 |
| 1.75 | 0.60 | 4.75 | 29.00 | 7.75 | 2.50 | 10.75 | 0.60 |
| 2.00 | 3.80 | 5.00 | 8.20 | 8.00 | 1.30 | 11.00 | 0.60 |
| 2.25 | 3.80 | 5.25 | 8.20 | 8.25 | 1.30 | 11.25 | 0.60 |
| 2.50 | 3.80 | 5.50 | 8.20 | 8.50 | 1.30 | 11.50 | 0.60 |
| 2.75 | 3.80 | 5.75 | 8.20 | 8.75 | 1.30 | 11.75 | 0.60 |

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| CALIB | | | | | |
|---|---|---|---|---|---|
| NASHYD ( 0001) | Area (ha)= | 3.04 | Curve Number (CN)= | 98.0 | |
| ID= 1 DT=10.0 min | Ia (mm)= | 5.00 | # of Linear Res.(N)= | 3.00 | |
| | U.H. Tp(hrs)= | 1.10 | | | |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.60 | 3.167 | 10.70 | 6.167 | 4.40 | 9.17 | 0.60 |
| 0.333 | 0.60 | 3.333 | 10.70 | 6.333 | 4.40 | 9.33 | 0.60 |
| 0.500 | 0.60 | 3.500 | 10.70 | 6.500 | 4.40 | 9.50 | 0.60 |
| 0.667 | 0.60 | 3.667 | 10.70 | 6.667 | 4.40 | 9.67 | 0.60 |
| 0.833 | 0.60 | 3.833 | 10.70 | 6.833 | 4.40 | 9.83 | 0.60 |
| 1.000 | 0.60 | 4.000 | 10.70 | 7.000 | 4.40 | 10.00 | 0.60 |
| 1.167 | 0.60 | 4.167 | 29.00 | 7.167 | 2.50 | 10.17 | 0.60 |
| 1.333 | 0.60 | 4.333 | 29.00 | 7.333 | 2.50 | 10.33 | 0.60 |
| 1.500 | 0.60 | 4.500 | 29.00 | 7.500 | 2.50 | 10.50 | 0.60 |
| 1.667 | 0.60 | 4.667 | 29.00 | 7.667 | 2.50 | 10.67 | 0.60 |
| 1.833 | 0.60 | 4.833 | 29.00 | 7.833 | 2.50 | 10.83 | 0.60 |
| 2.000 | 0.60 | 5.000 | 29.00 | 8.000 | 2.50 | 11.00 | 0.60 |
| 2.167 | 3.80 | 5.167 | 8.20 | 8.167 | 1.30 | 11.17 | 0.60 |
| 2.333 | 3.80 | 5.333 | 8.20 | 8.333 | 1.30 | 11.33 | 0.60 |
| 2.500 | 3.80 | 5.500 | 8.20 | 8.500 | 1.30 | 11.50 | 0.60 |
| 2.667 | 3.80 | 5.667 | 8.20 | 8.667 | 1.30 | 11.67 | 0.60 |
| 2.833 | 3.80 | 5.833 | 8.20 | 8.833 | 1.30 | 11.83 | 0.60 |
| 3.000 | 3.80 | 6.000 | 8.20 | 9.000 | 1.30 | 12.00 | 0.60 |

Unit Hyd Qpeak (cms)= 0.106

PEAK FLOW (cms)= 0.136 (i)
TIME TO PEAK (hrs)= 5.667
RUNOFF VOLUME (mm)= 53.140
TOTAL RAINFALL (mm)= 62.900
RUNOFF COEFFICIENT = 0.845

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

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| CALIB | | | | | |
|---|---|---|---|---|---|
| NASHYD ( 0109) | Area (ha)= | 1.38 | Curve Number (CN)= | 98.0 | |
| ID= 1 DT=10.0 min | Ia (mm)= | 5.00 | # of Linear Res.(N)= | 3.00 | |
| | U.H. Tp(hrs)= | 0.32 | | | |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.60 | 3.167 | 10.70 | 6.167 | 4.40 | 9.17 | 0.60 |
| 0.333 | 0.60 | 3.333 | 10.70 | 6.333 | 4.40 | 9.33 | 0.60 |
| 0.500 | 0.60 | 3.500 | 10.70 | 6.500 | 4.40 | 9.50 | 0.60 |
| 0.667 | 0.60 | 3.667 | 10.70 | 6.667 | 4.40 | 9.67 | 0.60 |
| 0.833 | 0.60 | 3.833 | 10.70 | 6.833 | 4.40 | 9.83 | 0.60 |
| 1.000 | 0.60 | 4.000 | 10.70 | 7.000 | 4.40 | 10.00 | 0.60 |
| 1.167 | 0.60 | 4.167 | 29.00 | 7.167 | 2.50 | 10.17 | 0.60 |
| 1.333 | 0.60 | 4.333 | 29.00 | 7.333 | 2.50 | 10.33 | 0.60 |
| 1.500 | 0.60 | 4.500 | 29.00 | 7.500 | 2.50 | 10.50 | 0.60 |
| 1.667 | 0.60 | 4.667 | 29.00 | 7.667 | 2.50 | 10.67 | 0.60 |

```
                1.833    0.60 | 4.833   29.00 | 7.833    2.50 | 10.83
0.60
                2.000    0.60 | 5.000   29.00 | 8.000    2.50 | 11.00
0.60
                2.167    3.80 | 5.167    8.20 | 8.167    1.30 | 11.17
0.60
                2.333    3.80 | 5.333    8.20 | 8.333    1.30 | 11.33
0.60
                2.500    3.80 | 5.500    8.20 | 8.500    1.30 | 11.50
0.60
                2.667    3.80 | 5.667    8.20 | 8.667    1.30 | 11.67
0.60
                2.833    3.80 | 5.833    8.20 | 8.833    1.30 | 11.83
0.60
                3.000    3.80 | 6.000    8.20 | 9.000    1.30 | 12.00
0.60

     Unit Hyd Qpeak  (cms)=   0.165

     PEAK FLOW       (cms)=   0.105 (i)
     TIME TO PEAK    (hrs)=   5.000
     RUNOFF VOLUME    (mm)=  52.902
     TOTAL RAINFALL   (mm)=  62.900
     RUNOFF COEFFICIENT   =   0.841

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

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--------------------
| CALIB            |
| STANDHYD (  0002)|   Area    (ha)=   0.16
|ID= 1 DT=10.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.16         0.00
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      32.66        40.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
                0.167    0.60 | 3.167   10.70 | 6.167    4.40 |  9.17
0.60
                0.333    0.60 | 3.333   10.70 | 6.333    4.40 |  9.33
0.60
                0.500    0.60 | 3.500   10.70 | 6.500    4.40 |  9.50
0.60
                0.667    0.60 | 3.667   10.70 | 6.667    4.40 |  9.67
0.60
                0.833    0.60 | 3.833   10.70 | 6.833    4.40 |  9.83
0.60
                1.000    0.60 | 4.000   10.70 | 7.000    4.40 | 10.00
0.60
                1.167    0.60 | 4.167   29.00 | 7.167    2.50 | 10.17
0.60
                1.333    0.60 | 4.333   29.00 | 7.333    2.50 | 10.33
0.60
                1.500    0.60 | 4.500   29.00 | 7.500    2.50 | 10.50
0.60
                1.667    0.60 | 4.667   29.00 | 7.667    2.50 | 10.67
0.60
                1.833    0.60 | 4.833   29.00 | 7.833    2.50 | 10.83
0.60
                2.000    0.60 | 5.000   29.00 | 8.000    2.50 | 11.00
0.60
                2.167    3.80 | 5.167    8.20 | 8.167    1.30 | 11.17
0.60
                2.333    3.80 | 5.333    8.20 | 8.333    1.30 | 11.33
0.60
                2.500    3.80 | 5.500    8.20 | 8.500    1.30 | 11.50
0.60
                2.667    3.80 | 5.667    8.20 | 8.667    1.30 | 11.67
0.60
                2.833    3.80 | 5.833    8.20 | 8.833    1.30 | 11.83
0.60
                3.000    3.80 | 6.000    8.20 | 9.000    1.30 | 12.00
0.60

     Max.Eff.Inten.(mm/hr)=      29.00        28.58
               over (min)        10.00        20.00
     Storage Coeff.  (min)=       2.14 (ii)   13.79 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.07
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.01         0.00          0.013 (iii)
     TIME TO PEAK    (hrs)=       5.00         5.00           5.00
     RUNOFF VOLUME    (mm)=      61.90        56.62          61.84
     TOTAL RAINFALL   (mm)=      62.90        62.90          62.90
     RUNOFF COEFFICIENT   =       0.98         0.90           0.98

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| ADD HYD  (  0003)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK      R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
       ID1= 1 (  0001):      3.04    0.136     5.67     53.14
     + ID2= 2 (  0109):      1.38    0.105     5.00     52.90
       ==========================================================
       ID = 3 (  0003):      4.42    0.207     5.17     53.07
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| ADD HYD ( 0003) | | AREA | QPEAK | TPEAK | R.V. |
|---|---|---|---|---|---|
| 3 + 2 = 1 | | (ha) | (cms) | (hrs) | (mm) |
| ID1= 3 ( 0003): | | 4.42 | 0.207 | 5.17 | 53.07 |
| + ID2= 2 ( 0002): | | 0.16 | 0.013 | 5.00 | 61.84 |
| ID = 1 ( 0003): | | 4.58 | 0.218 | 5.00 | 53.37 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| CALIB NASHYD ( 0008) ID= 1 DT=10.0 min | | | | |
|---|---|---|---|---|
| | Area | (ha)= | 0.76 | Curve Number (CN)= 98.0 |
| | Ia | (mm)= | 5.00 | # of Linear Res.(N)= 3.00 |
| | U.H. Tp(hrs)= | | 0.18 | |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.60 | 3.167 | 10.70 | 6.167 | 4.40 | 9.17 | 0.60 |
| 0.333 | 0.60 | 3.333 | 10.70 | 6.333 | 4.40 | 9.33 | 0.60 |
| 0.500 | 0.60 | 3.500 | 10.70 | 6.500 | 4.40 | 9.50 | 0.60 |
| 0.667 | 0.60 | 3.667 | 10.70 | 6.667 | 4.40 | 9.67 | 0.60 |
| 0.833 | 0.60 | 3.833 | 10.70 | 6.833 | 4.40 | 9.83 | 0.60 |
| 1.000 | 0.60 | 4.000 | 10.70 | 7.000 | 4.40 | 10.00 | 0.60 |
| 1.167 | 0.60 | 4.167 | 29.00 | 7.167 | 2.50 | 10.17 | 0.60 |
| 1.333 | 0.60 | 4.333 | 29.00 | 7.333 | 2.50 | 10.33 | 0.60 |
| 1.500 | 0.60 | 4.500 | 29.00 | 7.500 | 2.50 | 10.50 | 0.60 |
| 1.667 | 0.60 | 4.667 | 29.00 | 7.667 | 2.50 | 10.67 | 0.60 |
| 1.833 | 0.60 | 4.833 | 29.00 | 7.833 | 2.50 | 10.83 | 0.60 |
| 2.000 | 0.60 | 5.000 | 29.00 | 8.000 | 2.50 | 11.00 | 0.60 |
| 2.167 | 3.80 | 5.167 | 8.20 | 8.167 | 1.30 | 11.17 | 0.60 |
| 2.333 | 3.80 | 5.333 | 8.20 | 8.333 | 1.30 | 11.33 | 0.60 |
| 2.500 | 3.80 | 5.500 | 8.20 | 8.500 | 1.30 | 11.50 | 0.60 |
| 2.667 | 3.80 | 5.667 | 8.20 | 8.667 | 1.30 | 11.67 | 0.60 |
| 2.833 | 3.80 | 5.833 | 8.20 | 8.833 | 1.30 | 11.83 | 0.60 |
| 3.000 | 3.80 | 6.000 | 8.20 | 9.000 | 1.30 | 12.00 | 0.60 |

Unit Hyd Qpeak (cms)= 0.161

PEAK FLOW (cms)= 0.058 (i)
TIME TO PEAK (hrs)= 5.000
RUNOFF VOLUME (mm)= 51.136
TOTAL RAINFALL (mm)= 62.900
RUNOFF COEFFICIENT = 0.813

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

---

| CALIB STANDHYD ( 0006) ID= 1 DT=10.0 min | | | | |
|---|---|---|---|---|
| | Area | (ha)= | 1.55 | |
| | Total Imp(%)= | | 29.00 | Dir. Conn.(%)= 29.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.45 | 1.10 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 1.00 | 4.00 |
| Length | (m)= | 101.65 | 385.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.60 | 3.167 | 10.70 | 6.167 | 4.40 | 9.17 | 0.60 |
| 0.333 | 0.60 | 3.333 | 10.70 | 6.333 | 4.40 | 9.33 | 0.60 |
| 0.500 | 0.60 | 3.500 | 10.70 | 6.500 | 4.40 | 9.50 | 0.60 |
| 0.667 | 0.60 | 3.667 | 10.70 | 6.667 | 4.40 | 9.67 | 0.60 |
| 0.833 | 0.60 | 3.833 | 10.70 | 6.833 | 4.40 | 9.83 | 0.60 |
| 1.000 | 0.60 | 4.000 | 10.70 | 7.000 | 4.40 | 10.00 | 0.60 |
| 1.167 | 0.60 | 4.167 | 29.00 | 7.167 | 2.50 | 10.17 | 0.60 |
| 1.333 | 0.60 | 4.333 | 29.00 | 7.333 | 2.50 | 10.33 | 0.60 |
| 1.500 | 0.60 | 4.500 | 29.00 | 7.500 | 2.50 | 10.50 | 0.60 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1.667 | 0.60 | 4.667 | 29.00 | 7.667 | 2.50 | 10.67 | 0.60 |
| 1.833 | 0.60 | 4.833 | 29.00 | 7.833 | 2.50 | 10.83 | 0.60 |
| 2.000 | 0.60 | 5.000 | 29.00 | 8.000 | 2.50 | 11.00 | 0.60 |
| 2.167 | 3.80 | 5.167 | 8.20 | 8.167 | 1.30 | 11.17 | 0.60 |
| 2.333 | 3.80 | 5.333 | 8.20 | 8.333 | 1.30 | 11.33 | 0.60 |
| 2.500 | 3.80 | 5.500 | 8.20 | 8.500 | 1.30 | 11.50 | 0.60 |
| 2.667 | 3.80 | 5.667 | 8.20 | 8.667 | 1.30 | 11.67 | 0.60 |
| 2.833 | 3.80 | 5.833 | 8.20 | 8.833 | 1.30 | 11.83 | 0.60 |
| 3.000 | 3.80 | 6.000 | 8.20 | 9.000 | 1.30 | 12.00 | 0.60 |

| | | | |
|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 29.00 | 28.45 | |
| over (min) | 10.00 | 50.00 | |
| Storage Coeff. (min)= | 4.23 (ii) | 41.11 (ii) | |
| Unit Hyd. Tpeak (min)= | 10.00 | 50.00 | |
| Unit Hyd. peak (cms)= | 0.15 | 0.03 | |
| | | | *TOTALS* |
| PEAK FLOW (cms)= | 0.04 | 0.06 | 0.095 (iii) |
| TIME TO PEAK (hrs)= | 5.00 | 5.33 | 5.00 |
| RUNOFF VOLUME (mm)= | 61.90 | 56.62 | 58.14 |
| TOTAL RAINFALL (mm)= | 62.90 | 62.90 | 62.90 |
| RUNOFF COEFFICIENT = | 0.98 | 0.90 | 0.92 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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 ( 0007) | Area (ha)= 0.63 |
| ID= 1 DT=10.0 min | Total Imp(%)= 79.00 Dir. Conn.(%)= 79.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.50 | 0.13 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 3.00 | 2.00 |
| Length | (m)= | 405.00 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 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 |
| 0.167 | 0.60 | 3.167 | 10.70 | 6.167 | 4.40 | 9.17 | 0.60 |
| 0.333 | 0.60 | 3.333 | 10.70 | 6.333 | 4.40 | 9.33 | 0.60 |
| 0.500 | 0.60 | 3.500 | 10.70 | 6.500 | 4.40 | 9.50 | 0.60 |
| 0.667 | 0.60 | 3.667 | 10.70 | 6.667 | 4.40 | 9.67 | 0.60 |
| 0.833 | 0.60 | 3.833 | 10.70 | 6.833 | 4.40 | 9.83 | 0.60 |
| 1.000 | 0.60 | 4.000 | 10.70 | 7.000 | 4.40 | 10.00 | 0.60 |
| 1.167 | 0.60 | 4.167 | 29.00 | 7.167 | 2.50 | 10.17 | 0.60 |
| 1.333 | 0.60 | 4.333 | 29.00 | 7.333 | 2.50 | 10.33 | 0.60 |
| 1.500 | 0.60 | 4.500 | 29.00 | 7.500 | 2.50 | 10.50 | 0.60 |
| 1.667 | 0.60 | 4.667 | 29.00 | 7.667 | 2.50 | 10.67 | 0.60 |
| 1.833 | 0.60 | 4.833 | 29.00 | 7.833 | 2.50 | 10.83 | 0.60 |
| 2.000 | 0.60 | 5.000 | 29.00 | 8.000 | 2.50 | 11.00 | 0.60 |
| 2.167 | 3.80 | 5.167 | 8.20 | 8.167 | 1.30 | 11.17 | 0.60 |
| 2.333 | 3.80 | 5.333 | 8.20 | 8.333 | 1.30 | 11.33 | 0.60 |
| 2.500 | 3.80 | 5.500 | 8.20 | 8.500 | 1.30 | 11.50 | 0.60 |
| 2.667 | 3.80 | 5.667 | 8.20 | 8.667 | 1.30 | 11.67 | 0.60 |
| 2.833 | 3.80 | 5.833 | 8.20 | 8.833 | 1.30 | 11.83 | 0.60 |
| 3.000 | 3.80 | 6.000 | 8.20 | 9.000 | 1.30 | 12.00 | 0.60 |

| | | | |
|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 29.00 | 28.58 | |
| over (min) | 10.00 | 20.00 | |
| Storage Coeff. (min)= | 6.98 (ii) | 18.62 (ii) | |
| Unit Hyd. Tpeak (min)= | 10.00 | 20.00 | |
| Unit Hyd. peak (cms)= | 0.13 | 0.06 | |
| | | | *TOTALS* |
| PEAK FLOW (cms)= | 0.04 | 0.01 | 0.050 (iii) |
| TIME TO PEAK (hrs)= | 5.00 | 5.00 | 5.00 |
| RUNOFF VOLUME (mm)= | 61.90 | 56.62 | 60.78 |
| TOTAL RAINFALL (mm)= | 62.90 | 62.90 | 62.90 |
| RUNOFF COEFFICIENT = | 0.98 | 0.90 | 0.97 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------------------------------------------------------------------
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--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0006):     1.55   0.095     5.00    58.14
      + ID2= 2 (  0007):     0.63   0.050     5.00    60.78
        ================================================
        ID = 3 (  0010):     2.18   0.145     5.00    58.90

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0010):     2.18   0.145     5.00    58.90
      + ID2= 2 (  0008):     0.76   0.058     5.00    51.14
        ================================================
        ID = 1 (  0010):     2.94   0.203     5.00    56.89

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ADD HYD  (  0012)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0010):     2.94   0.203     5.00    56.89
      + ID2= 2 (  0003):     4.58   0.218     5.00    53.37
        ================================================
        ID = 3 (  0012):     7.52   0.421     5.00    54.75

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

       V    V   I    SSSSS  U   U    A    L             (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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```

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

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO
6.2\VO2\voin.dat
  Output  filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-
33eb-4790-b5ab-2fe711ab4c1b\92a8e5a5-8f9e-4505-a460-778888da7875\scenari
  Summary filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-
33eb-4790-b5ab-2fe711ab4c1b\92a8e5a5-8f9e-4505-a460-778888da7875\scenari

DATE: 04/22/2024                          TIME: 11:35:02

USER:


COMMENTS: _____________________________________________________

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  ***********************************************
  ** SIMULATION : H - 25Y1                     **
  ***********************************************


--------------------
|    READ STORM    |    Filename: C:\Users\qdar\AppD
|                  |              ata\Local\Temp\
|                  |              b014d45b-6f58-45eb-8754-
25dd5b7e6eb9\49a39099
| Ptotal= 45.90 mm |    Comments: 25Y1
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME
RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs
mm/hr
                0.00    0.00 |  0.33   82.62 |  0.67   44.06 |  1.00
5.51
                0.08    5.51 |  0.42  154.22 |  0.75   27.54 |
                0.17   16.52 |  0.50   82.62 |  0.83   16.52 |
                0.25   44.06 |  0.58   66.10 |  0.92    5.51 |

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--------------------
| CALIB            |
| NASHYD   (  0001)|   Area     (ha)=   3.04   Curve Number    (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.10

        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
                0.167    2.75 | 0.500  118.42 | 0.833   35.80 |  1.17
2.75
                0.333   30.29 | 0.667   74.36 | 1.000   11.01 |

     Unit Hyd Qpeak  (cms)=   0.106

     PEAK FLOW       (cms)=   0.147 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=  36.296
     TOTAL RAINFALL   (mm)=  45.899
     RUNOFF COEFFICIENT   =   0.791

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

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--------------------
| CALIB            |
| NASHYD   (  0109)|   Area     (ha)=   1.38   Curve Number    (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.32

        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
                0.167    2.75 | 0.500  118.42 | 0.833   35.80 |  1.17
2.75
                0.333   30.29 | 0.667   74.36 | 1.000   11.01 |

     Unit Hyd Qpeak  (cms)=   0.165

     PEAK FLOW       (cms)=   0.188 (i)
     TIME TO PEAK    (hrs)=   0.833
     RUNOFF VOLUME    (mm)=  36.134
     TOTAL RAINFALL   (mm)=  45.899
     RUNOFF COEFFICIENT   =   0.787

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

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--------------------
| CALIB            |
| STANDHYD (  0002)|   Area     (ha)=   0.16
|ID= 1 DT=10.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.16         0.00
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      32.66        40.00
     Mannings n           =      0.013        0.250

        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
                0.167    2.75 | 0.500  118.42 | 0.833   35.80 |  1.17
2.75
                0.333   30.29 | 0.667   74.36 | 1.000   11.01 |

     Max.Eff.Inten.(mm/hr)=     118.42       106.45
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      1.22 (ii)    8.10 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=      0.05         0.00          0.052 (iii)
     TIME TO PEAK    (hrs)=      0.50         0.50           0.50
     RUNOFF VOLUME    (mm)=     44.90        39.76          44.84
     TOTAL RAINFALL   (mm)=     45.90        45.90          45.90
     RUNOFF COEFFICIENT   =      0.98         0.87           0.98

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| ADD HYD  (  0003)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     3.04    0.147     1.67    36.30
      + ID2= 2 (  0109):     1.38    0.188     0.83    36.13
        ================================================
        ID = 3 (  0003):     4.42    0.255     1.00    36.25

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ADD HYD  (  0003)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0003):     4.42    0.255     1.00    36.25
      + ID2= 2 (  0002):     0.16    0.052     0.50    44.84
        ================================================
        ID = 1 (  0003):     4.58    0.266     0.83    36.55

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| CALIB            |
| NASHYD   (  0008)|   Area    (ha)=   0.76   Curve Number   (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
               0.167    2.75 | 0.500  118.42 | 0.833   35.80 |  1.17
2.75
               0.333   30.29 | 0.667   74.36 | 1.000   11.01 |

     Unit Hyd Qpeak  (cms)=   0.161

     PEAK FLOW       (cms)=   0.140 (i)
     TIME TO PEAK    (hrs)=   0.667
     RUNOFF VOLUME    (mm)=  34.928
     TOTAL RAINFALL   (mm)=  45.899
     RUNOFF COEFFICIENT   =   0.761

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

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-------
--------------------
| CALIB            |
| STANDHYD (  0006)|   Area    (ha)=   1.55
|ID= 1 DT=10.0 min |   Total Imp(%)=  29.00   Dir. Conn.(%)=  29.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.45         1.10
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         4.00
     Length            (m)=     101.65       385.00
     Mannings n           =      0.013        0.250

        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
               0.167    2.75 | 0.500  118.42 | 0.833   35.80 |  1.17
2.75
               0.333   30.29 | 0.667   74.36 | 1.000   11.01 |

     Max.Eff.Inten.(mm/hr)=     118.42        71.48
                over (min)       10.00        30.00
     Storage Coeff.  (min)=       2.41 (ii)   27.92 (ii)
     Unit Hyd. Tpeak (min)=      10.00        30.00
     Unit Hyd. peak  (cms)=       0.17         0.04
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.15         0.13          0.176 (iii)
     TIME TO PEAK    (hrs)=       0.50         1.00           0.50
     RUNOFF VOLUME    (mm)=      44.90        39.76          41.24
     TOTAL RAINFALL   (mm)=      45.90        45.90          45.90
     RUNOFF COEFFICIENT   =       0.98         0.87           0.90

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD (  0007)|   Area    (ha)=   0.63
|ID= 1 DT=10.0 min |   Total Imp(%)=  79.00   Dir. Conn.(%)=  79.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.50         0.13
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       3.00         2.00
     Length            (m)=     405.00        40.00
     Mannings n           =      0.013        0.250

        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
               0.167    2.75 | 0.500  118.42 | 0.833   35.80 |  1.17
2.75
               0.333   30.29 | 0.667   74.36 | 1.000   11.01 |

     Max.Eff.Inten.(mm/hr)=     118.42       106.45
                over (min)       10.00        20.00
     Storage Coeff.  (min)=       3.97 (ii)   10.86 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.16         0.08
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.15         0.02          0.164 (iii)
     TIME TO PEAK    (hrs)=       0.50         0.67           0.50
     RUNOFF VOLUME    (mm)=      44.90        39.76          43.81
     TOTAL RAINFALL   (mm)=      45.90        45.90          45.90
     RUNOFF COEFFICIENT   =       0.98         0.87           0.95

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    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 ( 0010)| | | | | |
|---|---|---|---|---|---|
| 1 + 2 = 3 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
| ID1= 1 ( 0006): | 1.55 | 0.176 | 0.50 | 41.24 |
| + ID2= 2 ( 0007): | 0.63 | 0.164 | 0.50 | 43.81 |
| ID = 3 ( 0010): | 2.18 | 0.340 | 0.50 | 41.98 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| ADD HYD ( 0010)| | | | | |
|---|---|---|---|---|---|
| 3 + 2 = 1 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
| ID1= 3 ( 0010): | 2.18 | 0.340 | 0.50 | 41.98 |
| + ID2= 2 ( 0008): | 0.76 | 0.140 | 0.67 | 34.93 |
| ID = 1 ( 0010): | 2.94 | 0.442 | 0.50 | 40.16 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| ADD HYD ( 0012)| | | | | |
|---|---|---|---|---|---|
| 1 + 2 = 3 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
| ID1= 1 ( 0010): | 2.94 | 0.442 | 0.50 | 40.16 |
| + ID2= 2 ( 0003): | 4.58 | 0.266 | 0.83 | 36.55 |
| ID = 3 ( 0012): | 7.52 | 0.664 | 0.67 | 37.96 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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```
V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
V    V   I    SS     U   U   A A   L
 V  V    I     SS    U   U  AAAAA  L
 V  V    I      SS   U   U  A   A  L
  VV     I    SSSSS  UUUUU  A   A  LLLLL

 OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
O   O    T      T    H   H   Y Y   MM MM  O   O
O   O    T      T    H   H    Y    M   M  O   O
 OOO     T      T    H   H    Y    M   M   OOO
```

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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
Output filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-33eb-4790-b5ab-2fe711ab4c1b\42ec2995-4cac-410d-8111-8e5bb30e3640\scenari
Summary filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-33eb-4790-b5ab-2fe711ab4c1b\42ec2995-4cac-410d-8111-8e5bb30e3640\scenari

DATE: 04/22/2024 TIME: 11:35:02

USER:

COMMENTS: _____

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```
**********************************************
** SIMULATION : I - 25Y12                   **
**********************************************
```

| READ STORM | Filename: C:\Users\qdar\AppData\Local\Temp\b014d45b-6f58-45eb-8754-25dd5b7e6eb9\65ad33b4 |
|---|---|
| Ptotal= 72.80 mm | Comments: 25Y12 UPDATED |

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.70 | 3.00 | 12.40 | 6.00 | 5.10 | 9.00 | 0.70 |
| 0.25 | 0.70 | 3.25 | 12.40 | 6.25 | 5.10 | 9.25 | 0.70 |
| 0.50 | 0.70 | 3.50 | 12.40 | 6.50 | 5.10 | 9.50 | 0.70 |
| 0.75 | 0.70 | 3.75 | 12.40 | 6.75 | 5.10 | 9.75 | 0.70 |
| 1.00 | 0.70 | 4.00 | 33.50 | 7.00 | 2.90 | 10.00 | 0.70 |
| 1.25 | 0.70 | 4.25 | 33.50 | 7.25 | 2.90 | 10.25 | 0.70 |
| 1.50 | 0.70 | 4.50 | 33.50 | 7.50 | 2.90 | 10.50 | 0.70 |
| 1.75 | 0.70 | 4.75 | 33.50 | 7.75 | 2.90 | 10.75 | 0.70 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2.00 | 4.40 | 5.00 | 9.50 | 8.00 | 1.50 | 11.00 |
| 0.70 | | | | | | |
| 2.25 | 4.40 | 5.25 | 9.50 | 8.25 | 1.50 | 11.25 |
| 0.70 | | | | | | |
| 2.50 | 4.40 | 5.50 | 9.50 | 8.50 | 1.50 | 11.50 |
| 0.70 | | | | | | |
| 2.75 | 4.40 | 5.75 | 9.50 | 8.75 | 1.50 | 11.75 |
| 0.70 | | | | | | |

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| CALIB | | | | | |
|---|---|---|---|---|---|
| NASHYD ( 0001) | Area (ha)= | 3.04 | Curve Number (CN)= | 98.0 | |
| ID= 1 DT=10.0 min | Ia (mm)= | 5.00 | # of Linear Res.(N)= | 3.00 | |
| | U.H. Tp(hrs)= | 1.10 | | | |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 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 |
| 0.167 | 0.70 | 3.167 | 12.40 | 6.167 | 5.10 | 9.17 | 0.70 |
| 0.333 | 0.70 | 3.333 | 12.40 | 6.333 | 5.10 | 9.33 | 0.70 |
| 0.500 | 0.70 | 3.500 | 12.40 | 6.500 | 5.10 | 9.50 | 0.70 |
| 0.667 | 0.70 | 3.667 | 12.40 | 6.667 | 5.10 | 9.67 | 0.70 |
| 0.833 | 0.70 | 3.833 | 12.40 | 6.833 | 5.10 | 9.83 | 0.70 |
| 1.000 | 0.70 | 4.000 | 12.40 | 7.000 | 5.10 | 10.00 | 0.70 |
| 1.167 | 0.70 | 4.167 | 33.50 | 7.167 | 2.90 | 10.17 | 0.70 |
| 1.333 | 0.70 | 4.333 | 33.50 | 7.333 | 2.90 | 10.33 | 0.70 |
| 1.500 | 0.70 | 4.500 | 33.50 | 7.500 | 2.90 | 10.50 | 0.70 |
| 1.667 | 0.70 | 4.667 | 33.50 | 7.667 | 2.90 | 10.67 | 0.70 |
| 1.833 | 0.70 | 4.833 | 33.50 | 7.833 | 2.90 | 10.83 | 0.70 |
| 2.000 | 0.70 | 5.000 | 33.50 | 8.000 | 2.90 | 11.00 | 0.70 |
| 2.167 | 4.40 | 5.167 | 9.50 | 8.167 | 1.50 | 11.17 | 0.70 |
| 2.333 | 4.40 | 5.333 | 9.50 | 8.333 | 1.50 | 11.33 | 0.70 |
| 2.500 | 4.40 | 5.500 | 9.50 | 8.500 | 1.50 | 11.50 | 0.70 |
| 2.667 | 4.40 | 5.667 | 9.50 | 8.667 | 1.50 | 11.67 | 0.70 |
| 2.833 | 4.40 | 5.833 | 9.50 | 8.833 | 1.50 | 11.83 | 0.70 |
| 3.000 | 4.40 | 6.000 | 9.50 | 9.000 | 1.50 | 12.00 | 0.70 |

Unit Hyd Qpeak (cms)= 0.106

PEAK FLOW (cms)= 0.161 (i)
TIME TO PEAK (hrs)= 5.667
RUNOFF VOLUME (mm)= 62.982
TOTAL RAINFALL (mm)= 72.800
RUNOFF COEFFICIENT = 0.865

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

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| CALIB | | | | | |
|---|---|---|---|---|---|
| NASHYD ( 0109) | Area (ha)= | 1.38 | Curve Number (CN)= | 98.0 | |
| ID= 1 DT=10.0 min | Ia (mm)= | 5.00 | # of Linear Res.(N)= | 3.00 | |
| | U.H. Tp(hrs)= | 0.32 | | | |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 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 |
| 0.167 | 0.70 | 3.167 | 12.40 | 6.167 | 5.10 | 9.17 | 0.70 |
| 0.333 | 0.70 | 3.333 | 12.40 | 6.333 | 5.10 | 9.33 | 0.70 |
| 0.500 | 0.70 | 3.500 | 12.40 | 6.500 | 5.10 | 9.50 | 0.70 |
| 0.667 | 0.70 | 3.667 | 12.40 | 6.667 | 5.10 | 9.67 | 0.70 |
| 0.833 | 0.70 | 3.833 | 12.40 | 6.833 | 5.10 | 9.83 | 0.70 |
| 1.000 | 0.70 | 4.000 | 12.40 | 7.000 | 5.10 | 10.00 | 0.70 |
| 1.167 | 0.70 | 4.167 | 33.50 | 7.167 | 2.90 | 10.17 | 0.70 |
| 1.333 | 0.70 | 4.333 | 33.50 | 7.333 | 2.90 | 10.33 | 0.70 |
| 1.500 | 0.70 | 4.500 | 33.50 | 7.500 | 2.90 | 10.50 | 0.70 |
| 1.667 | 0.70 | 4.667 | 33.50 | 7.667 | 2.90 | 10.67 | 0.70 |
| 1.833 | 0.70 | 4.833 | 33.50 | 7.833 | 2.90 | 10.83 | 0.70 |
| 2.000 | 0.70 | 5.000 | 33.50 | 8.000 | 2.90 | 11.00 | 0.70 |
| 2.167 | 4.40 | 5.167 | 9.50 | 8.167 | 1.50 | 11.17 | 0.70 |
| 2.333 | 4.40 | 5.333 | 9.50 | 8.333 | 1.50 | 11.33 | 0.70 |

```
               2.500    4.40 | 5.500    9.50 | 8.500    1.50 | 11.50
0.70
               2.667    4.40 | 5.667    9.50 | 8.667    1.50 | 11.67
0.70
               2.833    4.40 | 5.833    9.50 | 8.833    1.50 | 11.83
0.70
               3.000    4.40 | 6.000    9.50 | 9.000    1.50 | 12.00
0.70

     Unit Hyd Qpeak  (cms)=   0.165

     PEAK FLOW       (cms)=   0.122 (i)
     TIME TO PEAK    (hrs)=   5.000
     RUNOFF VOLUME    (mm)=  62.700
     TOTAL RAINFALL   (mm)=  72.800
     RUNOFF COEFFICIENT   =   0.861

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

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--------------------
| CALIB            |
| STANDHYD (  0002)|   Area    (ha)=   0.16
|ID= 1 DT=10.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.16         0.00
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      32.66        40.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
               0.167    0.70 | 3.167   12.40 | 6.167    5.10 |  9.17
0.70
               0.333    0.70 | 3.333   12.40 | 6.333    5.10 |  9.33
0.70
               0.500    0.70 | 3.500   12.40 | 6.500    5.10 |  9.50
0.70
               0.667    0.70 | 3.667   12.40 | 6.667    5.10 |  9.67
0.70
               0.833    0.70 | 3.833   12.40 | 6.833    5.10 |  9.83
0.70
               1.000    0.70 | 4.000   12.40 | 7.000    5.10 | 10.00
0.70
               1.167    0.70 | 4.167   33.50 | 7.167    2.90 | 10.17
0.70
               1.333    0.70 | 4.333   33.50 | 7.333    2.90 | 10.33
0.70
               1.500    0.70 | 4.500   33.50 | 7.500    2.90 | 10.50
0.70
               1.667    0.70 | 4.667   33.50 | 7.667    2.90 | 10.67
0.70
               1.833    0.70 | 4.833   33.50 | 7.833    2.90 | 10.83
0.70
               2.000    0.70 | 5.000   33.50 | 8.000    2.90 | 11.00
0.70
               2.167    4.40 | 5.167    9.50 | 8.167    1.50 | 11.17
0.70
               2.333    4.40 | 5.333    9.50 | 8.333    1.50 | 11.33
0.70
               2.500    4.40 | 5.500    9.50 | 8.500    1.50 | 11.50
0.70
               2.667    4.40 | 5.667    9.50 | 8.667    1.50 | 11.67
0.70
               2.833    4.40 | 5.833    9.50 | 8.833    1.50 | 11.83
0.70
               3.000    4.40 | 6.000    9.50 | 9.000    1.50 | 12.00
0.70

     Max.Eff.Inten.(mm/hr)=      33.50        33.13
               over (min)        10.00        20.00
     Storage Coeff.  (min)=       2.02 (ii)   13.00 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.07
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.01         0.00          0.015 (iii)
     TIME TO PEAK    (hrs)=       4.50         5.00           5.00
     RUNOFF VOLUME    (mm)=      71.80        66.47          71.74
     TOTAL RAINFALL   (mm)=      72.80        72.80          72.80
     RUNOFF COEFFICIENT   =       0.99         0.91           0.99

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| ADD HYD  (  0003)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):     3.04   0.161     5.67    62.98
     + ID2= 2 (  0109):     1.38   0.122     5.00    62.70
       ================================================
       ID = 3 (  0003):     4.42   0.244     5.17    62.89

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ADD HYD  (  0003)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
```

```
  ID1= 3 (  0003):     4.42   0.244     5.17    62.89
+ ID2= 2 (  0002):     0.16   0.015     5.00    71.74
  ================================================
  ID = 1 (  0003):     4.58   0.257     5.00    63.20

 NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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| CALIB | | | | | |
|---|---|---|---|---|---|
| NASHYD ( 0008) | Area (ha)= | 0.76 | Curve Number (CN)= | 98.0 |
| ID= 1 DT=10.0 min | Ia (mm)= | 5.00 | # of Linear Res.(N)= | 3.00 |
| | U.H. Tp(hrs)= | 0.18 | | |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

| TIME (hrs) | RAIN (mm/hr) | TIME (hrs) | RAIN (mm/hr) | TIME (hrs) | RAIN (mm/hr) | TIME (hrs) | RAIN (mm/hr) |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.70 | 3.167 | 12.40 | 6.167 | 5.10 | 9.17 | 0.70 |
| 0.333 | 0.70 | 3.333 | 12.40 | 6.333 | 5.10 | 9.33 | 0.70 |
| 0.500 | 0.70 | 3.500 | 12.40 | 6.500 | 5.10 | 9.50 | 0.70 |
| 0.667 | 0.70 | 3.667 | 12.40 | 6.667 | 5.10 | 9.67 | 0.70 |
| 0.833 | 0.70 | 3.833 | 12.40 | 6.833 | 5.10 | 9.83 | 0.70 |
| 1.000 | 0.70 | 4.000 | 12.40 | 7.000 | 5.10 | 10.00 | 0.70 |
| 1.167 | 0.70 | 4.167 | 33.50 | 7.167 | 2.90 | 10.17 | 0.70 |
| 1.333 | 0.70 | 4.333 | 33.50 | 7.333 | 2.90 | 10.33 | 0.70 |
| 1.500 | 0.70 | 4.500 | 33.50 | 7.500 | 2.90 | 10.50 | 0.70 |
| 1.667 | 0.70 | 4.667 | 33.50 | 7.667 | 2.90 | 10.67 | 0.70 |
| 1.833 | 0.70 | 4.833 | 33.50 | 7.833 | 2.90 | 10.83 | 0.70 |
| 2.000 | 0.70 | 5.000 | 33.50 | 8.000 | 2.90 | 11.00 | 0.70 |
| 2.167 | 4.40 | 5.167 | 9.50 | 8.167 | 1.50 | 11.17 | 0.70 |
| 2.333 | 4.40 | 5.333 | 9.50 | 8.333 | 1.50 | 11.33 | 0.70 |
| 2.500 | 4.40 | 5.500 | 9.50 | 8.500 | 1.50 | 11.50 | 0.70 |
| 2.667 | 4.40 | 5.667 | 9.50 | 8.667 | 1.50 | 11.67 | 0.70 |
| 2.833 | 4.40 | 5.833 | 9.50 | 8.833 | 1.50 | 11.83 | 0.70 |
| 3.000 | 4.40 | 6.000 | 9.50 | 9.000 | 1.50 | 12.00 | 0.70 |

```
Unit Hyd Qpeak  (cms)=   0.161

PEAK FLOW       (cms)=   0.067 (i)
TIME TO PEAK    (hrs)=   5.000
RUNOFF VOLUME    (mm)=  60.606
TOTAL RAINFALL   (mm)=  72.800
RUNOFF COEFFICIENT   =   0.833

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

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| CALIB | | | |
|---|---|---|---|
| STANDHYD ( 0006) | Area (ha)= | 1.55 | |
| ID= 1 DT=10.0 min | Total Imp(%)= | 29.00 | Dir. Conn.(%)= 29.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.45 | 1.10 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 1.00 | 4.00 |
| Length | (m)= | 101.65 | 385.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

| TIME (hrs) | RAIN (mm/hr) | TIME (hrs) | RAIN (mm/hr) | TIME (hrs) | RAIN (mm/hr) | TIME (hrs) | RAIN (mm/hr) |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.70 | 3.167 | 12.40 | 6.167 | 5.10 | 9.17 | 0.70 |
| 0.333 | 0.70 | 3.333 | 12.40 | 6.333 | 5.10 | 9.33 | 0.70 |
| 0.500 | 0.70 | 3.500 | 12.40 | 6.500 | 5.10 | 9.50 | 0.70 |
| 0.667 | 0.70 | 3.667 | 12.40 | 6.667 | 5.10 | 9.67 | 0.70 |
| 0.833 | 0.70 | 3.833 | 12.40 | 6.833 | 5.10 | 9.83 | 0.70 |
| 1.000 | 0.70 | 4.000 | 12.40 | 7.000 | 5.10 | 10.00 | 0.70 |
| 1.167 | 0.70 | 4.167 | 33.50 | 7.167 | 2.90 | 10.17 | 0.70 |
| 1.333 | 0.70 | 4.333 | 33.50 | 7.333 | 2.90 | 10.33 | 0.70 |
| 1.500 | 0.70 | 4.500 | 33.50 | 7.500 | 2.90 | 10.50 | 0.70 |
| 1.667 | 0.70 | 4.667 | 33.50 | 7.667 | 2.90 | 10.67 | 0.70 |
| 1.833 | 0.70 | 4.833 | 33.50 | 7.833 | 2.90 | 10.83 | 0.70 |
| 2.000 | 0.70 | 5.000 | 33.50 | 8.000 | 2.90 | 11.00 | 0.70 |
| 2.167 | 4.40 | 5.167 | 9.50 | 8.167 | 1.50 | 11.17 | 0.70 |

```
               2.333    4.40 | 5.333    9.50 | 8.333    1.50 | 11.33
0.70
               2.500    4.40 | 5.500    9.50 | 8.500    1.50 | 11.50
0.70
               2.667    4.40 | 5.667    9.50 | 8.667    1.50 | 11.67
0.70
               2.833    4.40 | 5.833    9.50 | 8.833    1.50 | 11.83
0.70
               3.000    4.40 | 6.000    9.50 | 9.000    1.50 | 12.00
0.70

     Max.Eff.Inten.(mm/hr)=      33.50        33.01
               over (min)        10.00        40.00
     Storage Coeff.  (min)=       4.00 (ii)   38.75 (ii)
     Unit Hyd. Tpeak (min)=      10.00        40.00
     Unit Hyd. peak  (cms)=       0.16         0.03
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.04         0.08       0.117 (iii)
     TIME TO PEAK    (hrs)=       5.00         5.17        5.00
     RUNOFF VOLUME    (mm)=      71.80        66.47       68.00
     TOTAL RAINFALL   (mm)=      72.80        72.80       72.80
     RUNOFF COEFFICIENT   =       0.99         0.91        0.93

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD (  0007)|   Area    (ha)=   0.63
|ID= 1 DT=10.0 min |   Total Imp(%)=  79.00   Dir. Conn.(%)=  79.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.50         0.13
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       3.00         2.00
     Length            (m)=     405.00        40.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
               0.167    0.70 | 3.167   12.40 | 6.167    5.10 |  9.17
0.70
               0.333    0.70 | 3.333   12.40 | 6.333    5.10 |  9.33
0.70
               0.500    0.70 | 3.500   12.40 | 6.500    5.10 |  9.50
0.70
               0.667    0.70 | 3.667   12.40 | 6.667    5.10 |  9.67
0.70
               0.833    0.70 | 3.833   12.40 | 6.833    5.10 |  9.83
0.70
               1.000    0.70 | 4.000   12.40 | 7.000    5.10 | 10.00
0.70
               1.167    0.70 | 4.167   33.50 | 7.167    2.90 | 10.17
0.70
               1.333    0.70 | 4.333   33.50 | 7.333    2.90 | 10.33
0.70
               1.500    0.70 | 4.500   33.50 | 7.500    2.90 | 10.50
0.70
               1.667    0.70 | 4.667   33.50 | 7.667    2.90 | 10.67
0.70
               1.833    0.70 | 4.833   33.50 | 7.833    2.90 | 10.83
0.70
               2.000    0.70 | 5.000   33.50 | 8.000    2.90 | 11.00
0.70
               2.167    4.40 | 5.167    9.50 | 8.167    1.50 | 11.17
0.70
               2.333    4.40 | 5.333    9.50 | 8.333    1.50 | 11.33
0.70
               2.500    4.40 | 5.500    9.50 | 8.500    1.50 | 11.50
0.70
               2.667    4.40 | 5.667    9.50 | 8.667    1.50 | 11.67
0.70
               2.833    4.40 | 5.833    9.50 | 8.833    1.50 | 11.83
0.70
               3.000    4.40 | 6.000    9.50 | 9.000    1.50 | 12.00
0.70

     Max.Eff.Inten.(mm/hr)=      33.50        33.13
               over (min)        10.00        20.00
     Storage Coeff.  (min)=       6.59 (ii)   17.57 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.13         0.06
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.05         0.01       0.058 (iii)
     TIME TO PEAK    (hrs)=       5.00         5.00        5.00
     RUNOFF VOLUME    (mm)=      71.80        66.47       70.66
     TOTAL RAINFALL   (mm)=      72.80        72.80       72.80
     RUNOFF COEFFICIENT   =       0.99         0.91        0.97

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0006):      1.55    0.117     5.00    68.00
```

```
      + ID2= 2 (  0007):     0.63   0.058     5.00    70.66
        ================================================
        ID = 3 (  0010):     2.18   0.175     5.00    68.77

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0010):     2.18   0.175     5.00    68.77
      + ID2= 2 (  0008):     0.76   0.067     5.00    60.61
        ================================================
        ID = 1 (  0010):     2.94   0.242     5.00    66.66

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ADD HYD  (  0012)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0010):     2.94   0.242     5.00    66.66
      + ID2= 2 (  0003):     4.58   0.257     5.00    63.20
        ================================================
        ID = 3 (  0012):     7.52   0.499     5.00    64.55

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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       V    V   I    SSSSS  U   U    A    L             (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO
6.2\VO2\voin.dat
  Output  filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-
33eb-4790-b5ab-2fe711ab4c1b\020be2dc-8dab-4611-b395-444d00de7d3c\scenari

  Summary filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-
33eb-4790-b5ab-2fe711ab4c1b\020be2dc-8dab-4611-b395-444d00de7d3c\scenari

DATE: 04/22/2024                          TIME: 11:35:02

USER:


COMMENTS: _____________________________________________________________


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  ***********************************************
  ** SIMULATION : J - 50Y1                     **
  ***********************************************


--------------------
|    READ STORM    |    Filename: C:\Users\qdar\AppD
|                  |              ata\Local\Temp\
|                  |              b014d45b-6f58-45eb-8754-
25dd5b7e6eb9\e266291d
| Ptotal= 51.40 mm |    Comments: 50Y1
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME
RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs
mm/hr
                0.00    0.00 |  0.33   92.52 |  0.67   49.34 |  1.00
6.17
                0.08    6.17 |  0.42  172.70 |  0.75   30.84 |
                0.17   18.50 |  0.50   92.52 |  0.83   18.50 |
                0.25   49.34 |  0.58   74.02 |  0.92    6.17 |

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--------------------
| CALIB            |
| NASHYD   (  0001)|   Area    (ha)=   3.04   Curve Number    (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.10

        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
               0.167    3.08 | 0.500  132.61 | 0.833   40.09 |  1.17
3.08
               0.333   33.92 | 0.667   83.27 | 1.000   12.33 |

     Unit Hyd Qpeak  (cms)=   0.106
```

```
     PEAK FLOW       (cms)=   0.169 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=  41.734
     TOTAL RAINFALL   (mm)=  51.399
     RUNOFF COEFFICIENT   =   0.812

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

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--------------------
| CALIB            |
| NASHYD   (  0109)|   Area     (ha)=   1.38   Curve Number    (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.32

         NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
               0.167    3.08 | 0.500  132.61 | 0.833   40.09 |  1.17
3.08
               0.333   33.92 | 0.667   83.27 | 1.000   12.33 |

     Unit Hyd Qpeak  (cms)=   0.165

     PEAK FLOW       (cms)=   0.215 (i)
     TIME TO PEAK    (hrs)=   0.833
     RUNOFF VOLUME    (mm)=  41.548
     TOTAL RAINFALL   (mm)=  51.399
     RUNOFF COEFFICIENT   =   0.808

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

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--------------------
| CALIB            |
| STANDHYD (  0002)|   Area     (ha)=   0.16
|ID= 1 DT=10.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.16         0.00
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      32.66        40.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
               0.167    3.08 | 0.500  132.61 | 0.833   40.09 |  1.17
3.08
               0.333   33.92 | 0.667   83.27 | 1.000   12.33 |

     Max.Eff.Inten.(mm/hr)=     132.61       121.29
               over (min)        10.00        10.00
     Storage Coeff.  (min)=       1.17 (ii)    7.70 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.06         0.00          0.059 (iii)
     TIME TO PEAK    (hrs)=       0.50         0.50           0.50
     RUNOFF VOLUME    (mm)=      50.40        45.20          50.34
     TOTAL RAINFALL   (mm)=      51.40        51.40          51.40
     RUNOFF COEFFICIENT   =       0.98         0.88           0.98

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| ADD HYD  (  0003)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     3.04   0.169     1.67    41.73
      + ID2= 2 (  0109):     1.38   0.215     0.83    41.55
        ================================================
        ID = 3 (  0003):     4.42   0.293     1.00    41.68

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ADD HYD  (  0003)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0003):     4.42   0.293     1.00    41.68
      + ID2= 2 (  0002):     0.16   0.059     0.50    50.34
        ================================================
        ID = 1 (  0003):     4.58   0.306     0.83    41.98

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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-------
--------------------
| CALIB            |
| NASHYD   (  0008)|   Area     (ha)=   0.76   Curve Number    (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18
```

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 3.08 | 0.500 | 132.61 | 0.833 | 40.09 | 1.17 | 3.08 |
| 0.333 | 33.92 | 0.667 | 83.27 | 1.000 | 12.33 | | |

---- TRANSFORMED HYETOGRAPH ----

Unit Hyd Qpeak (cms)= 0.161

PEAK FLOW (cms)= 0.161 (i)
TIME TO PEAK (hrs)= 0.667
RUNOFF VOLUME (mm)= 40.160
TOTAL RAINFALL (mm)= 51.399
RUNOFF COEFFICIENT = 0.781

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

---

| CALIB | |
|---|---|
| STANDHYD ( 0006) | Area (ha)= 1.55 |
| ID= 1 DT=10.0 min | Total Imp(%)= 29.00 Dir. Conn.(%)= 29.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.45 | 1.10 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 1.00 | 4.00 |
| Length | (m)= | 101.65 | 385.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 3.08 | 0.500 | 132.61 | 0.833 | 40.09 | 1.17 | 3.08 |
| 0.333 | 33.92 | 0.667 | 83.27 | 1.000 | 12.33 | | |

---- TRANSFORMED HYETOGRAPH ----

| | | | | *TOTALS* |
|---|---|---|---|---|
| Max.Eff.Inten. | (mm/hr)= | 132.61 | 80.89 | |
| over | (min) | 10.00 | 30.00 | |
| Storage Coeff. | (min)= | 2.30 (ii) | 26.58 (ii) | |
| Unit Hyd. Tpeak | (min)= | 10.00 | 30.00 | |
| Unit Hyd. peak | (cms)= | 0.17 | 0.04 | |
| PEAK FLOW | (cms)= | 0.16 | 0.15 | 0.200 (iii) |
| TIME TO PEAK | (hrs)= | 0.50 | 1.00 | 0.50 |
| RUNOFF VOLUME | (mm)= | 50.40 | 45.20 | 46.70 |
| TOTAL RAINFALL | (mm)= | 51.40 | 51.40 | 51.40 |
| RUNOFF COEFFICIENT | = | 0.98 | 0.88 | 0.91 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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 ( 0007) | Area (ha)= 0.63 |
| ID= 1 DT=10.0 min | Total Imp(%)= 79.00 Dir. Conn.(%)= 79.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.50 | 0.13 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 3.00 | 2.00 |
| Length | (m)= | 405.00 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 3.08 | 0.500 | 132.61 | 0.833 | 40.09 | 1.17 | 3.08 |
| 0.333 | 33.92 | 0.667 | 83.27 | 1.000 | 12.33 | | |

---- TRANSFORMED HYETOGRAPH ----

| | | | | *TOTALS* |
|---|---|---|---|---|
| Max.Eff.Inten. | (mm/hr)= | 132.61 | 121.29 | |
| over | (min) | 10.00 | 20.00 | |
| Storage Coeff. | (min)= | 3.80 (ii) | 10.33 (ii) | |
| Unit Hyd. Tpeak | (min)= | 10.00 | 20.00 | |
| Unit Hyd. peak | (cms)= | 0.16 | 0.08 | |
| PEAK FLOW | (cms)= | 0.17 | 0.03 | 0.186 (iii) |
| TIME TO PEAK | (hrs)= | 0.50 | 0.67 | 0.50 |
| RUNOFF VOLUME | (mm)= | 50.40 | 45.20 | 49.30 |
| TOTAL RAINFALL | (mm)= | 51.40 | 51.40 | 51.40 |
| RUNOFF COEFFICIENT | = | 0.98 | 0.88 | 0.96 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0006):     1.55   0.200     0.50    46.70
     + ID2= 2 (  0007):     0.63   0.186     0.50    49.30
       ================================================
       ID = 3 (  0010):     2.18   0.386     0.50    47.45

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0010):     2.18   0.386     0.50    47.45
     + ID2= 2 (  0008):     0.76   0.161     0.67    40.16
       ================================================
       ID = 1 (  0010):     2.94   0.505     0.50    45.57

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ADD HYD  (  0012)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0010):     2.94   0.505     0.50    45.57
     + ID2= 2 (  0003):     4.58   0.306     0.83    41.98
       ================================================
       ID = 3 (  0012):     7.52   0.761     0.67    43.38

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO
6.2\VO2\voin.dat
  Output  filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-
33eb-4790-b5ab-2fe711ab4c1b\41646777-6654-4fc2-8baf-634a4341f9ae\scenari
  Summary filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-
33eb-4790-b5ab-2fe711ab4c1b\41646777-6654-4fc2-8baf-634a4341f9ae\scenari

DATE: 04/22/2024                          TIME: 11:35:02

USER:


COMMENTS: _____________________________________________________________

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  ***********************************************
  ** SIMULATION : K - 50Y12                    **
  ***********************************************

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|    READ STORM    |    Filename: C:\Users\qdar\AppD
|                  |              ata\Local\Temp\
|                  |              b014d45b-6f58-45eb-8754-
25dd5b7e6eb9\597f8121
| Ptotal= 80.10 mm |    Comments: 50Y12 UPDATED
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME
RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs
mm/hr
                0.00    0.80 |  3.00   13.60 |  6.00    5.60 |  9.00
0.80
                0.25    0.80 |  3.25   13.60 |  6.25    5.60 |  9.25
0.80
                0.50    0.80 |  3.50   13.60 |  6.50    5.60 |  9.50
0.80
                0.75    0.80 |  3.75   13.60 |  6.75    5.60 |  9.75
0.80
                1.00    0.80 |  4.00   36.90 |  7.00    3.20 | 10.00
0.80
                1.25    0.80 |  4.25   36.90 |  7.25    3.20 | 10.25
0.80
                1.50    0.80 |  4.50   36.90 |  7.50    3.20 | 10.50
0.80
                1.75    0.80 |  4.75   36.90 |  7.75    3.20 | 10.75
0.80
                2.00    4.80 |  5.00   10.40 |  8.00    1.60 | 11.00
0.80
                2.25    4.80 |  5.25   10.40 |  8.25    1.60 | 11.25
0.80
                2.50    4.80 |  5.50   10.40 |  8.50    1.60 | 11.50
0.80
                2.75    4.80 |  5.75   10.40 |  8.75    1.60 | 11.75
0.80
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| CALIB | | | | | |
|---|---|---|---|---|---|
| NASHYD ( 0001) | Area (ha)= | 3.04 | Curve Number (CN)= | 98.0 |
| ID= 1 DT=10.0 min | Ia (mm)= | 5.00 | # of Linear Res.(N)= | 3.00 |
| | U.H. Tp(hrs)= | 1.10 | | |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.80 | 3.167 | 13.60 | 6.167 | 5.60 | 9.17 | 0.80 |
| 0.333 | 0.80 | 3.333 | 13.60 | 6.333 | 5.60 | 9.33 | 0.80 |
| 0.500 | 0.80 | 3.500 | 13.60 | 6.500 | 5.60 | 9.50 | 0.80 |
| 0.667 | 0.80 | 3.667 | 13.60 | 6.667 | 5.60 | 9.67 | 0.80 |
| 0.833 | 0.80 | 3.833 | 13.60 | 6.833 | 5.60 | 9.83 | 0.80 |
| 1.000 | 0.80 | 4.000 | 13.60 | 7.000 | 5.60 | 10.00 | 0.80 |
| 1.167 | 0.80 | 4.167 | 36.90 | 7.167 | 3.20 | 10.17 | 0.80 |
| 1.333 | 0.80 | 4.333 | 36.90 | 7.333 | 3.20 | 10.33 | 0.80 |
| 1.500 | 0.80 | 4.500 | 36.90 | 7.500 | 3.20 | 10.50 | 0.80 |
| 1.667 | 0.80 | 4.667 | 36.90 | 7.667 | 3.20 | 10.67 | 0.80 |
| 1.833 | 0.80 | 4.833 | 36.90 | 7.833 | 3.20 | 10.83 | 0.80 |
| 2.000 | 0.80 | 5.000 | 36.90 | 8.000 | 3.20 | 11.00 | 0.80 |
| 2.167 | 4.80 | 5.167 | 10.40 | 8.167 | 1.60 | 11.17 | 0.80 |
| 2.333 | 4.80 | 5.333 | 10.40 | 8.333 | 1.60 | 11.33 | 0.80 |
| 2.500 | 4.80 | 5.500 | 10.40 | 8.500 | 1.60 | 11.50 | 0.80 |
| 2.667 | 4.80 | 5.667 | 10.40 | 8.667 | 1.60 | 11.67 | 0.80 |
| 2.833 | 4.80 | 5.833 | 10.40 | 8.833 | 1.60 | 11.83 | 0.80 |
| 3.000 | 4.80 | 6.000 | 10.40 | 9.000 | 1.60 | 12.00 | 0.80 |

Unit Hyd Qpeak (cms)= 0.106

PEAK FLOW (cms)= 0.179 (i)
TIME TO PEAK (hrs)= 5.667

RUNOFF VOLUME (mm)= 70.248
TOTAL RAINFALL (mm)= 80.100
RUNOFF COEFFICIENT = 0.877

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

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| CALIB | | | | | |
|---|---|---|---|---|---|
| NASHYD ( 0109) | Area (ha)= | 1.38 | Curve Number (CN)= | 98.0 |
| ID= 1 DT=10.0 min | Ia (mm)= | 5.00 | # of Linear Res.(N)= | 3.00 |
| | U.H. Tp(hrs)= | 0.32 | | |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.80 | 3.167 | 13.60 | 6.167 | 5.60 | 9.17 | 0.80 |
| 0.333 | 0.80 | 3.333 | 13.60 | 6.333 | 5.60 | 9.33 | 0.80 |
| 0.500 | 0.80 | 3.500 | 13.60 | 6.500 | 5.60 | 9.50 | 0.80 |
| 0.667 | 0.80 | 3.667 | 13.60 | 6.667 | 5.60 | 9.67 | 0.80 |
| 0.833 | 0.80 | 3.833 | 13.60 | 6.833 | 5.60 | 9.83 | 0.80 |
| 1.000 | 0.80 | 4.000 | 13.60 | 7.000 | 5.60 | 10.00 | 0.80 |
| 1.167 | 0.80 | 4.167 | 36.90 | 7.167 | 3.20 | 10.17 | 0.80 |
| 1.333 | 0.80 | 4.333 | 36.90 | 7.333 | 3.20 | 10.33 | 0.80 |
| 1.500 | 0.80 | 4.500 | 36.90 | 7.500 | 3.20 | 10.50 | 0.80 |
| 1.667 | 0.80 | 4.667 | 36.90 | 7.667 | 3.20 | 10.67 | 0.80 |
| 1.833 | 0.80 | 4.833 | 36.90 | 7.833 | 3.20 | 10.83 | 0.80 |
| 2.000 | 0.80 | 5.000 | 36.90 | 8.000 | 3.20 | 11.00 | 0.80 |
| 2.167 | 4.80 | 5.167 | 10.40 | 8.167 | 1.60 | 11.17 | 0.80 |
| 2.333 | 4.80 | 5.333 | 10.40 | 8.333 | 1.60 | 11.33 | 0.80 |
| 2.500 | 4.80 | 5.500 | 10.40 | 8.500 | 1.60 | 11.50 | 0.80 |
| 2.667 | 4.80 | 5.667 | 10.40 | 8.667 | 1.60 | 11.67 | 0.80 |
| 2.833 | 4.80 | 5.833 | 10.40 | 8.833 | 1.60 | 11.83 | 0.80 |
| 3.000 | 4.80 | 6.000 | 10.40 | 9.000 | 1.60 | 12.00 | 0.80 |

Unit Hyd Qpeak (cms)= 0.165

PEAK FLOW (cms)= 0.135 (i)
TIME TO PEAK (hrs)= 5.000
RUNOFF VOLUME (mm)= 69.934
TOTAL RAINFALL (mm)= 80.100
RUNOFF COEFFICIENT = 0.873

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

---

| CALIB |
| --- |
| STANDHYD ( 0002) |
| ID= 1 DT=10.0 min |

Area (ha)= 0.16
Total Imp(%)= 99.00 Dir. Conn.(%)= 99.00

| | | IMPERVIOUS | PERVIOUS (i) |
| --- | --- | --- | --- |
| Surface Area | (ha)= | 0.16 | 0.00 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 1.00 | 2.00 |
| Length | (m)= | 32.66 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 0.167 | 0.80 | 3.167 | 13.60 | 6.167 | 5.60 | 9.17 | 0.80 |
| 0.333 | 0.80 | 3.333 | 13.60 | 6.333 | 5.60 | 9.33 | 0.80 |
| 0.500 | 0.80 | 3.500 | 13.60 | 6.500 | 5.60 | 9.50 | 0.80 |
| 0.667 | 0.80 | 3.667 | 13.60 | 6.667 | 5.60 | 9.67 | 0.80 |
| 0.833 | 0.80 | 3.833 | 13.60 | 6.833 | 5.60 | 9.83 | 0.80 |
| 1.000 | 0.80 | 4.000 | 13.60 | 7.000 | 5.60 | 10.00 | 0.80 |
| 1.167 | 0.80 | 4.167 | 36.90 | 7.167 | 3.20 | 10.17 | 0.80 |
| 1.333 | 0.80 | 4.333 | 36.90 | 7.333 | 3.20 | 10.33 | 0.80 |
| 1.500 | 0.80 | 4.500 | 36.90 | 7.500 | 3.20 | 10.50 | 0.80 |
| 1.667 | 0.80 | 4.667 | 36.90 | 7.667 | 3.20 | 10.67 | 0.80 |
| 1.833 | 0.80 | 4.833 | 36.90 | 7.833 | 3.20 | 10.83 | 0.80 |
| 2.000 | 0.80 | 5.000 | 36.90 | 8.000 | 3.20 | 11.00 | 0.80 |
| 2.167 | 4.80 | 5.167 | 10.40 | 8.167 | 1.60 | 11.17 | 0.80 |
| 2.333 | 4.80 | 5.333 | 10.40 | 8.333 | 1.60 | 11.33 | 0.80 |
| 2.500 | 4.80 | 5.500 | 10.40 | 8.500 | 1.60 | 11.50 | 0.80 |
| 2.667 | 4.80 | 5.667 | 10.40 | 8.667 | 1.60 | 11.67 | 0.80 |
| 2.833 | 4.80 | 5.833 | 10.40 | 8.833 | 1.60 | 11.83 | 0.80 |
| 3.000 | 4.80 | 6.000 | 10.40 | 9.000 | 1.60 | 12.00 | 0.80 |

| | | | | *TOTALS* |
| --- | --- | --- | --- | --- |
| Max.Eff.Inten. | (mm/hr)= | 36.90 | 36.56 | |
| | over (min) | 10.00 | 20.00 | |
| Storage Coeff. | (min)= | 1.95 (ii) | 12.50 (ii) | |
| Unit Hyd. Tpeak | (min)= | 10.00 | 20.00 | |
| Unit Hyd. peak | (cms)= | 0.17 | 0.07 | |
| PEAK FLOW | (cms)= | 0.02 | 0.00 | 0.016 (iii) |
| TIME TO PEAK | (hrs)= | 4.50 | 5.00 | 5.00 |
| RUNOFF VOLUME | (mm)= | 79.10 | 73.74 | 79.04 |
| TOTAL RAINFALL | (mm)= | 80.10 | 80.10 | 80.10 |
| RUNOFF COEFFICIENT | = | 0.99 | 0.92 | 0.99 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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 ( 0003) |
| --- |
| 1 + 2 = 3 |

| | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
| --- | --- | --- | --- | --- |
| ID1= 1 ( 0001): | 3.04 | 0.179 | 5.67 | 70.25 |
| + ID2= 2 ( 0109): | 1.38 | 0.135 | 5.00 | 69.93 |
| ID = 3 ( 0003): | 4.42 | 0.272 | 5.17 | 70.15 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| ADD HYD ( 0003) |
| --- |
| 3 + 2 = 1 |

| | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
| --- | --- | --- | --- | --- |
| ID1= 3 ( 0003): | 4.42 | 0.272 | 5.17 | 70.15 |
| + ID2= 2 ( 0002): | 0.16 | 0.016 | 5.00 | 79.04 |
| ID = 1 ( 0003): | 4.58 | 0.287 | 5.00 | 70.46 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| CALIB            |
| NASHYD   (  0008)|   Area     (ha)=   0.76   Curve Number    (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18
```

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.80 | 3.167 | 13.60 | 6.167 | 5.60 | 9.17 | 0.80 |
| 0.333 | 0.80 | 3.333 | 13.60 | 6.333 | 5.60 | 9.33 | 0.80 |
| 0.500 | 0.80 | 3.500 | 13.60 | 6.500 | 5.60 | 9.50 | 0.80 |
| 0.667 | 0.80 | 3.667 | 13.60 | 6.667 | 5.60 | 9.67 | 0.80 |
| 0.833 | 0.80 | 3.833 | 13.60 | 6.833 | 5.60 | 9.83 | 0.80 |
| 1.000 | 0.80 | 4.000 | 13.60 | 7.000 | 5.60 | 10.00 | 0.80 |
| 1.167 | 0.80 | 4.167 | 36.90 | 7.167 | 3.20 | 10.17 | 0.80 |
| 1.333 | 0.80 | 4.333 | 36.90 | 7.333 | 3.20 | 10.33 | 0.80 |
| 1.500 | 0.80 | 4.500 | 36.90 | 7.500 | 3.20 | 10.50 | 0.80 |
| 1.667 | 0.80 | 4.667 | 36.90 | 7.667 | 3.20 | 10.67 | 0.80 |
| 1.833 | 0.80 | 4.833 | 36.90 | 7.833 | 3.20 | 10.83 | 0.80 |
| 2.000 | 0.80 | 5.000 | 36.90 | 8.000 | 3.20 | 11.00 | 0.80 |
| 2.167 | 4.80 | 5.167 | 10.40 | 8.167 | 1.60 | 11.17 | 0.80 |
| 2.333 | 4.80 | 5.333 | 10.40 | 8.333 | 1.60 | 11.33 | 0.80 |
| 2.500 | 4.80 | 5.500 | 10.40 | 8.500 | 1.60 | 11.50 | 0.80 |
| 2.667 | 4.80 | 5.667 | 10.40 | 8.667 | 1.60 | 11.67 | 0.80 |
| 2.833 | 4.80 | 5.833 | 10.40 | 8.833 | 1.60 | 11.83 | 0.80 |
| 3.000 | 4.80 | 6.000 | 10.40 | 9.000 | 1.60 | 12.00 | 0.80 |

Unit Hyd Qpeak (cms)= 0.161

PEAK FLOW (cms)= 0.074 (i)
TIME TO PEAK (hrs)= 5.000
RUNOFF VOLUME (mm)= 67.599
TOTAL RAINFALL (mm)= 80.100
RUNOFF COEFFICIENT = 0.844

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

---

```
--------------------
| CALIB            |
| STANDHYD (  0006)|   Area     (ha)=   1.55
|ID= 1 DT=10.0 min |   Total Imp(%)=  29.00   Dir. Conn.(%)=  29.00
--------------------
```

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.45 | 1.10 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 1.00 | 4.00 |
| Length | (m)= | 101.65 | 385.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.80 | 3.167 | 13.60 | 6.167 | 5.60 | 9.17 | 0.80 |
| 0.333 | 0.80 | 3.333 | 13.60 | 6.333 | 5.60 | 9.33 | 0.80 |
| 0.500 | 0.80 | 3.500 | 13.60 | 6.500 | 5.60 | 9.50 | 0.80 |
| 0.667 | 0.80 | 3.667 | 13.60 | 6.667 | 5.60 | 9.67 | 0.80 |
| 0.833 | 0.80 | 3.833 | 13.60 | 6.833 | 5.60 | 9.83 | 0.80 |
| 1.000 | 0.80 | 4.000 | 13.60 | 7.000 | 5.60 | 10.00 | 0.80 |
| 1.167 | 0.80 | 4.167 | 36.90 | 7.167 | 3.20 | 10.17 | 0.80 |
| 1.333 | 0.80 | 4.333 | 36.90 | 7.333 | 3.20 | 10.33 | 0.80 |
| 1.500 | 0.80 | 4.500 | 36.90 | 7.500 | 3.20 | 10.50 | 0.80 |
| 1.667 | 0.80 | 4.667 | 36.90 | 7.667 | 3.20 | 10.67 | 0.80 |
| 1.833 | 0.80 | 4.833 | 36.90 | 7.833 | 3.20 | 10.83 | 0.80 |
| 2.000 | 0.80 | 5.000 | 36.90 | 8.000 | 3.20 | 11.00 | 0.80 |
| 2.167 | 4.80 | 5.167 | 10.40 | 8.167 | 1.60 | 11.17 | 0.80 |
| 2.333 | 4.80 | 5.333 | 10.40 | 8.333 | 1.60 | 11.33 | 0.80 |
| 2.500 | 4.80 | 5.500 | 10.40 | 8.500 | 1.60 | 11.50 | 0.80 |
| 2.667 | 4.80 | 5.667 | 10.40 | 8.667 | 1.60 | 11.67 | 0.80 |
| 2.833 | 4.80 | 5.833 | 10.40 | 8.833 | 1.60 | 11.83 | 0.80 |

```
               3.000    4.80 | 6.000   10.40 | 9.000    1.60 | 12.00
0.80

     Max.Eff.Inten.(mm/hr)=      36.90        36.45
               over (min)        10.00        40.00
     Storage Coeff.  (min)=       3.84 (ii)   37.24 (ii)
     Unit Hyd. Tpeak (min)=      10.00        40.00
     Unit Hyd. peak  (cms)=       0.16         0.03
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.05         0.09          0.131 (iii)
     TIME TO PEAK    (hrs)=       5.00         5.17           5.00
     RUNOFF VOLUME    (mm)=      79.10        73.74          75.28
     TOTAL RAINFALL   (mm)=      80.10        80.10          80.10
     RUNOFF COEFFICIENT   =       0.99         0.92           0.94

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------
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--------------------
| CALIB            |
| STANDHYD (  0007)|   Area    (ha)=   0.63
|ID= 1 DT=10.0 min |   Total Imp(%)=  79.00   Dir. Conn.(%)=  79.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.50         0.13
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       3.00         2.00
     Length            (m)=     405.00        40.00
     Mannings n            =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
               0.167    0.80 | 3.167   13.60 | 6.167    5.60 |  9.17
0.80
               0.333    0.80 | 3.333   13.60 | 6.333    5.60 |  9.33
0.80
               0.500    0.80 | 3.500   13.60 | 6.500    5.60 |  9.50
0.80
               0.667    0.80 | 3.667   13.60 | 6.667    5.60 |  9.67
0.80
               0.833    0.80 | 3.833   13.60 | 6.833    5.60 |  9.83
0.80
               1.000    0.80 | 4.000   13.60 | 7.000    5.60 | 10.00
0.80
               1.167    0.80 | 4.167   36.90 | 7.167    3.20 | 10.17
0.80
               1.333    0.80 | 4.333   36.90 | 7.333    3.20 | 10.33
0.80
               1.500    0.80 | 4.500   36.90 | 7.500    3.20 | 10.50
0.80
               1.667    0.80 | 4.667   36.90 | 7.667    3.20 | 10.67
0.80
               1.833    0.80 | 4.833   36.90 | 7.833    3.20 | 10.83
0.80
               2.000    0.80 | 5.000   36.90 | 8.000    3.20 | 11.00
0.80
               2.167    4.80 | 5.167   10.40 | 8.167    1.60 | 11.17
0.80
               2.333    4.80 | 5.333   10.40 | 8.333    1.60 | 11.33
0.80
               2.500    4.80 | 5.500   10.40 | 8.500    1.60 | 11.50
0.80
               2.667    4.80 | 5.667   10.40 | 8.667    1.60 | 11.67
0.80
               2.833    4.80 | 5.833   10.40 | 8.833    1.60 | 11.83
0.80
               3.000    4.80 | 6.000   10.40 | 9.000    1.60 | 12.00
0.80

     Max.Eff.Inten.(mm/hr)=      36.90        36.56
               over (min)        10.00        20.00
     Storage Coeff.  (min)=       6.34 (ii)   16.89 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.13         0.06
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.05         0.01          0.064 (iii)
     TIME TO PEAK    (hrs)=       5.00         5.00           5.00
     RUNOFF VOLUME    (mm)=      79.10        73.74          77.96
     TOTAL RAINFALL   (mm)=      80.10        80.10          80.10
     RUNOFF COEFFICIENT   =       0.99         0.92           0.97

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0006):      1.55    0.131     5.00    75.28
      + ID2= 2 (  0007):      0.63    0.064     5.00    77.96
        ================================================
        ID = 3 (  0010):      2.18    0.195     5.00    76.05

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0010):     2.18   0.195     5.00    76.05
     + ID2= 2 (  0008):     0.76   0.074     5.00    67.60
       ================================================
       ID = 1 (  0010):     2.94   0.269     5.00    73.87

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ADD HYD  (  0012)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0010):     2.94   0.269     5.00    73.87
     + ID2= 2 (  0003):     4.58   0.287     5.00    70.46
       ================================================
       ID = 3 (  0012):     7.52   0.555     5.00    71.79

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

       V    V   I    SSSSS  U   U    A    L             (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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


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6.2\VO2\voin.dat
  Output  filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-
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  Summary filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-
33eb-4790-b5ab-2fe711ab4c1b\fc8c86a7-deed-4e7a-aedc-7f72c39829e3\scenari


DATE: 04/22/2024                          TIME: 11:35:03

USER:

COMMENTS: _____________________________________________________________

------------------------------------------------------------------------------
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  ***********************************************
  ** SIMULATION : L - 100Y1                    **
  ***********************************************


--------------------
|    READ STORM    |    Filename: C:\Users\qdar\AppD
|                  |              ata\Local\Temp\
|                  |              b014d45b-6f58-45eb-8754-
25dd5b7e6eb9\a40d6b96
| Ptotal= 56.80 mm |    Comments: 100Y1
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME
RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs
mm/hr
                0.00    0.00 |  0.33  102.24 |  0.67   54.53 |  1.00
6.82
                0.08    6.82 |  0.42  190.85 |  0.75   34.08 |
                0.17   20.45 |  0.50  102.24 |  0.83   20.45 |
                0.25   54.53 |  0.58   81.79 |  0.92    6.82 |

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--------------------
| CALIB            |
| NASHYD   (  0001)|   Area     (ha)=   3.04   Curve Number    (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.10

        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
               0.167    3.41 | 0.500  146.54 | 0.833   44.30 |  1.17
3.41
               0.333   37.49 | 0.667   92.02 | 1.000   13.63 |

     Unit Hyd Qpeak  (cms)=   0.106

     PEAK FLOW       (cms)=   0.190 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=  47.087
     TOTAL RAINFALL   (mm)=  56.802
     RUNOFF COEFFICIENT   =   0.829

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
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-------
--------------------
| CALIB            |
| NASHYD   (  0109)|   Area    (ha)=   1.38   Curve Number    (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.32

        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
               0.167    3.41 | 0.500  146.54 | 0.833   44.30 |  1.17
3.41
               0.333   37.49 | 0.667   92.02 | 1.000   13.63 |

     Unit Hyd Qpeak  (cms)=   0.165

     PEAK FLOW       (cms)=   0.243 (i)
     TIME TO PEAK    (hrs)=   0.833
     RUNOFF VOLUME    (mm)=  46.877
     TOTAL RAINFALL   (mm)=  56.802
     RUNOFF COEFFICIENT   =   0.825

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

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-------
--------------------
| CALIB            |
| STANDHYD (  0002)|   Area    (ha)=   0.16
|ID= 1 DT=10.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.16         0.00
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      32.66        40.00
     Mannings n           =      0.013        0.250

        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
               0.167    3.41 | 0.500  146.54 | 0.833   44.30 |  1.17
3.41
               0.333   37.49 | 0.667   92.02 | 1.000   13.63 |

     Max.Eff.Inten.(mm/hr)=     146.54       135.81
                over (min)       10.00        10.00
     Storage Coeff.  (min)=       1.12 (ii)    7.36 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.17         0.13
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.06         0.00          0.065 (iii)
     TIME TO PEAK    (hrs)=       0.50         0.50           0.50
     RUNOFF VOLUME    (mm)=      55.80        50.56          55.74
     TOTAL RAINFALL   (mm)=      56.80        56.80          56.80
     RUNOFF COEFFICIENT   =       0.98         0.89           0.98

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    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  (  0003)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     3.04    0.190     1.67    47.09
      + ID2= 2 (  0109):     1.38    0.243     0.83    46.88
        ================================================
        ID = 3 (  0003):     4.42    0.330     1.00    47.02

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

--------------------
| ADD HYD  (  0003)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0003):     4.42    0.330     1.00    47.02
      + ID2= 2 (  0002):     0.16    0.065     0.50    55.74
        ================================================
        ID = 1 (  0003):     4.58    0.346     0.83    47.33

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------
--------------------
| CALIB            |
| NASHYD   (  0008)|   Area    (ha)=   0.76   Curve Number    (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
```

```
                0.167    3.41 | 0.500  146.54 | 0.833   44.30 |  1.17
3.41
                0.333   37.49 | 0.667   92.02 | 1.000   13.63 |

     Unit Hyd Qpeak  (cms)=   0.161

     PEAK FLOW       (cms)=   0.181 (i)
     TIME TO PEAK    (hrs)=   0.667
     RUNOFF VOLUME    (mm)=  45.311
     TOTAL RAINFALL   (mm)=  56.802
     RUNOFF COEFFICIENT   =   0.798

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

-------------------------------------------------------------------------
-------
--------------------
| CALIB            |
| STANDHYD (  0006)|   Area    (ha)=   1.55
|ID= 1 DT=10.0 min |   Total Imp(%)=  29.00   Dir. Conn.(%)=  29.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.45         1.10
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         4.00
     Length            (m)=     101.65       385.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
                0.167    3.41 | 0.500  146.54 | 0.833   44.30 |  1.17
3.41
                0.333   37.49 | 0.667   92.02 | 1.000   13.63 |

     Max.Eff.Inten.(mm/hr)=     146.54        90.10
               over (min)       10.00        30.00
     Storage Coeff.  (min)=      2.21 (ii)   25.47 (ii)
     Unit Hyd. Tpeak (min)=     10.00        30.00
     Unit Hyd. peak  (cms)=      0.17         0.04
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.18         0.17          0.223 (iii)
     TIME TO PEAK    (hrs)=      0.50         1.00          0.50
     RUNOFF VOLUME    (mm)=     55.80        50.56         52.07
     TOTAL RAINFALL   (mm)=     56.80        56.80         56.80
     RUNOFF COEFFICIENT   =      0.98         0.89          0.92

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    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 (  0007)|   Area    (ha)=   0.63
|ID= 1 DT=10.0 min |   Total Imp(%)=  79.00   Dir. Conn.(%)=  79.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.50         0.13
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       3.00         2.00
     Length            (m)=     405.00        40.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
                0.167    3.41 | 0.500  146.54 | 0.833   44.30 |  1.17
3.41
                0.333   37.49 | 0.667   92.02 | 1.000   13.63 |

     Max.Eff.Inten.(mm/hr)=     146.54       135.81
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      3.65 (ii)    9.89 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.16         0.11
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.19         0.03          0.226 (iii)
     TIME TO PEAK    (hrs)=      0.50         0.67          0.50
     RUNOFF VOLUME    (mm)=     55.80        50.56         54.69
     TOTAL RAINFALL   (mm)=     56.80        56.80         56.80
     RUNOFF COEFFICIENT   =      0.98         0.89          0.96

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0006):      1.55    0.223     0.50    52.07
     + ID2= 2 (  0007):      0.63    0.226     0.50    54.69
       ================================================
       ID = 3 (  0010):      2.18    0.449     0.50    52.83
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| ADD HYD ( 0010)| | | | | |
|---|---|---|---|---|---|
| 3 + 2 = 1 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
| ID1= 3 ( 0010): | 2.18 | 0.449 | 0.50 | 52.83 |
| + ID2= 2 ( 0008): | 0.76 | 0.181 | 0.67 | 45.31 |
| ID = 1 ( 0010): | 2.94 | 0.586 | 0.50 | 50.89 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| ADD HYD ( 0012)| | | | | |
|---|---|---|---|---|---|
| 1 + 2 = 3 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
| ID1= 1 ( 0010): | 2.94 | 0.586 | 0.50 | 50.89 |
| + ID2= 2 ( 0003): | 4.58 | 0.346 | 0.83 | 47.33 |
| ID = 3 ( 0012): | 7.52 | 0.857 | 0.67 | 48.72 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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```
       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
```



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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
Output filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-33eb-4790-b5ab-2fe711ab4c1b\813b121b-39a3-43f7-96d6-b2f04a63041f\scenari
Summary filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-33eb-4790-b5ab-2fe711ab4c1b\813b121b-39a3-43f7-96d6-b2f04a63041f\scenari

DATE: 04/22/2024 TIME: 11:35:02

USER:

COMMENTS: _____

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** SIMULATION : M - 100Y12 **

| READ STORM | Filename: C:\Users\qdar\AppData\Local\Temp\b014d45b-6f58-45eb-8754-25dd5b7e6eb9\44e1bea0 |
|---|---|
| Ptotal= 87.50 mm | Comments: 100Y12 UPDATED |

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.90 | 3.00 | 14.90 | 6.00 | 6.10 | 9.00 | 0.90 |
| 0.25 | 0.90 | 3.25 | 14.90 | 6.25 | 6.10 | 9.25 | 0.90 |
| 0.50 | 0.90 | 3.50 | 14.90 | 6.50 | 6.10 | 9.50 | 0.90 |
| 0.75 | 0.90 | 3.75 | 14.90 | 6.75 | 6.10 | 9.75 | 0.90 |
| 1.00 | 0.90 | 4.00 | 40.20 | 7.00 | 3.50 | 10.00 | 0.90 |
| 1.25 | 0.90 | 4.25 | 40.20 | 7.25 | 3.50 | 10.25 | 0.90 |
| 1.50 | 0.90 | 4.50 | 40.20 | 7.50 | 3.50 | 10.50 | 0.90 |
| 1.75 | 0.90 | 4.75 | 40.20 | 7.75 | 3.50 | 10.75 | 0.90 |
| 2.00 | 5.20 | 5.00 | 11.40 | 8.00 | 1.70 | 11.00 | 0.90 |
| 2.25 | 5.20 | 5.25 | 11.40 | 8.25 | 1.70 | 11.25 | 0.90 |
| 2.50 | 5.20 | 5.50 | 11.40 | 8.50 | 1.70 | 11.50 | 0.90 |
| 2.75 | 5.20 | 5.75 | 11.40 | 8.75 | 1.70 | 11.75 | 0.90 |

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| CALIB | | | |
|---|---|---|---|
| NASHYD ( 0001)\| ID= 1 DT=10.0 min | Area (ha)= 3.04 | Curve Number (CN)= 98.0 | |
| | Ia (mm)= 5.00 | # of Linear Res.(N)= 3.00 | |
| | U.H. Tp(hrs)= 1.10 | | |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 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 |
| 0.167 | 0.90 | 3.167 | 14.90 | 6.167 | 6.10 | 9.17 | 0.90 |
| 0.333 | 0.90 | 3.333 | 14.90 | 6.333 | 6.10 | 9.33 | 0.90 |
| 0.500 | 0.90 | 3.500 | 14.90 | 6.500 | 6.10 | 9.50 | 0.90 |
| 0.667 | 0.90 | 3.667 | 14.90 | 6.667 | 6.10 | 9.67 | 0.90 |
| 0.833 | 0.90 | 3.833 | 14.90 | 6.833 | 6.10 | 9.83 | 0.90 |
| 1.000 | 0.90 | 4.000 | 14.90 | 7.000 | 6.10 | 10.00 | 0.90 |
| 1.167 | 0.90 | 4.167 | 40.20 | 7.167 | 3.50 | 10.17 | 0.90 |
| 1.333 | 0.90 | 4.333 | 40.20 | 7.333 | 3.50 | 10.33 | 0.90 |
| 1.500 | 0.90 | 4.500 | 40.20 | 7.500 | 3.50 | 10.50 | 0.90 |
| 1.667 | 0.90 | 4.667 | 40.20 | 7.667 | 3.50 | 10.67 | 0.90 |
| 1.833 | 0.90 | 4.833 | 40.20 | 7.833 | 3.50 | 10.83 | 0.90 |
| 2.000 | 0.90 | 5.000 | 40.20 | 8.000 | 3.50 | 11.00 | 0.90 |
| 2.167 | 5.20 | 5.167 | 11.40 | 8.167 | 1.70 | 11.17 | 0.90 |
| 2.333 | 5.20 | 5.333 | 11.40 | 8.333 | 1.70 | 11.33 | 0.90 |
| 2.500 | 5.20 | 5.500 | 11.40 | 8.500 | 1.70 | 11.50 | 0.90 |
| 2.667 | 5.20 | 5.667 | 11.40 | 8.667 | 1.70 | 11.67 | 0.90 |
| 2.833 | 5.20 | 5.833 | 11.40 | 8.833 | 1.70 | 11.83 | 0.90 |
| 3.000 | 5.20 | 6.000 | 11.40 | 9.000 | 1.70 | 12.00 | 0.90 |

Unit Hyd Qpeak (cms)= 0.106

PEAK FLOW (cms)= 0.197 (i)
TIME TO PEAK (hrs)= 5.667
RUNOFF VOLUME (mm)= 77.619
TOTAL RAINFALL (mm)= 87.500
RUNOFF COEFFICIENT = 0.887

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

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| CALIB | | | |
|---|---|---|---|
| NASHYD ( 0109) | Area (ha)= | 1.38 | Curve Number (CN)= 98.0 |
| ID= 1 DT=10.0 min | Ia (mm)= | 5.00 | # of Linear Res.(N)= 3.00 |
| | U.H. Tp(hrs)= | 0.32 | |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 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 |
| 0.167 | 0.90 | 3.167 | 14.90 | 6.167 | 6.10 | 9.17 | 0.90 |
| 0.333 | 0.90 | 3.333 | 14.90 | 6.333 | 6.10 | 9.33 | 0.90 |
| 0.500 | 0.90 | 3.500 | 14.90 | 6.500 | 6.10 | 9.50 | 0.90 |
| 0.667 | 0.90 | 3.667 | 14.90 | 6.667 | 6.10 | 9.67 | 0.90 |
| 0.833 | 0.90 | 3.833 | 14.90 | 6.833 | 6.10 | 9.83 | 0.90 |
| 1.000 | 0.90 | 4.000 | 14.90 | 7.000 | 6.10 | 10.00 | 0.90 |
| 1.167 | 0.90 | 4.167 | 40.20 | 7.167 | 3.50 | 10.17 | 0.90 |
| 1.333 | 0.90 | 4.333 | 40.20 | 7.333 | 3.50 | 10.33 | 0.90 |
| 1.500 | 0.90 | 4.500 | 40.20 | 7.500 | 3.50 | 10.50 | 0.90 |
| 1.667 | 0.90 | 4.667 | 40.20 | 7.667 | 3.50 | 10.67 | 0.90 |
| 1.833 | 0.90 | 4.833 | 40.20 | 7.833 | 3.50 | 10.83 | 0.90 |
| 2.000 | 0.90 | 5.000 | 40.20 | 8.000 | 3.50 | 11.00 | 0.90 |
| 2.167 | 5.20 | 5.167 | 11.40 | 8.167 | 1.70 | 11.17 | 0.90 |
| 2.333 | 5.20 | 5.333 | 11.40 | 8.333 | 1.70 | 11.33 | 0.90 |
| 2.500 | 5.20 | 5.500 | 11.40 | 8.500 | 1.70 | 11.50 | 0.90 |
| 2.667 | 5.20 | 5.667 | 11.40 | 8.667 | 1.70 | 11.67 | 0.90 |
| 2.833 | 5.20 | 5.833 | 11.40 | 8.833 | 1.70 | 11.83 | 0.90 |
| 3.000 | 5.20 | 6.000 | 11.40 | 9.000 | 1.70 | 12.00 | 0.90 |

Unit Hyd Qpeak (cms)= 0.165

PEAK FLOW (cms)= 0.148 (i)
TIME TO PEAK (hrs)= 5.000
RUNOFF VOLUME (mm)= 77.273
TOTAL RAINFALL (mm)= 87.500
RUNOFF COEFFICIENT = 0.883

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

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| CALIB            |
| STANDHYD (  0002)|   Area    (ha)=   0.16
|ID= 1 DT=10.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.16         0.00
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      32.66        40.00
     Mannings n             =    0.013        0.250

        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
              0.167    0.90 | 3.167   14.90 | 6.167    6.10 |  9.17
0.90
              0.333    0.90 | 3.333   14.90 | 6.333    6.10 |  9.33
0.90
              0.500    0.90 | 3.500   14.90 | 6.500    6.10 |  9.50
0.90
              0.667    0.90 | 3.667   14.90 | 6.667    6.10 |  9.67
0.90
              0.833    0.90 | 3.833   14.90 | 6.833    6.10 |  9.83
0.90
              1.000    0.90 | 4.000   14.90 | 7.000    6.10 | 10.00
0.90
              1.167    0.90 | 4.167   40.20 | 7.167    3.50 | 10.17
0.90
              1.333    0.90 | 4.333   40.20 | 7.333    3.50 | 10.33
0.90
              1.500    0.90 | 4.500   40.20 | 7.500    3.50 | 10.50
0.90
              1.667    0.90 | 4.667   40.20 | 7.667    3.50 | 10.67
0.90
              1.833    0.90 | 4.833   40.20 | 7.833    3.50 | 10.83
0.90
              2.000    0.90 | 5.000   40.20 | 8.000    3.50 | 11.00
0.90
              2.167    5.20 | 5.167   11.40 | 8.167    1.70 | 11.17
0.90
              2.333    5.20 | 5.333   11.40 | 8.333    1.70 | 11.33
0.90
              2.500    5.20 | 5.500   11.40 | 8.500    1.70 | 11.50
0.90
              2.667    5.20 | 5.667   11.40 | 8.667    1.70 | 11.67
0.90
              2.833    5.20 | 5.833   11.40 | 8.833    1.70 | 11.83
0.90
              3.000    5.20 | 6.000   11.40 | 9.000    1.70 | 12.00
0.90
```

```
     Max.Eff.Inten.(mm/hr)=      40.20        39.89
               over (min)        10.00        20.00
     Storage Coeff.  (min)=       1.88 (ii)   12.07 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.07
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.00          0.018 (iii)
     TIME TO PEAK    (hrs)=       4.50         5.00           5.00
     RUNOFF VOLUME    (mm)=      86.50        81.11          86.44
     TOTAL RAINFALL   (mm)=      87.50        87.50          87.50
     RUNOFF COEFFICIENT   =       0.99         0.93           0.99

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| ADD HYD  (  0003)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     3.04    0.197     5.67    77.62
      + ID2= 2 (  0109):     1.38    0.148     5.00    77.27
        ==================================================
        ID = 3 (  0003):     4.42    0.299     5.17    77.51

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ADD HYD  (  0003)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0003):     4.42    0.299     5.17    77.51
      + ID2= 2 (  0002):     0.16    0.018     5.00    86.44
        ==================================================
        ID = 1 (  0003):     4.58    0.315     5.00    77.82

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| CALIB            |
| NASHYD   (  0008)|   Area    (ha)=   0.76   Curve Number   (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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 |
| 0.167 | 0.90 | 3.167 | 14.90 | 6.167 | 6.10 | 9.17 | 0.90 |
| 0.333 | 0.90 | 3.333 | 14.90 | 6.333 | 6.10 | 9.33 | 0.90 |
| 0.500 | 0.90 | 3.500 | 14.90 | 6.500 | 6.10 | 9.50 | 0.90 |
| 0.667 | 0.90 | 3.667 | 14.90 | 6.667 | 6.10 | 9.67 | 0.90 |
| 0.833 | 0.90 | 3.833 | 14.90 | 6.833 | 6.10 | 9.83 | 0.90 |
| 1.000 | 0.90 | 4.000 | 14.90 | 7.000 | 6.10 | 10.00 | 0.90 |
| 1.167 | 0.90 | 4.167 | 40.20 | 7.167 | 3.50 | 10.17 | 0.90 |
| 1.333 | 0.90 | 4.333 | 40.20 | 7.333 | 3.50 | 10.33 | 0.90 |
| 1.500 | 0.90 | 4.500 | 40.20 | 7.500 | 3.50 | 10.50 | 0.90 |
| 1.667 | 0.90 | 4.667 | 40.20 | 7.667 | 3.50 | 10.67 | 0.90 |
| 1.833 | 0.90 | 4.833 | 40.20 | 7.833 | 3.50 | 10.83 | 0.90 |
| 2.000 | 0.90 | 5.000 | 40.20 | 8.000 | 3.50 | 11.00 | 0.90 |
| 2.167 | 5.20 | 5.167 | 11.40 | 8.167 | 1.70 | 11.17 | 0.90 |
| 2.333 | 5.20 | 5.333 | 11.40 | 8.333 | 1.70 | 11.33 | 0.90 |
| 2.500 | 5.20 | 5.500 | 11.40 | 8.500 | 1.70 | 11.50 | 0.90 |
| 2.667 | 5.20 | 5.667 | 11.40 | 8.667 | 1.70 | 11.67 | 0.90 |
| 2.833 | 5.20 | 5.833 | 11.40 | 8.833 | 1.70 | 11.83 | 0.90 |
| 3.000 | 5.20 | 6.000 | 11.40 | 9.000 | 1.70 | 12.00 | 0.90 |

Unit Hyd Qpeak (cms)= 0.161

PEAK FLOW (cms)= 0.081 (i)
TIME TO PEAK (hrs)= 5.000
RUNOFF VOLUME (mm)= 74.692
TOTAL RAINFALL (mm)= 87.500
RUNOFF COEFFICIENT = 0.854

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

---

| CALIB |
|---|
| STANDHYD ( 0006) |
| ID= 1 DT=10.0 min |

Area (ha)= 1.55
Total Imp(%)= 29.00 Dir. Conn.(%)= 29.00

| | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|
| Surface Area (ha)= | 0.45 | 1.10 |
| Dep. Storage (mm)= | 1.00 | 1.50 |
| Average Slope (%)= | 1.00 | 4.00 |
| Length (m)= | 101.65 | 385.00 |
| Mannings n = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 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 |
| 0.167 | 0.90 | 3.167 | 14.90 | 6.167 | 6.10 | 9.17 | 0.90 |
| 0.333 | 0.90 | 3.333 | 14.90 | 6.333 | 6.10 | 9.33 | 0.90 |
| 0.500 | 0.90 | 3.500 | 14.90 | 6.500 | 6.10 | 9.50 | 0.90 |
| 0.667 | 0.90 | 3.667 | 14.90 | 6.667 | 6.10 | 9.67 | 0.90 |
| 0.833 | 0.90 | 3.833 | 14.90 | 6.833 | 6.10 | 9.83 | 0.90 |
| 1.000 | 0.90 | 4.000 | 14.90 | 7.000 | 6.10 | 10.00 | 0.90 |
| 1.167 | 0.90 | 4.167 | 40.20 | 7.167 | 3.50 | 10.17 | 0.90 |
| 1.333 | 0.90 | 4.333 | 40.20 | 7.333 | 3.50 | 10.33 | 0.90 |
| 1.500 | 0.90 | 4.500 | 40.20 | 7.500 | 3.50 | 10.50 | 0.90 |
| 1.667 | 0.90 | 4.667 | 40.20 | 7.667 | 3.50 | 10.67 | 0.90 |
| 1.833 | 0.90 | 4.833 | 40.20 | 7.833 | 3.50 | 10.83 | 0.90 |
| 2.000 | 0.90 | 5.000 | 40.20 | 8.000 | 3.50 | 11.00 | 0.90 |
| 2.167 | 5.20 | 5.167 | 11.40 | 8.167 | 1.70 | 11.17 | 0.90 |
| 2.333 | 5.20 | 5.333 | 11.40 | 8.333 | 1.70 | 11.33 | 0.90 |
| 2.500 | 5.20 | 5.500 | 11.40 | 8.500 | 1.70 | 11.50 | 0.90 |
| 2.667 | 5.20 | 5.667 | 11.40 | 8.667 | 1.70 | 11.67 | 0.90 |
| 2.833 | 5.20 | 5.833 | 11.40 | 8.833 | 1.70 | 11.83 | 0.90 |
| 3.000 | 5.20 | 6.000 | 11.40 | 9.000 | 1.70 | 12.00 | 0.90 |

| | | | *TOTALS* |
|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 40.20 | 39.78 | |
| over (min) | 10.00 | 40.00 | |
| Storage Coeff. (min)= | 3.71 (ii) | 35.97 (ii) | |
| Unit Hyd. Tpeak (min)= | 10.00 | 40.00 | |
| Unit Hyd. peak (cms)= | 0.16 | 0.03 | |
| PEAK FLOW (cms)= | 0.05 | 0.10 | 0.144 (iii) |
| TIME TO PEAK (hrs)= | 5.00 | 5.17 | 5.00 |

```
     RUNOFF VOLUME     (mm)=      86.50        81.11          82.66
     TOTAL RAINFALL    (mm)=      87.50        87.50          87.50
     RUNOFF COEFFICIENT   =       0.99         0.93           0.94

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD (  0007)|   Area    (ha)=   0.63
|ID= 1 DT=10.0 min |   Total Imp(%)=  79.00   Dir. Conn.(%)=  79.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.50         0.13
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       3.00         2.00
     Length            (m)=     405.00        40.00
     Mannings n           =      0.013        0.250

        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
               0.167    0.90 | 3.167   14.90 | 6.167    6.10 |  9.17
0.90
               0.333    0.90 | 3.333   14.90 | 6.333    6.10 |  9.33
0.90
               0.500    0.90 | 3.500   14.90 | 6.500    6.10 |  9.50
0.90
               0.667    0.90 | 3.667   14.90 | 6.667    6.10 |  9.67
0.90
               0.833    0.90 | 3.833   14.90 | 6.833    6.10 |  9.83
0.90
               1.000    0.90 | 4.000   14.90 | 7.000    6.10 | 10.00
0.90
               1.167    0.90 | 4.167   40.20 | 7.167    3.50 | 10.17
0.90
               1.333    0.90 | 4.333   40.20 | 7.333    3.50 | 10.33
0.90
               1.500    0.90 | 4.500   40.20 | 7.500    3.50 | 10.50
0.90
               1.667    0.90 | 4.667   40.20 | 7.667    3.50 | 10.67
0.90
               1.833    0.90 | 4.833   40.20 | 7.833    3.50 | 10.83
0.90
               2.000    0.90 | 5.000   40.20 | 8.000    3.50 | 11.00
0.90
               2.167    5.20 | 5.167   11.40 | 8.167    1.70 | 11.17
0.90
               2.333    5.20 | 5.333   11.40 | 8.333    1.70 | 11.33
0.90
               2.500    5.20 | 5.500   11.40 | 8.500    1.70 | 11.50
0.90
               2.667    5.20 | 5.667   11.40 | 8.667    1.70 | 11.67
0.90
               2.833    5.20 | 5.833   11.40 | 8.833    1.70 | 11.83
0.90
               3.000    5.20 | 6.000   11.40 | 9.000    1.70 | 12.00
0.90

     Max.Eff.Inten.(mm/hr)=      40.20        39.89
               over (min)        10.00        20.00
     Storage Coeff.  (min)=       6.12 (ii)   16.32 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.14         0.06
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.06         0.01          0.070 (iii)
     TIME TO PEAK    (hrs)=       5.00         5.00           5.00
     RUNOFF VOLUME    (mm)=      86.50        81.11          85.35
     TOTAL RAINFALL   (mm)=      87.50        87.50          87.50
     RUNOFF COEFFICIENT   =       0.99         0.93           0.98

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0006):     1.55    0.144     5.00    82.66
      + ID2= 2 (  0007):     0.63    0.070     5.00    85.35
        ================================================
        ID = 3 (  0010):     2.18    0.214     5.00    83.44

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0010):     2.18    0.214     5.00    83.44
      + ID2= 2 (  0008):     0.76    0.081     5.00    74.69
        ================================================
        ID = 1 (  0010):     2.94    0.295     5.00    81.18

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ADD HYD  (  0012)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0010):     2.94   0.295     5.00    81.18
     + ID2= 2 (  0003):     4.58   0.315     5.00    77.82
       ================================================
       ID = 3 (  0012):     7.52   0.610     5.00    79.13

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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      V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
      V    V   I    SS     U   U   A A   L
       V  V    I     SS    U   U  AAAAA  L
       V  V    I      SS   U   U  A   A  L
        VV     I    SSSSS  UUUUU  A   A  LLLLL

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

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO
6.2\VO2\voin.dat
  Output  filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-
33eb-4790-b5ab-2fe711ab4c1b\5b730506-98c3-4267-8fdc-7dbe062a3902\scenari
  Summary filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-
33eb-4790-b5ab-2fe711ab4c1b\5b730506-98c3-4267-8fdc-7dbe062a3902\scenari

DATE: 04/22/2024                          TIME: 11:35:02

USER:

COMMENTS: _____

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  ***********************************************
  ** SIMULATION : N - Regional (Hazel)          **
  ***********************************************

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|    READ STORM    |    Filename: C:\Users\qdar\AppD
|                  |              ata\Local\Temp\
|                  |              b014d45b-6f58-45eb-8754-
25dd5b7e6eb9\3705d6c4
| Ptotal=212.00 mm |    Comments: Hazel
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME
RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs
mm/hr
               0.00    6.00 |  3.00   13.00 |  6.00   23.00 |  9.00
53.00
               0.25    6.00 |  3.25   13.00 |  6.25   23.00 |  9.25
53.00
               0.50    6.00 |  3.50   13.00 |  6.50   23.00 |  9.50
53.00
               0.75    6.00 |  3.75   13.00 |  6.75   23.00 |  9.75
53.00
               1.00    4.00 |  4.00   17.00 |  7.00   13.00 | 10.00
38.00
               1.25    4.00 |  4.25   17.00 |  7.25   13.00 | 10.25
38.00
               1.50    4.00 |  4.50   17.00 |  7.50   13.00 | 10.50
38.00
               1.75    4.00 |  4.75   17.00 |  7.75   13.00 | 10.75
38.00
               2.00    6.00 |  5.00   13.00 |  8.00   13.00 | 11.00
13.00
               2.25    6.00 |  5.25   13.00 |  8.25   13.00 | 11.25
13.00
               2.50    6.00 |  5.50   13.00 |  8.50   13.00 | 11.50
13.00
               2.75    6.00 |  5.75   13.00 |  8.75   13.00 | 11.75
13.00

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| CALIB            |
| NASHYD   (  0001)|   Area     (ha)=   3.04   Curve Number    (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.10

        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
              0.167    6.00 | 3.167   13.00 | 6.167   23.00 |  9.17
53.00
              0.333    6.00 | 3.333   13.00 | 6.333   23.00 |  9.33
53.00
```

```
                0.500    6.00 | 3.500   13.00 | 6.500   23.00 |  9.50
53.00
                0.667    6.00 | 3.667   13.00 | 6.667   23.00 |  9.67
53.00
                0.833    6.00 | 3.833   13.00 | 6.833   23.00 |  9.83
53.00
                1.000    6.00 | 4.000   13.00 | 7.000   23.00 | 10.00
53.00
                1.167    4.00 | 4.167   17.00 | 7.167   13.00 | 10.17
38.00
                1.333    4.00 | 4.333   17.00 | 7.333   13.00 | 10.33
38.00
                1.500    4.00 | 4.500   17.00 | 7.500   13.00 | 10.50
38.00
                1.667    4.00 | 4.667   17.00 | 7.667   13.00 | 10.67
38.00
                1.833    4.00 | 4.833   17.00 | 7.833   13.00 | 10.83
38.00
                2.000    4.00 | 5.000   17.00 | 8.000   13.00 | 11.00
38.00
                2.167    6.00 | 5.167   13.00 | 8.167   13.00 | 11.17
13.00
                2.333    6.00 | 5.333   13.00 | 8.333   13.00 | 11.33
13.00
                2.500    6.00 | 5.500   13.00 | 8.500   13.00 | 11.50
13.00
                2.667    6.00 | 5.667   13.00 | 8.667   13.00 | 11.67
13.00
                2.833    6.00 | 5.833   13.00 | 8.833   13.00 | 11.83
13.00
                3.000    6.00 | 6.000   13.00 | 9.000   13.00 | 12.00
13.00

     Unit Hyd Qpeak  (cms)=   0.106

     PEAK FLOW       (cms)=   0.320 (i)
     TIME TO PEAK    (hrs)=  11.167
     RUNOFF VOLUME    (mm)= 201.935
     TOTAL RAINFALL   (mm)= 212.000
     RUNOFF COEFFICIENT   =   0.953

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

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--------------------
| CALIB            |
| NASHYD   (  0109)|   Area     (ha)=   1.38   Curve Number   (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.32

        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
                0.167    6.00 | 3.167   13.00 | 6.167   23.00 |  9.17
53.00
                0.333    6.00 | 3.333   13.00 | 6.333   23.00 |  9.33
53.00
                0.500    6.00 | 3.500   13.00 | 6.500   23.00 |  9.50
53.00
                0.667    6.00 | 3.667   13.00 | 6.667   23.00 |  9.67
53.00
                0.833    6.00 | 3.833   13.00 | 6.833   23.00 |  9.83
53.00
                1.000    6.00 | 4.000   13.00 | 7.000   23.00 | 10.00
53.00
                1.167    4.00 | 4.167   17.00 | 7.167   13.00 | 10.17
38.00
                1.333    4.00 | 4.333   17.00 | 7.333   13.00 | 10.33
38.00
                1.500    4.00 | 4.500   17.00 | 7.500   13.00 | 10.50
38.00
                1.667    4.00 | 4.667   17.00 | 7.667   13.00 | 10.67
38.00
                1.833    4.00 | 4.833   17.00 | 7.833   13.00 | 10.83
38.00
                2.000    4.00 | 5.000   17.00 | 8.000   13.00 | 11.00
38.00
                2.167    6.00 | 5.167   13.00 | 8.167   13.00 | 11.17
13.00
                2.333    6.00 | 5.333   13.00 | 8.333   13.00 | 11.33
13.00
                2.500    6.00 | 5.500   13.00 | 8.500   13.00 | 11.50
13.00
                2.667    6.00 | 5.667   13.00 | 8.667   13.00 | 11.67
13.00
                2.833    6.00 | 5.833   13.00 | 8.833   13.00 | 11.83
13.00
                3.000    6.00 | 6.000   13.00 | 9.000   13.00 | 12.00
13.00

     Unit Hyd Qpeak  (cms)=   0.165

     PEAK FLOW       (cms)=   0.197 (i)
     TIME TO PEAK    (hrs)=  10.000
     RUNOFF VOLUME    (mm)= 201.033
     TOTAL RAINFALL   (mm)= 212.000
     RUNOFF COEFFICIENT   =   0.948

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

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| CALIB            |
| STANDHYD (  0002)|   Area     (ha)=   0.16
|ID= 1 DT=10.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.16         0.00
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      32.66        40.00
```

Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 6.00 | 3.167 | 13.00 | 6.167 | 23.00 | 9.17 | 53.00 |
| 0.333 | 6.00 | 3.333 | 13.00 | 6.333 | 23.00 | 9.33 | 53.00 |
| 0.500 | 6.00 | 3.500 | 13.00 | 6.500 | 23.00 | 9.50 | 53.00 |
| 0.667 | 6.00 | 3.667 | 13.00 | 6.667 | 23.00 | 9.67 | 53.00 |
| 0.833 | 6.00 | 3.833 | 13.00 | 6.833 | 23.00 | 9.83 | 53.00 |
| 1.000 | 6.00 | 4.000 | 13.00 | 7.000 | 23.00 | 10.00 | 53.00 |
| 1.167 | 4.00 | 4.167 | 17.00 | 7.167 | 13.00 | 10.17 | 38.00 |
| 1.333 | 4.00 | 4.333 | 17.00 | 7.333 | 13.00 | 10.33 | 38.00 |
| 1.500 | 4.00 | 4.500 | 17.00 | 7.500 | 13.00 | 10.50 | 38.00 |
| 1.667 | 4.00 | 4.667 | 17.00 | 7.667 | 13.00 | 10.67 | 38.00 |
| 1.833 | 4.00 | 4.833 | 17.00 | 7.833 | 13.00 | 10.83 | 38.00 |
| 2.000 | 4.00 | 5.000 | 17.00 | 8.000 | 13.00 | 11.00 | 38.00 |
| 2.167 | 6.00 | 5.167 | 13.00 | 8.167 | 13.00 | 11.17 | 13.00 |
| 2.333 | 6.00 | 5.333 | 13.00 | 8.333 | 13.00 | 11.33 | 13.00 |
| 2.500 | 6.00 | 5.500 | 13.00 | 8.500 | 13.00 | 11.50 | 13.00 |
| 2.667 | 6.00 | 5.667 | 13.00 | 8.667 | 13.00 | 11.67 | 13.00 |
| 2.833 | 6.00 | 5.833 | 13.00 | 8.833 | 13.00 | 11.83 | 13.00 |
| 3.000 | 6.00 | 6.000 | 13.00 | 9.000 | 13.00 | 12.00 | 13.00 |

| | | | | *TOTALS* |
|---|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 53.00 | 52.94 | | |
| over (min) | 10.00 | 20.00 | | |
| Storage Coeff. (min)= | 1.68 (ii) | 10.78 (ii) | | |
| Unit Hyd. Tpeak (min)= | 10.00 | 20.00 | | |
| Unit Hyd. peak (cms)= | 0.17 | 0.08 | | |
| PEAK FLOW (cms)= | 0.02 | 0.00 | 0.024 (iii) | |
| TIME TO PEAK (hrs)= | 9.67 | 10.00 | 10.00 | |
| RUNOFF VOLUME (mm)= | 211.00 | 205.44 | 210.91 | |
| TOTAL RAINFALL (mm)= | 212.00 | 212.00 | 212.00 | |
| RUNOFF COEFFICIENT = | 1.00 | 0.97 | 0.99 | |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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 ( 0003) | | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
|---|---|---|---|---|---|
| 1 + 2 = 3 | ID1= 1 ( 0001): | 3.04 | 0.320 | 11.17 | 201.94 |
| | + ID2= 2 ( 0109): | 1.38 | 0.197 | 10.00 | 201.03 |
| | ID = 3 ( 0003): | 4.42 | 0.464 | 11.00 | 201.65 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| ADD HYD ( 0003) | | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
|---|---|---|---|---|---|
| 3 + 2 = 1 | ID1= 3 ( 0003): | 4.42 | 0.464 | 11.00 | 201.65 |
| | + ID2= 2 ( 0002): | 0.16 | 0.024 | 10.00 | 210.91 |
| | ID = 1 ( 0003): | 4.58 | 0.481 | 11.00 | 201.98 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| CALIB | | | | | |
|---|---|---|---|---|---|
| NASHYD ( 0008) | Area (ha)= | 0.76 | Curve Number (CN)= | 98.0 | |
| ID= 1 DT=10.0 min | Ia (mm)= | 5.00 | # of Linear Res.(N)= | 3.00 | |
| | U.H. Tp(hrs)= | 0.18 | | | |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 6.00 | 3.167 | 13.00 | 6.167 | 23.00 | 9.17 | 53.00 |
| 0.333 | 6.00 | 3.333 | 13.00 | 6.333 | 23.00 | 9.33 | 53.00 |
| 0.500 | 6.00 | 3.500 | 13.00 | 6.500 | 23.00 | 9.50 | 53.00 |
| 0.667 | 6.00 | 3.667 | 13.00 | 6.667 | 23.00 | 9.67 | 53.00 |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.833 | 6.00 | 3.833 | 13.00 | 6.833 | 23.00 | 9.83 | 53.00 | | 1.000 | 6.00 | 4.000 | 13.00 | 7.000 | 23.00 | 10.00 | 53.00 | | 1.167 | 4.00 | 4.167 | 17.00 | 7.167 | 13.00 | 10.17 | 38.00 | | 1.333 | 4.00 | 4.333 | 17.00 | 7.333 | 13.00 | 10.33 | 38.00 | | 1.500 | 4.00 | 4.500 | 17.00 | 7.500 | 13.00 | 10.50 | 38.00 | | 1.667 | 4.00 | 4.667 | 17.00 | 7.667 | 13.00 | 10.67 | 38.00 | | 1.833 | 4.00 | 4.833 | 17.00 | 7.833 | 13.00 | 10.83 | 38.00 | | 2.000 | 4.00 | 5.000 | 17.00 | 8.000 | 13.00 | 11.00 | 38.00 | | 2.167 | 6.00 | 5.167 | 13.00 | 8.167 | 13.00 | 11.17 | 13.00 | | 2.333 | 6.00 | 5.333 | 13.00 | 8.333 | 13.00 | 11.33 | 13.00 | | 2.500 | 6.00 | 5.500 | 13.00 | 8.500 | 13.00 | 11.50 | 13.00 | | 2.667 | 6.00 | 5.667 | 13.00 | 8.667 | 13.00 | 11.67 | 13.00 | | 2.833 | 6.00 | 5.833 | 13.00 | 8.833 | 13.00 | 11.83 | 13.00 | | 3.000 | 6.00 | 6.000 | 13.00 | 9.000 | 13.00 | 12.00 | 13.00 |

Unit Hyd Qpeak (cms)= 0.161

PEAK FLOW (cms)= 0.107 (i)
TIME TO PEAK (hrs)= 10.000
RUNOFF VOLUME (mm)= 194.319
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.917

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

---

| CALIB | |
|---|---|
| STANDHYD ( 0006) | Area (ha)= 1.55 |
| ID= 1 DT=10.0 min | Total Imp(%)= 29.00 Dir. Conn.(%)= 29.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.45 | 1.10 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 1.00 | 4.00 |
| Length | (m)= | 101.65 | 385.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 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 |
| 0.167 | 6.00 | 3.167 | 13.00 | 6.167 | 23.00 | 9.17 | 53.00 |
| 0.333 | 6.00 | 3.333 | 13.00 | 6.333 | 23.00 | 9.33 | 53.00 |
| 0.500 | 6.00 | 3.500 | 13.00 | 6.500 | 23.00 | 9.50 | 53.00 |
| 0.667 | 6.00 | 3.667 | 13.00 | 6.667 | 23.00 | 9.67 | 53.00 |
| 0.833 | 6.00 | 3.833 | 13.00 | 6.833 | 23.00 | 9.83 | 53.00 |
| 1.000 | 6.00 | 4.000 | 13.00 | 7.000 | 23.00 | 10.00 | 53.00 |
| 1.167 | 4.00 | 4.167 | 17.00 | 7.167 | 13.00 | 10.17 | 38.00 |
| 1.333 | 4.00 | 4.333 | 17.00 | 7.333 | 13.00 | 10.33 | 38.00 |
| 1.500 | 4.00 | 4.500 | 17.00 | 7.500 | 13.00 | 10.50 | 38.00 |
| 1.667 | 4.00 | 4.667 | 17.00 | 7.667 | 13.00 | 10.67 | 38.00 |
| 1.833 | 4.00 | 4.833 | 17.00 | 7.833 | 13.00 | 10.83 | 38.00 |
| 2.000 | 4.00 | 5.000 | 17.00 | 8.000 | 13.00 | 11.00 | 38.00 |
| 2.167 | 6.00 | 5.167 | 13.00 | 8.167 | 13.00 | 11.17 | 13.00 |
| 2.333 | 6.00 | 5.333 | 13.00 | 8.333 | 13.00 | 11.33 | 13.00 |
| 2.500 | 6.00 | 5.500 | 13.00 | 8.500 | 13.00 | 11.50 | 13.00 |
| 2.667 | 6.00 | 5.667 | 13.00 | 8.667 | 13.00 | 11.67 | 13.00 |
| 2.833 | 6.00 | 5.833 | 13.00 | 8.833 | 13.00 | 11.83 | 13.00 |
| 3.000 | 6.00 | 6.000 | 13.00 | 9.000 | 13.00 | 12.00 | 13.00 |

| | | | | *TOTALS* |
|---|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | | 53.00 | 52.94 | |
| over (min) | | 10.00 | 40.00 | |
| Storage Coeff. (min)= | | 3.33 (ii) | 32.09 (ii) | |
| Unit Hyd. Tpeak (min)= | | 10.00 | 40.00 | |
| Unit Hyd. peak (cms)= | | 0.16 | 0.03 | |
| PEAK FLOW | (cms)= | 0.07 | 0.14 | 0.194 (iii) |
| TIME TO PEAK | (hrs)= | 9.83 | 10.33 | 10.00 |
| RUNOFF VOLUME | (mm)= | 211.00 | 205.44 | 207.04 |
| TOTAL RAINFALL | (mm)= | 212.00 | 212.00 | 212.00 |
| RUNOFF COEFFICIENT | = | 1.00 | 0.97 | 0.98 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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 (  0007)|   Area    (ha)=   0.63
|ID= 1 DT=10.0 min |   Total Imp(%)=  79.00   Dir. Conn.(%)=  79.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.50         0.13
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       3.00         2.00
     Length            (m)=     405.00        40.00
     Mannings n             =     0.013        0.250

        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
              0.167    6.00 | 3.167   13.00 | 6.167   23.00 |  9.17
53.00
              0.333    6.00 | 3.333   13.00 | 6.333   23.00 |  9.33
53.00
              0.500    6.00 | 3.500   13.00 | 6.500   23.00 |  9.50
53.00
              0.667    6.00 | 3.667   13.00 | 6.667   23.00 |  9.67
53.00
              0.833    6.00 | 3.833   13.00 | 6.833   23.00 |  9.83
53.00
              1.000    6.00 | 4.000   13.00 | 7.000   23.00 | 10.00
53.00
              1.167    4.00 | 4.167   17.00 | 7.167   13.00 | 10.17
38.00
              1.333    4.00 | 4.333   17.00 | 7.333   13.00 | 10.33
38.00
              1.500    4.00 | 4.500   17.00 | 7.500   13.00 | 10.50
38.00
              1.667    4.00 | 4.667   17.00 | 7.667   13.00 | 10.67
38.00
              1.833    4.00 | 4.833   17.00 | 7.833   13.00 | 10.83
38.00
              2.000    4.00 | 5.000   17.00 | 8.000   13.00 | 11.00
38.00
              2.167    6.00 | 5.167   13.00 | 8.167   13.00 | 11.17
13.00
              2.333    6.00 | 5.333   13.00 | 8.333   13.00 | 11.33
13.00
              2.500    6.00 | 5.500   13.00 | 8.500   13.00 | 11.50
13.00
              2.667    6.00 | 5.667   13.00 | 8.667   13.00 | 11.67
13.00
              2.833    6.00 | 5.833   13.00 | 8.833   13.00 | 11.83
13.00
              3.000    6.00 | 6.000   13.00 | 9.000   13.00 | 12.00
13.00

     Max.Eff.Inten.(mm/hr)=      53.00        52.94
           over (min)       10.00        20.00
     Storage Coeff.  (min)=       5.48 (ii)   14.58 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.14         0.07
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.07         0.02          0.092 (iii)
     TIME TO PEAK    (hrs)=      10.00        10.00          10.00
     RUNOFF VOLUME    (mm)=     211.00       205.44         209.82
     TOTAL RAINFALL   (mm)=     212.00       212.00         212.00
     RUNOFF COEFFICIENT   =       1.00         0.97           0.99

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    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  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0006):     1.55    0.194    10.00   207.04
      + ID2= 2 (  0007):     0.63    0.092    10.00   209.82
        ==================================================
        ID = 3 (  0010):     2.18    0.286    10.00   207.84

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

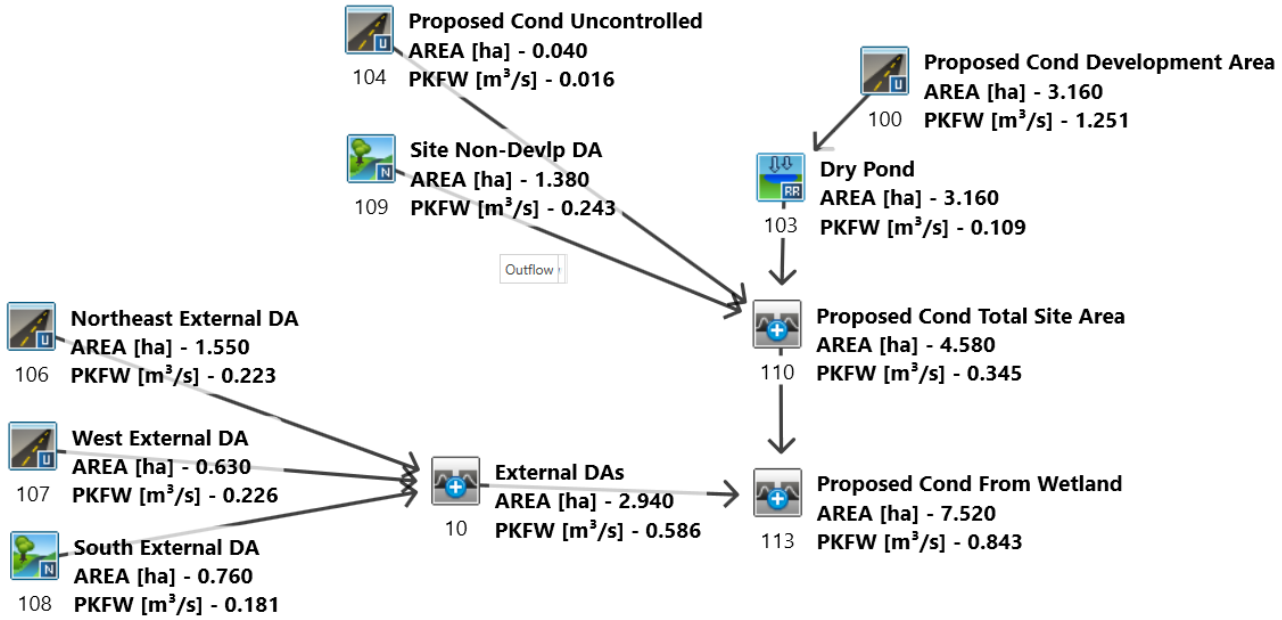
--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0010):     2.18    0.286    10.00   207.84
      + ID2= 2 (  0008):     0.76    0.107    10.00   194.32
        ==================================================
        ID = 1 (  0010):     2.94    0.394    10.00   204.35

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

--------------------
| ADD HYD  (  0012)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0010):     2.94    0.394    10.00   204.35
      + ID2= 2 (  0003):     4.58    0.481    11.00   201.98
        ==================================================
        ID = 3 (  0012):     7.52    0.835    10.00   202.90

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

## Proposed Conditions – VO6 Output




**Simulation A – 25 mm 4 Hour AES**
**Simulation B – 2 Year – 1 Hour AES**
**Simulation C – 2 Year – 12 Hour AES**
**Simulation D – 5 Year – 1 Hour AES**
**Simulation E – 5 Year – 12 Hour AES**
**Simulation F – 10 Year – 1 Hour AES**
**Simulation G – 10 Year – 12 Hour AES**
**Simulation H – 25 Year – 1 Hour AES**
**Simulation I – 25 Year – 12 Hour AES**
**Simulation J – 50 Year – 1 Hour AES**
**Simulation K – 50 Year – 12 Hour AES**
**Simulation L – 100 Year – 1 Hour AES**
**Simulation M – 100 Year – 12 Hour AES**
**Simulation N – Regional (Hazel)**

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

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-33eb-4790-
b5ab-2fe711ab4c1b\af217a6f-edd5-42a6-b0f8-2a015d53c209\scenari
  Summary filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-33eb-4790-
b5ab-2fe711ab4c1b\af217a6f-edd5-42a6-b0f8-2a015d53c209\scenari


DATE: 04/22/2024                          TIME: 11:21:45

USER:



COMMENTS: _____________________________________________________________


--------------------------------------------------------------------------------
--------------------------
  ***********************************************
  ** SIMULATION : A - 25 mm 4 hour             **
  ***********************************************


--------------------
|    READ STORM    |    Filename: C:\Users\qdar\AppD
|                  |              ata\Local\Temp\
|                  |              76b488fe-908e-4071-918b-7207f3d34655\9ec56025
| Ptotal= 25.02 mm |    Comments: 25MM4HR
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    2.17 |  1.00    6.20 |  2.00    5.62 |  3.00    2.95
                0.17    2.38 |  1.17   12.18 |  2.17    4.80 |  3.17    2.76
                0.33    2.66 |  1.33   41.67 |  2.33    4.21 |  3.33    2.62
                0.50    3.03 |  1.50   15.28 |  2.50    3.78 |  3.50    2.47
                0.67    3.58 |  1.67    9.22 |  2.67    3.45 |  3.67    2.35
                0.83    4.47 |  1.83    6.88 |  2.83    3.18 |  3.83    2.23

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

--------------------
| CALIB            |
| NASHYD   (  0109)|   Area     (ha)=   1.38   Curve Number    (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.32

     Unit Hyd Qpeak  (cms)=   0.165

     PEAK FLOW       (cms)=   0.046 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  15.834
     TOTAL RAINFALL   (mm)=  25.023
     RUNOFF COEFFICIENT   =   0.633

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0104)|   Area     (ha)=   0.04
|ID= 1 DT=10.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.04          0.00
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       1.00          2.00
     Length            (m)=      16.33         40.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=      41.67         24.43
               over (min)        10.00         20.00
     Storage Coeff.  (min)=       1.22 (ii)    13.63 (ii)
     Unit Hyd. Tpeak (min)=      10.00         20.00
     Unit Hyd. peak  (cms)=       0.17          0.07
                                                            *TOTALS*
     PEAK FLOW       (cms)=       0.00          0.00          0.005 (iii)
     TIME TO PEAK    (hrs)=       1.50          1.67          1.50
     RUNOFF VOLUME    (mm)=      24.02         19.28         23.97
     TOTAL RAINFALL   (mm)=      25.02         25.02         25.02
     RUNOFF COEFFICIENT   =       0.96          0.77          0.96

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    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 (  0100)|   Area     (ha)=   3.16
|ID= 1 DT=10.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------
                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.03          0.13
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       4.00          2.00
     Length            (m)=     250.00         40.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=      41.67         24.43
               over (min)        10.00         20.00
     Storage Coeff.  (min)=       4.15 (ii)    16.55 (ii)
     Unit Hyd. Tpeak (min)=      10.00         20.00
     Unit Hyd. peak  (cms)=       0.15          0.06
                                                            *TOTALS*
     PEAK FLOW       (cms)=       0.33          0.01          0.332 (iii)
```

```
     TIME TO PEAK    (hrs)=       1.50         1.67          1.50
     RUNOFF VOLUME    (mm)=      24.02        19.28         23.83
     TOTAL RAINFALL   (mm)=      25.02        25.02         25.02
     RUNOFF COEFFICIENT   =       0.96         0.77          0.95

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  98.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0103)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 10.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0750     0.1285
                          0.0130     0.0753   |   0.0930     0.1427
                          0.0340     0.0932   |   0.1200     0.1650
                          0.0520     0.1091   |   1.2510     0.3172

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0100)     3.160     0.332      1.50      23.83
   OUTFLOW: ID= 1 (  0103)     3.160     0.011      4.00      23.37

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  3.40
                  TIME SHIFT OF PEAK FLOW         (min)=150.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0657

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

--------------------
| ADD HYD  (  0110)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0103):     3.16   0.011     4.00    23.37
     + ID2= 2 (  0104):     0.04   0.005     1.50    23.97
       ================================================
       ID = 3 (  0110):     3.20   0.012     4.00    23.38

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

--------------------
| ADD HYD  (  0110)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0110):     3.20   0.012     4.00    23.38
     + ID2= 2 (  0109):     1.38   0.046     1.83    15.83
       ================================================
       ID = 1 (  0110):     4.58   0.054     1.83    21.10

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0108)|   Area    (ha)=   0.76   Curve Number   (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.161

     PEAK FLOW       (cms)=   0.033 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=  15.304
     TOTAL RAINFALL   (mm)=  25.023
     RUNOFF COEFFICIENT   =   0.612

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0106)|   Area    (ha)=   1.55
|ID= 1 DT=10.0 min |   Total Imp(%)=  29.00   Dir. Conn.(%)=  29.00
--------------------

                                    IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=           0.45          1.10
     Dep. Storage     (mm)=           1.00          1.50
     Average Slope     (%)=           1.00          4.00
     Length            (m)=         101.65        385.00
     Mannings n             =        0.013         0.250

     Max.Eff.Inten.(mm/hr)=          41.67         14.36
               over (min)            10.00         60.00
     Storage Coeff.  (min)=           3.66 (ii)    52.14 (ii)
     Unit Hyd. Tpeak (min)=          10.00         60.00
     Unit Hyd. peak  (cms)=           0.16          0.02
                                                              *TOTALS*
     PEAK FLOW       (cms)=           0.05          0.03        0.054 (iii)
     TIME TO PEAK    (hrs)=           1.50          2.33         1.50
     RUNOFF VOLUME    (mm)=          24.02         19.28        20.64
     TOTAL RAINFALL   (mm)=          25.02         25.02        25.02
     RUNOFF COEFFICIENT   =           0.96          0.77         0.82

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  98.0    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 (  0107)|   Area    (ha)=   0.63
|ID= 1 DT=10.0 min |   Total Imp(%)=  79.00   Dir. Conn.(%)=  79.00
--------------------

                                    IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=           0.50          0.13
     Dep. Storage     (mm)=           1.00          1.50
     Average Slope     (%)=           3.00          2.00
     Length            (m)=         405.00         40.00
     Mannings n             =        0.013         0.250

     Max.Eff.Inten.(mm/hr)=          41.67         24.43
               over (min)            10.00         20.00
     Storage Coeff.  (min)=           6.04 (ii)    18.44 (ii)
     Unit Hyd. Tpeak (min)=          10.00         20.00
     Unit Hyd. peak  (cms)=           0.14          0.06
                                                              *TOTALS*
     PEAK FLOW       (cms)=           0.05          0.01        0.053 (iii)
     TIME TO PEAK    (hrs)=           1.50          1.67         1.50
     RUNOFF VOLUME    (mm)=          24.02         19.28        23.01
     TOTAL RAINFALL   (mm)=          25.02         25.02        25.02
```

```
     RUNOFF COEFFICIENT   =       0.96         0.77          0.92

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  98.0    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  (  0010)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0106):     1.55   0.054     1.50    20.64
      + ID2= 2 (  0107):     0.63   0.053     1.50    23.01
        ====================================================
        ID = 3 (  0010):     2.18   0.107     1.50    21.32

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

--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0010):     2.18   0.107     1.50    21.32
      + ID2= 2 (  0108):     0.76   0.033     1.67    15.30
        ====================================================
        ID = 1 (  0010):     2.94   0.137     1.50    19.77

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

--------------------
| ADD HYD  (  0113)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0010):     2.94   0.137     1.50    19.77
      + ID2= 2 (  0110):     4.58   0.054     1.83    21.10
        ====================================================
        ID = 3 (  0113):     7.52   0.169     1.50    20.58

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

       V    V   I    SSSSS  U   U    A    L             (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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```

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

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-33eb-4790-
b5ab-2fe711ab4c1b\5b613cc3-a047-4d1d-9415-e8294a398256\scenari
  Summary filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-33eb-4790-
b5ab-2fe711ab4c1b\5b613cc3-a047-4d1d-9415-e8294a398256\scenari

DATE: 04/22/2024                          TIME: 11:21:45

USER:


COMMENTS: _____________________________________________________

--------------------------------------------------------------------------------
---------------------------
  **********************************************
  ** SIMULATION : B - 2Y1                      **
  **********************************************


--------------------
|    READ STORM    |    Filename: C:\Users\qdar\AppD
|                  |              ata\Local\Temp\
|                  |              76b488fe-908e-4071-918b-7207f3d34655\59d3ca12
| Ptotal= 23.80 mm |    Comments: 2Y1
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    0.00 |  0.33   42.84 |  0.67   22.85 |  1.00    2.86
                0.08    2.86 |  0.42   79.97 |  0.75   14.28 |
                0.17    8.57 |  0.50   42.84 |  0.83    8.57 |
                0.25   22.85 |  0.58   34.27 |  0.92    2.86 |

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

--------------------
| CALIB            |
| NASHYD   (  0109)|   Area     (ha)=   1.38   Curve Number    (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.32

        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
               0.167    1.43 | 0.500   61.40 | 0.833   18.56 |  1.17    1.43
               0.333   15.71 | 0.667   38.56 | 1.000    5.71 |

    Unit Hyd Qpeak  (cms)=   0.165

    PEAK FLOW       (cms)=   0.076 (i)
    TIME TO PEAK    (hrs)=   0.833
    RUNOFF VOLUME    (mm)=  14.672
    TOTAL RAINFALL   (mm)=  23.802
    RUNOFF COEFFICIENT   =   0.616

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

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0104)|   Area    (ha)=   0.04
|ID= 1 DT=10.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.04         0.00
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      16.33        40.00
     Mannings n             =    0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
              0.167    1.43 | 0.500   61.40 | 0.833   18.56 |  1.17    1.43
              0.333   15.71 | 0.667   38.56 | 1.000    5.71 |

     Max.Eff.Inten.(mm/hr)=      61.40        46.37
               over (min)        10.00        20.00
     Storage Coeff.  (min)=       1.05 (ii)   10.64 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.17         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.01         0.00          0.007 (iii)
     TIME TO PEAK    (hrs)=       0.50         0.67          0.50
     RUNOFF VOLUME    (mm)=      22.80        18.10         22.75
     TOTAL RAINFALL   (mm)=      23.80        23.80         23.80
     RUNOFF COEFFICIENT   =       0.96         0.76          0.96

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    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 (  0100)|   Area    (ha)=   3.16
|ID= 1 DT=10.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.03         0.13
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       4.00         2.00
     Length            (m)=     250.00        40.00
     Mannings n             =    0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
              0.167    1.43 | 0.500   61.40 | 0.833   18.56 |  1.17    1.43
              0.333   15.71 | 0.667   38.56 | 1.000    5.71 |

     Max.Eff.Inten.(mm/hr)=      61.40        46.37
               over (min)        10.00        20.00
     Storage Coeff.  (min)=       3.55 (ii)   13.15 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.16         0.07
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.49         0.01          0.495 (iii)
     TIME TO PEAK    (hrs)=       0.50         0.83          0.50
     RUNOFF VOLUME    (mm)=      22.80        18.10         22.61
     TOTAL RAINFALL   (mm)=      23.80        23.80         23.80
     RUNOFF COEFFICIENT   =       0.96         0.76          0.95

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0103)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 10.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)      (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000    |  0.0750     0.1285
                          0.0130     0.0753    |  0.0930     0.1427
                          0.0340     0.0932    |  0.1200     0.1650
                          0.0520     0.1091    |  1.2510     0.3172

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0100)      3.160     0.495     0.50       22.61
   OUTFLOW: ID= 1 (  0103)      3.160     0.012     1.17       22.15

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  2.38
                  TIME SHIFT OF PEAK FLOW         (min)= 40.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0685

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

--------------------
| ADD HYD  (  0110)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0103):     3.16   0.012     1.17    22.15
      + ID2= 2 (  0104):     0.04   0.007     0.50    22.75
        ==================================================
        ID = 3 (  0110):     3.20   0.012     0.83    22.16

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

--------------------
| ADD HYD  (  0110)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0110):     3.20   0.012     0.83    22.16
      + ID2= 2 (  0109):     1.38   0.076     0.83    14.67
        ==================================================
        ID = 1 (  0110):     4.58   0.088     0.83    19.90

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

```
--------------------
| CALIB            |
| NASHYD   (  0108)|   Area     (ha)=   0.76   Curve Number    (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18
```

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

| ---- TRANSFORMED HYETOGRAPH ---- | | | | | | | |
|---|---|---|---|---|---|---|---|
| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
| 0.167 | 1.43 | 0.500 | 61.40 | 0.833 | 18.56 | 1.17 | 1.43 |
| 0.333 | 15.71 | 0.667 | 38.56 | 1.000 | 5.71 | | |

Unit Hyd Qpeak (cms)= 0.161

PEAK FLOW (cms)= 0.056 (i)
TIME TO PEAK (hrs)= 0.667
RUNOFF VOLUME (mm)= 14.182
TOTAL RAINFALL (mm)= 23.802
RUNOFF COEFFICIENT = 0.596

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

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--------------------
| CALIB            |
| STANDHYD (  0106)|   Area     (ha)=   1.55
|ID= 1 DT=10.0 min |   Total Imp(%)=  29.00   Dir. Conn.(%)=  29.00
--------------------
```

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.45 | 1.10 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 1.00 | 4.00 |
| Length | (m)= | 101.65 | 385.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

| ---- TRANSFORMED HYETOGRAPH ---- | | | | | | | |
|---|---|---|---|---|---|---|---|
| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
| 0.167 | 1.43 | 0.500 | 61.40 | 0.833 | 18.56 | 1.17 | 1.43 |
| 0.333 | 15.71 | 0.667 | 38.56 | 1.000 | 5.71 | | |

| | | | | |
|---|---|---|---|---|
| Max.Eff.Inten. | (mm/hr)= | 61.40 | 26.38 | |
| over | (min) | 10.00 | 50.00 | |
| Storage Coeff. | (min)= | 3.14 (ii) | 41.15 (ii) | |
| Unit Hyd. Tpeak | (min)= | 10.00 | 50.00 | |
| Unit Hyd. peak | (cms)= | 0.16 | 0.03 | |
| | | | | *TOTALS* |
| PEAK FLOW | (cms)= | 0.07 | 0.04 | 0.079 (iii) |
| TIME TO PEAK | (hrs)= | 0.50 | 1.33 | 0.50 |
| RUNOFF VOLUME | (mm)= | 22.80 | 18.10 | 19.45 |
| TOTAL RAINFALL | (mm)= | 23.80 | 23.80 | 23.80 |
| RUNOFF COEFFICIENT | = | 0.96 | 0.76 | 0.82 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.

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

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--------------------
| CALIB            |
| STANDHYD (  0107)|   Area     (ha)=   0.63
|ID= 1 DT=10.0 min |   Total Imp(%)=  79.00   Dir. Conn.(%)=  79.00
--------------------
```

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.50 | 0.13 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 3.00 | 2.00 |
| Length | (m)= | 405.00 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

| ---- TRANSFORMED HYETOGRAPH ---- | | | | | | | |
|---|---|---|---|---|---|---|---|
| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
| 0.167 | 1.43 | 0.500 | 61.40 | 0.833 | 18.56 | 1.17 | 1.43 |
| 0.333 | 15.71 | 0.667 | 38.56 | 1.000 | 5.71 | | |

| | | | | |
|---|---|---|---|---|
| Max.Eff.Inten. | (mm/hr)= | 61.40 | 46.37 | |
| over | (min) | 10.00 | 20.00 | |
| Storage Coeff. | (min)= | 5.17 (ii) | 14.77 (ii) | |
| Unit Hyd. Tpeak | (min)= | 10.00 | 20.00 | |
| Unit Hyd. peak | (cms)= | 0.15 | 0.07 | |
| | | | | *TOTALS* |
| PEAK FLOW | (cms)= | 0.07 | 0.01 | 0.078 (iii) |
| TIME TO PEAK | (hrs)= | 0.50 | 0.83 | 0.50 |
| RUNOFF VOLUME | (mm)= | 22.80 | 18.10 | 21.80 |
| TOTAL RAINFALL | (mm)= | 23.80 | 23.80 | 23.80 |
| RUNOFF COEFFICIENT | = | 0.96 | 0.76 | 0.92 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
       ID1= 1 (  0106):      1.55    0.079     0.50    19.45
     + ID2= 2 (  0107):      0.63    0.078     0.50    21.80
       ================================================
       ID = 3 (  0010):      2.18    0.157     0.50    20.13
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

```
--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
       ID1= 3 (  0010):      2.18    0.157     0.50    20.13
     + ID2= 2 (  0108):      0.76    0.056     0.67    14.18
       ================================================
```

```
        ID = 1 (  0010):     2.94   0.188     0.50    18.59

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

--------------------
| ADD HYD  (  0113)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0010):     2.94   0.188     0.50    18.59
     + ID2= 2 (  0110):     4.58   0.088     0.83    19.90
       ================================================
       ID = 3 (  0113):     7.52   0.254     0.67    19.39

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

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-33eb-4790-
b5ab-2fe711ab4c1b\0fca4416-7bbf-406b-8abc-acbd3fd11c4e\scenari
  Summary filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-33eb-4790-
b5ab-2fe711ab4c1b\0fca4416-7bbf-406b-8abc-acbd3fd11c4e\scenari


DATE: 04/22/2024                          TIME: 11:21:45

USER:


COMMENTS: _____________________________________________________________


--------------------------------------------------------------------------------
-------------------------
  ***********************************************
  ** SIMULATION : C - 2Y12                     **
  ***********************************************


--------------------
|    READ STORM    |    Filename: C:\Users\qdar\AppD
|                  |              ata\Local\Temp\
|                  |              76b488fe-908e-4071-918b-7207f3d34655\e13a2953
| Ptotal= 43.20 mm |    Comments: 2Y12 UPDATED
--------------------
```

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.40 | 3.00 | 7.40 | 6.00 | 3.00 | 9.00 | 0.40 |
| 0.25 | 0.40 | 3.25 | 7.40 | 6.25 | 3.00 | 9.25 | 0.40 |
| 0.50 | 0.40 | 3.50 | 7.40 | 6.50 | 3.00 | 9.50 | 0.40 |
| 0.75 | 0.40 | 3.75 | 7.40 | 6.75 | 3.00 | 9.75 | 0.40 |
| 1.00 | 0.40 | 4.00 | 20.00 | 7.00 | 1.70 | 10.00 | 0.40 |
| 1.25 | 0.40 | 4.25 | 20.00 | 7.25 | 1.70 | 10.25 | 0.40 |
| 1.50 | 0.40 | 4.50 | 20.00 | 7.50 | 1.70 | 10.50 | 0.40 |
| 1.75 | 0.40 | 4.75 | 20.00 | 7.75 | 1.70 | 10.75 | 0.40 |
| 2.00 | 2.60 | 5.00 | 5.60 | 8.00 | 0.90 | 11.00 | 0.40 |
| 2.25 | 2.60 | 5.25 | 5.60 | 8.25 | 0.90 | 11.25 | 0.40 |
| 2.50 | 2.60 | 5.50 | 5.60 | 8.50 | 0.90 | 11.50 | 0.40 |
| 2.75 | 2.60 | 5.75 | 5.60 | 8.75 | 0.90 | 11.75 | 0.40 |

```
--------------------------------------------------------------------------------

--------------------
| CALIB            |
| NASHYD   (  0109)|   Area    (ha)=   1.38   Curve Number   (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.32

        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 MIN. TIME STEP.
```

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.40 | 3.167 | 7.40 | 6.167 | 3.00 | 9.17 | 0.40 |
| 0.333 | 0.40 | 3.333 | 7.40 | 6.333 | 3.00 | 9.33 | 0.40 |
| 0.500 | 0.40 | 3.500 | 7.40 | 6.500 | 3.00 | 9.50 | 0.40 |
| 0.667 | 0.40 | 3.667 | 7.40 | 6.667 | 3.00 | 9.67 | 0.40 |
| 0.833 | 0.40 | 3.833 | 7.40 | 6.833 | 3.00 | 9.83 | 0.40 |
| 1.000 | 0.40 | 4.000 | 7.40 | 7.000 | 3.00 | 10.00 | 0.40 |
| 1.167 | 0.40 | 4.167 | 20.00 | 7.167 | 1.70 | 10.17 | 0.40 |
| 1.333 | 0.40 | 4.333 | 20.00 | 7.333 | 1.70 | 10.33 | 0.40 |
| 1.500 | 0.40 | 4.500 | 20.00 | 7.500 | 1.70 | 10.50 | 0.40 |
| 1.667 | 0.40 | 4.667 | 20.00 | 7.667 | 1.70 | 10.67 | 0.40 |
| 1.833 | 0.40 | 4.833 | 20.00 | 7.833 | 1.70 | 10.83 | 0.40 |
| 2.000 | 0.40 | 5.000 | 20.00 | 8.000 | 1.70 | 11.00 | 0.40 |
| 2.167 | 2.60 | 5.167 | 5.60 | 8.167 | 0.90 | 11.17 | 0.40 |
| 2.333 | 2.60 | 5.333 | 5.60 | 8.333 | 0.90 | 11.33 | 0.40 |
| 2.500 | 2.60 | 5.500 | 5.60 | 8.500 | 0.90 | 11.50 | 0.40 |
| 2.667 | 2.60 | 5.667 | 5.60 | 8.667 | 0.90 | 11.67 | 0.40 |
| 2.833 | 2.60 | 5.833 | 5.60 | 8.833 | 0.90 | 11.83 | 0.40 |
| 3.000 | 2.60 | 6.000 | 5.60 | 9.000 | 0.90 | 12.00 | 0.40 |

```
     Unit Hyd Qpeak  (cms)=   0.165

     PEAK FLOW       (cms)=   0.070 (i)
     TIME TO PEAK    (hrs)=   5.000
     RUNOFF VOLUME    (mm)=  33.484
     TOTAL RAINFALL   (mm)=  43.200
     RUNOFF COEFFICIENT   =   0.775

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0104)|   Area    (ha)=   0.04
|ID= 1 DT=10.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
```

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.04 | 0.00 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 1.00 | 2.00 |
| Length | (m)= | 16.33 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.40 | 3.167 | 7.40 | 6.167 | 3.00 | 9.17 | 0.40 |
| 0.333 | 0.40 | 3.333 | 7.40 | 6.333 | 3.00 | 9.33 | 0.40 |
| 0.500 | 0.40 | 3.500 | 7.40 | 6.500 | 3.00 | 9.50 | 0.40 |
| 0.667 | 0.40 | 3.667 | 7.40 | 6.667 | 3.00 | 9.67 | 0.40 |
| 0.833 | 0.40 | 3.833 | 7.40 | 6.833 | 3.00 | 9.83 | 0.40 |
| 1.000 | 0.40 | 4.000 | 7.40 | 7.000 | 3.00 | 10.00 | 0.40 |
| 1.167 | 0.40 | 4.167 | 20.00 | 7.167 | 1.70 | 10.17 | 0.40 |
| 1.333 | 0.40 | 4.333 | 20.00 | 7.333 | 1.70 | 10.33 | 0.40 |
| 1.500 | 0.40 | 4.500 | 20.00 | 7.500 | 1.70 | 10.50 | 0.40 |
| 1.667 | 0.40 | 4.667 | 20.00 | 7.667 | 1.70 | 10.67 | 0.40 |
| 1.833 | 0.40 | 4.833 | 20.00 | 7.833 | 1.70 | 10.83 | 0.40 |
| 2.000 | 0.40 | 5.000 | 20.00 | 8.000 | 1.70 | 11.00 | 0.40 |
| 2.167 | 2.60 | 5.167 | 5.60 | 8.167 | 0.90 | 11.17 | 0.40 |
| 2.333 | 2.60 | 5.333 | 5.60 | 8.333 | 0.90 | 11.33 | 0.40 |
| 2.500 | 2.60 | 5.500 | 5.60 | 8.500 | 0.90 | 11.50 | 0.40 |
| 2.667 | 2.60 | 5.667 | 5.60 | 8.667 | 0.90 | 11.67 | 0.40 |
| 2.833 | 2.60 | 5.833 | 5.60 | 8.833 | 0.90 | 11.83 | 0.40 |
| 3.000 | 2.60 | 6.000 | 5.60 | 9.000 | 0.90 | 12.00 | 0.40 |

| | | | | *TOTALS* |
|---|---|---|---|---|
| Max.Eff.Inten. | (mm/hr)= | 20.00 | 19.44 | |
| over | (min) | 10.00 | 20.00 | |
| Storage Coeff. | (min)= | 1.64 (ii) | 15.23 (ii) | |
| Unit Hyd. Tpeak | (min)= | 10.00 | 20.00 | |
| Unit Hyd. peak | (cms)= | 0.17 | 0.07 | |
| PEAK FLOW | (cms)= | 0.00 | 0.00 | 0.002 (iii) |
| TIME TO PEAK | (hrs)= | 4.50 | 5.00 | 5.00 |
| RUNOFF VOLUME | (mm)= | 42.20 | 37.09 | 40.95 |
| TOTAL RAINFALL | (mm)= | 43.20 | 43.20 | 43.20 |
| RUNOFF COEFFICIENT | = | 0.98 | 0.86 | 0.95 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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 ( 0100) | Area | (ha)= | 3.16 |
| ID= 1 DT=10.0 min | Total Imp | (%)= | 96.00 Dir. Conn.(%)= 96.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 3.03 | 0.13 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 4.00 | 2.00 |
| Length | (m)= | 250.00 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.40 | 3.167 | 7.40 | 6.167 | 3.00 | 9.17 | 0.40 |
| 0.333 | 0.40 | 3.333 | 7.40 | 6.333 | 3.00 | 9.33 | 0.40 |
| 0.500 | 0.40 | 3.500 | 7.40 | 6.500 | 3.00 | 9.50 | 0.40 |
| 0.667 | 0.40 | 3.667 | 7.40 | 6.667 | 3.00 | 9.67 | 0.40 |
| 0.833 | 0.40 | 3.833 | 7.40 | 6.833 | 3.00 | 9.83 | 0.40 |
| 1.000 | 0.40 | 4.000 | 7.40 | 7.000 | 3.00 | 10.00 | 0.40 |
| 1.167 | 0.40 | 4.167 | 20.00 | 7.167 | 1.70 | 10.17 | 0.40 |
| 1.333 | 0.40 | 4.333 | 20.00 | 7.333 | 1.70 | 10.33 | 0.40 |
| 1.500 | 0.40 | 4.500 | 20.00 | 7.500 | 1.70 | 10.50 | 0.40 |
| 1.667 | 0.40 | 4.667 | 20.00 | 7.667 | 1.70 | 10.67 | 0.40 |
| 1.833 | 0.40 | 4.833 | 20.00 | 7.833 | 1.70 | 10.83 | 0.40 |
| 2.000 | 0.40 | 5.000 | 20.00 | 8.000 | 1.70 | 11.00 | 0.40 |
| 2.167 | 2.60 | 5.167 | 5.60 | 8.167 | 0.90 | 11.17 | 0.40 |
| 2.333 | 2.60 | 5.333 | 5.60 | 8.333 | 0.90 | 11.33 | 0.40 |
| 2.500 | 2.60 | 5.500 | 5.60 | 8.500 | 0.90 | 11.50 | 0.40 |
| 2.667 | 2.60 | 5.667 | 5.60 | 8.667 | 0.90 | 11.67 | 0.40 |
| 2.833 | 2.60 | 5.833 | 5.60 | 8.833 | 0.90 | 11.83 | 0.40 |
| 3.000 | 2.60 | 6.000 | 5.60 | 9.000 | 0.90 | 12.00 | 0.40 |

| | | | | *TOTALS* |
|---|---|---|---|---|
| Max.Eff.Inten. | (mm/hr)= | 20.00 | 19.44 | |
| over | (min) | 10.00 | 20.00 | |
| Storage Coeff. | (min)= | 5.56 (ii) | 19.15 (ii) | |
| Unit Hyd. Tpeak | (min)= | 10.00 | 20.00 | |
| Unit Hyd. peak | (cms)= | 0.14 | 0.06 | |
| PEAK FLOW | (cms)= | 0.17 | 0.01 | 0.175 (iii) |
| TIME TO PEAK | (hrs)= | 5.00 | 5.00 | 5.00 |
| RUNOFF VOLUME | (mm)= | 42.20 | 37.09 | 41.99 |
| TOTAL RAINFALL | (mm)= | 43.20 | 43.20 | 43.20 |
| RUNOFF COEFFICIENT | = | 0.98 | 0.86 | 0.97 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

---

| RESERVOIR( 0103) | OVERFLOW IS OFF | | | |
|---|---|---|---|---|
| IN= 2---> OUT= 1 | | | | |
| DT= 10.0 min | OUTFLOW (cms) | STORAGE (ha.m.) | OUTFLOW (cms) | STORAGE (ha.m.) |
| | 0.0000 | 0.0000 | 0.0750 | 0.1285 |
| | 0.0130 | 0.0753 | 0.0930 | 0.1427 |
| | 0.0340 | 0.0932 | 0.1200 | 0.1650 |
| | 0.0520 | 0.1091 | 1.2510 | 0.3172 |

| | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
|---|---|---|---|---|
| INFLOW : ID= 2 ( 0100) | 3.160 | 0.175 | 5.00 | 41.99 |
| OUTFLOW: ID= 1 ( 0103) | 3.160 | 0.035 | 6.17 | 41.53 |

PEAK FLOW REDUCTION [Qout/Qin](%)= 19.91
TIME SHIFT OF PEAK FLOW (min)= 70.00
MAXIMUM STORAGE USED (ha.m.)= 0.0941

| ADD HYD ( 0110) | | AREA | QPEAK | TPEAK | R.V. |
|---|---|---|---|---|---|
| 1 + 2 = 3 | | (ha) | (cms) | (hrs) | (mm) |
| ID1= 1 ( 0103): | | 3.16 | 0.035 | 6.17 | 41.53 |
| + ID2= 2 ( 0104): | | 0.04 | 0.002 | 5.00 | 40.95 |
| ID = 3 ( 0110): | | 3.20 | 0.035 | 6.17 | 41.53 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD ( 0110) | | AREA | QPEAK | TPEAK | R.V. |
|---|---|---|---|---|---|
| 3 + 2 = 1 | | (ha) | (cms) | (hrs) | (mm) |
| ID1= 3 ( 0110): | | 3.20 | 0.035 | 6.17 | 41.53 |
| + ID2= 2 ( 0109): | | 1.38 | 0.070 | 5.00 | 33.48 |
| ID = 1 ( 0110): | | 4.58 | 0.092 | 5.00 | 39.10 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB | | | | | |
|---|---|---|---|---|---|
| NASHYD ( 0108) | Area (ha)= | 0.76 | Curve Number (CN)= | 98.0 | |
| ID= 1 DT=10.0 min | Ia (mm)= | 5.00 | # of Linear Res.(N)= | 3.00 | |
| | U.H. Tp(hrs)= | 0.18 | | | |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.40 | 3.167 | 7.40 | 6.167 | 3.00 | 9.17 | 0.40 |
| 0.333 | 0.40 | 3.333 | 7.40 | 6.333 | 3.00 | 9.33 | 0.40 |
| 0.500 | 0.40 | 3.500 | 7.40 | 6.500 | 3.00 | 9.50 | 0.40 |
| 0.667 | 0.40 | 3.667 | 7.40 | 6.667 | 3.00 | 9.67 | 0.40 |
| 0.833 | 0.40 | 3.833 | 7.40 | 6.833 | 3.00 | 9.83 | 0.40 |
| 1.000 | 0.40 | 4.000 | 7.40 | 7.000 | 3.00 | 10.00 | 0.40 |
| 1.167 | 0.40 | 4.167 | 20.00 | 7.167 | 1.70 | 10.17 | 0.40 |
| 1.333 | 0.40 | 4.333 | 20.00 | 7.333 | 1.70 | 10.33 | 0.40 |
| 1.500 | 0.40 | 4.500 | 20.00 | 7.500 | 1.70 | 10.50 | 0.40 |
| 1.667 | 0.40 | 4.667 | 20.00 | 7.667 | 1.70 | 10.67 | 0.40 |
| 1.833 | 0.40 | 4.833 | 20.00 | 7.833 | 1.70 | 10.83 | 0.40 |
| 2.000 | 0.40 | 5.000 | 20.00 | 8.000 | 1.70 | 11.00 | 0.40 |
| 2.167 | 2.60 | 5.167 | 5.60 | 8.167 | 0.90 | 11.17 | 0.40 |
| 2.333 | 2.60 | 5.333 | 5.60 | 8.333 | 0.90 | 11.33 | 0.40 |
| 2.500 | 2.60 | 5.500 | 5.60 | 8.500 | 0.90 | 11.50 | 0.40 |
| 2.667 | 2.60 | 5.667 | 5.60 | 8.667 | 0.90 | 11.67 | 0.40 |
| 2.833 | 2.60 | 5.833 | 5.60 | 8.833 | 0.90 | 11.83 | 0.40 |
| 3.000 | 2.60 | 6.000 | 5.60 | 9.000 | 0.90 | 12.00 | 0.40 |

Unit Hyd Qpeak (cms)= 0.161

PEAK FLOW (cms)= 0.039 (i)
TIME TO PEAK (hrs)= 5.000
RUNOFF VOLUME (mm)= 32.365
TOTAL RAINFALL (mm)= 43.200
RUNOFF COEFFICIENT = 0.749

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

| CALIB | | | | | |
|---|---|---|---|---|---|
| STANDHYD ( 0106) | Area (ha)= | 1.55 | | | |
| ID= 1 DT=10.0 min | Total Imp(%)= | 29.00 | Dir. Conn.(%)= | 29.00 | |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.45 | 1.10 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 1.00 | 4.00 |
| Length | (m)= | 101.65 | 385.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.40 | 3.167 | 7.40 | 6.167 | 3.00 | 9.17 | 0.40 |
| 0.333 | 0.40 | 3.333 | 7.40 | 6.333 | 3.00 | 9.33 | 0.40 |
| 0.500 | 0.40 | 3.500 | 7.40 | 6.500 | 3.00 | 9.50 | 0.40 |
| 0.667 | 0.40 | 3.667 | 7.40 | 6.667 | 3.00 | 9.67 | 0.40 |
| 0.833 | 0.40 | 3.833 | 7.40 | 6.833 | 3.00 | 9.83 | 0.40 |
| 1.000 | 0.40 | 4.000 | 7.40 | 7.000 | 3.00 | 10.00 | 0.40 |
| 1.167 | 0.40 | 4.167 | 20.00 | 7.167 | 1.70 | 10.17 | 0.40 |
| 1.333 | 0.40 | 4.333 | 20.00 | 7.333 | 1.70 | 10.33 | 0.40 |
| 1.500 | 0.40 | 4.500 | 20.00 | 7.500 | 1.70 | 10.50 | 0.40 |
| 1.667 | 0.40 | 4.667 | 20.00 | 7.667 | 1.70 | 10.67 | 0.40 |
| 1.833 | 0.40 | 4.833 | 20.00 | 7.833 | 1.70 | 10.83 | 0.40 |
| 2.000 | 0.40 | 5.000 | 20.00 | 8.000 | 1.70 | 11.00 | 0.40 |
| 2.167 | 2.60 | 5.167 | 5.60 | 8.167 | 0.90 | 11.17 | 0.40 |
| 2.333 | 2.60 | 5.333 | 5.60 | 8.333 | 0.90 | 11.33 | 0.40 |
| 2.500 | 2.60 | 5.500 | 5.60 | 8.500 | 0.90 | 11.50 | 0.40 |
| 2.667 | 2.60 | 5.667 | 5.60 | 8.667 | 0.90 | 11.67 | 0.40 |
| 2.833 | 2.60 | 5.833 | 5.60 | 8.833 | 0.90 | 11.83 | 0.40 |
| 3.000 | 2.60 | 6.000 | 5.60 | 9.000 | 0.90 | 12.00 | 0.40 |

| | | | | |
|---|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 20.00 | 19.13 | | |
| over (min) | 10.00 | 50.00 | | |
| Storage Coeff. (min)= | 4.91 (ii) | 48.14 (ii) | | |
| Unit Hyd. Tpeak (min)= | 10.00 | 50.00 | | |
| Unit Hyd. peak (cms)= | 0.15 | 0.02 | | |
| | | | | *TOTALS* |
| PEAK FLOW (cms)= | 0.02 | 0.04 | | 0.061 (iii) |
| TIME TO PEAK (hrs)= | 5.00 | 5.33 | | 5.00 |
| RUNOFF VOLUME (mm)= | 42.20 | 37.09 | | 38.55 |
| TOTAL RAINFALL (mm)= | 43.20 | 43.20 | | 43.20 |
| RUNOFF COEFFICIENT = | 0.98 | 0.86 | | 0.89 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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 ( 0107) | Area (ha)= | 0.63 | | | |
| ID= 1 DT=10.0 min | Total Imp(%)= | 79.00 | Dir. Conn.(%)= | 79.00 | |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.50 | 0.13 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 3.00 | 2.00 |
| Length | (m)= | 405.00 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.40 | 3.167 | 7.40 | 6.167 | 3.00 | 9.17 | 0.40 |
| 0.333 | 0.40 | 3.333 | 7.40 | 6.333 | 3.00 | 9.33 | 0.40 |
| 0.500 | 0.40 | 3.500 | 7.40 | 6.500 | 3.00 | 9.50 | 0.40 |
| 0.667 | 0.40 | 3.667 | 7.40 | 6.667 | 3.00 | 9.67 | 0.40 |
| 0.833 | 0.40 | 3.833 | 7.40 | 6.833 | 3.00 | 9.83 | 0.40 |
| 1.000 | 0.40 | 4.000 | 7.40 | 7.000 | 3.00 | 10.00 | 0.40 |
| 1.167 | 0.40 | 4.167 | 20.00 | 7.167 | 1.70 | 10.17 | 0.40 |
| 1.333 | 0.40 | 4.333 | 20.00 | 7.333 | 1.70 | 10.33 | 0.40 |
| 1.500 | 0.40 | 4.500 | 20.00 | 7.500 | 1.70 | 10.50 | 0.40 |
| 1.667 | 0.40 | 4.667 | 20.00 | 7.667 | 1.70 | 10.67 | 0.40 |
| 1.833 | 0.40 | 4.833 | 20.00 | 7.833 | 1.70 | 10.83 | 0.40 |
| 2.000 | 0.40 | 5.000 | 20.00 | 8.000 | 1.70 | 11.00 | 0.40 |
| 2.167 | 2.60 | 5.167 | 5.60 | 8.167 | 0.90 | 11.17 | 0.40 |
| 2.333 | 2.60 | 5.333 | 5.60 | 8.333 | 0.90 | 11.33 | 0.40 |
| 2.500 | 2.60 | 5.500 | 5.60 | 8.500 | 0.90 | 11.50 | 0.40 |
| 2.667 | 2.60 | 5.667 | 5.60 | 8.667 | 0.90 | 11.67 | 0.40 |
| 2.833 | 2.60 | 5.833 | 5.60 | 8.833 | 0.90 | 11.83 | 0.40 |
| 3.000 | 2.60 | 6.000 | 5.60 | 9.000 | 0.90 | 12.00 | 0.40 |

| | | | | *TOTALS* |
|---|---|---|---|---|
| Max.Eff.Inten. | (mm/hr)= | 20.00 | 19.44 | |
| over | (min) | 10.00 | 30.00 | |
| Storage Coeff. | (min)= | 8.10 (ii) | 21.68 (ii) | |
| Unit Hyd. Tpeak | (min)= | 10.00 | 30.00 | |
| Unit Hyd. peak | (cms)= | 0.12 | 0.05 | |
| PEAK FLOW | (cms)= | 0.03 | 0.01 | 0.034 (iii) |
| TIME TO PEAK | (hrs)= | 5.00 | 5.00 | 5.00 |
| RUNOFF VOLUME | (mm)= | 42.20 | 37.09 | 41.11 |
| TOTAL RAINFALL | (mm)= | 43.20 | 43.20 | 43.20 |
| RUNOFF COEFFICIENT | = | 0.98 | 0.86 | 0.95 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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 ( 0010) | | AREA | QPEAK | TPEAK | R.V. |
|---|---|---|---|---|---|
| 1 + 2 = 3 | | (ha) | (cms) | (hrs) | (mm) |
| ID1= 1 ( 0106): | | 1.55 | 0.061 | 5.00 | 38.55 |
| + ID2= 2 ( 0107): | | 0.63 | 0.034 | 5.00 | 41.11 |
| ID = 3 ( 0010): | | 2.18 | 0.095 | 5.00 | 39.29 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| ADD HYD ( 0010) | | AREA | QPEAK | TPEAK | R.V. |
|---|---|---|---|---|---|
| 3 + 2 = 1 | | (ha) | (cms) | (hrs) | (mm) |
| ID1= 3 ( 0010): | | 2.18 | 0.095 | 5.00 | 39.29 |
| + ID2= 2 ( 0108): | | 0.76 | 0.039 | 5.00 | 32.37 |
| ID = 1 ( 0010): | | 2.94 | 0.134 | 5.00 | 37.50 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| ADD HYD ( 0113) | | AREA | QPEAK | TPEAK | R.V. |
|---|---|---|---|---|---|
| 1 + 2 = 3 | | (ha) | (cms) | (hrs) | (mm) |
| ID1= 1 ( 0010): | | 2.94 | 0.134 | 5.00 | 37.50 |
| + ID2= 2 ( 0110): | | 4.58 | 0.092 | 5.00 | 39.10 |
| ID = 3 ( 0113): | | 7.52 | 0.226 | 5.00 | 38.48 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

```
 V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
 V    V   I    SS     U   U   A A   L
  V  V    I     SS    U   U  AAAAA  L
  V  V    I      SS   U   U  A   A  L
   VV     I    SSSSS  UUUUU  A   A  LLLLL

  OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
 O   O    T      T    H   H   Y Y   MM MM  O   O
 O   O    T      T    H   H    Y    M   M  O   O
  OOO     T      T    H   H    Y    M   M   OOO
```

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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
Output filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-33eb-4790-b5ab-2fe711ab4c1b\dd1cd154-bafa-47b6-a227-2f6ac17c5d8e\scenari
Summary filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-33eb-4790-b5ab-2fe711ab4c1b\dd1cd154-bafa-47b6-a227-2f6ac17c5d8e\scenari

DATE: 04/22/2024 TIME: 11:21:45

USER:

COMMENTS: _____

**********
** SIMULATION : D - 5Y1 **

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|    READ STORM    |    Filename: C:\Users\qdar\AppD
|                  |              ata\Local\Temp\
|                  |              76b488fe-908e-4071-918b-7207f3d34655\e8091281
| Ptotal= 32.60 mm |    Comments: 5Y1
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    0.00 |  0.33   58.68 |  0.67   31.30 |  1.00    3.91
                0.08    3.91 |  0.42  109.54 |  0.75   19.56 |
                0.17   11.74 |  0.50   58.68 |  0.83   11.74 |
                0.25   31.30 |  0.58   46.94 |  0.92    3.91 |

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

--------------------
| CALIB            |
| NASHYD   (  0109)|   Area    (ha)=   1.38   Curve Number   (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.32

        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
               0.167    1.95 | 0.500   84.11 | 0.833   25.43 |  1.17    1.95
               0.333   21.52 | 0.667   52.81 | 1.000    7.82 |

    Unit Hyd Qpeak  (cms)=   0.165

    PEAK FLOW       (cms)=   0.120 (i)
    TIME TO PEAK    (hrs)=   0.833
    RUNOFF VOLUME    (mm)=  23.132
    TOTAL RAINFALL   (mm)=  32.601
    RUNOFF COEFFICIENT   =   0.710

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0104)|   Area    (ha)=   0.04
|ID= 1 DT=10.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=       0.04         0.00
    Dep. Storage     (mm)=       1.00         1.50
    Average Slope     (%)=       1.00         2.00
    Length            (m)=      16.33        40.00
    Mannings n           =      0.013        0.250

        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
               0.167    1.95 | 0.500   84.11 | 0.833   25.43 |  1.17    1.95
               0.333   21.52 | 0.667   52.81 | 1.000    7.82 |

    Max.Eff.Inten.(mm/hr)=      84.11        70.34
              over (min)        10.00        10.00
    Storage Coeff.  (min)=       0.92 (ii)    9.05 (ii)
    Unit Hyd. Tpeak (min)=      10.00        10.00
    Unit Hyd. peak  (cms)=       0.17         0.12
                                                          *TOTALS*
    PEAK FLOW       (cms)=       0.01         0.00          0.009 (iii)
    TIME TO PEAK    (hrs)=       0.50         0.67          0.50
    RUNOFF VOLUME    (mm)=      31.60        26.66         31.55
    TOTAL RAINFALL   (mm)=      32.60        32.60         32.60
    RUNOFF COEFFICIENT   =       0.97         0.82          0.97

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

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  98.0    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 (  0100)|   Area    (ha)=   3.16
|ID= 1 DT=10.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=       3.03         0.13
    Dep. Storage     (mm)=       1.00         1.50
    Average Slope     (%)=       4.00         2.00
    Length            (m)=     250.00        40.00
    Mannings n           =      0.013        0.250

        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
               0.167    1.95 | 0.500   84.11 | 0.833   25.43 |  1.17    1.95
               0.333   21.52 | 0.667   52.81 | 1.000    7.82 |

    Max.Eff.Inten.(mm/hr)=      84.11        70.34
              over (min)        10.00        20.00
    Storage Coeff.  (min)=       3.13 (ii)   11.25 (ii)
    Unit Hyd. Tpeak (min)=      10.00        20.00
    Unit Hyd. peak  (cms)=       0.16         0.08
                                                          *TOTALS*
    PEAK FLOW       (cms)=       0.69         0.02          0.692 (iii)
    TIME TO PEAK    (hrs)=       0.50         0.67          0.50
    RUNOFF VOLUME    (mm)=      31.60        26.66         31.40
    TOTAL RAINFALL   (mm)=      32.60        32.60         32.60
    RUNOFF COEFFICIENT   =       0.97         0.82          0.96

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

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  98.0    Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| RESERVOIR(  0103)|     OVERFLOW IS OFF
```

| IN= 2---> OUT= 1 |
| DT= 10.0 min | OUTFLOW (cms) | STORAGE (ha.m.) | OUTFLOW (cms) | STORAGE (ha.m.) |
|---|---|---|---|---|
| | 0.0000 | 0.0000 | 0.0750 | 0.1285 |
| | 0.0130 | 0.0753 | 0.0930 | 0.1427 |
| | 0.0340 | 0.0932 | 0.1200 | 0.1650 |
| | 0.0520 | 0.1091 | 1.2510 | 0.3172 |

| | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
|---|---|---|---|---|
| INFLOW : ID= 2 ( 0100) | 3.160 | 0.692 | 0.50 | 31.40 |
| OUTFLOW: ID= 1 ( 0103) | 3.160 | 0.034 | 1.17 | 30.94 |

PEAK FLOW REDUCTION [Qout/Qin](%)= 4.86
TIME SHIFT OF PEAK FLOW (min)= 40.00
MAXIMUM STORAGE USED (ha.m.)= 0.0932

---

| ADD HYD ( 0110) | | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
|---|---|---|---|---|---|
| 1 + 2 = 3 | ID1= 1 ( 0103): | 3.16 | 0.034 | 1.17 | 30.94 |
| | + ID2= 2 ( 0104): | 0.04 | 0.009 | 0.50 | 31.55 |
| | ID = 3 ( 0110): | 3.20 | 0.034 | 1.17 | 30.95 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| ADD HYD ( 0110) | | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
|---|---|---|---|---|---|
| 3 + 2 = 1 | ID1= 3 ( 0110): | 3.20 | 0.034 | 1.17 | 30.95 |
| | + ID2= 2 ( 0109): | 1.38 | 0.120 | 0.83 | 23.13 |
| | ID = 1 ( 0110): | 4.58 | 0.146 | 0.83 | 28.59 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| CALIB | NASHYD ( 0108) | ID= 1 DT=10.0 min |
|---|---|---|

Area (ha)= 0.76 Curve Number (CN)= 98.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.18

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 1.95 | 0.500 | 84.11 | 0.833 | 25.43 | 1.17 | 1.95 |
| 0.333 | 21.52 | 0.667 | 52.81 | 1.000 | 7.82 | | |

Unit Hyd Qpeak (cms)= 0.161

PEAK FLOW (cms)= 0.089 (i)
TIME TO PEAK (hrs)= 0.667
RUNOFF VOLUME (mm)= 22.359
TOTAL RAINFALL (mm)= 32.601
RUNOFF COEFFICIENT = 0.686

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

---

| CALIB | STANDHYD ( 0106) | ID= 1 DT=10.0 min |
|---|---|---|

Area (ha)= 1.55
Total Imp(%)= 29.00 Dir. Conn.(%)= 29.00

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.45 | 1.10 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 1.00 | 4.00 |
| Length | (m)= | 101.65 | 385.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 1.95 | 0.500 | 84.11 | 0.833 | 25.43 | 1.17 | 1.95 |
| 0.333 | 21.52 | 0.667 | 52.81 | 1.000 | 7.82 | | |

| | | | | *TOTALS* |
|---|---|---|---|---|
| Max.Eff.Inten. | (mm/hr)= | 84.11 | 48.59 | |
| over | (min) | 10.00 | 40.00 | |
| Storage Coeff. | (min)= | 2.76 (ii) | 32.53 (ii) | |
| Unit Hyd. Tpeak | (min)= | 10.00 | 40.00 | |
| Unit Hyd. peak | (cms)= | 0.17 | 0.03 | |
| PEAK FLOW | (cms)= | 0.10 | 0.07 | 0.114 (iii) |
| TIME TO PEAK | (hrs)= | 0.50 | 1.17 | 0.50 |
| RUNOFF VOLUME | (mm)= | 31.60 | 26.66 | 28.08 |
| TOTAL RAINFALL | (mm)= | 32.60 | 32.60 | 32.60 |
| RUNOFF COEFFICIENT | = | 0.97 | 0.82 | 0.86 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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 ( 0107) | ID= 1 DT=10.0 min |
|---|---|---|

Area (ha)= 0.63
Total Imp(%)= 79.00 Dir. Conn.(%)= 79.00

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.50 | 0.13 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 3.00 | 2.00 |
| Length | (m)= | 405.00 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 1.95 | 0.500 | 84.11 | 0.833 | 25.43 | 1.17 | 1.95 |
| 0.333 | 21.52 | 0.667 | 52.81 | 1.000 | 7.82 | | |

| | | | |
|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 84.11 | 70.34 | |
| over (min) | 10.00 | 20.00 | |
| Storage Coeff. (min)= | 4.56 (ii) | 12.68 (ii) | |
| Unit Hyd. Tpeak (min)= | 10.00 | 20.00 | |
| Unit Hyd. peak (cms)= | 0.15 | 0.07 | |
| | | | *TOTALS* |
| PEAK FLOW (cms)= | 0.11 | 0.02 | 0.112 (iii) |
| TIME TO PEAK (hrs)= | 0.50 | 0.67 | 0.50 |
| RUNOFF VOLUME (mm)= | 31.60 | 26.66 | 30.55 |
| TOTAL RAINFALL (mm)= | 32.60 | 32.60 | 32.60 |
| RUNOFF COEFFICIENT = | 0.97 | 0.82 | 0.94 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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 ( 0010) | | AREA | QPEAK | TPEAK | R.V. |
|---|---|---|---|---|---|
| | | (ha) | (cms) | (hrs) | (mm) |
| ID1= 1 ( 0106): | | 1.55 | 0.114 | 0.50 | 28.08 |
| + ID2= 2 ( 0107): | | 0.63 | 0.112 | 0.50 | 30.55 |
| ID = 3 ( 0010): | | 2.18 | 0.226 | 0.50 | 28.80 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| ADD HYD ( 0010) | | AREA | QPEAK | TPEAK | R.V. |
|---|---|---|---|---|---|
| | | (ha) | (cms) | (hrs) | (mm) |
| ID1= 3 ( 0010): | | 2.18 | 0.226 | 0.50 | 28.80 |
| + ID2= 2 ( 0108): | | 0.76 | 0.089 | 0.67 | 22.36 |
| ID = 1 ( 0010): | | 2.94 | 0.285 | 0.50 | 27.13 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| ADD HYD ( 0113) | | AREA | QPEAK | TPEAK | R.V. |
|---|---|---|---|---|---|
| | | (ha) | (cms) | (hrs) | (mm) |
| ID1= 1 ( 0010): | | 2.94 | 0.285 | 0.50 | 27.13 |
| + ID2= 2 ( 0110): | | 4.58 | 0.146 | 0.83 | 28.59 |
| ID = 3 ( 0113): | | 7.52 | 0.392 | 0.67 | 28.02 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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```
 VV     I    SSSSS  UUUUU  A   A  LLLLL

 OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
O   O    T      T    H   H   Y Y   MM MM  O   O
O   O    T      T    H   H    Y    M   M  O   O
 OOO     T      T    H   H    Y    M   M   OOO
```

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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
Output filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-33eb-4790-b5ab-2fe711ab4c1b\d3f48665-b673-4334-b296-06f8fb7cb546\scenari
Summary filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-33eb-4790-b5ab-2fe711ab4c1b\d3f48665-b673-4334-b296-06f8fb7cb546\scenari

DATE: 04/22/2024 TIME: 11:21:45

USER:

COMMENTS: _____

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**********
** SIMULATION : E - 5Y12 **
**********

| READ STORM | Filename: C:\Users\qdar\AppD ata\Local\Temp\ 76b488fe-908e-4071-918b-7207f3d34655\901f9b64 |
|---|---|
| Ptotal= 55.50 mm | Comments: 5Y12 UPDATED |

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.60 | 3.00 | 9.40 | 6.00 | 3.90 | 9.00 | 0.60 |
| 0.25 | 0.60 | 3.25 | 9.40 | 6.25 | 3.90 | 9.25 | 0.60 |
| 0.50 | 0.60 | 3.50 | 9.40 | 6.50 | 3.90 | 9.50 | 0.60 |
| 0.75 | 0.60 | 3.75 | 9.40 | 6.75 | 3.90 | 9.75 | 0.60 |
| 1.00 | 0.60 | 4.00 | 25.40 | 7.00 | 2.20 | 10.00 | 0.60 |
| 1.25 | 0.60 | 4.25 | 25.40 | 7.25 | 2.20 | 10.25 | 0.60 |
| 1.50 | 0.60 | 4.50 | 25.40 | 7.50 | 2.20 | 10.50 | 0.60 |
| 1.75 | 0.60 | 4.75 | 25.40 | 7.75 | 2.20 | 10.75 | 0.60 |
| 2.00 | 3.30 | 5.00 | 7.20 | 8.00 | 1.10 | 11.00 | 0.60 |
| 2.25 | 3.30 | 5.25 | 7.20 | 8.25 | 1.10 | 11.25 | 0.60 |
| 2.50 | 3.30 | 5.50 | 7.20 | 8.50 | 1.10 | 11.50 | 0.60 |
| 2.75 | 3.30 | 5.75 | 7.20 | 8.75 | 1.10 | 11.75 | 0.60 |

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| CALIB | | | | | |
|---|---|---|---|---|---|
| NASHYD ( 0109) | Area | (ha)= | 1.38 | Curve Number (CN)= | 98.0 |
| ID= 1 DT=10.0 min | Ia | (mm)= | 5.00 | # of Linear Res.(N)= | 3.00 |
| | U.H. Tp(hrs)= | | 0.32 | | |

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 V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
 V    V   I    SS     U   U   A A   L
  V  V    I     SS    U   U  AAAAA  L
  V  V    I      SS   U   U  A   A  L
```

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.60 | 3.167 | 9.40 | 6.167 | 3.90 | 9.17 | 0.60 |
| 0.333 | 0.60 | 3.333 | 9.40 | 6.333 | 3.90 | 9.33 | 0.60 |
| 0.500 | 0.60 | 3.500 | 9.40 | 6.500 | 3.90 | 9.50 | 0.60 |
| 0.667 | 0.60 | 3.667 | 9.40 | 6.667 | 3.90 | 9.67 | 0.60 |
| 0.833 | 0.60 | 3.833 | 9.40 | 6.833 | 3.90 | 9.83 | 0.60 |
| 1.000 | 0.60 | 4.000 | 9.40 | 7.000 | 3.90 | 10.00 | 0.60 |
| 1.167 | 0.60 | 4.167 | 25.40 | 7.167 | 2.20 | 10.17 | 0.60 |
| 1.333 | 0.60 | 4.333 | 25.40 | 7.333 | 2.20 | 10.33 | 0.60 |
| 1.500 | 0.60 | 4.500 | 25.40 | 7.500 | 2.20 | 10.50 | 0.60 |
| 1.667 | 0.60 | 4.667 | 25.40 | 7.667 | 2.20 | 10.67 | 0.60 |
| 1.833 | 0.60 | 4.833 | 25.40 | 7.833 | 2.20 | 10.83 | 0.60 |
| 2.000 | 0.60 | 5.000 | 25.40 | 8.000 | 2.20 | 11.00 | 0.60 |
| 2.167 | 3.30 | 5.167 | 7.20 | 8.167 | 1.10 | 11.17 | 0.60 |
| 2.333 | 3.30 | 5.333 | 7.20 | 8.333 | 1.10 | 11.33 | 0.60 |
| 2.500 | 3.30 | 5.500 | 7.20 | 8.500 | 1.10 | 11.50 | 0.60 |
| 2.667 | 3.30 | 5.667 | 7.20 | 8.667 | 1.10 | 11.67 | 0.60 |
| 2.833 | 3.30 | 5.833 | 7.20 | 8.833 | 1.10 | 11.83 | 0.60 |
| 3.000 | 3.30 | 6.000 | 7.20 | 9.000 | 1.10 | 12.00 | 0.60 |

| | | | |
|---|---|---|---|
| Unit Hyd Qpeak (cms)= | 0.165 | | |
| PEAK FLOW (cms)= | 0.091 (i) | | |
| TIME TO PEAK (hrs)= | 5.000 | | |
| RUNOFF VOLUME (mm)= | 45.592 | | |
| TOTAL RAINFALL (mm)= | 55.500 | | |
| RUNOFF COEFFICIENT = | 0.821 | | |

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

---

| CALIB | | | |
|---|---|---|---|
| STANDHYD ( 0104) | Area (ha)= | 0.04 | |
| ID= 1 DT=10.0 min | Total Imp(%)= | 99.00 | Dir. Conn.(%)= 99.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.04 | 0.00 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 1.00 | 2.00 |
| Length | (m)= | 16.33 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.60 | 3.167 | 9.40 | 6.167 | 3.90 | 9.17 | 0.60 |
| 0.333 | 0.60 | 3.333 | 9.40 | 6.333 | 3.90 | 9.33 | 0.60 |
| 0.500 | 0.60 | 3.500 | 9.40 | 6.500 | 3.90 | 9.50 | 0.60 |
| 0.667 | 0.60 | 3.667 | 9.40 | 6.667 | 3.90 | 9.67 | 0.60 |
| 0.833 | 0.60 | 3.833 | 9.40 | 6.833 | 3.90 | 9.83 | 0.60 |
| 1.000 | 0.60 | 4.000 | 9.40 | 7.000 | 3.90 | 10.00 | 0.60 |
| 1.167 | 0.60 | 4.167 | 25.40 | 7.167 | 2.20 | 10.17 | 0.60 |
| 1.333 | 0.60 | 4.333 | 25.40 | 7.333 | 2.20 | 10.33 | 0.60 |
| 1.500 | 0.60 | 4.500 | 25.40 | 7.500 | 2.20 | 10.50 | 0.60 |
| 1.667 | 0.60 | 4.667 | 25.40 | 7.667 | 2.20 | 10.67 | 0.60 |
| 1.833 | 0.60 | 4.833 | 25.40 | 7.833 | 2.20 | 10.83 | 0.60 |
| 2.000 | 0.60 | 5.000 | 25.40 | 8.000 | 2.20 | 11.00 | 0.60 |
| 2.167 | 3.30 | 5.167 | 7.20 | 8.167 | 1.10 | 11.17 | 0.60 |
| 2.333 | 3.30 | 5.333 | 7.20 | 8.333 | 1.10 | 11.33 | 0.60 |
| 2.500 | 3.30 | 5.500 | 7.20 | 8.500 | 1.10 | 11.50 | 0.60 |
| 2.667 | 3.30 | 5.667 | 7.20 | 8.667 | 1.10 | 11.67 | 0.60 |
| 2.833 | 3.30 | 5.833 | 7.20 | 8.833 | 1.10 | 11.83 | 0.60 |
| 3.000 | 3.30 | 6.000 | 7.20 | 9.000 | 1.10 | 12.00 | 0.60 |

| | | | | |
|---|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 25.40 | 24.94 | | |
| over (min) | 10.00 | 20.00 | | |
| Storage Coeff. (min)= | 1.49 (ii) | 13.79 (ii) | | |
| Unit Hyd. Tpeak (min)= | 10.00 | 20.00 | | |
| Unit Hyd. peak (cms)= | 0.17 | 0.07 | | |
| | | | | *TOTALS* |
| PEAK FLOW (cms)= | 0.00 | 0.00 | | 0.003 (iii) |
| TIME TO PEAK (hrs)= | 4.50 | 5.00 | | 5.00 |
| RUNOFF VOLUME (mm)= | 54.50 | 49.27 | | 52.65 |
| TOTAL RAINFALL (mm)= | 55.50 | 55.50 | | 55.50 |
| RUNOFF COEFFICIENT = | 0.98 | 0.89 | | 0.95 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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 ( 0100) | Area (ha)= | 3.16 | |
| ID= 1 DT=10.0 min | Total Imp(%)= | 96.00 | Dir. Conn.(%)= 96.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 3.03 | 0.13 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 4.00 | 2.00 |
| Length | (m)= | 250.00 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.60 | 3.167 | 9.40 | 6.167 | 3.90 | 9.17 | 0.60 |
| 0.333 | 0.60 | 3.333 | 9.40 | 6.333 | 3.90 | 9.33 | 0.60 |
| 0.500 | 0.60 | 3.500 | 9.40 | 6.500 | 3.90 | 9.50 | 0.60 |
| 0.667 | 0.60 | 3.667 | 9.40 | 6.667 | 3.90 | 9.67 | 0.60 |
| 0.833 | 0.60 | 3.833 | 9.40 | 6.833 | 3.90 | 9.83 | 0.60 |
| 1.000 | 0.60 | 4.000 | 9.40 | 7.000 | 3.90 | 10.00 | 0.60 |
| 1.167 | 0.60 | 4.167 | 25.40 | 7.167 | 2.20 | 10.17 | 0.60 |
| 1.333 | 0.60 | 4.333 | 25.40 | 7.333 | 2.20 | 10.33 | 0.60 |
| 1.500 | 0.60 | 4.500 | 25.40 | 7.500 | 2.20 | 10.50 | 0.60 |
| 1.667 | 0.60 | 4.667 | 25.40 | 7.667 | 2.20 | 10.67 | 0.60 |
| 1.833 | 0.60 | 4.833 | 25.40 | 7.833 | 2.20 | 10.83 | 0.60 |
| 2.000 | 0.60 | 5.000 | 25.40 | 8.000 | 2.20 | 11.00 | 0.60 |
| 2.167 | 3.30 | 5.167 | 7.20 | 8.167 | 1.10 | 11.17 | 0.60 |
| 2.333 | 3.30 | 5.333 | 7.20 | 8.333 | 1.10 | 11.33 | 0.60 |
| 2.500 | 3.30 | 5.500 | 7.20 | 8.500 | 1.10 | 11.50 | 0.60 |
| 2.667 | 3.30 | 5.667 | 7.20 | 8.667 | 1.10 | 11.67 | 0.60 |
| 2.833 | 3.30 | 5.833 | 7.20 | 8.833 | 1.10 | 11.83 | 0.60 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 3.000 | 3.30 | 6.000 | 7.20 | 9.000 | 1.10 | 12.00 | 0.60 |

| | | | |
|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 25.40 | 24.94 | |
| over (min) | 10.00 | 20.00 | |
| Storage Coeff. (min)= | 5.05 (ii) | 17.35 (ii) | |
| Unit Hyd. Tpeak (min)= | 10.00 | 20.00 | |
| Unit Hyd. peak (cms)= | 0.15 | 0.06 | |
| | | | *TOTALS* |
| PEAK FLOW (cms)= | 0.21 | 0.01 | 0.222 (iii) |
| TIME TO PEAK (hrs)= | 5.00 | 5.00 | 5.00 |
| RUNOFF VOLUME (mm)= | 54.50 | 49.27 | 54.29 |
| TOTAL RAINFALL (mm)= | 55.50 | 55.50 | 55.50 |
| RUNOFF COEFFICIENT = | 0.98 | 0.89 | 0.98 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

---

| RESERVOIR( 0103) | OVERFLOW IS OFF | | | |
|---|---|---|---|---|
| IN= 2---> OUT= 1 | | | | |
| DT= 10.0 min | OUTFLOW (cms) | STORAGE (ha.m.) | OUTFLOW (cms) | STORAGE (ha.m.) |
| | 0.0000 | 0.0000 | 0.0750 | 0.1285 |
| | 0.0130 | 0.0753 | 0.0930 | 0.1427 |
| | 0.0340 | 0.0932 | 0.1200 | 0.1650 |
| | 0.0520 | 0.1091 | 1.2510 | 0.3172 |

| | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
|---|---|---|---|---|
| INFLOW : ID= 2 ( 0100) | 3.160 | 0.222 | 5.00 | 54.29 |
| OUTFLOW: ID= 1 ( 0103) | 3.160 | 0.057 | 6.00 | 53.83 |

PEAK FLOW REDUCTION [Qout/Qin](%)= 25.46
TIME SHIFT OF PEAK FLOW (min)= 60.00
MAXIMUM STORAGE USED (ha.m.)= 0.1132

---

| ADD HYD ( 0110) | | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
|---|---|---|---|---|---|
| 1 + 2 = 3 | ID1= 1 ( 0103): | 3.16 | 0.057 | 6.00 | 53.83 |
| | + ID2= 2 ( 0104): | 0.04 | 0.003 | 5.00 | 52.65 |
| | ID = 3 ( 0110): | 3.20 | 0.057 | 6.00 | 53.81 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| ADD HYD ( 0110) | | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
|---|---|---|---|---|---|
| 3 + 2 = 1 | ID1= 3 ( 0110): | 3.20 | 0.057 | 6.00 | 53.81 |
| | + ID2= 2 ( 0109): | 1.38 | 0.091 | 5.00 | 45.59 |
| | ID = 1 ( 0110): | 4.58 | 0.139 | 5.00 | 51.34 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| CALIB NASHYD ( 0108) ID= 1 DT=10.0 min | Area (ha)= 0.76 | Curve Number (CN)= 98.0 |
|---|---|---|
| | Ia (mm)= 5.00 | # of Linear Res.(N)= 3.00 |
| | U.H. Tp(hrs)= 0.18 | |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.60 | 3.167 | 9.40 | 6.167 | 3.90 | 9.17 | 0.60 |
| 0.333 | 0.60 | 3.333 | 9.40 | 6.333 | 3.90 | 9.33 | 0.60 |
| 0.500 | 0.60 | 3.500 | 9.40 | 6.500 | 3.90 | 9.50 | 0.60 |
| 0.667 | 0.60 | 3.667 | 9.40 | 6.667 | 3.90 | 9.67 | 0.60 |
| 0.833 | 0.60 | 3.833 | 9.40 | 6.833 | 3.90 | 9.83 | 0.60 |
| 1.000 | 0.60 | 4.000 | 9.40 | 7.000 | 3.90 | 10.00 | 0.60 |
| 1.167 | 0.60 | 4.167 | 25.40 | 7.167 | 2.20 | 10.17 | 0.60 |
| 1.333 | 0.60 | 4.333 | 25.40 | 7.333 | 2.20 | 10.33 | 0.60 |
| 1.500 | 0.60 | 4.500 | 25.40 | 7.500 | 2.20 | 10.50 | 0.60 |
| 1.667 | 0.60 | 4.667 | 25.40 | 7.667 | 2.20 | 10.67 | 0.60 |
| 1.833 | 0.60 | 4.833 | 25.40 | 7.833 | 2.20 | 10.83 | 0.60 |
| 2.000 | 0.60 | 5.000 | 25.40 | 8.000 | 2.20 | 11.00 | 0.60 |
| 2.167 | 3.30 | 5.167 | 7.20 | 8.167 | 1.10 | 11.17 | 0.60 |
| 2.333 | 3.30 | 5.333 | 7.20 | 8.333 | 1.10 | 11.33 | 0.60 |
| 2.500 | 3.30 | 5.500 | 7.20 | 8.500 | 1.10 | 11.50 | 0.60 |
| 2.667 | 3.30 | 5.667 | 7.20 | 8.667 | 1.10 | 11.67 | 0.60 |
| 2.833 | 3.30 | 5.833 | 7.20 | 8.833 | 1.10 | 11.83 | 0.60 |
| 3.000 | 3.30 | 6.000 | 7.20 | 9.000 | 1.10 | 12.00 | 0.60 |

| | | |
|---|---|---|
| Unit Hyd Qpeak (cms)= | 0.161 | |
| PEAK FLOW (cms)= | 0.050 (i) | |
| TIME TO PEAK (hrs)= | 5.000 | |
| RUNOFF VOLUME (mm)= | 44.070 | |
| TOTAL RAINFALL (mm)= | 55.500 | |
| RUNOFF COEFFICIENT = | 0.794 | |

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

---

| CALIB STANDHYD ( 0106) ID= 1 DT=10.0 min | Area (ha)= 1.55 | |
|---|---|---|
| | Total Imp(%)= 29.00 | Dir. Conn.(%)= 29.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.45 | 1.10 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 1.00 | 4.00 |
| Length | (m)= | 101.65 | 385.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.60 | 3.167 | 9.40 | 6.167 | 3.90 | 9.17 | 0.60 |
| 0.333 | 0.60 | 3.333 | 9.40 | 6.333 | 3.90 | 9.33 | 0.60 |
| 0.500 | 0.60 | 3.500 | 9.40 | 6.500 | 3.90 | 9.50 | 0.60 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 0.667 | 0.60 | 3.667 | 9.40 | 6.667 | 3.90 | 9.67 | 0.60 |
| 0.833 | 0.60 | 3.833 | 9.40 | 6.833 | 3.90 | 9.83 | 0.60 |
| 1.000 | 0.60 | 4.000 | 9.40 | 7.000 | 3.90 | 10.00 | 0.60 |
| 1.167 | 0.60 | 4.167 | 25.40 | 7.167 | 2.20 | 10.17 | 0.60 |
| 1.333 | 0.60 | 4.333 | 25.40 | 7.333 | 2.20 | 10.33 | 0.60 |
| 1.500 | 0.60 | 4.500 | 25.40 | 7.500 | 2.20 | 10.50 | 0.60 |
| 1.667 | 0.60 | 4.667 | 25.40 | 7.667 | 2.20 | 10.67 | 0.60 |
| 1.833 | 0.60 | 4.833 | 25.40 | 7.833 | 2.20 | 10.83 | 0.60 |
| 2.000 | 0.60 | 5.000 | 25.40 | 8.000 | 2.20 | 11.00 | 0.60 |
| 2.167 | 3.30 | 5.167 | 7.20 | 8.167 | 1.10 | 11.17 | 0.60 |
| 2.333 | 3.30 | 5.333 | 7.20 | 8.333 | 1.10 | 11.33 | 0.60 |
| 2.500 | 3.30 | 5.500 | 7.20 | 8.500 | 1.10 | 11.50 | 0.60 |
| 2.667 | 3.30 | 5.667 | 7.20 | 8.667 | 1.10 | 11.67 | 0.60 |
| 2.833 | 3.30 | 5.833 | 7.20 | 8.833 | 1.10 | 11.83 | 0.60 |
| 3.000 | 3.30 | 6.000 | 7.20 | 9.000 | 1.10 | 12.00 | 0.60 |

| | | | | |
|---|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 25.40 | 24.79 | | |
| over (min) | 10.00 | 50.00 | | |
| Storage Coeff. (min)= | 4.46 (ii) | 43.43 (ii) | | |
| Unit Hyd. Tpeak (min)= | 10.00 | 50.00 | | |
| Unit Hyd. peak (cms)= | 0.15 | 0.02 | | |
| | | | *TOTALS* | |
| PEAK FLOW (cms)= | 0.03 | 0.05 | 0.081 (iii) | |
| TIME TO PEAK (hrs)= | 5.00 | 5.33 | 5.00 | |
| RUNOFF VOLUME (mm)= | 54.50 | 49.27 | 50.77 | |
| TOTAL RAINFALL (mm)= | 55.50 | 55.50 | 55.50 | |
| RUNOFF COEFFICIENT = | 0.98 | 0.89 | 0.91 | |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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 ( 0107) | Area (ha)= 0.63 |
| ID= 1 DT=10.0 min | Total Imp(%)= 79.00 Dir. Conn.(%)= 79.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.50 | 0.13 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 3.00 | 2.00 |
| Length | (m)= | 405.00 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.60 | 3.167 | 9.40 | 6.167 | 3.90 | 9.17 | 0.60 |
| 0.333 | 0.60 | 3.333 | 9.40 | 6.333 | 3.90 | 9.33 | 0.60 |
| 0.500 | 0.60 | 3.500 | 9.40 | 6.500 | 3.90 | 9.50 | 0.60 |
| 0.667 | 0.60 | 3.667 | 9.40 | 6.667 | 3.90 | 9.67 | 0.60 |
| 0.833 | 0.60 | 3.833 | 9.40 | 6.833 | 3.90 | 9.83 | 0.60 |
| 1.000 | 0.60 | 4.000 | 9.40 | 7.000 | 3.90 | 10.00 | 0.60 |
| 1.167 | 0.60 | 4.167 | 25.40 | 7.167 | 2.20 | 10.17 | 0.60 |
| 1.333 | 0.60 | 4.333 | 25.40 | 7.333 | 2.20 | 10.33 | 0.60 |
| 1.500 | 0.60 | 4.500 | 25.40 | 7.500 | 2.20 | 10.50 | 0.60 |
| 1.667 | 0.60 | 4.667 | 25.40 | 7.667 | 2.20 | 10.67 | 0.60 |
| 1.833 | 0.60 | 4.833 | 25.40 | 7.833 | 2.20 | 10.83 | 0.60 |
| 2.000 | 0.60 | 5.000 | 25.40 | 8.000 | 2.20 | 11.00 | 0.60 |
| 2.167 | 3.30 | 5.167 | 7.20 | 8.167 | 1.10 | 11.17 | 0.60 |
| 2.333 | 3.30 | 5.333 | 7.20 | 8.333 | 1.10 | 11.33 | 0.60 |
| 2.500 | 3.30 | 5.500 | 7.20 | 8.500 | 1.10 | 11.50 | 0.60 |
| 2.667 | 3.30 | 5.667 | 7.20 | 8.667 | 1.10 | 11.67 | 0.60 |
| 2.833 | 3.30 | 5.833 | 7.20 | 8.833 | 1.10 | 11.83 | 0.60 |
| 3.000 | 3.30 | 6.000 | 7.20 | 9.000 | 1.10 | 12.00 | 0.60 |

| | | | | |
|---|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 25.40 | 24.94 | | |
| over (min) | 10.00 | 20.00 | | |
| Storage Coeff. (min)= | 7.36 (ii) | 19.66 (ii) | | |
| Unit Hyd. Tpeak (min)= | 10.00 | 20.00 | | |
| Unit Hyd. peak (cms)= | 0.13 | 0.06 | | |
| | | | *TOTALS* | |
| PEAK FLOW (cms)= | 0.04 | 0.01 | 0.044 (iii) | |
| TIME TO PEAK (hrs)= | 5.00 | 5.00 | 5.00 | |
| RUNOFF VOLUME (mm)= | 54.50 | 49.27 | 53.38 | |
| TOTAL RAINFALL (mm)= | 55.50 | 55.50 | 55.50 | |
| RUNOFF COEFFICIENT = | 0.98 | 0.89 | 0.96 | |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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 ( 0010) | | | | |
|---|---|---|---|---|
| 1 + 2 = 3 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
| ID1= 1 ( 0106): | 1.55 | 0.081 | 5.00 | 50.77 |
| + ID2= 2 ( 0107): | 0.63 | 0.044 | 5.00 | 53.38 |
| ID = 3 ( 0010): | 2.18 | 0.125 | 5.00 | 51.53 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| ADD HYD ( 0010) | | | | |
|---|---|---|---|---|
| 3 + 2 = 1 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
| ID1= 3 ( 0010): | 2.18 | 0.125 | 5.00 | 51.53 |
| + ID2= 2 ( 0108): | 0.76 | 0.050 | 5.00 | 44.07 |
| ID = 1 ( 0010): | 2.94 | 0.175 | 5.00 | 49.60 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| ADD HYD ( 0113) | | | | |
|---|---|---|---|---|
| 1 + 2 = 3 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
| ID1= 1 ( 0010): | 2.94 | 0.175 | 5.00 | 49.60 |
| + ID2= 2 ( 0110): | 4.58 | 0.139 | 5.00 | 51.34 |
| ID = 3 ( 0113): | 7.52 | 0.314 | 5.00 | 50.66 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-33eb-4790-
b5ab-2fe711ab4c1b\5b6700d4-fbc9-47af-85d3-e52eae3a3d85\scenari
  Summary filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-33eb-4790-
b5ab-2fe711ab4c1b\5b6700d4-fbc9-47af-85d3-e52eae3a3d85\scenari


DATE: 04/22/2024                          TIME: 11:21:45

USER:


COMMENTS: _____________________________________________________________


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  ***********************************************
  ** SIMULATION : F - 10Y1                     **
  ***********************************************


--------------------
|    READ STORM    |    Filename: C:\Users\qdar\AppD
|                  |              ata\Local\Temp\
|                  |              76b488fe-908e-4071-918b-7207f3d34655\6547ab38
| Ptotal= 38.50 mm |    Comments: 10Y1
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    0.00 |  0.33   69.30 |  0.67   36.96 |  1.00    4.62
                0.08    4.62 |  0.42  129.36 |  0.75   23.10 |
                0.17   13.86 |  0.50   69.30 |  0.83   13.86 |
                0.25   36.96 |  0.58   55.44 |  0.92    4.62 |

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--------------------
| CALIB            |
| NASHYD   (  0109)|   Area     (ha)=   1.38   Curve Number    (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.32

                NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
                0.167   2.31 | 0.500   99.33 | 0.833   30.03 |  1.17    2.31
                0.333  25.41 | 0.667   62.37 | 1.000    9.24 |

     Unit Hyd Qpeak  (cms)=   0.165

     PEAK FLOW       (cms)=   0.150 (i)
     TIME TO PEAK    (hrs)=   0.833
     RUNOFF VOLUME    (mm)=  28.880
     TOTAL RAINFALL   (mm)=  38.500
     RUNOFF COEFFICIENT   =   0.750

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0104)|   Area     (ha)=   0.04
|ID= 1 DT=10.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.04          0.00
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       1.00          2.00
     Length            (m)=      16.33         40.00
     Mannings n           =      0.013         0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
                0.167   2.31 | 0.500   99.33 | 0.833   30.03 |  1.17    2.31
                0.333  25.41 | 0.667   62.37 | 1.000    9.24 |

     Max.Eff.Inten.(mm/hr)=      99.33         86.40
               over (min)        10.00         10.00
     Storage Coeff.  (min)=       0.86 (ii)     8.35 (ii)
     Unit Hyd. Tpeak (min)=      10.00         10.00
     Unit Hyd. peak  (cms)=       0.17          0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.01          0.00          0.011 (iii)
     TIME TO PEAK    (hrs)=       0.50          0.50           0.50
     RUNOFF VOLUME    (mm)=      37.50         32.45          37.45
     TOTAL RAINFALL   (mm)=      38.50         38.50          38.50
     RUNOFF COEFFICIENT   =       0.97          0.84           0.97

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
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| STANDHYD (  0100)|   Area    (ha)=   3.16
|ID= 1 DT=10.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.03         0.13
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       4.00         2.00
     Length            (m)=     250.00        40.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
              0.167    2.31 | 0.500   99.33 | 0.833   30.03 |  1.17    2.31
              0.333   25.41 | 0.667   62.37 | 1.000    9.24 |

     Max.Eff.Inten.(mm/hr)=      99.33        86.40
                over (min)       10.00        20.00
     Storage Coeff.  (min)=       2.93 (ii)   10.41 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.16         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.82         0.02      0.824 (iii)
     TIME TO PEAK    (hrs)=       0.50         0.67       0.50
     RUNOFF VOLUME    (mm)=      37.50        32.45      37.30
     TOTAL RAINFALL   (mm)=      38.50        38.50      38.50
     RUNOFF COEFFICIENT   =       0.97         0.84       0.97

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0103)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 10.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   0.0750     0.1285
                         0.0130     0.0753   |   0.0930     0.1427
                         0.0340     0.0932   |   0.1200     0.1650
                         0.0520     0.1091   |   1.2510     0.3172

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0100)   3.160     0.824      0.50      37.30
   OUTFLOW: ID= 1 (  0103)   3.160     0.051      1.17      36.83

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  6.23
                  TIME SHIFT OF PEAK FLOW         (min)= 40.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1092

--------------------------------------------------------------------------------
--------------------
| ADD HYD  (  0110)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0103):     3.16   0.051     1.17    36.83
     + ID2= 2 (  0104):     0.04   0.011     0.50    37.45
       ================================================
       ID = 3 (  0110):     3.20   0.052     1.00    36.84

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

--------------------
| ADD HYD  (  0110)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0110):     3.20   0.052     1.00    36.84
     + ID2= 2 (  0109):     1.38   0.150     0.83    28.88
       ================================================
       ID = 1 (  0110):     4.58   0.194     0.83    34.44

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0108)|   Area    (ha)=   0.76   Curve Number   (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

         NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
              0.167    2.31 | 0.500   99.33 | 0.833   30.03 |  1.17    2.31
              0.333   25.41 | 0.667   62.37 | 1.000    9.24 |

    Unit Hyd Qpeak  (cms)=   0.161

    PEAK FLOW       (cms)=   0.112 (i)
    TIME TO PEAK    (hrs)=   0.667
    RUNOFF VOLUME    (mm)=  27.915
    TOTAL RAINFALL   (mm)=  38.500
    RUNOFF COEFFICIENT   =   0.725

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0106)|   Area    (ha)=   1.55
|ID= 1 DT=10.0 min |   Total Imp(%)=  29.00   Dir. Conn.(%)=  29.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.45         1.10
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         4.00
     Length            (m)=     101.65       385.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
              0.167    2.31 | 0.500   99.33 | 0.833   30.03 |  1.17    2.31
              0.333   25.41 | 0.667   62.37 | 1.000    9.24 |
```

```
     Max.Eff.Inten.(mm/hr)=      99.33        58.77
               over (min)       10.00        40.00
     Storage Coeff.  (min)=      2.59 (ii)   30.18 (ii)
     Unit Hyd. Tpeak (min)=     10.00        40.00
     Unit Hyd. peak  (cms)=      0.17         0.03
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.12         0.09      0.137 (iii)
     TIME TO PEAK    (hrs)=      0.50         1.00       0.50
     RUNOFF VOLUME    (mm)=     37.50        32.45      33.91
     TOTAL RAINFALL   (mm)=     38.50        38.50      38.50
     RUNOFF COEFFICIENT   =      0.97         0.84       0.88

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    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 (  0107)|   Area    (ha)=   0.63
|ID= 1 DT=10.0 min |   Total Imp(%)=  79.00   Dir. Conn.(%)=  79.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.50         0.13
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      3.00         2.00
     Length            (m)=    405.00        40.00
     Mannings n            =     0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
    0.167    2.31 | 0.500   99.33 | 0.833   30.03 |  1.17    2.31
    0.333   25.41 | 0.667   62.37 | 1.000    9.24 |

     Max.Eff.Inten.(mm/hr)=      99.33        86.40
               over (min)       10.00        20.00
     Storage Coeff.  (min)=      4.26 (ii)   11.75 (ii)
     Unit Hyd. Tpeak (min)=     10.00        20.00
     Unit Hyd. peak  (cms)=      0.15         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.13         0.02       0.135 (iii)
     TIME TO PEAK    (hrs)=      0.50         0.67       0.50
     RUNOFF VOLUME    (mm)=     37.50        32.45      36.43
     TOTAL RAINFALL   (mm)=     38.50        38.50      38.50
     RUNOFF COEFFICIENT   =      0.97         0.84       0.95

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    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  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0106):      1.55    0.137     0.50    33.91
     + ID2= 2 (  0107):      0.63    0.135     0.50    36.43
       ==================================================
       ID = 3 (  0010):      2.18    0.272     0.50    34.64

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

--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0010):      2.18    0.272     0.50    34.64
     + ID2= 2 (  0108):      0.76    0.112     0.67    27.92
       ==================================================
       ID = 1 (  0010):      2.94    0.350     0.50    32.90

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

--------------------
| ADD HYD  (  0113)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0010):      2.94    0.350     0.50    32.90
     + ID2= 2 (  0110):      4.58    0.194     0.83    34.44
       ==================================================
       ID = 3 (  0113):      7.52    0.484     0.67    33.84

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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================================================================================
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      V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
      V    V   I    SS     U   U   A A   L
       V  V    I     SS    U   U  AAAAA  L
       V  V    I      SS   U   U  A   A  L
        VV     I    SSSSS  UUUUU  A   A  LLLLL

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-33eb-4790-
b5ab-2fe711ab4c1b\0337d498-5cee-4259-a615-8acf26458ace\scenari
  Summary filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-33eb-4790-
b5ab-2fe711ab4c1b\0337d498-5cee-4259-a615-8acf26458ace\scenari

DATE: 04/22/2024                          TIME: 11:21:44
```

USER:

COMMENTS: _____

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**********
** SIMULATION : G - 10Y12 **
**********

| READ STORM | Filename: C:\Users\qdar\AppData\Local\Temp\76b488fe-908e-4071-918b-7207f3d34655\94fd42c2 |
|---|---|
| Ptotal= 62.90 mm | Comments: 10Y12 UPDATED |

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.60 | 3.00 | 10.70 | 6.00 | 4.40 | 9.00 | 0.60 |
| 0.25 | 0.60 | 3.25 | 10.70 | 6.25 | 4.40 | 9.25 | 0.60 |
| 0.50 | 0.60 | 3.50 | 10.70 | 6.50 | 4.40 | 9.50 | 0.60 |
| 0.75 | 0.60 | 3.75 | 10.70 | 6.75 | 4.40 | 9.75 | 0.60 |
| 1.00 | 0.60 | 4.00 | 29.00 | 7.00 | 2.50 | 10.00 | 0.60 |
| 1.25 | 0.60 | 4.25 | 29.00 | 7.25 | 2.50 | 10.25 | 0.60 |
| 1.50 | 0.60 | 4.50 | 29.00 | 7.50 | 2.50 | 10.50 | 0.60 |
| 1.75 | 0.60 | 4.75 | 29.00 | 7.75 | 2.50 | 10.75 | 0.60 |
| 2.00 | 3.80 | 5.00 | 8.20 | 8.00 | 1.30 | 11.00 | 0.60 |
| 2.25 | 3.80 | 5.25 | 8.20 | 8.25 | 1.30 | 11.25 | 0.60 |
| 2.50 | 3.80 | 5.50 | 8.20 | 8.50 | 1.30 | 11.50 | 0.60 |
| 2.75 | 3.80 | 5.75 | 8.20 | 8.75 | 1.30 | 11.75 | 0.60 |
| 2.833 | 3.80 | 5.833 | 8.20 | 8.833 | 1.30 | 11.83 | 0.60 |
| 3.000 | 3.80 | 6.000 | 8.20 | 9.000 | 1.30 | 12.00 | 0.60 |

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| CALIB | |
|---|---|
| NASHYD ( 0109) | Area (ha)= 1.38 Curve Number (CN)= 98.0 |
| ID= 1 DT=10.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00 |
| | U.H. Tp(hrs)= 0.32 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.60 | 3.167 | 10.70 | 6.167 | 4.40 | 9.17 | 0.60 |
| 0.333 | 0.60 | 3.333 | 10.70 | 6.333 | 4.40 | 9.33 | 0.60 |
| 0.500 | 0.60 | 3.500 | 10.70 | 6.500 | 4.40 | 9.50 | 0.60 |
| 0.667 | 0.60 | 3.667 | 10.70 | 6.667 | 4.40 | 9.67 | 0.60 |
| 0.833 | 0.60 | 3.833 | 10.70 | 6.833 | 4.40 | 9.83 | 0.60 |
| 1.000 | 0.60 | 4.000 | 10.70 | 7.000 | 4.40 | 10.00 | 0.60 |
| 1.167 | 0.60 | 4.167 | 29.00 | 7.167 | 2.50 | 10.17 | 0.60 |
| 1.333 | 0.60 | 4.333 | 29.00 | 7.333 | 2.50 | 10.33 | 0.60 |
| 1.500 | 0.60 | 4.500 | 29.00 | 7.500 | 2.50 | 10.50 | 0.60 |
| 1.667 | 0.60 | 4.667 | 29.00 | 7.667 | 2.50 | 10.67 | 0.60 |
| 1.833 | 0.60 | 4.833 | 29.00 | 7.833 | 2.50 | 10.83 | 0.60 |
| 2.000 | 0.60 | 5.000 | 29.00 | 8.000 | 2.50 | 11.00 | 0.60 |
| 2.167 | 3.80 | 5.167 | 8.20 | 8.167 | 1.30 | 11.17 | 0.60 |
| 2.333 | 3.80 | 5.333 | 8.20 | 8.333 | 1.30 | 11.33 | 0.60 |
| 2.500 | 3.80 | 5.500 | 8.20 | 8.500 | 1.30 | 11.50 | 0.60 |
| 2.667 | 3.80 | 5.667 | 8.20 | 8.667 | 1.30 | 11.67 | 0.60 |
| 2.833 | 3.80 | 5.833 | 8.20 | 8.833 | 1.30 | 11.83 | 0.60 |
| 3.000 | 3.80 | 6.000 | 8.20 | 9.000 | 1.30 | 12.00 | 0.60 |

Unit Hyd Qpeak (cms)= 0.165

PEAK FLOW (cms)= 0.105 (i)
TIME TO PEAK (hrs)= 5.000
RUNOFF VOLUME (mm)= 52.902
TOTAL RAINFALL (mm)= 62.900
RUNOFF COEFFICIENT = 0.841

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

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| CALIB | |
|---|---|
| STANDHYD ( 0104) | Area (ha)= 0.04 |
| ID= 1 DT=10.0 min | Total Imp(%)= 99.00 Dir. Conn.(%)= 99.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.04 | 0.00 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 1.00 | 2.00 |
| Length | (m)= | 16.33 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.60 | 3.167 | 10.70 | 6.167 | 4.40 | 9.17 | 0.60 |
| 0.333 | 0.60 | 3.333 | 10.70 | 6.333 | 4.40 | 9.33 | 0.60 |
| 0.500 | 0.60 | 3.500 | 10.70 | 6.500 | 4.40 | 9.50 | 0.60 |
| 0.667 | 0.60 | 3.667 | 10.70 | 6.667 | 4.40 | 9.67 | 0.60 |
| 0.833 | 0.60 | 3.833 | 10.70 | 6.833 | 4.40 | 9.83 | 0.60 |
| 1.000 | 0.60 | 4.000 | 10.70 | 7.000 | 4.40 | 10.00 | 0.60 |
| 1.167 | 0.60 | 4.167 | 29.00 | 7.167 | 2.50 | 10.17 | 0.60 |
| 1.333 | 0.60 | 4.333 | 29.00 | 7.333 | 2.50 | 10.33 | 0.60 |
| 1.500 | 0.60 | 4.500 | 29.00 | 7.500 | 2.50 | 10.50 | 0.60 |
| 1.667 | 0.60 | 4.667 | 29.00 | 7.667 | 2.50 | 10.67 | 0.60 |
| 1.833 | 0.60 | 4.833 | 29.00 | 7.833 | 2.50 | 10.83 | 0.60 |
| 2.000 | 0.60 | 5.000 | 29.00 | 8.000 | 2.50 | 11.00 | 0.60 |
| 2.167 | 3.80 | 5.167 | 8.20 | 8.167 | 1.30 | 11.17 | 0.60 |
| 2.333 | 3.80 | 5.333 | 8.20 | 8.333 | 1.30 | 11.33 | 0.60 |
| 2.500 | 3.80 | 5.500 | 8.20 | 8.500 | 1.30 | 11.50 | 0.60 |
| 2.667 | 3.80 | 5.667 | 8.20 | 8.667 | 1.30 | 11.67 | 0.60 |
| 2.833 | 3.80 | 5.833 | 8.20 | 8.833 | 1.30 | 11.83 | 0.60 |
| 3.000 | 3.80 | 6.000 | 8.20 | 9.000 | 1.30 | 12.00 | 0.60 |

| | | | | |
|---|---|---|---|---|
| Max.Eff.Inten. | (mm/hr)= | 29.00 | 28.58 | |
| | over (min) | 10.00 | 20.00 | |
| Storage Coeff. | (min)= | 1.41 (ii) | 13.06 (ii) | |
| Unit Hyd. Tpeak | (min)= | 10.00 | 20.00 | |
| Unit Hyd. peak | (cms)= | 0.17 | 0.07 | |
| | | | | *TOTALS* |
| PEAK FLOW | (cms)= | 0.00 | 0.00 | 0.003 (iii) |
| TIME TO PEAK | (hrs)= | 4.50 | 5.00 | 5.00 |
| RUNOFF VOLUME | (mm)= | 61.90 | 56.62 | 60.04 |
| TOTAL RAINFALL | (mm)= | 62.90 | 62.90 | 62.90 |
| RUNOFF COEFFICIENT | = | 0.98 | 0.90 | 0.95 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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 ( 0100) | Area (ha)= 3.16 |
| ID= 1 DT=10.0 min | Total Imp(%)= 96.00 Dir. Conn.(%)= 96.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 3.03 | 0.13 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 4.00 | 2.00 |
| Length | (m)= | 250.00 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.60 | 3.167 | 10.70 | 6.167 | 4.40 | 9.17 | 0.60 |
| 0.333 | 0.60 | 3.333 | 10.70 | 6.333 | 4.40 | 9.33 | 0.60 |
| 0.500 | 0.60 | 3.500 | 10.70 | 6.500 | 4.40 | 9.50 | 0.60 |
| 0.667 | 0.60 | 3.667 | 10.70 | 6.667 | 4.40 | 9.67 | 0.60 |
| 0.833 | 0.60 | 3.833 | 10.70 | 6.833 | 4.40 | 9.83 | 0.60 |
| 1.000 | 0.60 | 4.000 | 10.70 | 7.000 | 4.40 | 10.00 | 0.60 |
| 1.167 | 0.60 | 4.167 | 29.00 | 7.167 | 2.50 | 10.17 | 0.60 |
| 1.333 | 0.60 | 4.333 | 29.00 | 7.333 | 2.50 | 10.33 | 0.60 |
| 1.500 | 0.60 | 4.500 | 29.00 | 7.500 | 2.50 | 10.50 | 0.60 |
| 1.667 | 0.60 | 4.667 | 29.00 | 7.667 | 2.50 | 10.67 | 0.60 |
| 1.833 | 0.60 | 4.833 | 29.00 | 7.833 | 2.50 | 10.83 | 0.60 |
| 2.000 | 0.60 | 5.000 | 29.00 | 8.000 | 2.50 | 11.00 | 0.60 |
| 2.167 | 3.80 | 5.167 | 8.20 | 8.167 | 1.30 | 11.17 | 0.60 |
| 2.333 | 3.80 | 5.333 | 8.20 | 8.333 | 1.30 | 11.33 | 0.60 |
| 2.500 | 3.80 | 5.500 | 8.20 | 8.500 | 1.30 | 11.50 | 0.60 |
| 2.667 | 3.80 | 5.667 | 8.20 | 8.667 | 1.30 | 11.67 | 0.60 |
| 2.833 | 3.80 | 5.833 | 8.20 | 8.833 | 1.30 | 11.83 | 0.60 |
| 3.000 | 3.80 | 6.000 | 8.20 | 9.000 | 1.30 | 12.00 | 0.60 |

| | | | | *TOTALS* |
|---|---|---|---|---|
| Max.Eff.Inten. | (mm/hr)= | 29.00 | 28.58 | |
| over | (min) | 10.00 | 20.00 | |
| Storage Coeff. | (min)= | 4.79 (ii) | 16.44 (ii) | |
| Unit Hyd. Tpeak | (min)= | 10.00 | 20.00 | |
| Unit Hyd. peak | (cms)= | 0.15 | 0.06 | |
| PEAK FLOW | (cms)= | 0.24 | 0.01 | 0.254 (iii) |
| TIME TO PEAK | (hrs)= | 5.00 | 5.00 | 5.00 |
| RUNOFF VOLUME | (mm)= | 61.90 | 56.62 | 61.69 |
| TOTAL RAINFALL | (mm)= | 62.90 | 62.90 | 62.90 |
| RUNOFF COEFFICIENT | = | 0.98 | 0.90 | 0.98 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

---

| RESERVOIR( 0103) | OVERFLOW IS OFF |
|---|---|
| IN= 2---> OUT= 1 | |
| DT= 10.0 min | |

| OUTFLOW (cms) | STORAGE (ha.m.) | OUTFLOW (cms) | STORAGE (ha.m.) |
|---|---|---|---|
| 0.0000 | 0.0000 | 0.0750 | 0.1285 |
| 0.0130 | 0.0753 | 0.0930 | 0.1427 |
| 0.0340 | 0.0932 | 0.1200 | 0.1650 |
| 0.0520 | 0.1091 | 1.2510 | 0.3172 |

| | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
|---|---|---|---|---|
| INFLOW : ID= 2 ( 0100) | 3.160 | 0.254 | 5.00 | 61.69 |
| OUTFLOW: ID= 1 ( 0103) | 3.160 | 0.071 | 6.00 | 61.22 |

PEAK FLOW REDUCTION [Qout/Qin](%)= 27.78
TIME SHIFT OF PEAK FLOW (min)= 60.00
MAXIMUM STORAGE USED (ha.m.)= 0.1248

---

| ADD HYD ( 0110) | | | | | |
|---|---|---|---|---|---|
| 1 + 2 = 3 | | AREA | QPEAK | TPEAK | R.V. |
| | | (ha) | (cms) | (hrs) | (mm) |
| | ID1= 1 ( 0103): | 3.16 | 0.071 | 6.00 | 61.22 |
| | + ID2= 2 ( 0104): | 0.04 | 0.003 | 5.00 | 60.04 |
| | ID = 3 ( 0110): | 3.20 | 0.072 | 6.00 | 61.21 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| ADD HYD ( 0110) | | | | | |
|---|---|---|---|---|---|
| 3 + 2 = 1 | | AREA | QPEAK | TPEAK | R.V. |
| | | (ha) | (cms) | (hrs) | (mm) |
| | ID1= 3 ( 0110): | 3.20 | 0.072 | 6.00 | 61.21 |
| | + ID2= 2 ( 0109): | 1.38 | 0.105 | 5.00 | 52.90 |
| | ID = 1 ( 0110): | 4.58 | 0.169 | 5.00 | 58.70 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| CALIB | |
|---|---|
| NASHYD ( 0108) | Area (ha)= 0.76 Curve Number (CN)= 98.0 |
| ID= 1 DT=10.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00 |
| | U.H. Tp(hrs)= 0.18 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.60 | 3.167 | 10.70 | 6.167 | 4.40 | 9.17 | 0.60 |
| 0.333 | 0.60 | 3.333 | 10.70 | 6.333 | 4.40 | 9.33 | 0.60 |
| 0.500 | 0.60 | 3.500 | 10.70 | 6.500 | 4.40 | 9.50 | 0.60 |
| 0.667 | 0.60 | 3.667 | 10.70 | 6.667 | 4.40 | 9.67 | 0.60 |
| 0.833 | 0.60 | 3.833 | 10.70 | 6.833 | 4.40 | 9.83 | 0.60 |
| 1.000 | 0.60 | 4.000 | 10.70 | 7.000 | 4.40 | 10.00 | 0.60 |
| 1.167 | 0.60 | 4.167 | 29.00 | 7.167 | 2.50 | 10.17 | 0.60 |
| 1.333 | 0.60 | 4.333 | 29.00 | 7.333 | 2.50 | 10.33 | 0.60 |
| 1.500 | 0.60 | 4.500 | 29.00 | 7.500 | 2.50 | 10.50 | 0.60 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1.667 | 0.60 | 4.667 | 29.00 | 7.667 | 2.50 | 10.67 | 0.60 |
| 1.833 | 0.60 | 4.833 | 29.00 | 7.833 | 2.50 | 10.83 | 0.60 |
| 2.000 | 0.60 | 5.000 | 29.00 | 8.000 | 2.50 | 11.00 | 0.60 |
| 2.167 | 3.80 | 5.167 | 8.20 | 8.167 | 1.30 | 11.17 | 0.60 |
| 2.333 | 3.80 | 5.333 | 8.20 | 8.333 | 1.30 | 11.33 | 0.60 |
| 2.500 | 3.80 | 5.500 | 8.20 | 8.500 | 1.30 | 11.50 | 0.60 |
| 2.667 | 3.80 | 5.667 | 8.20 | 8.667 | 1.30 | 11.67 | 0.60 |
| 2.833 | 3.80 | 5.833 | 8.20 | 8.833 | 1.30 | 11.83 | 0.60 |
| 3.000 | 3.80 | 6.000 | 8.20 | 9.000 | 1.30 | 12.00 | 0.60 |

Unit Hyd Qpeak (cms)= 0.161

PEAK FLOW (cms)= 0.058 (i)
TIME TO PEAK (hrs)= 5.000
RUNOFF VOLUME (mm)= 51.136
TOTAL RAINFALL (mm)= 62.900
RUNOFF COEFFICIENT = 0.813

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

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| CALIB | |
|---|---|
| STANDHYD ( 0106) | Area (ha)= 1.55 |
| ID= 1 DT=10.0 min | Total Imp(%)= 29.00 Dir. Conn.(%)= 29.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.45 | 1.10 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 1.00 | 4.00 |
| Length | (m)= | 101.65 | 385.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.60 | 3.167 | 10.70 | 6.167 | 4.40 | 9.17 | 0.60 |
| 0.333 | 0.60 | 3.333 | 10.70 | 6.333 | 4.40 | 9.33 | 0.60 |
| 0.500 | 0.60 | 3.500 | 10.70 | 6.500 | 4.40 | 9.50 | 0.60 |
| 0.667 | 0.60 | 3.667 | 10.70 | 6.667 | 4.40 | 9.67 | 0.60 |
| 0.833 | 0.60 | 3.833 | 10.70 | 6.833 | 4.40 | 9.83 | 0.60 |
| 1.000 | 0.60 | 4.000 | 10.70 | 7.000 | 4.40 | 10.00 | 0.60 |
| 1.167 | 0.60 | 4.167 | 29.00 | 7.167 | 2.50 | 10.17 | 0.60 |
| 1.333 | 0.60 | 4.333 | 29.00 | 7.333 | 2.50 | 10.33 | 0.60 |
| 1.500 | 0.60 | 4.500 | 29.00 | 7.500 | 2.50 | 10.50 | 0.60 |
| 1.667 | 0.60 | 4.667 | 29.00 | 7.667 | 2.50 | 10.67 | 0.60 |
| 1.833 | 0.60 | 4.833 | 29.00 | 7.833 | 2.50 | 10.83 | 0.60 |
| 2.000 | 0.60 | 5.000 | 29.00 | 8.000 | 2.50 | 11.00 | 0.60 |
| 2.167 | 3.80 | 5.167 | 8.20 | 8.167 | 1.30 | 11.17 | 0.60 |
| 2.333 | 3.80 | 5.333 | 8.20 | 8.333 | 1.30 | 11.33 | 0.60 |
| 2.500 | 3.80 | 5.500 | 8.20 | 8.500 | 1.30 | 11.50 | 0.60 |
| 2.667 | 3.80 | 5.667 | 8.20 | 8.667 | 1.30 | 11.67 | 0.60 |
| 2.833 | 3.80 | 5.833 | 8.20 | 8.833 | 1.30 | 11.83 | 0.60 |
| 3.000 | 3.80 | 6.000 | 8.20 | 9.000 | 1.30 | 12.00 | 0.60 |

| | | | | |
|---|---|---|---|---|
| Max.Eff.Inten. | (mm/hr)= | 29.00 | 28.45 | |
| | over (min) | 10.00 | 50.00 | |
| Storage Coeff. | (min)= | 4.23 (ii) | 41.11 (ii) | |
| Unit Hyd. Tpeak | (min)= | 10.00 | 50.00 | |
| Unit Hyd. peak | (cms)= | 0.15 | 0.03 | |
| | | | | *TOTALS* |
| PEAK FLOW | (cms)= | 0.04 | 0.06 | 0.095 (iii) |
| TIME TO PEAK | (hrs)= | 5.00 | 5.33 | 5.00 |
| RUNOFF VOLUME | (mm)= | 61.90 | 56.62 | 58.14 |
| TOTAL RAINFALL | (mm)= | 62.90 | 62.90 | 62.90 |
| RUNOFF COEFFICIENT | = | 0.98 | 0.90 | 0.92 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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 ( 0107) | Area (ha)= 0.63 |
| ID= 1 DT=10.0 min | Total Imp(%)= 79.00 Dir. Conn.(%)= 79.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.50 | 0.13 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 3.00 | 2.00 |
| Length | (m)= | 405.00 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.60 | 3.167 | 10.70 | 6.167 | 4.40 | 9.17 | 0.60 |
| 0.333 | 0.60 | 3.333 | 10.70 | 6.333 | 4.40 | 9.33 | 0.60 |
| 0.500 | 0.60 | 3.500 | 10.70 | 6.500 | 4.40 | 9.50 | 0.60 |
| 0.667 | 0.60 | 3.667 | 10.70 | 6.667 | 4.40 | 9.67 | 0.60 |
| 0.833 | 0.60 | 3.833 | 10.70 | 6.833 | 4.40 | 9.83 | 0.60 |
| 1.000 | 0.60 | 4.000 | 10.70 | 7.000 | 4.40 | 10.00 | 0.60 |
| 1.167 | 0.60 | 4.167 | 29.00 | 7.167 | 2.50 | 10.17 | 0.60 |
| 1.333 | 0.60 | 4.333 | 29.00 | 7.333 | 2.50 | 10.33 | 0.60 |
| 1.500 | 0.60 | 4.500 | 29.00 | 7.500 | 2.50 | 10.50 | 0.60 |
| 1.667 | 0.60 | 4.667 | 29.00 | 7.667 | 2.50 | 10.67 | 0.60 |
| 1.833 | 0.60 | 4.833 | 29.00 | 7.833 | 2.50 | 10.83 | 0.60 |
| 2.000 | 0.60 | 5.000 | 29.00 | 8.000 | 2.50 | 11.00 | 0.60 |
| 2.167 | 3.80 | 5.167 | 8.20 | 8.167 | 1.30 | 11.17 | 0.60 |
| 2.333 | 3.80 | 5.333 | 8.20 | 8.333 | 1.30 | 11.33 | 0.60 |
| 2.500 | 3.80 | 5.500 | 8.20 | 8.500 | 1.30 | 11.50 | 0.60 |
| 2.667 | 3.80 | 5.667 | 8.20 | 8.667 | 1.30 | 11.67 | 0.60 |
| 2.833 | 3.80 | 5.833 | 8.20 | 8.833 | 1.30 | 11.83 | 0.60 |
| 3.000 | 3.80 | 6.000 | 8.20 | 9.000 | 1.30 | 12.00 | 0.60 |

| | | | | |
|---|---|---|---|---|
| Max.Eff.Inten. | (mm/hr)= | 29.00 | 28.58 | |
| | over (min) | 10.00 | 20.00 | |
| Storage Coeff. | (min)= | 6.98 (ii) | 18.62 (ii) | |
| Unit Hyd. Tpeak | (min)= | 10.00 | 20.00 | |
| Unit Hyd. peak | (cms)= | 0.13 | 0.06 | |
| | | | | *TOTALS* |
| PEAK FLOW | (cms)= | 0.04 | 0.01 | 0.050 (iii) |
| TIME TO PEAK | (hrs)= | 5.00 | 5.00 | 5.00 |
| RUNOFF VOLUME | (mm)= | 61.90 | 56.62 | 60.78 |
| TOTAL RAINFALL | (mm)= | 62.90 | 62.90 | 62.90 |
| RUNOFF COEFFICIENT | = | 0.98 | 0.90 | 0.97 |

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

```
       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  98.0    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  (  0010)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0106):     1.55   0.095     5.00    58.14
      + ID2= 2 (  0107):     0.63   0.050     5.00    60.78
        ====================================================
        ID = 3 (  0010):     2.18   0.145     5.00    58.90

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

--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0010):     2.18   0.145     5.00    58.90
      + ID2= 2 (  0108):     0.76   0.058     5.00    51.14
        ====================================================
        ID = 1 (  0010):     2.94   0.203     5.00    56.89

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

--------------------
| ADD HYD  (  0113)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0010):     2.94   0.203     5.00    56.89
      + ID2= 2 (  0110):     4.58   0.169     5.00    58.70
        ====================================================
        ID = 3 (  0113):     7.52   0.371     5.00    58.00

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
================================================================================
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       V    V   I    SSSSS  U   U    A    L             (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-33eb-4790-
b5ab-2fe711ab4c1b\c534cc55-1f3a-42b7-97f0-7500b7759e15\scenari
  Summary filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-33eb-4790-
b5ab-2fe711ab4c1b\c534cc55-1f3a-42b7-97f0-7500b7759e15\scenari

DATE: 04/22/2024                          TIME: 11:21:45

USER:


COMMENTS: _____________________________________________________

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  **********************************************
  ** SIMULATION : H - 25Y1                     **
  **********************************************


--------------------
|    READ STORM    |    Filename: C:\Users\qdar\AppD
|                  |              ata\Local\Temp\
|                  |              76b488fe-908e-4071-918b-7207f3d34655\49a39099
| Ptotal= 45.90 mm |    Comments: 25Y1
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    0.00 |  0.33   82.62 |  0.67   44.06 |  1.00    5.51
                0.08    5.51 |  0.42  154.22 |  0.75   27.54 |
                0.17   16.52 |  0.50   82.62 |  0.83   16.52 |
                0.25   44.06 |  0.58   66.10 |  0.92    5.51 |

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

--------------------
| CALIB            |
| NASHYD   (  0109)|   Area    (ha)=   1.38   Curve Number    (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.32

        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
               0.167    2.75 | 0.500  118.42 | 0.833   35.80 |  1.17    2.75
               0.333   30.29 | 0.667   74.36 | 1.000   11.01 |

     Unit Hyd Qpeak  (cms)=   0.165

     PEAK FLOW       (cms)=   0.188 (i)
     TIME TO PEAK    (hrs)=   0.833
     RUNOFF VOLUME    (mm)=  36.134
     TOTAL RAINFALL   (mm)=  45.899
     RUNOFF COEFFICIENT   =   0.787

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

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--------------------
| CALIB            |
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```
| STANDHYD (  0104)|   Area    (ha)=   0.04
|ID= 1 DT=10.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.04         0.00
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      16.33        40.00
     Mannings n            =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
              0.167    2.75 | 0.500  118.42 | 0.833   35.80 |  1.17    2.75
              0.333   30.29 | 0.667   74.36 | 1.000   11.01 |

     Max.Eff.Inten.(mm/hr)=     118.42       106.45
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      0.80 (ii)    7.69 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.01         0.00        0.013 (iii)
     TIME TO PEAK    (hrs)=      0.50         0.50         0.50
     RUNOFF VOLUME    (mm)=     44.90        39.76        44.84
     TOTAL RAINFALL   (mm)=     45.90        45.90        45.90
     RUNOFF COEFFICIENT   =      0.98         0.87         0.98

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    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 (  0100)|   Area    (ha)=   3.16
|ID= 1 DT=10.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.03         0.13
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       4.00         2.00
     Length            (m)=     250.00        40.00
     Mannings n            =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
              0.167    2.75 | 0.500  118.42 | 0.833   35.80 |  1.17    2.75
              0.333   30.29 | 0.667   74.36 | 1.000   11.01 |

     Max.Eff.Inten.(mm/hr)=     118.42       106.45
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      2.73 (ii)    9.61 (ii)
     Unit Hyd. Tpeak (min)=     10.00        10.00
     Unit Hyd. peak  (cms)=      0.17         0.11
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.98         0.03         1.003 (iii)
     TIME TO PEAK    (hrs)=      0.50         0.67         0.50
     RUNOFF VOLUME    (mm)=     44.90        39.76        44.69
     TOTAL RAINFALL   (mm)=     45.90        45.90        45.90
     RUNOFF COEFFICIENT   =      0.98         0.87         0.97

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0103)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 10.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   0.0750     0.1285
                         0.0130     0.0753   |   0.0930     0.1427
                         0.0340     0.0932   |   0.1200     0.1650
                         0.0520     0.1091   |   1.2510     0.3172

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0100)      3.160     1.003      0.50      44.69
   OUTFLOW: ID= 1 (  0103)      3.160     0.074      1.00      44.23

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  7.38
                  TIME SHIFT OF PEAK FLOW         (min)= 30.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1286

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

--------------------
| ADD HYD  (  0110)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0103):      3.16   0.074     1.00    44.23
     + ID2= 2 (  0104):      0.04   0.013     0.50    44.84
       ================================================
       ID = 3 (  0110):      3.20   0.075     1.00    44.24

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

--------------------
| ADD HYD  (  0110)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0110):      3.20   0.075     1.00    44.24
     + ID2= 2 (  0109):      1.38   0.188     0.83    36.13
       ================================================
       ID = 1 (  0110):      4.58   0.255     0.83    41.80

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0108)|   Area    (ha)=   0.76   Curve Number    (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
```

```
--------------------   U.H. Tp(hrs)=   0.18

        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
              0.167    2.75 | 0.500  118.42 | 0.833   35.80 |  1.17    2.75
              0.333   30.29 | 0.667   74.36 | 1.000   11.01 |

     Unit Hyd Qpeak  (cms)=   0.161

     PEAK FLOW       (cms)=   0.140 (i)
     TIME TO PEAK    (hrs)=   0.667
     RUNOFF VOLUME    (mm)=  34.928
     TOTAL RAINFALL   (mm)=  45.899
     RUNOFF COEFFICIENT   =   0.761

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0106)|   Area    (ha)=   1.55
|ID= 1 DT=10.0 min |   Total Imp(%)=  29.00   Dir. Conn.(%)=  29.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.45         1.10
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      1.00         4.00
     Length            (m)=    101.65       385.00
     Mannings n           =     0.013        0.250

        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
              0.167    2.75 | 0.500  118.42 | 0.833   35.80 |  1.17    2.75
              0.333   30.29 | 0.667   74.36 | 1.000   11.01 |

     Max.Eff.Inten.(mm/hr)=     118.42        71.48
               over (min)       10.00        30.00
     Storage Coeff.  (min)=      2.41 (ii)   27.92 (ii)
     Unit Hyd. Tpeak (min)=     10.00        30.00
     Unit Hyd. peak  (cms)=      0.17         0.04
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.15         0.13       0.176 (iii)
     TIME TO PEAK    (hrs)=      0.50         1.00        0.50
     RUNOFF VOLUME    (mm)=     44.90        39.76       41.24
     TOTAL RAINFALL   (mm)=     45.90        45.90       45.90
     RUNOFF COEFFICIENT   =      0.98         0.87        0.90

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    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 (  0107)|   Area    (ha)=   0.63
|ID= 1 DT=10.0 min |   Total Imp(%)=  79.00   Dir. Conn.(%)=  79.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.50         0.13
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      3.00         2.00
     Length            (m)=    405.00        40.00
     Mannings n           =     0.013        0.250

        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
              0.167    2.75 | 0.500  118.42 | 0.833   35.80 |  1.17    2.75
              0.333   30.29 | 0.667   74.36 | 1.000   11.01 |

     Max.Eff.Inten.(mm/hr)=     118.42       106.45
               over (min)       10.00        20.00
     Storage Coeff.  (min)=      3.97 (ii)   10.86 (ii)
     Unit Hyd. Tpeak (min)=     10.00        20.00
     Unit Hyd. peak  (cms)=      0.16         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.15         0.02       0.164 (iii)
     TIME TO PEAK    (hrs)=      0.50         0.67        0.50
     RUNOFF VOLUME    (mm)=     44.90        39.76       43.81
     TOTAL RAINFALL   (mm)=     45.90        45.90       45.90
     RUNOFF COEFFICIENT   =      0.98         0.87        0.95

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    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  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0106):     1.55   0.176     0.50    41.24
      + ID2= 2 (  0107):     0.63   0.164     0.50    43.81
        ================================================
        ID = 3 (  0010):     2.18   0.340     0.50    41.98

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

--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0010):     2.18   0.340     0.50    41.98
      + ID2= 2 (  0108):     0.76   0.140     0.67    34.93
        ================================================
        ID = 1 (  0010):     2.94   0.442     0.50    40.16

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| ADD HYD  (  0113)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
       ID1= 1 (  0010):     2.94   0.442     0.50    40.16
     + ID2= 2 (  0110):     4.58   0.255     0.83    41.80
       ================================================
       ID = 3 (  0113):     7.52   0.640     0.67    41.15

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

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-33eb-4790-
b5ab-2fe711ab4c1b\0f69fe23-fd05-4238-9fa4-cc622a928d6a\scenari
  Summary filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-33eb-4790-
b5ab-2fe711ab4c1b\0f69fe23-fd05-4238-9fa4-cc622a928d6a\scenari


DATE: 04/22/2024                          TIME: 11:21:44

USER:


COMMENTS: _____________________________________________________________


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  ***********************************************
  ** SIMULATION : I - 25Y12                    **
  ***********************************************


--------------------
|    READ STORM    |    Filename: C:\Users\qdar\AppD
|                  |              ata\Local\Temp\
|                  |              76b488fe-908e-4071-918b-7207f3d34655\65ad33b4
| Ptotal= 72.80 mm |    Comments: 25Y12 UPDATED
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    0.70 |  3.00   12.40 |  6.00    5.10 |  9.00    0.70
                0.25    0.70 |  3.25   12.40 |  6.25    5.10 |  9.25    0.70
                0.50    0.70 |  3.50   12.40 |  6.50    5.10 |  9.50    0.70
                0.75    0.70 |  3.75   12.40 |  6.75    5.10 |  9.75    0.70
                1.00    0.70 |  4.00   33.50 |  7.00    2.90 | 10.00    0.70
                1.25    0.70 |  4.25   33.50 |  7.25    2.90 | 10.25    0.70
                1.50    0.70 |  4.50   33.50 |  7.50    2.90 | 10.50    0.70
                1.75    0.70 |  4.75   33.50 |  7.75    2.90 | 10.75    0.70
                2.00    4.40 |  5.00    9.50 |  8.00    1.50 | 11.00    0.70
                2.25    4.40 |  5.25    9.50 |  8.25    1.50 | 11.25    0.70
                2.50    4.40 |  5.50    9.50 |  8.50    1.50 | 11.50    0.70
                2.75    4.40 |  5.75    9.50 |  8.75    1.50 | 11.75    0.70

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--------------------
| CALIB            |
| NASHYD   (  0109)|   Area     (ha)=   1.38   Curve Number    (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.32

     NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
               0.167    0.70 | 3.167   12.40 | 6.167    5.10 |  9.17    0.70
               0.333    0.70 | 3.333   12.40 | 6.333    5.10 |  9.33    0.70
               0.500    0.70 | 3.500   12.40 | 6.500    5.10 |  9.50    0.70
               0.667    0.70 | 3.667   12.40 | 6.667    5.10 |  9.67    0.70
               0.833    0.70 | 3.833   12.40 | 6.833    5.10 |  9.83    0.70
               1.000    0.70 | 4.000   12.40 | 7.000    5.10 | 10.00    0.70
               1.167    0.70 | 4.167   33.50 | 7.167    2.90 | 10.17    0.70
               1.333    0.70 | 4.333   33.50 | 7.333    2.90 | 10.33    0.70
               1.500    0.70 | 4.500   33.50 | 7.500    2.90 | 10.50    0.70
               1.667    0.70 | 4.667   33.50 | 7.667    2.90 | 10.67    0.70
               1.833    0.70 | 4.833   33.50 | 7.833    2.90 | 10.83    0.70
               2.000    0.70 | 5.000   33.50 | 8.000    2.90 | 11.00    0.70
               2.167    4.40 | 5.167    9.50 | 8.167    1.50 | 11.17    0.70
               2.333    4.40 | 5.333    9.50 | 8.333    1.50 | 11.33    0.70
               2.500    4.40 | 5.500    9.50 | 8.500    1.50 | 11.50    0.70
               2.667    4.40 | 5.667    9.50 | 8.667    1.50 | 11.67    0.70
               2.833    4.40 | 5.833    9.50 | 8.833    1.50 | 11.83    0.70
               3.000    4.40 | 6.000    9.50 | 9.000    1.50 | 12.00    0.70

     Unit Hyd Qpeak  (cms)=   0.165

     PEAK FLOW       (cms)=   0.122 (i)
     TIME TO PEAK    (hrs)=   5.000
     RUNOFF VOLUME    (mm)=  62.700
     TOTAL RAINFALL   (mm)=  72.800
     RUNOFF COEFFICIENT   =   0.861

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

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--------------------
| CALIB            |
| STANDHYD (  0104)|   Area     (ha)=   0.04
|ID= 1 DT=10.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.04          0.00
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       1.00          2.00
```

| | | | |
|---|---|---|---|
| Length | (m)= | 16.33 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.70 | 3.167 | 12.40 | 6.167 | 5.10 | 9.17 | 0.70 |
| 0.333 | 0.70 | 3.333 | 12.40 | 6.333 | 5.10 | 9.33 | 0.70 |
| 0.500 | 0.70 | 3.500 | 12.40 | 6.500 | 5.10 | 9.50 | 0.70 |
| 0.667 | 0.70 | 3.667 | 12.40 | 6.667 | 5.10 | 9.67 | 0.70 |
| 0.833 | 0.70 | 3.833 | 12.40 | 6.833 | 5.10 | 9.83 | 0.70 |
| 1.000 | 0.70 | 4.000 | 12.40 | 7.000 | 5.10 | 10.00 | 0.70 |
| 1.167 | 0.70 | 4.167 | 33.50 | 7.167 | 2.90 | 10.17 | 0.70 |
| 1.333 | 0.70 | 4.333 | 33.50 | 7.333 | 2.90 | 10.33 | 0.70 |
| 1.500 | 0.70 | 4.500 | 33.50 | 7.500 | 2.90 | 10.50 | 0.70 |
| 1.667 | 0.70 | 4.667 | 33.50 | 7.667 | 2.90 | 10.67 | 0.70 |
| 1.833 | 0.70 | 4.833 | 33.50 | 7.833 | 2.90 | 10.83 | 0.70 |
| 2.000 | 0.70 | 5.000 | 33.50 | 8.000 | 2.90 | 11.00 | 0.70 |
| 2.167 | 4.40 | 5.167 | 9.50 | 8.167 | 1.50 | 11.17 | 0.70 |
| 2.333 | 4.40 | 5.333 | 9.50 | 8.333 | 1.50 | 11.33 | 0.70 |
| 2.500 | 4.40 | 5.500 | 9.50 | 8.500 | 1.50 | 11.50 | 0.70 |
| 2.667 | 4.40 | 5.667 | 9.50 | 8.667 | 1.50 | 11.67 | 0.70 |
| 2.833 | 4.40 | 5.833 | 9.50 | 8.833 | 1.50 | 11.83 | 0.70 |
| 3.000 | 4.40 | 6.000 | 9.50 | 9.000 | 1.50 | 12.00 | 0.70 |

| | | | | |
|---|---|---|---|---|
| Max.Eff.Inten. | (mm/hr)= | 33.50 | 33.13 | |
| over | (min) | 10.00 | 20.00 | |
| Storage Coeff. | (min)= | 1.33 (ii) | 12.31 (ii) | |
| Unit Hyd. Tpeak | (min)= | 10.00 | 20.00 | |
| Unit Hyd. peak | (cms)= | 0.17 | 0.07 | |
| | | | | *TOTALS* |
| PEAK FLOW | (cms)= | 0.00 | 0.00 | 0.004 (iii) |
| TIME TO PEAK | (hrs)= | 4.50 | 5.00 | 5.00 |
| RUNOFF VOLUME | (mm)= | 71.80 | 66.47 | 69.64 |
| TOTAL RAINFALL | (mm)= | 72.80 | 72.80 | 72.80 |
| RUNOFF COEFFICIENT | = | 0.99 | 0.91 | 0.96 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB | STANDHYD ( 0100) | Area (ha)= 3.16 |
|---|---|---|
| ID= 1 DT=10.0 min | | Total Imp(%)= 96.00 Dir. Conn.(%)= 96.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 3.03 | 0.13 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 4.00 | 2.00 |
| Length | (m)= | 250.00 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.70 | 3.167 | 12.40 | 6.167 | 5.10 | 9.17 | 0.70 |
| 0.333 | 0.70 | 3.333 | 12.40 | 6.333 | 5.10 | 9.33 | 0.70 |
| 0.500 | 0.70 | 3.500 | 12.40 | 6.500 | 5.10 | 9.50 | 0.70 |
| 0.667 | 0.70 | 3.667 | 12.40 | 6.667 | 5.10 | 9.67 | 0.70 |
| 0.833 | 0.70 | 3.833 | 12.40 | 6.833 | 5.10 | 9.83 | 0.70 |
| 1.000 | 0.70 | 4.000 | 12.40 | 7.000 | 5.10 | 10.00 | 0.70 |
| 1.167 | 0.70 | 4.167 | 33.50 | 7.167 | 2.90 | 10.17 | 0.70 |
| 1.333 | 0.70 | 4.333 | 33.50 | 7.333 | 2.90 | 10.33 | 0.70 |
| 1.500 | 0.70 | 4.500 | 33.50 | 7.500 | 2.90 | 10.50 | 0.70 |
| 1.667 | 0.70 | 4.667 | 33.50 | 7.667 | 2.90 | 10.67 | 0.70 |
| 1.833 | 0.70 | 4.833 | 33.50 | 7.833 | 2.90 | 10.83 | 0.70 |
| 2.000 | 0.70 | 5.000 | 33.50 | 8.000 | 2.90 | 11.00 | 0.70 |
| 2.167 | 4.40 | 5.167 | 9.50 | 8.167 | 1.50 | 11.17 | 0.70 |
| 2.333 | 4.40 | 5.333 | 9.50 | 8.333 | 1.50 | 11.33 | 0.70 |
| 2.500 | 4.40 | 5.500 | 9.50 | 8.500 | 1.50 | 11.50 | 0.70 |
| 2.667 | 4.40 | 5.667 | 9.50 | 8.667 | 1.50 | 11.67 | 0.70 |
| 2.833 | 4.40 | 5.833 | 9.50 | 8.833 | 1.50 | 11.83 | 0.70 |
| 3.000 | 4.40 | 6.000 | 9.50 | 9.000 | 1.50 | 12.00 | 0.70 |

| | | | | |
|---|---|---|---|---|
| Max.Eff.Inten. | (mm/hr)= | 33.50 | 33.13 | |
| over | (min) | 10.00 | 20.00 | |
| Storage Coeff. | (min)= | 4.52 (ii) | 15.50 (ii) | |
| Unit Hyd. Tpeak | (min)= | 10.00 | 20.00 | |
| Unit Hyd. peak | (cms)= | 0.15 | 0.07 | |
| | | | | *TOTALS* |
| PEAK FLOW | (cms)= | 0.28 | 0.01 | 0.294 (iii) |
| TIME TO PEAK | (hrs)= | 5.00 | 5.00 | 5.00 |
| RUNOFF VOLUME | (mm)= | 71.80 | 66.47 | 71.58 |
| TOTAL RAINFALL | (mm)= | 72.80 | 72.80 | 72.80 |
| RUNOFF COEFFICIENT | = | 0.99 | 0.91 | 0.98 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

---

| RESERVOIR( 0103) | OVERFLOW IS OFF | | | |
|---|---|---|---|---|
| IN= 2---> OUT= 1 | | | | |
| DT= 10.0 min | OUTFLOW (cms) | STORAGE (ha.m.) | OUTFLOW (cms) | STORAGE (ha.m.) |
| | 0.0000 | 0.0000 | 0.0750 | 0.1285 |
| | 0.0130 | 0.0753 | 0.0930 | 0.1427 |
| | 0.0340 | 0.0932 | 0.1200 | 0.1650 |
| | 0.0520 | 0.1091 | 1.2510 | 0.3172 |

| | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
|---|---|---|---|---|
| INFLOW : ID= 2 ( 0100) | 3.160 | 0.294 | 5.00 | 71.58 |
| OUTFLOW: ID= 1 ( 0103) | 3.160 | 0.090 | 5.33 | 71.12 |

PEAK FLOW REDUCTION [Qout/Qin](%)= 30.70
TIME SHIFT OF PEAK FLOW (min)= 20.00
MAXIMUM STORAGE USED (ha.m.)= 0.1405

---

| ADD HYD ( 0110) |
|---|

| 1 + 2 = 3 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
|---|---|---|---|---|
| ID1= 1 ( 0103): | 3.16 | 0.090 | 5.33 | 71.12 |
| + ID2= 2 ( 0104): | 0.04 | 0.004 | 5.00 | 69.64 |
| ID = 3 ( 0110): | 3.20 | 0.091 | 5.33 | 71.10 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| ADD HYD ( 0110) | | | | |
|---|---|---|---|---|
| 3 + 2 = 1 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
| ID1= 3 ( 0110): | 3.20 | 0.091 | 5.33 | 71.10 |
| + ID2= 2 ( 0109): | 1.38 | 0.122 | 5.00 | 62.70 |
| ID = 1 ( 0110): | 4.58 | 0.206 | 5.00 | 68.57 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| CALIB | | | | | |
|---|---|---|---|---|---|
| NASHYD ( 0108) | Area (ha)= | 0.76 | Curve Number (CN)= | 98.0 |
| ID= 1 DT=10.0 min | Ia (mm)= | 5.00 | # of Linear Res.(N)= | 3.00 |
| | U.H. Tp(hrs)= | 0.18 | | |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.70 | 3.167 | 12.40 | 6.167 | 5.10 | 9.17 | 0.70 |
| 0.333 | 0.70 | 3.333 | 12.40 | 6.333 | 5.10 | 9.33 | 0.70 |
| 0.500 | 0.70 | 3.500 | 12.40 | 6.500 | 5.10 | 9.50 | 0.70 |
| 0.667 | 0.70 | 3.667 | 12.40 | 6.667 | 5.10 | 9.67 | 0.70 |
| 0.833 | 0.70 | 3.833 | 12.40 | 6.833 | 5.10 | 9.83 | 0.70 |
| 1.000 | 0.70 | 4.000 | 12.40 | 7.000 | 5.10 | 10.00 | 0.70 |
| 1.167 | 0.70 | 4.167 | 33.50 | 7.167 | 2.90 | 10.17 | 0.70 |
| 1.333 | 0.70 | 4.333 | 33.50 | 7.333 | 2.90 | 10.33 | 0.70 |
| 1.500 | 0.70 | 4.500 | 33.50 | 7.500 | 2.90 | 10.50 | 0.70 |
| 1.667 | 0.70 | 4.667 | 33.50 | 7.667 | 2.90 | 10.67 | 0.70 |
| 1.833 | 0.70 | 4.833 | 33.50 | 7.833 | 2.90 | 10.83 | 0.70 |
| 2.000 | 0.70 | 5.000 | 33.50 | 8.000 | 2.90 | 11.00 | 0.70 |
| 2.167 | 4.40 | 5.167 | 9.50 | 8.167 | 1.50 | 11.17 | 0.70 |
| 2.333 | 4.40 | 5.333 | 9.50 | 8.333 | 1.50 | 11.33 | 0.70 |
| 2.500 | 4.40 | 5.500 | 9.50 | 8.500 | 1.50 | 11.50 | 0.70 |
| 2.667 | 4.40 | 5.667 | 9.50 | 8.667 | 1.50 | 11.67 | 0.70 |
| 2.833 | 4.40 | 5.833 | 9.50 | 8.833 | 1.50 | 11.83 | 0.70 |
| 3.000 | 4.40 | 6.000 | 9.50 | 9.000 | 1.50 | 12.00 | 0.70 |

Unit Hyd Qpeak (cms)= 0.161

PEAK FLOW (cms)= 0.067 (i)
TIME TO PEAK (hrs)= 5.000
RUNOFF VOLUME (mm)= 60.606
TOTAL RAINFALL (mm)= 72.800
RUNOFF COEFFICIENT = 0.833

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

---

| CALIB | | | | | |
|---|---|---|---|---|---|
| STANDHYD ( 0106) | Area (ha)= | 1.55 | | |
| ID= 1 DT=10.0 min | Total Imp(%)= | 29.00 | Dir. Conn.(%)= | 29.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.45 | 1.10 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 1.00 | 4.00 |
| Length | (m)= | 101.65 | 385.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.70 | 3.167 | 12.40 | 6.167 | 5.10 | 9.17 | 0.70 |
| 0.333 | 0.70 | 3.333 | 12.40 | 6.333 | 5.10 | 9.33 | 0.70 |
| 0.500 | 0.70 | 3.500 | 12.40 | 6.500 | 5.10 | 9.50 | 0.70 |
| 0.667 | 0.70 | 3.667 | 12.40 | 6.667 | 5.10 | 9.67 | 0.70 |
| 0.833 | 0.70 | 3.833 | 12.40 | 6.833 | 5.10 | 9.83 | 0.70 |
| 1.000 | 0.70 | 4.000 | 12.40 | 7.000 | 5.10 | 10.00 | 0.70 |
| 1.167 | 0.70 | 4.167 | 33.50 | 7.167 | 2.90 | 10.17 | 0.70 |
| 1.333 | 0.70 | 4.333 | 33.50 | 7.333 | 2.90 | 10.33 | 0.70 |
| 1.500 | 0.70 | 4.500 | 33.50 | 7.500 | 2.90 | 10.50 | 0.70 |
| 1.667 | 0.70 | 4.667 | 33.50 | 7.667 | 2.90 | 10.67 | 0.70 |
| 1.833 | 0.70 | 4.833 | 33.50 | 7.833 | 2.90 | 10.83 | 0.70 |
| 2.000 | 0.70 | 5.000 | 33.50 | 8.000 | 2.90 | 11.00 | 0.70 |
| 2.167 | 4.40 | 5.167 | 9.50 | 8.167 | 1.50 | 11.17 | 0.70 |
| 2.333 | 4.40 | 5.333 | 9.50 | 8.333 | 1.50 | 11.33 | 0.70 |
| 2.500 | 4.40 | 5.500 | 9.50 | 8.500 | 1.50 | 11.50 | 0.70 |
| 2.667 | 4.40 | 5.667 | 9.50 | 8.667 | 1.50 | 11.67 | 0.70 |
| 2.833 | 4.40 | 5.833 | 9.50 | 8.833 | 1.50 | 11.83 | 0.70 |
| 3.000 | 4.40 | 6.000 | 9.50 | 9.000 | 1.50 | 12.00 | 0.70 |

| | | | | *TOTALS* |
|---|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 33.50 | 33.01 | | |
| over (min) | 10.00 | 40.00 | | |
| Storage Coeff. (min)= | 4.00 (ii) | 38.75 (ii) | | |
| Unit Hyd. Tpeak (min)= | 10.00 | 40.00 | | |
| Unit Hyd. peak (cms)= | 0.16 | 0.03 | | |
| PEAK FLOW (cms)= | 0.04 | 0.08 | | 0.117 (iii) |
| TIME TO PEAK (hrs)= | 5.00 | 5.17 | | 5.00 |
| RUNOFF VOLUME (mm)= | 71.80 | 66.47 | | 68.00 |
| TOTAL RAINFALL (mm)= | 72.80 | 72.80 | | 72.80 |
| RUNOFF COEFFICIENT = | 0.99 | 0.91 | | 0.93 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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 ( 0107) | Area (ha)= | 0.63 | | |
| ID= 1 DT=10.0 min | Total Imp(%)= | 79.00 | Dir. Conn.(%)= | 79.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.50 | 0.13 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 3.00 | 2.00 |

| | | | |
|---|---|---|---|
| Length | (m)= | 405.00 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.70 | 3.167 | 12.40 | 6.167 | 5.10 | 9.17 | 0.70 |
| 0.333 | 0.70 | 3.333 | 12.40 | 6.333 | 5.10 | 9.33 | 0.70 |
| 0.500 | 0.70 | 3.500 | 12.40 | 6.500 | 5.10 | 9.50 | 0.70 |
| 0.667 | 0.70 | 3.667 | 12.40 | 6.667 | 5.10 | 9.67 | 0.70 |
| 0.833 | 0.70 | 3.833 | 12.40 | 6.833 | 5.10 | 9.83 | 0.70 |
| 1.000 | 0.70 | 4.000 | 12.40 | 7.000 | 5.10 | 10.00 | 0.70 |
| 1.167 | 0.70 | 4.167 | 33.50 | 7.167 | 2.90 | 10.17 | 0.70 |
| 1.333 | 0.70 | 4.333 | 33.50 | 7.333 | 2.90 | 10.33 | 0.70 |
| 1.500 | 0.70 | 4.500 | 33.50 | 7.500 | 2.90 | 10.50 | 0.70 |
| 1.667 | 0.70 | 4.667 | 33.50 | 7.667 | 2.90 | 10.67 | 0.70 |
| 1.833 | 0.70 | 4.833 | 33.50 | 7.833 | 2.90 | 10.83 | 0.70 |
| 2.000 | 0.70 | 5.000 | 33.50 | 8.000 | 2.90 | 11.00 | 0.70 |
| 2.167 | 4.40 | 5.167 | 9.50 | 8.167 | 1.50 | 11.17 | 0.70 |
| 2.333 | 4.40 | 5.333 | 9.50 | 8.333 | 1.50 | 11.33 | 0.70 |
| 2.500 | 4.40 | 5.500 | 9.50 | 8.500 | 1.50 | 11.50 | 0.70 |
| 2.667 | 4.40 | 5.667 | 9.50 | 8.667 | 1.50 | 11.67 | 0.70 |
| 2.833 | 4.40 | 5.833 | 9.50 | 8.833 | 1.50 | 11.83 | 0.70 |
| 3.000 | 4.40 | 6.000 | 9.50 | 9.000 | 1.50 | 12.00 | 0.70 |

| | | | | |
|---|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 33.50 | 33.13 | | |
| over (min) | 10.00 | 20.00 | | |
| Storage Coeff. (min)= | 6.59 (ii) | 17.57 (ii) | | |
| Unit Hyd. Tpeak (min)= | 10.00 | 20.00 | | |
| Unit Hyd. peak (cms)= | 0.13 | 0.06 | | |
| | | | *TOTALS* | |
| PEAK FLOW (cms)= | 0.05 | 0.01 | 0.058 (iii) | |
| TIME TO PEAK (hrs)= | 5.00 | 5.00 | 5.00 | |
| RUNOFF VOLUME (mm)= | 71.80 | 66.47 | 70.66 | |
| TOTAL RAINFALL (mm)= | 72.80 | 72.80 | 72.80 | |
| RUNOFF COEFFICIENT = | 0.99 | 0.91 | 0.97 | |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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 ( 0010) \| 1 + 2 = 3 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
|---|---|---|---|---|
| ID1= 1 ( 0106): | 1.55 | 0.117 | 5.00 | 68.00 |
| + ID2= 2 ( 0107): | 0.63 | 0.058 | 5.00 | 70.66 |
| ID = 3 ( 0010): | 2.18 | 0.175 | 5.00 | 68.77 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| ADD HYD ( 0010) \| 3 + 2 = 1 | AREA | QPEAK | TPEAK | R.V. |
|---|---|---|---|---|
| ID1= 3 ( 0010): | 2.18 | 0.175 | 5.00 | 68.77 |
| + ID2= 2 ( 0108): | 0.76 | 0.067 | 5.00 | 60.61 |
| ID = 1 ( 0010): | 2.94 | 0.242 | 5.00 | 66.66 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| ADD HYD ( 0113) \| 1 + 2 = 3 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
|---|---|---|---|---|
| ID1= 1 ( 0010): | 2.94 | 0.242 | 5.00 | 66.66 |
| + ID2= 2 ( 0110): | 4.58 | 0.206 | 5.00 | 68.57 |
| ID = 3 ( 0113): | 7.52 | 0.449 | 5.00 | 67.82 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

V V I SSSSS U U A L (v 6.2.2015)
V V I SS U U A A L
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OOO TTTTT TTTTT H H Y Y M M OOO TM
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O O T T H H Y M M O O
OOO T T H H Y M M OOO

Developed and Distributed by Smart City Water Inc


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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
Output filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-33eb-4790-b5ab-2fe711ab4c1b\3d5e2b4f-6158-477c-99f4-fdba0e7c352e\scenari
Summary filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-33eb-4790-b5ab-2fe711ab4c1b\3d5e2b4f-6158-477c-99f4-fdba0e7c352e\scenari

DATE: 04/22/2024 TIME: 11:21:45

USER:

COMMENTS: _____

**********
** SIMULATION : J - 50Y1 **
**********

---

```
|    READ STORM    |    Filename: C:\Users\qdar\AppD
|                  |              ata\Local\Temp\
|                  |              76b488fe-908e-4071-918b-7207f3d34655\e266291d
| Ptotal= 51.40 mm |    Comments: 50Y1
--------------------
```

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.33 | 92.52 | 0.67 | 49.34 | 1.00 | 6.17 |
| 0.08 | 6.17 | 0.42 | 172.70 | 0.75 | 30.84 | | |
| 0.17 | 18.50 | 0.50 | 92.52 | 0.83 | 18.50 | | |
| 0.25 | 49.34 | 0.58 | 74.02 | 0.92 | 6.17 | | |

```
--------------------
| CALIB            |
| NASHYD   (  0109)|   Area     (ha)=   1.38   Curve Number    (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.32

        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 MIN. TIME STEP.
```

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 3.08 | 0.500 | 132.61 | 0.833 | 40.09 | 1.17 | 3.08 |
| 0.333 | 33.92 | 0.667 | 83.27 | 1.000 | 12.33 | | |

```
     Unit Hyd Qpeak  (cms)=   0.165

     PEAK FLOW       (cms)=   0.215 (i)
     TIME TO PEAK    (hrs)=   0.833
     RUNOFF VOLUME    (mm)=  41.548
     TOTAL RAINFALL   (mm)=  51.399
     RUNOFF COEFFICIENT   =   0.808

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

--------------------
| CALIB            |
| STANDHYD (  0104)|   Area     (ha)=   0.04
|ID= 1 DT=10.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
```

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.04 | 0.00 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 1.00 | 2.00 |
| Length | (m)= | 16.33 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

```
        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 MIN. TIME STEP.
```

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 3.08 | 0.500 | 132.61 | 0.833 | 40.09 | 1.17 | 3.08 |
| 0.333 | 33.92 | 0.667 | 83.27 | 1.000 | 12.33 | | |

| | | | |
|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 132.61 | 121.29 | |
| over (min) | 10.00 | 10.00 | |
| Storage Coeff. (min)= | 0.77 (ii) | 7.30 (ii) | |
| Unit Hyd. Tpeak (min)= | 10.00 | 10.00 | |
| Unit Hyd. peak (cms)= | 0.17 | 0.13 | |
| | | | *TOTALS* |
| PEAK FLOW (cms)= | 0.01 | 0.00 | 0.015 (iii) |
| TIME TO PEAK (hrs)= | 0.50 | 0.50 | 0.50 |
| RUNOFF VOLUME (mm)= | 50.40 | 45.20 | 50.34 |
| TOTAL RAINFALL (mm)= | 51.40 | 51.40 | 51.40 |
| RUNOFF COEFFICIENT = | 0.98 | 0.88 | 0.98 |

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    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 (  0100)|   Area     (ha)=   3.16
|ID= 1 DT=10.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------
```

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 3.03 | 0.13 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 4.00 | 2.00 |
| Length | (m)= | 250.00 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

```
        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 MIN. TIME STEP.
```

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 3.08 | 0.500 | 132.61 | 0.833 | 40.09 | 1.17 | 3.08 |
| 0.333 | 33.92 | 0.667 | 83.27 | 1.000 | 12.33 | | |

| | | | |
|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 132.61 | 121.29 | |
| over (min) | 10.00 | 10.00 | |
| Storage Coeff. (min)= | 2.61 (ii) | 9.14 (ii) | |
| Unit Hyd. Tpeak (min)= | 10.00 | 10.00 | |
| Unit Hyd. peak (cms)= | 0.17 | 0.11 | |
| | | | *TOTALS* |
| PEAK FLOW (cms)= | 1.10 | 0.03 | 1.128 (iii) |
| TIME TO PEAK (hrs)= | 0.50 | 0.50 | 0.50 |
| RUNOFF VOLUME (mm)= | 50.40 | 45.20 | 50.19 |
| TOTAL RAINFALL (mm)= | 51.40 | 51.40 | 51.40 |
| RUNOFF COEFFICIENT = | 0.98 | 0.88 | 0.98 |

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------
| RESERVOIR(  0103)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 10.0 min     |
--------------------
```

| OUTFLOW (cms) | STORAGE (ha.m.) | OUTFLOW (cms) | STORAGE (ha.m.) |
|---|---|---|---|
| 0.0000 | 0.0000 | 0.0750 | 0.1285 |

| | | | | |
|---|---|---|---|---|
| 0.0130 | 0.0753 | 0.0930 | 0.1427 |
| 0.0340 | 0.0932 | 0.1200 | 0.1650 |
| 0.0520 | 0.1091 | 1.2510 | 0.3172 |

| | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
|---|---|---|---|---|
| INFLOW : ID= 2 ( 0100) | 3.160 | 1.128 | 0.50 | 50.19 |
| OUTFLOW: ID= 1 ( 0103) | 3.160 | 0.092 | 1.00 | 49.73 |

PEAK FLOW REDUCTION [Qout/Qin](%)= 8.18
TIME SHIFT OF PEAK FLOW (min)= 30.00
MAXIMUM STORAGE USED (ha.m.)= 0.1429

---

| ADD HYD ( 0110) | | AREA | QPEAK | TPEAK | R.V. |
|---|---|---|---|---|---|
| 1 + 2 = 3 | | (ha) | (cms) | (hrs) | (mm) |
| | ID1= 1 ( 0103): | 3.16 | 0.092 | 1.00 | 49.73 |
| | + ID2= 2 ( 0104): | 0.04 | 0.015 | 0.50 | 50.34 |
| | ID = 3 ( 0110): | 3.20 | 0.094 | 1.00 | 49.74 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| ADD HYD ( 0110) | | AREA | QPEAK | TPEAK | R.V. |
|---|---|---|---|---|---|
| 3 + 2 = 1 | | (ha) | (cms) | (hrs) | (mm) |
| | ID1= 3 ( 0110): | 3.20 | 0.094 | 1.00 | 49.74 |
| | + ID2= 2 ( 0109): | 1.38 | 0.215 | 0.83 | 41.55 |
| | ID = 1 ( 0110): | 4.58 | 0.300 | 0.83 | 47.27 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| CALIB | | | | |
|---|---|---|---|---|
| NASHYD ( 0108) | Area (ha)= 0.76 | Curve Number (CN)= 98.0 |
| ID= 1 DT=10.0 min | Ia (mm)= 5.00 | # of Linear Res.(N)= 3.00 |
| | U.H. Tp(hrs)= 0.18 | |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 3.08 | 0.500 | 132.61 | 0.833 | 40.09 | 1.17 | 3.08 |
| 0.333 | 33.92 | 0.667 | 83.27 | 1.000 | 12.33 | | |

Unit Hyd Qpeak (cms)= 0.161

PEAK FLOW (cms)= 0.161 (i)
TIME TO PEAK (hrs)= 0.667
RUNOFF VOLUME (mm)= 40.160
TOTAL RAINFALL (mm)= 51.399
RUNOFF COEFFICIENT = 0.781

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

---

| CALIB | | |
|---|---|---|
| STANDHYD ( 0106) | Area (ha)= 1.55 | |
| ID= 1 DT=10.0 min | Total Imp(%)= 29.00 | Dir. Conn.(%)= 29.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.45 | 1.10 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 1.00 | 4.00 |
| Length | (m)= | 101.65 | 385.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 3.08 | 0.500 | 132.61 | 0.833 | 40.09 | 1.17 | 3.08 |
| 0.333 | 33.92 | 0.667 | 83.27 | 1.000 | 12.33 | | |

| | | | | *TOTALS* |
|---|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | | 132.61 | 80.89 | |
| over (min) | | 10.00 | 30.00 | |
| Storage Coeff. (min)= | | 2.30 (ii) | 26.58 (ii) | |
| Unit Hyd. Tpeak (min)= | | 10.00 | 30.00 | |
| Unit Hyd. peak (cms)= | | 0.17 | 0.04 | |
| PEAK FLOW | (cms)= | 0.16 | 0.15 | 0.200 (iii) |
| TIME TO PEAK | (hrs)= | 0.50 | 1.00 | 0.50 |
| RUNOFF VOLUME | (mm)= | 50.40 | 45.20 | 46.70 |
| TOTAL RAINFALL | (mm)= | 51.40 | 51.40 | 51.40 |
| RUNOFF COEFFICIENT | = | 0.98 | 0.88 | 0.91 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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 ( 0107) | Area (ha)= 0.63 | |
| ID= 1 DT=10.0 min | Total Imp(%)= 79.00 | Dir. Conn.(%)= 79.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.50 | 0.13 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 3.00 | 2.00 |
| Length | (m)= | 405.00 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 3.08 | 0.500 | 132.61 | 0.833 | 40.09 | 1.17 | 3.08 |
| 0.333 | 33.92 | 0.667 | 83.27 | 1.000 | 12.33 | | |

| | | | |
|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 132.61 | 121.29 |
| over (min) | 10.00 | 20.00 |
| Storage Coeff. (min)= | 3.80 (ii) | 10.33 (ii) |

| | | | |
|---|---|---|---|
| Unit Hyd. Tpeak (min)= | 10.00 | 20.00 | |
| Unit Hyd. peak (cms)= | 0.16 | 0.08 | |
| | | | *TOTALS* |
| PEAK FLOW (cms)= | 0.17 | 0.03 | 0.186 (iii) |
| TIME TO PEAK (hrs)= | 0.50 | 0.67 | 0.50 |
| RUNOFF VOLUME (mm)= | 50.40 | 45.20 | 49.30 |
| TOTAL RAINFALL (mm)= | 51.40 | 51.40 | 51.40 |
| RUNOFF COEFFICIENT = | 0.98 | 0.88 | 0.96 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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 ( 0010) | | AREA | QPEAK | TPEAK | R.V. |
|---|---|---|---|---|---|
| 1 + 2 = 3 | | (ha) | (cms) | (hrs) | (mm) |
| ID1= 1 ( 0106): | | 1.55 | 0.200 | 0.50 | 46.70 |
| + ID2= 2 ( 0107): | | 0.63 | 0.186 | 0.50 | 49.30 |
| ID = 3 ( 0010): | | 2.18 | 0.386 | 0.50 | 47.45 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| ADD HYD ( 0010) | | AREA | QPEAK | TPEAK | R.V. |
|---|---|---|---|---|---|
| 3 + 2 = 1 | | (ha) | (cms) | (hrs) | (mm) |
| ID1= 3 ( 0010): | | 2.18 | 0.386 | 0.50 | 47.45 |
| + ID2= 2 ( 0108): | | 0.76 | 0.161 | 0.67 | 40.16 |
| ID = 1 ( 0010): | | 2.94 | 0.505 | 0.50 | 45.57 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| ADD HYD ( 0113) | | AREA | QPEAK | TPEAK | R.V. |
|---|---|---|---|---|---|
| 1 + 2 = 3 | | (ha) | (cms) | (hrs) | (mm) |
| ID1= 1 ( 0010): | | 2.94 | 0.505 | 0.50 | 45.57 |
| + ID2= 2 ( 0110): | | 4.58 | 0.300 | 0.83 | 47.27 |
| ID = 3 ( 0113): | | 7.52 | 0.742 | 0.67 | 46.60 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

```
V    V   I    SSSSS  U   U    A    L             (v 6.2.2015)
V    V   I    SS     U   U   A A   L
 V  V    I     SS    U   U  AAAAA  L
 V  V    I      SS   U   U  A   A  L
  VV     I    SSSSS  UUUUU  A   A  LLLLL

 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
```



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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
Output filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-33eb-4790-b5ab-2fe711ab4c1b\a51bbe5f-ad19-4a58-84e9-fe085b2ad914\scenari
Summary filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-33eb-4790-b5ab-2fe711ab4c1b\a51bbe5f-ad19-4a58-84e9-fe085b2ad914\scenari

DATE: 04/22/2024 TIME: 11:21:45

USER:

COMMENTS: _____

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```
**********************************************
** SIMULATION : K - 50Y12                    **
**********************************************
```

| READ STORM | Filename: C:\Users\qdar\AppData\Local\Temp\76b488fe-908e-4071-918b-7207f3d34655\597f8121 |
|---|---|
| Ptotal= 80.10 mm | Comments: 50Y12 UPDATED |

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.80 | 3.00 | 13.60 | 6.00 | 5.60 | 9.00 | 0.80 |
| 0.25 | 0.80 | 3.25 | 13.60 | 6.25 | 5.60 | 9.25 | 0.80 |
| 0.50 | 0.80 | 3.50 | 13.60 | 6.50 | 5.60 | 9.50 | 0.80 |
| 0.75 | 0.80 | 3.75 | 13.60 | 6.75 | 5.60 | 9.75 | 0.80 |
| 1.00 | 0.80 | 4.00 | 36.90 | 7.00 | 3.20 | 10.00 | 0.80 |
| 1.25 | 0.80 | 4.25 | 36.90 | 7.25 | 3.20 | 10.25 | 0.80 |
| 1.50 | 0.80 | 4.50 | 36.90 | 7.50 | 3.20 | 10.50 | 0.80 |
| 1.75 | 0.80 | 4.75 | 36.90 | 7.75 | 3.20 | 10.75 | 0.80 |
| 2.00 | 4.80 | 5.00 | 10.40 | 8.00 | 1.60 | 11.00 | 0.80 |
| 2.25 | 4.80 | 5.25 | 10.40 | 8.25 | 1.60 | 11.25 | 0.80 |
| 2.50 | 4.80 | 5.50 | 10.40 | 8.50 | 1.60 | 11.50 | 0.80 |
| 2.75 | 4.80 | 5.75 | 10.40 | 8.75 | 1.60 | 11.75 | 0.80 |

---

| CALIB | | | | | |
|---|---|---|---|---|---|
| NASHYD ( 0109) | Area | (ha)= | 1.38 | Curve Number | (CN)= 98.0 |
| ID= 1 DT=10.0 min | Ia | (mm)= | 5.00 | # of Linear Res. | (N)= 3.00 |
| | U.H. Tp(hrs)= | | 0.32 | | |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.80 | 3.167 | 13.60 | 6.167 | 5.60 | 9.17 | 0.80 |
| 0.333 | 0.80 | 3.333 | 13.60 | 6.333 | 5.60 | 9.33 | 0.80 |
| 0.500 | 0.80 | 3.500 | 13.60 | 6.500 | 5.60 | 9.50 | 0.80 |
| 0.667 | 0.80 | 3.667 | 13.60 | 6.667 | 5.60 | 9.67 | 0.80 |
| 0.833 | 0.80 | 3.833 | 13.60 | 6.833 | 5.60 | 9.83 | 0.80 |
| 1.000 | 0.80 | 4.000 | 13.60 | 7.000 | 5.60 | 10.00 | 0.80 |
| 1.167 | 0.80 | 4.167 | 36.90 | 7.167 | 3.20 | 10.17 | 0.80 |
| 1.333 | 0.80 | 4.333 | 36.90 | 7.333 | 3.20 | 10.33 | 0.80 |
| 1.500 | 0.80 | 4.500 | 36.90 | 7.500 | 3.20 | 10.50 | 0.80 |
| 1.667 | 0.80 | 4.667 | 36.90 | 7.667 | 3.20 | 10.67 | 0.80 |
| 1.833 | 0.80 | 4.833 | 36.90 | 7.833 | 3.20 | 10.83 | 0.80 |
| 2.000 | 0.80 | 5.000 | 36.90 | 8.000 | 3.20 | 11.00 | 0.80 |
| 2.167 | 4.80 | 5.167 | 10.40 | 8.167 | 1.60 | 11.17 | 0.80 |
| 2.333 | 4.80 | 5.333 | 10.40 | 8.333 | 1.60 | 11.33 | 0.80 |
| 2.500 | 4.80 | 5.500 | 10.40 | 8.500 | 1.60 | 11.50 | 0.80 |
| 2.667 | 4.80 | 5.667 | 10.40 | 8.667 | 1.60 | 11.67 | 0.80 |
| 2.833 | 4.80 | 5.833 | 10.40 | 8.833 | 1.60 | 11.83 | 0.80 |
| 3.000 | 4.80 | 6.000 | 10.40 | 9.000 | 1.60 | 12.00 | 0.80 |

| | | | |
|---|---|---|---|
| Unit Hyd Qpeak (cms)= | 0.165 | | |
| PEAK FLOW (cms)= | 0.135 (i) | | |
| TIME TO PEAK (hrs)= | 5.000 | | |
| RUNOFF VOLUME (mm)= | 69.934 | | |
| TOTAL RAINFALL (mm)= | 80.100 | | |
| RUNOFF COEFFICIENT = | 0.873 | | |

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

---

| CALIB | | | |
|---|---|---|---|
| STANDHYD ( 0104) | Area (ha)= | 0.04 | |
| ID= 1 DT=10.0 min | Total Imp(%)= | 99.00 | Dir. Conn.(%)= 99.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.04 | 0.00 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 1.00 | 2.00 |
| Length | (m)= | 16.33 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.80 | 3.167 | 13.60 | 6.167 | 5.60 | 9.17 | 0.80 |
| 0.333 | 0.80 | 3.333 | 13.60 | 6.333 | 5.60 | 9.33 | 0.80 |
| 0.500 | 0.80 | 3.500 | 13.60 | 6.500 | 5.60 | 9.50 | 0.80 |
| 0.667 | 0.80 | 3.667 | 13.60 | 6.667 | 5.60 | 9.67 | 0.80 |
| 0.833 | 0.80 | 3.833 | 13.60 | 6.833 | 5.60 | 9.83 | 0.80 |
| 1.000 | 0.80 | 4.000 | 13.60 | 7.000 | 5.60 | 10.00 | 0.80 |
| 1.167 | 0.80 | 4.167 | 36.90 | 7.167 | 3.20 | 10.17 | 0.80 |
| 1.333 | 0.80 | 4.333 | 36.90 | 7.333 | 3.20 | 10.33 | 0.80 |
| 1.500 | 0.80 | 4.500 | 36.90 | 7.500 | 3.20 | 10.50 | 0.80 |
| 1.667 | 0.80 | 4.667 | 36.90 | 7.667 | 3.20 | 10.67 | 0.80 |
| 1.833 | 0.80 | 4.833 | 36.90 | 7.833 | 3.20 | 10.83 | 0.80 |
| 2.000 | 0.80 | 5.000 | 36.90 | 8.000 | 3.20 | 11.00 | 0.80 |
| 2.167 | 4.80 | 5.167 | 10.40 | 8.167 | 1.60 | 11.17 | 0.80 |
| 2.333 | 4.80 | 5.333 | 10.40 | 8.333 | 1.60 | 11.33 | 0.80 |
| 2.500 | 4.80 | 5.500 | 10.40 | 8.500 | 1.60 | 11.50 | 0.80 |
| 2.667 | 4.80 | 5.667 | 10.40 | 8.667 | 1.60 | 11.67 | 0.80 |
| 2.833 | 4.80 | 5.833 | 10.40 | 8.833 | 1.60 | 11.83 | 0.80 |
| 3.000 | 4.80 | 6.000 | 10.40 | 9.000 | 1.60 | 12.00 | 0.80 |

| | | | | |
|---|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 36.90 | 36.56 | | |
| over (min) | 10.00 | 20.00 | | |
| Storage Coeff. (min)= | 1.28 (ii) | 11.84 (ii) | | |
| Unit Hyd. Tpeak (min)= | 10.00 | 20.00 | | |
| Unit Hyd. peak (cms)= | 0.17 | 0.08 | | |
| | | | *TOTALS* | |
| PEAK FLOW (cms)= | 0.00 | 0.00 | 0.004 (iii) | |
| TIME TO PEAK (hrs)= | 4.50 | 5.00 | 5.00 | |
| RUNOFF VOLUME (mm)= | 79.10 | 73.74 | 76.64 | |
| TOTAL RAINFALL (mm)= | 80.10 | 80.10 | 80.10 | |
| RUNOFF COEFFICIENT = | 0.99 | 0.92 | 0.96 | |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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 ( 0100) | Area (ha)= | 3.16 | |
| ID= 1 DT=10.0 min | Total Imp(%)= | 96.00 | Dir. Conn.(%)= 96.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 3.03 | 0.13 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 4.00 | 2.00 |
| Length | (m)= | 250.00 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.80 | 3.167 | 13.60 | 6.167 | 5.60 | 9.17 | 0.80 |
| 0.333 | 0.80 | 3.333 | 13.60 | 6.333 | 5.60 | 9.33 | 0.80 |
| 0.500 | 0.80 | 3.500 | 13.60 | 6.500 | 5.60 | 9.50 | 0.80 |
| 0.667 | 0.80 | 3.667 | 13.60 | 6.667 | 5.60 | 9.67 | 0.80 |
| 0.833 | 0.80 | 3.833 | 13.60 | 6.833 | 5.60 | 9.83 | 0.80 |
| 1.000 | 0.80 | 4.000 | 13.60 | 7.000 | 5.60 | 10.00 | 0.80 |
| 1.167 | 0.80 | 4.167 | 36.90 | 7.167 | 3.20 | 10.17 | 0.80 |
| 1.333 | 0.80 | 4.333 | 36.90 | 7.333 | 3.20 | 10.33 | 0.80 |
| 1.500 | 0.80 | 4.500 | 36.90 | 7.500 | 3.20 | 10.50 | 0.80 |
| 1.667 | 0.80 | 4.667 | 36.90 | 7.667 | 3.20 | 10.67 | 0.80 |
| 1.833 | 0.80 | 4.833 | 36.90 | 7.833 | 3.20 | 10.83 | 0.80 |
| 2.000 | 0.80 | 5.000 | 36.90 | 8.000 | 3.20 | 11.00 | 0.80 |
| 2.167 | 4.80 | 5.167 | 10.40 | 8.167 | 1.60 | 11.17 | 0.80 |
| 2.333 | 4.80 | 5.333 | 10.40 | 8.333 | 1.60 | 11.33 | 0.80 |
| 2.500 | 4.80 | 5.500 | 10.40 | 8.500 | 1.60 | 11.50 | 0.80 |
| 2.667 | 4.80 | 5.667 | 10.40 | 8.667 | 1.60 | 11.67 | 0.80 |
| 2.833 | 4.80 | 5.833 | 10.40 | 8.833 | 1.60 | 11.83 | 0.80 |
| 3.000 | 4.80 | 6.000 | 10.40 | 9.000 | 1.60 | 12.00 | 0.80 |

| | | | |
|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 36.90 | 36.56 | |
| over (min) | 10.00 | 20.00 | |

```
     Storage Coeff.  (min)=       4.35 (ii)   14.91 (ii)
     Unit Hyd. Tpeak (min)=      10.00        20.00
     Unit Hyd. peak  (cms)=       0.15         0.07
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.31         0.01      0.324 (iii)
     TIME TO PEAK    (hrs)=       5.00         5.00       5.00
     RUNOFF VOLUME    (mm)=      79.10        73.74      78.88
     TOTAL RAINFALL   (mm)=      80.10        80.10      80.10
     RUNOFF COEFFICIENT   =       0.99         0.92       0.98

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  98.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| RESERVOIR(  0103)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 10.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   0.0750     0.1285
                         0.0130     0.0753   |   0.0930     0.1427
                         0.0340     0.0932   |   0.1200     0.1650
                         0.0520     0.1091   |   1.2510     0.3172

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0100)      3.160     0.324      5.00      78.88
   OUTFLOW: ID= 1 (  0103)      3.160     0.105      5.33      78.42

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 32.37
                  TIME SHIFT OF PEAK FLOW         (min)= 20.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1526

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

--------------------
| ADD HYD  (  0110)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0103):      3.16   0.105     5.33    78.42
     + ID2= 2 (  0104):      0.04   0.004     5.00    76.64
       ================================================
       ID = 3 (  0110):      3.20   0.106     5.33    78.40

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

--------------------
| ADD HYD  (  0110)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0110):      3.20   0.106     5.33    78.40
     + ID2= 2 (  0109):      1.38   0.135     5.00    69.93
       ================================================
       ID = 1 (  0110):      4.58   0.235     5.00    75.85

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0108)|   Area     (ha)=   0.76   Curve Number    (CN)= 98.0
|ID= 1 DT=10.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
   0.167    0.80 | 3.167   13.60 | 6.167    5.60 |  9.17    0.80
   0.333    0.80 | 3.333   13.60 | 6.333    5.60 |  9.33    0.80
   0.500    0.80 | 3.500   13.60 | 6.500    5.60 |  9.50    0.80
   0.667    0.80 | 3.667   13.60 | 6.667    5.60 |  9.67    0.80
   0.833    0.80 | 3.833   13.60 | 6.833    5.60 |  9.83    0.80
   1.000    0.80 | 4.000   13.60 | 7.000    5.60 | 10.00    0.80
   1.167    0.80 | 4.167   36.90 | 7.167    3.20 | 10.17    0.80
   1.333    0.80 | 4.333   36.90 | 7.333    3.20 | 10.33    0.80
   1.500    0.80 | 4.500   36.90 | 7.500    3.20 | 10.50    0.80
   1.667    0.80 | 4.667   36.90 | 7.667    3.20 | 10.67    0.80
   1.833    0.80 | 4.833   36.90 | 7.833    3.20 | 10.83    0.80
   2.000    0.80 | 5.000   36.90 | 8.000    3.20 | 11.00    0.80
   2.167    4.80 | 5.167   10.40 | 8.167    1.60 | 11.17    0.80
   2.333    4.80 | 5.333   10.40 | 8.333    1.60 | 11.33    0.80
   2.500    4.80 | 5.500   10.40 | 8.500    1.60 | 11.50    0.80
   2.667    4.80 | 5.667   10.40 | 8.667    1.60 | 11.67    0.80
   2.833    4.80 | 5.833   10.40 | 8.833    1.60 | 11.83    0.80
   3.000    4.80 | 6.000   10.40 | 9.000    1.60 | 12.00    0.80

     Unit Hyd Qpeak  (cms)=   0.161

     PEAK FLOW       (cms)=   0.074 (i)
     TIME TO PEAK    (hrs)=   5.000
     RUNOFF VOLUME    (mm)=  67.599
     TOTAL RAINFALL   (mm)=  80.100
     RUNOFF COEFFICIENT   =   0.844

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0106)|   Area     (ha)=   1.55
|ID= 1 DT=10.0 min |   Total Imp(%)=  29.00   Dir. Conn.(%)=  29.00
--------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.45         1.10
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         4.00
     Length            (m)=     101.65       385.00
     Mannings n           =      0.013        0.250

        NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
   0.167    0.80 | 3.167   13.60 | 6.167    5.60 |  9.17    0.80
   0.333    0.80 | 3.333   13.60 | 6.333    5.60 |  9.33    0.80
   0.500    0.80 | 3.500   13.60 | 6.500    5.60 |  9.50    0.80
   0.667    0.80 | 3.667   13.60 | 6.667    5.60 |  9.67    0.80
   0.833    0.80 | 3.833   13.60 | 6.833    5.60 |  9.83    0.80
   1.000    0.80 | 4.000   13.60 | 7.000    5.60 | 10.00    0.80
   1.167    0.80 | 4.167   36.90 | 7.167    3.20 | 10.17    0.80
```

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1.333 | 0.80 | 4.333 | 36.90 | 7.333 | 3.20 | 10.33 | 0.80 |
| 1.500 | 0.80 | 4.500 | 36.90 | 7.500 | 3.20 | 10.50 | 0.80 |
| 1.667 | 0.80 | 4.667 | 36.90 | 7.667 | 3.20 | 10.67 | 0.80 |
| 1.833 | 0.80 | 4.833 | 36.90 | 7.833 | 3.20 | 10.83 | 0.80 |
| 2.000 | 0.80 | 5.000 | 36.90 | 8.000 | 3.20 | 11.00 | 0.80 |
| 2.167 | 4.80 | 5.167 | 10.40 | 8.167 | 1.60 | 11.17 | 0.80 |
| 2.333 | 4.80 | 5.333 | 10.40 | 8.333 | 1.60 | 11.33 | 0.80 |
| 2.500 | 4.80 | 5.500 | 10.40 | 8.500 | 1.60 | 11.50 | 0.80 |
| 2.667 | 4.80 | 5.667 | 10.40 | 8.667 | 1.60 | 11.67 | 0.80 |
| 2.833 | 4.80 | 5.833 | 10.40 | 8.833 | 1.60 | 11.83 | 0.80 |
| 3.000 | 4.80 | 6.000 | 10.40 | 9.000 | 1.60 | 12.00 | 0.80 |

| | | | |
|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 36.90 | 36.45 | |
| over (min) | 10.00 | 40.00 | |
| Storage Coeff. (min)= | 3.84 (ii) | 37.24 (ii) | |
| Unit Hyd. Tpeak (min)= | 10.00 | 40.00 | |
| Unit Hyd. peak (cms)= | 0.16 | 0.03 | |
| | | | *TOTALS* |
| PEAK FLOW (cms)= | 0.05 | 0.09 | 0.131 (iii) |
| TIME TO PEAK (hrs)= | 5.00 | 5.17 | 5.00 |
| RUNOFF VOLUME (mm)= | 79.10 | 73.74 | 75.28 |
| TOTAL RAINFALL (mm)= | 80.10 | 80.10 | 80.10 |
| RUNOFF COEFFICIENT = | 0.99 | 0.92 | 0.94 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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 ( 0107) | Area (ha)= 0.63 | | |
| ID= 1 DT=10.0 min | Total Imp(%)= 79.00 | Dir. Conn.(%)= 79.00 | |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.50 | 0.13 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 3.00 | 2.00 |
| Length | (m)= | 405.00 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.80 | 3.167 | 13.60 | 6.167 | 5.60 | 9.17 | 0.80 |
| 0.333 | 0.80 | 3.333 | 13.60 | 6.333 | 5.60 | 9.33 | 0.80 |
| 0.500 | 0.80 | 3.500 | 13.60 | 6.500 | 5.60 | 9.50 | 0.80 |
| 0.667 | 0.80 | 3.667 | 13.60 | 6.667 | 5.60 | 9.67 | 0.80 |
| 0.833 | 0.80 | 3.833 | 13.60 | 6.833 | 5.60 | 9.83 | 0.80 |
| 1.000 | 0.80 | 4.000 | 13.60 | 7.000 | 5.60 | 10.00 | 0.80 |
| 1.167 | 0.80 | 4.167 | 36.90 | 7.167 | 3.20 | 10.17 | 0.80 |
| 1.333 | 0.80 | 4.333 | 36.90 | 7.333 | 3.20 | 10.33 | 0.80 |
| 1.500 | 0.80 | 4.500 | 36.90 | 7.500 | 3.20 | 10.50 | 0.80 |
| 1.667 | 0.80 | 4.667 | 36.90 | 7.667 | 3.20 | 10.67 | 0.80 |
| 1.833 | 0.80 | 4.833 | 36.90 | 7.833 | 3.20 | 10.83 | 0.80 |
| 2.000 | 0.80 | 5.000 | 36.90 | 8.000 | 3.20 | 11.00 | 0.80 |
| 2.167 | 4.80 | 5.167 | 10.40 | 8.167 | 1.60 | 11.17 | 0.80 |
| 2.333 | 4.80 | 5.333 | 10.40 | 8.333 | 1.60 | 11.33 | 0.80 |
| 2.500 | 4.80 | 5.500 | 10.40 | 8.500 | 1.60 | 11.50 | 0.80 |
| 2.667 | 4.80 | 5.667 | 10.40 | 8.667 | 1.60 | 11.67 | 0.80 |
| 2.833 | 4.80 | 5.833 | 10.40 | 8.833 | 1.60 | 11.83 | 0.80 |
| 3.000 | 4.80 | 6.000 | 10.40 | 9.000 | 1.60 | 12.00 | 0.80 |

| | | | |
|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 36.90 | 36.56 | |
| over (min) | 10.00 | 20.00 | |
| Storage Coeff. (min)= | 6.34 (ii) | 16.89 (ii) | |
| Unit Hyd. Tpeak (min)= | 10.00 | 20.00 | |
| Unit Hyd. peak (cms)= | 0.13 | 0.06 | |
| | | | *TOTALS* |
| PEAK FLOW (cms)= | 0.05 | 0.01 | 0.064 (iii) |
| TIME TO PEAK (hrs)= | 5.00 | 5.00 | 5.00 |
| RUNOFF VOLUME (mm)= | 79.10 | 73.74 | 77.96 |
| TOTAL RAINFALL (mm)= | 80.10 | 80.10 | 80.10 |
| RUNOFF COEFFICIENT = | 0.99 | 0.92 | 0.97 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| ADD HYD ( 0010) | | | | |
|---|---|---|---|---|
| 1 + 2 = 3 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
| ID1= 1 ( 0106): | 1.55 | 0.131 | 5.00 | 75.28 |
| + ID2= 2 ( 0107): | 0.63 | 0.064 | 5.00 | 77.96 |
| ID = 3 ( 0010): | 2.18 | 0.195 | 5.00 | 76.05 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| ADD HYD ( 0010) | | | | |
|---|---|---|---|---|
| 3 + 2 = 1 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
| ID1= 3 ( 0010): | 2.18 | 0.195 | 5.00 | 76.05 |
| + ID2= 2 ( 0108): | 0.76 | 0.074 | 5.00 | 67.60 |
| ID = 1 ( 0010): | 2.94 | 0.269 | 5.00 | 73.87 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| ADD HYD ( 0113) | | | | |
|---|---|---|---|---|
| 1 + 2 = 3 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
| ID1= 1 ( 0010): | 2.94 | 0.269 | 5.00 | 73.87 |
| + ID2= 2 ( 0110): | 4.58 | 0.235 | 5.00 | 75.85 |
| ID = 3 ( 0113): | 7.52 | 0.504 | 5.00 | 75.07 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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       V    V   I    SSSSS  U   U    A    L             (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
```



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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
Output filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-33eb-4790-b5ab-2fe711ab4c1b\9665cf61-1797-4631-b79a-5d7aa1f71a4c\scenari
Summary filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-33eb-4790-b5ab-2fe711ab4c1b\9665cf61-1797-4631-b79a-5d7aa1f71a4c\scenari

DATE: 04/22/2024 TIME: 11:21:45

USER:

COMMENTS: _____

**********
** SIMULATION : L - 100Y1 **
**********

| READ STORM | Filename: C:\Users\qdar\AppData\Local\Temp\76b488fe-908e-4071-918b-7207f3d34655\2462330d |
|---|---|
| Ptotal= 56.80 mm | Comments: 100Y1 |

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.33 | 102.24 | 0.67 | 54.53 | 1.00 | 6.82 |
| 0.08 | 6.82 | 0.42 | 190.85 | 0.75 | 34.08 | | |
| 0.17 | 20.45 | 0.50 | 102.24 | 0.83 | 20.45 | | |
| 0.25 | 54.53 | 0.58 | 81.79 | 0.92 | 6.82 | | |

| CALIB | |
|---|---|
| NASHYD ( 0109) | Area (ha)= 1.38 Curve Number (CN)= 98.0 |
| ID= 1 DT=10.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00 |
| | U.H. Tp(hrs)= 0.32 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 3.41 | 0.500 | 146.54 | 0.833 | 44.30 | 1.17 | 3.41 |
| 0.333 | 37.49 | 0.667 | 92.02 | 1.000 | 13.63 | | |

Unit Hyd Qpeak (cms)= 0.165

PEAK FLOW (cms)= 0.243 (i)
TIME TO PEAK (hrs)= 0.833
RUNOFF VOLUME (mm)= 46.877
TOTAL RAINFALL (mm)= 56.802
RUNOFF COEFFICIENT = 0.825

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

| CALIB | |
|---|---|
| STANDHYD ( 0104) | Area (ha)= 0.04 |
| ID= 1 DT=10.0 min | Total Imp(%)= 99.00 Dir. Conn.(%)= 99.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.04 | 0.00 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 1.00 | 2.00 |
| Length | (m)= | 16.33 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 3.41 | 0.500 | 146.54 | 0.833 | 44.30 | 1.17 | 3.41 |
| 0.333 | 37.49 | 0.667 | 92.02 | 1.000 | 13.63 | | |

| | | | | |
|---|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 146.54 | 135.81 | | |
| over (min) | 10.00 | 10.00 | | |
| Storage Coeff. (min)= | 0.74 (ii) | 6.98 (ii) | | |
| Unit Hyd. Tpeak (min)= | 10.00 | 10.00 | | |
| Unit Hyd. peak (cms)= | 0.17 | 0.13 | | |
| | | | | *TOTALS* |
| PEAK FLOW (cms)= | 0.02 | 0.00 | | 0.016 (iii) |
| TIME TO PEAK (hrs)= | 0.50 | 0.50 | | 0.50 |
| RUNOFF VOLUME (mm)= | 55.80 | 50.56 | | 55.75 |
| TOTAL RAINFALL (mm)= | 56.80 | 56.80 | | 56.80 |
| RUNOFF COEFFICIENT = | 0.98 | 0.89 | | 0.98 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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 ( 0100) | Area (ha)= 3.16 |
| ID= 1 DT=10.0 min | Total Imp(%)= 96.00 Dir. Conn.(%)= 96.00 |

| | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|

| | | | |
|---|---|---|---|
| Surface Area | (ha)= | 3.03 | 0.13 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 4.00 | 2.00 |
| Length | (m)= | 250.00 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 3.41 | 0.500 | 146.54 | 0.833 | 44.30 | 1.17 | 3.41 |
| 0.333 | 37.49 | 0.667 | 92.02 | 1.000 | 13.63 | | |

| | | | | |
|---|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 146.54 | 135.81 | | |
| over (min) | 10.00 | 10.00 | | |
| Storage Coeff. (min)= | 2.51 (ii) | 8.75 (ii) | | |
| Unit Hyd. Tpeak (min)= | 10.00 | 10.00 | | |
| Unit Hyd. peak (cms)= | 0.17 | 0.12 | | |
| | | | *TOTALS* | |
| PEAK FLOW (cms)= | 1.22 | 0.03 | 1.251 (iii) | |
| TIME TO PEAK (hrs)= | 0.50 | 0.50 | 0.50 | |
| RUNOFF VOLUME (mm)= | 55.80 | 50.56 | 55.59 | |
| TOTAL RAINFALL (mm)= | 56.80 | 56.80 | 56.80 | |
| RUNOFF COEFFICIENT = | 0.98 | 0.89 | 0.98 | |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

---

| RESERVOIR( 0103) | OVERFLOW IS OFF |
|---|---|
| IN= 2---> OUT= 1 | |
| DT= 10.0 min | |

| OUTFLOW (cms) | STORAGE (ha.m.) | OUTFLOW (cms) | STORAGE (ha.m.) |
|---|---|---|---|
| 0.0000 | 0.0000 | 0.0750 | 0.1285 |
| 0.0130 | 0.0753 | 0.0930 | 0.1427 |
| 0.0340 | 0.0932 | 0.1200 | 0.1650 |
| 0.0520 | 0.1091 | 1.2510 | 0.3172 |

| | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
|---|---|---|---|---|
| INFLOW : ID= 2 ( 0100) | 3.160 | 1.251 | 0.50 | 55.59 |
| OUTFLOW: ID= 1 ( 0103) | 3.160 | 0.109 | 1.00 | 55.13 |

PEAK FLOW REDUCTION [Qout/Qin](%)= 8.75
TIME SHIFT OF PEAK FLOW (min)= 30.00
MAXIMUM STORAGE USED (ha.m.)= 0.1569

---

| ADD HYD ( 0110) | | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
|---|---|---|---|---|---|
| 1 + 2 = 3 | ID1= 1 ( 0103): | 3.16 | 0.109 | 1.00 | 55.13 |
| | + ID2= 2 ( 0104): | 0.04 | 0.016 | 0.50 | 55.75 |
| | ID = 3 ( 0110): | 3.20 | 0.111 | 1.00 | 55.14 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| ADD HYD ( 0110) | | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
|---|---|---|---|---|---|
| 3 + 2 = 1 | ID1= 3 ( 0110): | 3.20 | 0.111 | 1.00 | 55.14 |
| | + ID2= 2 ( 0109): | 1.38 | 0.243 | 0.83 | 46.88 |
| | ID = 1 ( 0110): | 4.58 | 0.345 | 0.83 | 52.65 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| CALIB | | | | |
|---|---|---|---|---|
| NASHYD ( 0108) | Area (ha)= | 0.76 | Curve Number (CN)= | 98.0 |
| ID= 1 DT=10.0 min | Ia (mm)= | 5.00 | # of Linear Res.(N)= | 3.00 |
| | U.H. Tp(hrs)= | 0.18 | | |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 3.41 | 0.500 | 146.54 | 0.833 | 44.30 | 1.17 | 3.41 |
| 0.333 | 37.49 | 0.667 | 92.02 | 1.000 | 13.63 | | |

| | | |
|---|---|---|
| Unit Hyd Qpeak (cms)= | 0.161 | |
| PEAK FLOW (cms)= | 0.181 | (i) |
| TIME TO PEAK (hrs)= | 0.667 | |
| RUNOFF VOLUME (mm)= | 45.311 | |
| TOTAL RAINFALL (mm)= | 56.802 | |
| RUNOFF COEFFICIENT = | 0.798 | |

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

---

| CALIB | | | | |
|---|---|---|---|---|
| STANDHYD ( 0106) | Area (ha)= | 1.55 | | |
| ID= 1 DT=10.0 min | Total Imp(%)= | 29.00 | Dir. Conn.(%)= | 29.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.45 | 1.10 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 1.00 | 4.00 |
| Length | (m)= | 101.65 | 385.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 3.41 | 0.500 | 146.54 | 0.833 | 44.30 | 1.17 | 3.41 |
| 0.333 | 37.49 | 0.667 | 92.02 | 1.000 | 13.63 | | |

| | | | |
|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 146.54 | 90.10 | |
| over (min) | 10.00 | 30.00 | |
| Storage Coeff. (min)= | 2.21 (ii) | 25.47 (ii) | |

```
     Unit Hyd. Tpeak (min)=      10.00        30.00
     Unit Hyd. peak  (cms)=       0.17         0.04
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.18         0.17          0.223 (iii)
     TIME TO PEAK    (hrs)=       0.50         1.00          0.50
     RUNOFF VOLUME    (mm)=      55.80        50.56         52.07
     TOTAL RAINFALL   (mm)=      56.80        56.80         56.80
     RUNOFF COEFFICIENT   =       0.98         0.89          0.92

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    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 (  0107)|   Area    (ha)=   0.63
|ID= 1 DT=10.0 min |   Total Imp(%)=  79.00   Dir. Conn.(%)=  79.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.50         0.13
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       3.00         2.00
     Length            (m)=     405.00        40.00
     Mannings n            =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO  10.0 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
               0.167    3.41 | 0.500  146.54 | 0.833   44.30 |  1.17    3.41
               0.333   37.49 | 0.667   92.02 | 1.000   13.63 |

     Max.Eff.Inten.(mm/hr)=     146.54       135.81
               over (min)       10.00        10.00
     Storage Coeff.  (min)=      3.65 (ii)    9.89 (ii)
     Unit Hyd. Tpeak (min)=      10.00        10.00
     Unit Hyd. peak  (cms)=       0.16         0.11
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.19         0.03          0.226 (iii)
     TIME TO PEAK    (hrs)=       0.50         0.67          0.50
     RUNOFF VOLUME    (mm)=      55.80        50.56         54.69
     TOTAL RAINFALL   (mm)=      56.80        56.80         56.80
     RUNOFF COEFFICIENT   =       0.98         0.89          0.96

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  98.0    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  (  0010)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0106):     1.55    0.223     0.50     52.07
     + ID2= 2 (  0107):     0.63    0.226     0.50     54.69
       ================================================
       ID = 3 (  0010):     2.18    0.449     0.50     52.83

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

--------------------
| ADD HYD  (  0010)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0010):     2.18    0.449     0.50     52.83
     + ID2= 2 (  0108):     0.76    0.181     0.67     45.31
       ================================================
       ID = 1 (  0010):     2.94    0.586     0.50     50.89

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

--------------------
| ADD HYD  (  0113)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0010):     2.94    0.586     0.50     50.89
     + ID2= 2 (  0110):     4.58    0.345     0.83     52.65
       ================================================
       ID = 3 (  0113):     7.52    0.843     0.67     51.96

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

      V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
      V    V   I    SS     U   U   A A   L
       V  V    I     SS    U   U  AAAAA  L
       V  V    I      SS   U   U  A   A  L
        VV     I    SSSSS  UUUUU  A   A  LLLLL

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-33eb-4790-
b5ab-2fe711ab4c1b\a00cd6c8-cf7c-43c6-af88-9fb86f59d604\scenari
  Summary filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-33eb-4790-
b5ab-2fe711ab4c1b\a00cd6c8-cf7c-43c6-af88-9fb86f59d604\scenari


DATE: 04/22/2024                          TIME: 11:21:45

USER:
```

COMMENTS: _____

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**********
** SIMULATION : M - 100Y12 **
**********

| READ STORM | Filename: C:\Users\qdar\AppData\Local\Temp\76b488fe-908e-4071-918b-7207f3d34655\8b28d2fb |
|---|---|
| Ptotal= 87.50 mm | Comments: 100Y12 UPDATED |

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.00 | 0.90 | 3.00 | 14.90 | 6.00 | 6.10 | 9.00 | 0.90 |
| 0.25 | 0.90 | 3.25 | 14.90 | 6.25 | 6.10 | 9.25 | 0.90 |
| 0.50 | 0.90 | 3.50 | 14.90 | 6.50 | 6.10 | 9.50 | 0.90 |
| 0.75 | 0.90 | 3.75 | 14.90 | 6.75 | 6.10 | 9.75 | 0.90 |
| 1.00 | 0.90 | 4.00 | 40.20 | 7.00 | 3.50 | 10.00 | 0.90 |
| 1.25 | 0.90 | 4.25 | 40.20 | 7.25 | 3.50 | 10.25 | 0.90 |
| 1.50 | 0.90 | 4.50 | 40.20 | 7.50 | 3.50 | 10.50 | 0.90 |
| 1.75 | 0.90 | 4.75 | 40.20 | 7.75 | 3.50 | 10.75 | 0.90 |
| 2.00 | 5.20 | 5.00 | 11.40 | 8.00 | 1.70 | 11.00 | 0.90 |
| 2.25 | 5.20 | 5.25 | 11.40 | 8.25 | 1.70 | 11.25 | 0.90 |
| 2.50 | 5.20 | 5.50 | 11.40 | 8.50 | 1.70 | 11.50 | 0.90 |
| 2.75 | 5.20 | 5.75 | 11.40 | 8.75 | 1.70 | 11.75 | 0.90 |

---

| CALIB | | | |
|---|---|---|---|
| NASHYD ( 0109) | Area (ha)= 1.38 | Curve Number (CN)= 98.0 | |
| ID= 1 DT=10.0 min | Ia (mm)= 5.00 | # of Linear Res.(N)= 3.00 | |
| | U.H. Tp(hrs)= 0.32 | | |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.90 | 3.167 | 14.90 | 6.167 | 6.10 | 9.17 | 0.90 |
| 0.333 | 0.90 | 3.333 | 14.90 | 6.333 | 6.10 | 9.33 | 0.90 |
| 0.500 | 0.90 | 3.500 | 14.90 | 6.500 | 6.10 | 9.50 | 0.90 |
| 0.667 | 0.90 | 3.667 | 14.90 | 6.667 | 6.10 | 9.67 | 0.90 |
| 0.833 | 0.90 | 3.833 | 14.90 | 6.833 | 6.10 | 9.83 | 0.90 |
| 1.000 | 0.90 | 4.000 | 14.90 | 7.000 | 6.10 | 10.00 | 0.90 |
| 1.167 | 0.90 | 4.167 | 40.20 | 7.167 | 3.50 | 10.17 | 0.90 |
| 1.333 | 0.90 | 4.333 | 40.20 | 7.333 | 3.50 | 10.33 | 0.90 |
| 1.500 | 0.90 | 4.500 | 40.20 | 7.500 | 3.50 | 10.50 | 0.90 |
| 1.667 | 0.90 | 4.667 | 40.20 | 7.667 | 3.50 | 10.67 | 0.90 |
| 1.833 | 0.90 | 4.833 | 40.20 | 7.833 | 3.50 | 10.83 | 0.90 |
| 2.000 | 0.90 | 5.000 | 40.20 | 8.000 | 3.50 | 11.00 | 0.90 |
| 2.167 | 5.20 | 5.167 | 11.40 | 8.167 | 1.70 | 11.17 | 0.90 |
| 2.333 | 5.20 | 5.333 | 11.40 | 8.333 | 1.70 | 11.33 | 0.90 |
| 2.500 | 5.20 | 5.500 | 11.40 | 8.500 | 1.70 | 11.50 | 0.90 |
| 2.667 | 5.20 | 5.667 | 11.40 | 8.667 | 1.70 | 11.67 | 0.90 |
| 2.833 | 5.20 | 5.833 | 11.40 | 8.833 | 1.70 | 11.83 | 0.90 |
| 3.000 | 5.20 | 6.000 | 11.40 | 9.000 | 1.70 | 12.00 | 0.90 |

Unit Hyd Qpeak (cms)= 0.165

PEAK FLOW (cms)= 0.148 (i)
TIME TO PEAK (hrs)= 5.000
RUNOFF VOLUME (mm)= 77.273
TOTAL RAINFALL (mm)= 87.500
RUNOFF COEFFICIENT = 0.883

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

---

| CALIB | | |
|---|---|---|
| STANDHYD ( 0104) | Area (ha)= 0.04 | |
| ID= 1 DT=10.0 min | Total Imp(%)= 99.00 | Dir. Conn.(%)= 99.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.04 | 0.00 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 1.00 | 2.00 |
| Length | (m)= | 16.33 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.90 | 3.167 | 14.90 | 6.167 | 6.10 | 9.17 | 0.90 |
| 0.333 | 0.90 | 3.333 | 14.90 | 6.333 | 6.10 | 9.33 | 0.90 |
| 0.500 | 0.90 | 3.500 | 14.90 | 6.500 | 6.10 | 9.50 | 0.90 |
| 0.667 | 0.90 | 3.667 | 14.90 | 6.667 | 6.10 | 9.67 | 0.90 |
| 0.833 | 0.90 | 3.833 | 14.90 | 6.833 | 6.10 | 9.83 | 0.90 |
| 1.000 | 0.90 | 4.000 | 14.90 | 7.000 | 6.10 | 10.00 | 0.90 |
| 1.167 | 0.90 | 4.167 | 40.20 | 7.167 | 3.50 | 10.17 | 0.90 |
| 1.333 | 0.90 | 4.333 | 40.20 | 7.333 | 3.50 | 10.33 | 0.90 |
| 1.500 | 0.90 | 4.500 | 40.20 | 7.500 | 3.50 | 10.50 | 0.90 |
| 1.667 | 0.90 | 4.667 | 40.20 | 7.667 | 3.50 | 10.67 | 0.90 |
| 1.833 | 0.90 | 4.833 | 40.20 | 7.833 | 3.50 | 10.83 | 0.90 |
| 2.000 | 0.90 | 5.000 | 40.20 | 8.000 | 3.50 | 11.00 | 0.90 |
| 2.167 | 5.20 | 5.167 | 11.40 | 8.167 | 1.70 | 11.17 | 0.90 |
| 2.333 | 5.20 | 5.333 | 11.40 | 8.333 | 1.70 | 11.33 | 0.90 |
| 2.500 | 5.20 | 5.500 | 11.40 | 8.500 | 1.70 | 11.50 | 0.90 |
| 2.667 | 5.20 | 5.667 | 11.40 | 8.667 | 1.70 | 11.67 | 0.90 |
| 2.833 | 5.20 | 5.833 | 11.40 | 8.833 | 1.70 | 11.83 | 0.90 |
| 3.000 | 5.20 | 6.000 | 11.40 | 9.000 | 1.70 | 12.00 | 0.90 |

| | | | | |
|---|---|---|---|---|
| Max.Eff.Inten. | (mm/hr)= | 40.20 | 39.89 | |
| over | (min) | 10.00 | 20.00 | |
| Storage Coeff. | (min)= | 1.24 (ii) | 11.43 (ii) | |
| Unit Hyd. Tpeak | (min)= | 10.00 | 20.00 | |
| Unit Hyd. peak | (cms)= | 0.17 | 0.08 | |
| | | | | *TOTALS* |
| PEAK FLOW | (cms)= | 0.00 | 0.00 | 0.004 (iii) |
| TIME TO PEAK | (hrs)= | 4.50 | 5.00 | 5.00 |
| RUNOFF VOLUME | (mm)= | 86.50 | 81.11 | 86.44 |
| TOTAL RAINFALL | (mm)= | 87.50 | 87.50 | 87.50 |
| RUNOFF COEFFICIENT | = | 0.99 | 0.93 | 0.99 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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 ( 0100) | Area (ha)= 3.16 | | |
| ID= 1 DT=10.0 min | Total Imp(%)= 96.00 | Dir. Conn.(%)= 96.00 | |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 3.03 | 0.13 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 4.00 | 2.00 |
| Length | (m)= | 250.00 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.90 | 3.167 | 14.90 | 6.167 | 6.10 | 9.17 | 0.90 |
| 0.333 | 0.90 | 3.333 | 14.90 | 6.333 | 6.10 | 9.33 | 0.90 |
| 0.500 | 0.90 | 3.500 | 14.90 | 6.500 | 6.10 | 9.50 | 0.90 |
| 0.667 | 0.90 | 3.667 | 14.90 | 6.667 | 6.10 | 9.67 | 0.90 |
| 0.833 | 0.90 | 3.833 | 14.90 | 6.833 | 6.10 | 9.83 | 0.90 |
| 1.000 | 0.90 | 4.000 | 14.90 | 7.000 | 6.10 | 10.00 | 0.90 |
| 1.167 | 0.90 | 4.167 | 40.20 | 7.167 | 3.50 | 10.17 | 0.90 |
| 1.333 | 0.90 | 4.333 | 40.20 | 7.333 | 3.50 | 10.33 | 0.90 |
| 1.500 | 0.90 | 4.500 | 40.20 | 7.500 | 3.50 | 10.50 | 0.90 |
| 1.667 | 0.90 | 4.667 | 40.20 | 7.667 | 3.50 | 10.67 | 0.90 |
| 1.833 | 0.90 | 4.833 | 40.20 | 7.833 | 3.50 | 10.83 | 0.90 |
| 2.000 | 0.90 | 5.000 | 40.20 | 8.000 | 3.50 | 11.00 | 0.90 |
| 2.167 | 5.20 | 5.167 | 11.40 | 8.167 | 1.70 | 11.17 | 0.90 |
| 2.333 | 5.20 | 5.333 | 11.40 | 8.333 | 1.70 | 11.33 | 0.90 |
| 2.500 | 5.20 | 5.500 | 11.40 | 8.500 | 1.70 | 11.50 | 0.90 |
| 2.667 | 5.20 | 5.667 | 11.40 | 8.667 | 1.70 | 11.67 | 0.90 |
| 2.833 | 5.20 | 5.833 | 11.40 | 8.833 | 1.70 | 11.83 | 0.90 |
| 3.000 | 5.20 | 6.000 | 11.40 | 9.000 | 1.70 | 12.00 | 0.90 |

| | | | | |
|---|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | | 40.20 | 39.89 | |
| over (min) | | 10.00 | 20.00 | |
| Storage Coeff. (min)= | | 4.21 (ii) | 14.40 (ii) | |
| Unit Hyd. Tpeak (min)= | | 10.00 | 20.00 | |
| Unit Hyd. peak (cms)= | | 0.15 | 0.07 | |
| | | | | *TOTALS* |
| PEAK FLOW | (cms)= | 0.34 | 0.01 | 0.352 (iii) |
| TIME TO PEAK | (hrs)= | 5.00 | 5.00 | 5.00 |
| RUNOFF VOLUME | (mm)= | 86.50 | 81.11 | 86.28 |
| TOTAL RAINFALL | (mm)= | 87.50 | 87.50 | 87.50 |
| RUNOFF COEFFICIENT | = | 0.99 | 0.93 | 0.99 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

---

| RESERVOIR( 0103) | OVERFLOW IS OFF | | | |
|---|---|---|---|---|
| IN= 2---> OUT= 1 | | | | |
| DT= 10.0 min | OUTFLOW | STORAGE | OUTFLOW | STORAGE |
| | (cms) | (ha.m.) | (cms) | (ha.m.) |
| | 0.0000 | 0.0000 | 0.0750 | 0.1285 |
| | 0.0130 | 0.0753 | 0.0930 | 0.1427 |
| | 0.0340 | 0.0932 | 0.1200 | 0.1650 |
| | 0.0520 | 0.1091 | 1.2510 | 0.3172 |

| | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
|---|---|---|---|---|
| INFLOW : ID= 2 ( 0100) | 3.160 | 0.352 | 5.00 | 86.28 |
| OUTFLOW: ID= 1 ( 0103) | 3.160 | 0.119 | 5.17 | 85.82 |

PEAK FLOW REDUCTION [Qout/Qin](%)= 33.81
TIME SHIFT OF PEAK FLOW (min)= 10.00
MAXIMUM STORAGE USED (ha.m.)= 0.1646

---

| ADD HYD ( 0110) | | | | |
|---|---|---|---|---|
| 1 + 2 = 3 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
| ID1= 1 ( 0103): | 3.16 | 0.119 | 5.17 | 85.82 |
| + ID2= 2 ( 0104): | 0.04 | 0.004 | 5.00 | 86.44 |
| ID = 3 ( 0110): | 3.20 | 0.120 | 5.17 | 85.83 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| ADD HYD ( 0110) | | | | |
|---|---|---|---|---|
| 3 + 2 = 1 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
| ID1= 3 ( 0110): | 3.20 | 0.120 | 5.17 | 85.83 |
| + ID2= 2 ( 0109): | 1.38 | 0.148 | 5.00 | 77.27 |
| ID = 1 ( 0110): | 4.58 | 0.262 | 5.00 | 83.25 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| CALIB | | | |
|---|---|---|---|
| NASHYD ( 0108) | Area (ha)= 0.76 | Curve Number (CN)= 98.0 | |
| ID= 1 DT=10.0 min | Ia (mm)= 5.00 | # of Linear Res.(N)= 3.00 | |
| | U.H. Tp(hrs)= 0.18 | | |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.90 | 3.167 | 14.90 | 6.167 | 6.10 | 9.17 | 0.90 |
| 0.333 | 0.90 | 3.333 | 14.90 | 6.333 | 6.10 | 9.33 | 0.90 |
| 0.500 | 0.90 | 3.500 | 14.90 | 6.500 | 6.10 | 9.50 | 0.90 |
| 0.667 | 0.90 | 3.667 | 14.90 | 6.667 | 6.10 | 9.67 | 0.90 |
| 0.833 | 0.90 | 3.833 | 14.90 | 6.833 | 6.10 | 9.83 | 0.90 |
| 1.000 | 0.90 | 4.000 | 14.90 | 7.000 | 6.10 | 10.00 | 0.90 |
| 1.167 | 0.90 | 4.167 | 40.20 | 7.167 | 3.50 | 10.17 | 0.90 |
| 1.333 | 0.90 | 4.333 | 40.20 | 7.333 | 3.50 | 10.33 | 0.90 |
| 1.500 | 0.90 | 4.500 | 40.20 | 7.500 | 3.50 | 10.50 | 0.90 |
| 1.667 | 0.90 | 4.667 | 40.20 | 7.667 | 3.50 | 10.67 | 0.90 |
| 1.833 | 0.90 | 4.833 | 40.20 | 7.833 | 3.50 | 10.83 | 0.90 |
| 2.000 | 0.90 | 5.000 | 40.20 | 8.000 | 3.50 | 11.00 | 0.90 |
| 2.167 | 5.20 | 5.167 | 11.40 | 8.167 | 1.70 | 11.17 | 0.90 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2.333 | 5.20 | 5.333 | 11.40 | 8.333 | 1.70 | 11.33 | 0.90 |
| 2.500 | 5.20 | 5.500 | 11.40 | 8.500 | 1.70 | 11.50 | 0.90 |
| 2.667 | 5.20 | 5.667 | 11.40 | 8.667 | 1.70 | 11.67 | 0.90 |
| 2.833 | 5.20 | 5.833 | 11.40 | 8.833 | 1.70 | 11.83 | 0.90 |
| 3.000 | 5.20 | 6.000 | 11.40 | 9.000 | 1.70 | 12.00 | 0.90 |

Unit Hyd Qpeak (cms)= 0.161

PEAK FLOW (cms)= 0.081 (i)
TIME TO PEAK (hrs)= 5.000
RUNOFF VOLUME (mm)= 74.692
TOTAL RAINFALL (mm)= 87.500
RUNOFF COEFFICIENT = 0.854

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

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| CALIB | |
|---|---|
| STANDHYD ( 0106) | Area (ha)= 1.55 |
| ID= 1 DT=10.0 min | Total Imp(%)= 29.00 Dir. Conn.(%)= 29.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.45 | 1.10 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 1.00 | 4.00 |
| Length | (m)= | 101.65 | 385.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.90 | 3.167 | 14.90 | 6.167 | 6.10 | 9.17 | 0.90 |
| 0.333 | 0.90 | 3.333 | 14.90 | 6.333 | 6.10 | 9.33 | 0.90 |
| 0.500 | 0.90 | 3.500 | 14.90 | 6.500 | 6.10 | 9.50 | 0.90 |
| 0.667 | 0.90 | 3.667 | 14.90 | 6.667 | 6.10 | 9.67 | 0.90 |
| 0.833 | 0.90 | 3.833 | 14.90 | 6.833 | 6.10 | 9.83 | 0.90 |
| 1.000 | 0.90 | 4.000 | 14.90 | 7.000 | 6.10 | 10.00 | 0.90 |
| 1.167 | 0.90 | 4.167 | 40.20 | 7.167 | 3.50 | 10.17 | 0.90 |
| 1.333 | 0.90 | 4.333 | 40.20 | 7.333 | 3.50 | 10.33 | 0.90 |
| 1.500 | 0.90 | 4.500 | 40.20 | 7.500 | 3.50 | 10.50 | 0.90 |
| 1.667 | 0.90 | 4.667 | 40.20 | 7.667 | 3.50 | 10.67 | 0.90 |
| 1.833 | 0.90 | 4.833 | 40.20 | 7.833 | 3.50 | 10.83 | 0.90 |
| 2.000 | 0.90 | 5.000 | 40.20 | 8.000 | 3.50 | 11.00 | 0.90 |
| 2.167 | 5.20 | 5.167 | 11.40 | 8.167 | 1.70 | 11.17 | 0.90 |
| 2.333 | 5.20 | 5.333 | 11.40 | 8.333 | 1.70 | 11.33 | 0.90 |
| 2.500 | 5.20 | 5.500 | 11.40 | 8.500 | 1.70 | 11.50 | 0.90 |
| 2.667 | 5.20 | 5.667 | 11.40 | 8.667 | 1.70 | 11.67 | 0.90 |
| 2.833 | 5.20 | 5.833 | 11.40 | 8.833 | 1.70 | 11.83 | 0.90 |
| 3.000 | 5.20 | 6.000 | 11.40 | 9.000 | 1.70 | 12.00 | 0.90 |

| | | | | |
|---|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 40.20 | 39.78 | | |
| over (min) | 10.00 | 40.00 | | |
| Storage Coeff. (min)= | 3.71 (ii) | 35.97 (ii) | | |
| Unit Hyd. Tpeak (min)= | 10.00 | 40.00 | | |
| Unit Hyd. peak (cms)= | 0.16 | 0.03 | | |
| | | | *TOTALS* | |
| PEAK FLOW (cms)= | 0.05 | 0.10 | 0.144 (iii) | |
| TIME TO PEAK (hrs)= | 5.00 | 5.17 | 5.00 | |
| RUNOFF VOLUME (mm)= | 86.50 | 81.11 | 82.66 | |
| TOTAL RAINFALL (mm)= | 87.50 | 87.50 | 87.50 | |
| RUNOFF COEFFICIENT = | 0.99 | 0.93 | 0.94 | |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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 ( 0107) | Area (ha)= 0.63 |
| ID= 1 DT=10.0 min | Total Imp(%)= 79.00 Dir. Conn.(%)= 79.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.50 | 0.13 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 3.00 | 2.00 |
| Length | (m)= | 405.00 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 0.90 | 3.167 | 14.90 | 6.167 | 6.10 | 9.17 | 0.90 |
| 0.333 | 0.90 | 3.333 | 14.90 | 6.333 | 6.10 | 9.33 | 0.90 |
| 0.500 | 0.90 | 3.500 | 14.90 | 6.500 | 6.10 | 9.50 | 0.90 |
| 0.667 | 0.90 | 3.667 | 14.90 | 6.667 | 6.10 | 9.67 | 0.90 |
| 0.833 | 0.90 | 3.833 | 14.90 | 6.833 | 6.10 | 9.83 | 0.90 |
| 1.000 | 0.90 | 4.000 | 14.90 | 7.000 | 6.10 | 10.00 | 0.90 |
| 1.167 | 0.90 | 4.167 | 40.20 | 7.167 | 3.50 | 10.17 | 0.90 |
| 1.333 | 0.90 | 4.333 | 40.20 | 7.333 | 3.50 | 10.33 | 0.90 |
| 1.500 | 0.90 | 4.500 | 40.20 | 7.500 | 3.50 | 10.50 | 0.90 |
| 1.667 | 0.90 | 4.667 | 40.20 | 7.667 | 3.50 | 10.67 | 0.90 |
| 1.833 | 0.90 | 4.833 | 40.20 | 7.833 | 3.50 | 10.83 | 0.90 |
| 2.000 | 0.90 | 5.000 | 40.20 | 8.000 | 3.50 | 11.00 | 0.90 |
| 2.167 | 5.20 | 5.167 | 11.40 | 8.167 | 1.70 | 11.17 | 0.90 |
| 2.333 | 5.20 | 5.333 | 11.40 | 8.333 | 1.70 | 11.33 | 0.90 |
| 2.500 | 5.20 | 5.500 | 11.40 | 8.500 | 1.70 | 11.50 | 0.90 |
| 2.667 | 5.20 | 5.667 | 11.40 | 8.667 | 1.70 | 11.67 | 0.90 |
| 2.833 | 5.20 | 5.833 | 11.40 | 8.833 | 1.70 | 11.83 | 0.90 |
| 3.000 | 5.20 | 6.000 | 11.40 | 9.000 | 1.70 | 12.00 | 0.90 |

| | | | | |
|---|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 40.20 | 39.89 | | |
| over (min) | 10.00 | 20.00 | | |
| Storage Coeff. (min)= | 6.12 (ii) | 16.32 (ii) | | |
| Unit Hyd. Tpeak (min)= | 10.00 | 20.00 | | |
| Unit Hyd. peak (cms)= | 0.14 | 0.06 | | |
| | | | *TOTALS* | |
| PEAK FLOW (cms)= | 0.06 | 0.01 | 0.070 (iii) | |
| TIME TO PEAK (hrs)= | 5.00 | 5.00 | 5.00 | |
| RUNOFF VOLUME (mm)= | 86.50 | 81.11 | 85.35 | |
| TOTAL RAINFALL (mm)= | 87.50 | 87.50 | 87.50 | |
| RUNOFF COEFFICIENT = | 0.99 | 0.93 | 0.98 | |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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 ( 0010) | | AREA | QPEAK | TPEAK | R.V. |
|---|---|---|---|---|---|
| 1 + 2 = 3 | | (ha) | (cms) | (hrs) | (mm) |
| | ID1= 1 ( 0106): | 1.55 | 0.144 | 5.00 | 82.66 |
| | + ID2= 2 ( 0107): | 0.63 | 0.070 | 5.00 | 85.35 |
| | ID = 3 ( 0010): | 2.18 | 0.214 | 5.00 | 83.44 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| ADD HYD ( 0010) | | AREA | QPEAK | TPEAK | R.V. |
|---|---|---|---|---|---|
| 3 + 2 = 1 | | (ha) | (cms) | (hrs) | (mm) |
| | ID1= 3 ( 0010): | 2.18 | 0.214 | 5.00 | 83.44 |
| | + ID2= 2 ( 0108): | 0.76 | 0.081 | 5.00 | 74.69 |
| | ID = 1 ( 0010): | 2.94 | 0.295 | 5.00 | 81.18 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| ADD HYD ( 0113) | | AREA | QPEAK | TPEAK | R.V. |
|---|---|---|---|---|---|
| 1 + 2 = 3 | | (ha) | (cms) | (hrs) | (mm) |
| | ID1= 1 ( 0010): | 2.94 | 0.295 | 5.00 | 81.18 |
| | + ID2= 2 ( 0110): | 4.58 | 0.262 | 5.00 | 83.25 |
| | ID = 3 ( 0113): | 7.52 | 0.557 | 5.00 | 82.44 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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```
       V    V   I    SSSSS  U   U    A    L             (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
```



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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
Output filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-33eb-4790-b5ab-2fe711ab4c1b\9e076787-2a6d-4e36-8549-eddde30d1d78\scenari
Summary filename: C:\Users\qdar\AppData\Local\Civica\VH5\7956b992-33eb-4790-b5ab-2fe711ab4c1b\9e076787-2a6d-4e36-8549-eddde30d1d78\scenari

DATE: 04/22/2024 TIME: 11:21:45

USER:

COMMENTS: _____

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** SIMULATION : N - Regional (Hazel) **

| READ STORM | Filename: C:\Users\qdar\AppData\Local\Temp\76b488fe-908e-4071-918b-7207f3d34655\3705d6c4 |
|---|---|
| Ptotal=212.00 mm | Comments: Hazel |

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.00 | 6.00 | 3.00 | 13.00 | 6.00 | 23.00 | 9.00 | 53.00 |
| 0.25 | 6.00 | 3.25 | 13.00 | 6.25 | 23.00 | 9.25 | 53.00 |
| 0.50 | 6.00 | 3.50 | 13.00 | 6.50 | 23.00 | 9.50 | 53.00 |
| 0.75 | 6.00 | 3.75 | 13.00 | 6.75 | 23.00 | 9.75 | 53.00 |
| 1.00 | 4.00 | 4.00 | 17.00 | 7.00 | 13.00 | 10.00 | 38.00 |
| 1.25 | 4.00 | 4.25 | 17.00 | 7.25 | 13.00 | 10.25 | 38.00 |
| 1.50 | 4.00 | 4.50 | 17.00 | 7.50 | 13.00 | 10.50 | 38.00 |
| 1.75 | 4.00 | 4.75 | 17.00 | 7.75 | 13.00 | 10.75 | 38.00 |
| 2.00 | 6.00 | 5.00 | 13.00 | 8.00 | 13.00 | 11.00 | 13.00 |
| 2.25 | 6.00 | 5.25 | 13.00 | 8.25 | 13.00 | 11.25 | 13.00 |
| 2.50 | 6.00 | 5.50 | 13.00 | 8.50 | 13.00 | 11.50 | 13.00 |
| 2.75 | 6.00 | 5.75 | 13.00 | 8.75 | 13.00 | 11.75 | 13.00 |

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| CALIB | | | |
|---|---|---|---|
| NASHYD ( 0109) | Area (ha)= 1.38 | Curve Number (CN)= 98.0 | |
| ID= 1 DT=10.0 min | Ia (mm)= 5.00 | # of Linear Res.(N)= 3.00 | |
| | U.H. Tp(hrs)= 0.32 | | |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 6.00 | 3.167 | 13.00 | 6.167 | 23.00 | 9.17 | 53.00 |
| 0.333 | 6.00 | 3.333 | 13.00 | 6.333 | 23.00 | 9.33 | 53.00 |
| 0.500 | 6.00 | 3.500 | 13.00 | 6.500 | 23.00 | 9.50 | 53.00 |
| 0.667 | 6.00 | 3.667 | 13.00 | 6.667 | 23.00 | 9.67 | 53.00 |
| 0.833 | 6.00 | 3.833 | 13.00 | 6.833 | 23.00 | 9.83 | 53.00 |
| 1.000 | 6.00 | 4.000 | 13.00 | 7.000 | 23.00 | 10.00 | 53.00 |
| 1.167 | 4.00 | 4.167 | 17.00 | 7.167 | 13.00 | 10.17 | 38.00 |
| 1.333 | 4.00 | 4.333 | 17.00 | 7.333 | 13.00 | 10.33 | 38.00 |
| 1.500 | 4.00 | 4.500 | 17.00 | 7.500 | 13.00 | 10.50 | 38.00 |
| 1.667 | 4.00 | 4.667 | 17.00 | 7.667 | 13.00 | 10.67 | 38.00 |
| 1.833 | 4.00 | 4.833 | 17.00 | 7.833 | 13.00 | 10.83 | 38.00 |
| 2.000 | 4.00 | 5.000 | 17.00 | 8.000 | 13.00 | 11.00 | 38.00 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2.167 | 6.00 | 5.167 | 13.00 | 8.167 | 13.00 | 11.17 | 13.00 |
| 2.333 | 6.00 | 5.333 | 13.00 | 8.333 | 13.00 | 11.33 | 13.00 |
| 2.500 | 6.00 | 5.500 | 13.00 | 8.500 | 13.00 | 11.50 | 13.00 |
| 2.667 | 6.00 | 5.667 | 13.00 | 8.667 | 13.00 | 11.67 | 13.00 |
| 2.833 | 6.00 | 5.833 | 13.00 | 8.833 | 13.00 | 11.83 | 13.00 |
| 3.000 | 6.00 | 6.000 | 13.00 | 9.000 | 13.00 | 12.00 | 13.00 |

Unit Hyd Qpeak (cms)= 0.165

PEAK FLOW (cms)= 0.197 (i)
TIME TO PEAK (hrs)= 10.000
RUNOFF VOLUME (mm)= 201.033
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.948

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

---

| CALIB | |
|---|---|
| STANDHYD ( 0104) | Area (ha)= 0.04 |
| ID= 1 DT=10.0 min | Total Imp(%)= 99.00 Dir. Conn.(%)= 99.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.04 | 0.00 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 1.00 | 2.00 |
| Length | (m)= | 16.33 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 6.00 | 3.167 | 13.00 | 6.167 | 23.00 | 9.17 | 53.00 |
| 0.333 | 6.00 | 3.333 | 13.00 | 6.333 | 23.00 | 9.33 | 53.00 |
| 0.500 | 6.00 | 3.500 | 13.00 | 6.500 | 23.00 | 9.50 | 53.00 |
| 0.667 | 6.00 | 3.667 | 13.00 | 6.667 | 23.00 | 9.67 | 53.00 |
| 0.833 | 6.00 | 3.833 | 13.00 | 6.833 | 23.00 | 9.83 | 53.00 |
| 1.000 | 6.00 | 4.000 | 13.00 | 7.000 | 23.00 | 10.00 | 53.00 |
| 1.167 | 4.00 | 4.167 | 17.00 | 7.167 | 13.00 | 10.17 | 38.00 |
| 1.333 | 4.00 | 4.333 | 17.00 | 7.333 | 13.00 | 10.33 | 38.00 |
| 1.500 | 4.00 | 4.500 | 17.00 | 7.500 | 13.00 | 10.50 | 38.00 |
| 1.667 | 4.00 | 4.667 | 17.00 | 7.667 | 13.00 | 10.67 | 38.00 |
| 1.833 | 4.00 | 4.833 | 17.00 | 7.833 | 13.00 | 10.83 | 38.00 |
| 2.000 | 4.00 | 5.000 | 17.00 | 8.000 | 13.00 | 11.00 | 38.00 |
| 2.167 | 6.00 | 5.167 | 13.00 | 8.167 | 13.00 | 11.17 | 13.00 |
| 2.333 | 6.00 | 5.333 | 13.00 | 8.333 | 13.00 | 11.33 | 13.00 |
| 2.500 | 6.00 | 5.500 | 13.00 | 8.500 | 13.00 | 11.50 | 13.00 |
| 2.667 | 6.00 | 5.667 | 13.00 | 8.667 | 13.00 | 11.67 | 13.00 |
| 2.833 | 6.00 | 5.833 | 13.00 | 8.833 | 13.00 | 11.83 | 13.00 |
| 3.000 | 6.00 | 6.000 | 13.00 | 9.000 | 13.00 | 12.00 | 13.00 |

| | | | | |
|---|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | | 53.00 | 52.94 | |
| over (min) | | 10.00 | 20.00 | |
| Storage Coeff. (min)= | | 1.11 (ii) | 10.21 (ii) | |
| Unit Hyd. Tpeak (min)= | | 10.00 | 20.00 | |
| Unit Hyd. peak (cms)= | | 0.17 | 0.08 | |
| | | | | *TOTALS* |
| PEAK FLOW | (cms)= | 0.01 | 0.00 | 0.006 (iii) |
| TIME TO PEAK | (hrs)= | 9.33 | 10.00 | 10.00 |
| RUNOFF VOLUME | (mm)= | 211.00 | 205.44 | 210.92 |
| TOTAL RAINFALL | (mm)= | 212.00 | 212.00 | 212.00 |
| RUNOFF COEFFICIENT | = | 1.00 | 0.97 | 0.99 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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 ( 0100) | Area (ha)= 3.16 |
| ID= 1 DT=10.0 min | Total Imp(%)= 96.00 Dir. Conn.(%)= 96.00 |

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 3.03 | 0.13 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 4.00 | 2.00 |
| Length | (m)= | 250.00 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 6.00 | 3.167 | 13.00 | 6.167 | 23.00 | 9.17 | 53.00 |
| 0.333 | 6.00 | 3.333 | 13.00 | 6.333 | 23.00 | 9.33 | 53.00 |
| 0.500 | 6.00 | 3.500 | 13.00 | 6.500 | 23.00 | 9.50 | 53.00 |
| 0.667 | 6.00 | 3.667 | 13.00 | 6.667 | 23.00 | 9.67 | 53.00 |
| 0.833 | 6.00 | 3.833 | 13.00 | 6.833 | 23.00 | 9.83 | 53.00 |
| 1.000 | 6.00 | 4.000 | 13.00 | 7.000 | 23.00 | 10.00 | 53.00 |
| 1.167 | 4.00 | 4.167 | 17.00 | 7.167 | 13.00 | 10.17 | 38.00 |
| 1.333 | 4.00 | 4.333 | 17.00 | 7.333 | 13.00 | 10.33 | 38.00 |
| 1.500 | 4.00 | 4.500 | 17.00 | 7.500 | 13.00 | 10.50 | 38.00 |
| 1.667 | 4.00 | 4.667 | 17.00 | 7.667 | 13.00 | 10.67 | 38.00 |
| 1.833 | 4.00 | 4.833 | 17.00 | 7.833 | 13.00 | 10.83 | 38.00 |
| 2.000 | 4.00 | 5.000 | 17.00 | 8.000 | 13.00 | 11.00 | 38.00 |
| 2.167 | 6.00 | 5.167 | 13.00 | 8.167 | 13.00 | 11.17 | 13.00 |
| 2.333 | 6.00 | 5.333 | 13.00 | 8.333 | 13.00 | 11.33 | 13.00 |
| 2.500 | 6.00 | 5.500 | 13.00 | 8.500 | 13.00 | 11.50 | 13.00 |
| 2.667 | 6.00 | 5.667 | 13.00 | 8.667 | 13.00 | 11.67 | 13.00 |
| 2.833 | 6.00 | 5.833 | 13.00 | 8.833 | 13.00 | 11.83 | 13.00 |
| 3.000 | 6.00 | 6.000 | 13.00 | 9.000 | 13.00 | 12.00 | 13.00 |

| | | | | |
|---|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | | 53.00 | 52.94 | |
| over (min) | | 10.00 | 20.00 | |
| Storage Coeff. (min)= | | 3.77 (ii) | 12.87 (ii) | |
| Unit Hyd. Tpeak (min)= | | 10.00 | 20.00 | |
| Unit Hyd. peak (cms)= | | 0.16 | 0.07 | |
| | | | | *TOTALS* |
| PEAK FLOW | (cms)= | 0.45 | 0.02 | 0.465 (iii) |
| TIME TO PEAK | (hrs)= | 9.83 | 10.00 | 10.00 |
| RUNOFF VOLUME | (mm)= | 211.00 | 205.44 | 210.77 |
| TOTAL RAINFALL | (mm)= | 212.00 | 212.00 | 212.00 |
| RUNOFF COEFFICIENT | = | 1.00 | 0.97 | 0.99 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL

THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

---

| RESERVOIR( 0103)<br>IN= 2---> OUT= 1<br>DT= 10.0 min | OVERFLOW IS OFF | | | |
|---|---|---|---|---|
| | OUTFLOW (cms) | STORAGE (ha.m.) | OUTFLOW (cms) | STORAGE (ha.m.) |
| | 0.0000 | 0.0000 | 0.0750 | 0.1285 |
| | 0.0130 | 0.0753 | 0.0930 | 0.1427 |
| | 0.0340 | 0.0932 | 0.1200 | 0.1650 |
| | 0.0520 | 0.1091 | 1.2510 | 0.3172 |

| | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
|---|---|---|---|---|
| INFLOW : ID= 2 ( 0100) | 3.160 | 0.465 | 10.00 | 210.77 |
| OUTFLOW: ID= 1 ( 0103) | 3.160 | 0.432 | 10.00 | 210.31 |

PEAK FLOW REDUCTION [Qout/Qin](%)= 92.84
TIME SHIFT OF PEAK FLOW (min)= 0.00
MAXIMUM STORAGE USED (ha.m.)= 0.2079

---

| ADD HYD ( 0110)<br>1 + 2 = 3 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
|---|---|---|---|---|
| ID1= 1 ( 0103): | 3.16 | 0.432 | 10.00 | 210.31 |
| + ID2= 2 ( 0104): | 0.04 | 0.006 | 10.00 | 210.92 |
| ID = 3 ( 0110): | 3.20 | 0.438 | 10.00 | 210.32 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| ADD HYD ( 0110)<br>3 + 2 = 1 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
|---|---|---|---|---|
| ID1= 3 ( 0110): | 3.20 | 0.438 | 10.00 | 210.32 |
| + ID2= 2 ( 0109): | 1.38 | 0.197 | 10.00 | 201.03 |
| ID = 1 ( 0110): | 4.58 | 0.634 | 10.00 | 207.52 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| CALIB<br>NASHYD ( 0108)<br>ID= 1 DT=10.0 min | | | | |
|---|---|---|---|---|
| | Area (ha)= | 0.76 | Curve Number (CN)= | 98.0 |
| | Ia (mm)= | 5.00 | # of Linear Res.(N)= | 3.00 |
| | U.H. Tp(hrs)= | 0.18 | | |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 6.00 | 3.167 | 13.00 | 6.167 | 23.00 | 9.17 | 53.00 |
| 0.333 | 6.00 | 3.333 | 13.00 | 6.333 | 23.00 | 9.33 | 53.00 |
| 0.500 | 6.00 | 3.500 | 13.00 | 6.500 | 23.00 | 9.50 | 53.00 |
| 0.667 | 6.00 | 3.667 | 13.00 | 6.667 | 23.00 | 9.67 | 53.00 |
| 0.833 | 6.00 | 3.833 | 13.00 | 6.833 | 23.00 | 9.83 | 53.00 |
| 1.000 | 6.00 | 4.000 | 13.00 | 7.000 | 23.00 | 10.00 | 53.00 |
| 1.167 | 4.00 | 4.167 | 17.00 | 7.167 | 13.00 | 10.17 | 38.00 |
| 1.333 | 4.00 | 4.333 | 17.00 | 7.333 | 13.00 | 10.33 | 38.00 |
| 1.500 | 4.00 | 4.500 | 17.00 | 7.500 | 13.00 | 10.50 | 38.00 |
| 1.667 | 4.00 | 4.667 | 17.00 | 7.667 | 13.00 | 10.67 | 38.00 |
| 1.833 | 4.00 | 4.833 | 17.00 | 7.833 | 13.00 | 10.83 | 38.00 |
| 2.000 | 4.00 | 5.000 | 17.00 | 8.000 | 13.00 | 11.00 | 38.00 |
| 2.167 | 6.00 | 5.167 | 13.00 | 8.167 | 13.00 | 11.17 | 13.00 |
| 2.333 | 6.00 | 5.333 | 13.00 | 8.333 | 13.00 | 11.33 | 13.00 |
| 2.500 | 6.00 | 5.500 | 13.00 | 8.500 | 13.00 | 11.50 | 13.00 |
| 2.667 | 6.00 | 5.667 | 13.00 | 8.667 | 13.00 | 11.67 | 13.00 |
| 2.833 | 6.00 | 5.833 | 13.00 | 8.833 | 13.00 | 11.83 | 13.00 |
| 3.000 | 6.00 | 6.000 | 13.00 | 9.000 | 13.00 | 12.00 | 13.00 |

Unit Hyd Qpeak (cms)= 0.161

PEAK FLOW (cms)= 0.107 (i)
TIME TO PEAK (hrs)= 10.000
RUNOFF VOLUME (mm)= 194.319
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.917

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

---

| CALIB<br>STANDHYD ( 0106)<br>ID= 1 DT=10.0 min | Area (ha)= 1.55 | | |
|---|---|---|---|
| | Total Imp(%)= 29.00 | Dir. Conn.(%)= 29.00 | |
| | | IMPERVIOUS | PERVIOUS (i) |
| Surface Area | (ha)= | 0.45 | 1.10 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 1.00 | 4.00 |
| Length | (m)= | 101.65 | 385.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 6.00 | 3.167 | 13.00 | 6.167 | 23.00 | 9.17 | 53.00 |
| 0.333 | 6.00 | 3.333 | 13.00 | 6.333 | 23.00 | 9.33 | 53.00 |
| 0.500 | 6.00 | 3.500 | 13.00 | 6.500 | 23.00 | 9.50 | 53.00 |
| 0.667 | 6.00 | 3.667 | 13.00 | 6.667 | 23.00 | 9.67 | 53.00 |
| 0.833 | 6.00 | 3.833 | 13.00 | 6.833 | 23.00 | 9.83 | 53.00 |
| 1.000 | 6.00 | 4.000 | 13.00 | 7.000 | 23.00 | 10.00 | 53.00 |
| 1.167 | 4.00 | 4.167 | 17.00 | 7.167 | 13.00 | 10.17 | 38.00 |
| 1.333 | 4.00 | 4.333 | 17.00 | 7.333 | 13.00 | 10.33 | 38.00 |
| 1.500 | 4.00 | 4.500 | 17.00 | 7.500 | 13.00 | 10.50 | 38.00 |
| 1.667 | 4.00 | 4.667 | 17.00 | 7.667 | 13.00 | 10.67 | 38.00 |
| 1.833 | 4.00 | 4.833 | 17.00 | 7.833 | 13.00 | 10.83 | 38.00 |
| 2.000 | 4.00 | 5.000 | 17.00 | 8.000 | 13.00 | 11.00 | 38.00 |
| 2.167 | 6.00 | 5.167 | 13.00 | 8.167 | 13.00 | 11.17 | 13.00 |
| 2.333 | 6.00 | 5.333 | 13.00 | 8.333 | 13.00 | 11.33 | 13.00 |
| 2.500 | 6.00 | 5.500 | 13.00 | 8.500 | 13.00 | 11.50 | 13.00 |
| 2.667 | 6.00 | 5.667 | 13.00 | 8.667 | 13.00 | 11.67 | 13.00 |
| 2.833 | 6.00 | 5.833 | 13.00 | 8.833 | 13.00 | 11.83 | 13.00 |
| 3.000 | 6.00 | 6.000 | 13.00 | 9.000 | 13.00 | 12.00 | 13.00 |

| | | | |
|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 53.00 | 52.94 | |
| over (min) | 10.00 | 40.00 | |
| Storage Coeff. (min)= | 3.33 (ii) | 32.09 (ii) | |

| | | | |
|---|---|---|---|
| Unit Hyd. Tpeak (min)= | 10.00 | 40.00 | |
| Unit Hyd. peak (cms)= | 0.16 | 0.03 | |
| | | | *TOTALS* |
| PEAK FLOW (cms)= | 0.07 | 0.14 | 0.194 (iii) |
| TIME TO PEAK (hrs)= | 9.83 | 10.33 | 10.00 |
| RUNOFF VOLUME (mm)= | 211.00 | 205.44 | 207.04 |
| TOTAL RAINFALL (mm)= | 212.00 | 212.00 | 212.00 |
| RUNOFF COEFFICIENT = | 1.00 | 0.97 | 0.98 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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 ( 0107) | ID= 1 DT=10.0 min |
|---|---|---|

Area (ha)= 0.63
Total Imp(%)= 79.00 Dir. Conn.(%)= 79.00

| | | IMPERVIOUS | PERVIOUS (i) |
|---|---|---|---|
| Surface Area | (ha)= | 0.50 | 0.13 |
| Dep. Storage | (mm)= | 1.00 | 1.50 |
| Average Slope | (%)= | 3.00 | 2.00 |
| Length | (m)= | 405.00 | 40.00 |
| Mannings n | = | 0.013 | 0.250 |

NOTE: RAINFALL WAS TRANSFORMED TO 10.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

| TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr | TIME hrs | RAIN mm/hr |
|---|---|---|---|---|---|---|---|
| 0.167 | 6.00 | 3.167 | 13.00 | 6.167 | 23.00 | 9.17 | 53.00 |
| 0.333 | 6.00 | 3.333 | 13.00 | 6.333 | 23.00 | 9.33 | 53.00 |
| 0.500 | 6.00 | 3.500 | 13.00 | 6.500 | 23.00 | 9.50 | 53.00 |
| 0.667 | 6.00 | 3.667 | 13.00 | 6.667 | 23.00 | 9.67 | 53.00 |
| 0.833 | 6.00 | 3.833 | 13.00 | 6.833 | 23.00 | 9.83 | 53.00 |
| 1.000 | 6.00 | 4.000 | 13.00 | 7.000 | 23.00 | 10.00 | 53.00 |
| 1.167 | 4.00 | 4.167 | 17.00 | 7.167 | 13.00 | 10.17 | 38.00 |
| 1.333 | 4.00 | 4.333 | 17.00 | 7.333 | 13.00 | 10.33 | 38.00 |
| 1.500 | 4.00 | 4.500 | 17.00 | 7.500 | 13.00 | 10.50 | 38.00 |
| 1.667 | 4.00 | 4.667 | 17.00 | 7.667 | 13.00 | 10.67 | 38.00 |
| 1.833 | 4.00 | 4.833 | 17.00 | 7.833 | 13.00 | 10.83 | 38.00 |
| 2.000 | 4.00 | 5.000 | 17.00 | 8.000 | 13.00 | 11.00 | 38.00 |
| 2.167 | 6.00 | 5.167 | 13.00 | 8.167 | 13.00 | 11.17 | 13.00 |
| 2.333 | 6.00 | 5.333 | 13.00 | 8.333 | 13.00 | 11.33 | 13.00 |
| 2.500 | 6.00 | 5.500 | 13.00 | 8.500 | 13.00 | 11.50 | 13.00 |
| 2.667 | 6.00 | 5.667 | 13.00 | 8.667 | 13.00 | 11.67 | 13.00 |
| 2.833 | 6.00 | 5.833 | 13.00 | 8.833 | 13.00 | 11.83 | 13.00 |
| 3.000 | 6.00 | 6.000 | 13.00 | 9.000 | 13.00 | 12.00 | 13.00 |

| | | | |
|---|---|---|---|
| Max.Eff.Inten.(mm/hr)= | 53.00 | 52.94 | |
| over (min) | 10.00 | 20.00 | |
| Storage Coeff. (min)= | 5.48 (ii) | 14.58 (ii) | |
| Unit Hyd. Tpeak (min)= | 10.00 | 20.00 | |
| Unit Hyd. peak (cms)= | 0.14 | 0.07 | |
| | | | *TOTALS* |
| PEAK FLOW (cms)= | 0.07 | 0.02 | 0.092 (iii) |
| TIME TO PEAK (hrs)= | 10.00 | 10.00 | 10.00 |
| RUNOFF VOLUME (mm)= | 211.00 | 205.44 | 209.82 |
| TOTAL RAINFALL (mm)= | 212.00 | 212.00 | 212.00 |
| RUNOFF COEFFICIENT = | 1.00 | 0.97 | 0.99 |

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 98.0 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 ( 0010) | 1 + 2 = 3 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
|---|---|---|---|---|---|
| | ID1= 1 ( 0106): | 1.55 | 0.194 | 10.00 | 207.04 |
| | + ID2= 2 ( 0107): | 0.63 | 0.092 | 10.00 | 209.82 |
| | ID = 3 ( 0010): | 2.18 | 0.286 | 10.00 | 207.84 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| ADD HYD ( 0010) | 3 + 2 = 1 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
|---|---|---|---|---|---|
| | ID1= 3 ( 0010): | 2.18 | 0.286 | 10.00 | 207.84 |
| | + ID2= 2 ( 0108): | 0.76 | 0.107 | 10.00 | 194.32 |
| | ID = 1 ( 0010): | 2.94 | 0.394 | 10.00 | 204.35 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---

| ADD HYD ( 0113) | 1 + 2 = 3 | AREA (ha) | QPEAK (cms) | TPEAK (hrs) | R.V. (mm) |
|---|---|---|---|---|---|
| | ID1= 1 ( 0010): | 2.94 | 0.394 | 10.00 | 204.35 |
| | + ID2= 2 ( 0110): | 4.58 | 0.634 | 10.00 | 207.52 |
| | ID = 3 ( 0113): | 7.52 | 1.028 | 10.00 | 206.28 |

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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FINISH