FUNCTIONAL SERVICING & STORMWATER MANAGEMENT REPORT

RIDGE ESTATES BLOCK 38

SOLCORP DEVELOPMENTS (PEAKS RIDGE) INC.
TOWN OF THE BLUE MOUNTAINS

PREPARED BY:

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CROZIER
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1.0 INTRODUCTION

CF Crozier & Associates Inc. ("Crozier") was retained by Solcorp Developments (Ridge Estates) Inc., to provide engineering analysis strategies management to support the Draft Plan approval of the Ridge Estates Block 38 ("Site") in the Town of The Blue Mountains ("TOBM"). The 2.37 hectare (5.86 acre) property is bounded by the Georgian Bay Club to the north, Georgian Ridge Estates development to the east, NEC escarpment land to the south and agricultural land to the west.

The proposed development will be a common element condominium consisting of 31 single detached dwellings, recreation facility, and roadway block. Access to the development will be solely from George McCrae Road, which was constructed as part of the Georgian Ridge Estates development.

This report has been prepared to provide details associated with the preliminary servicing and stormwater strategies for the proposed development. Contained within this report is a review of the following:

1. Project background information
2. Description of the existing site conditions
3. Discussion of the existing and proposed systems:
    a) Road networks
    b) Sanitary sewage collection and conveyance
    c) Potable water distribution and fire protection
    d) Stormwater management controls
    e) Utility plants
4. Conclusions

The Site is located at the current west terminus of George McCrae Road west of Camperdown Road. The Site continues development from Georgian Ridge Estates, extending George McCrae Road west. The Site is legally described as Registered Plan 16M-24 West End of George McCrae Road Block 38 within the Town of The Blue Mountains (Formerly Township of Collingwood), County of Grey.

In preparing this report our office reviewed the following documentation:

1. "Certificate of Approval Review: Stormwater Management Ponds 1, 2 and 3" prepared by R.J. Burnside & Associates Ltd. dated March 2003.
2. "Stormwater Implementation Report: Georgian Ridge Estates" prepared by C.F. Crozier & Associates Inc. dated June 2004.
3. "2017 Annual Performance Report: Thornbury Wastewater Treatment Plant and Associated Collection System" prepared by TOBM 2017.
4. "Ridge Estates, Clarksburg, Ontario Geotechnical Investigation" prepared by WSP dated September 2018.

Construction of the civil infrastructure (inclusive of roads, undergrounds and utilities) to service lots and blocks in the Georgian Ridge Estates development, located along George McCrae Road and

Maryward Crescent, was completed in 2006. Sanitary and storm sewers and watermain were extended and installed immediately beyond the existing west phase limit along George McCrae Road for future connections. An additional watermain connection was stubbed and capped at the west property corner of Lots 24 and 25 along Maryward Crescent.

2.0 SITE DESCRIPTION

A geotechnical investigation was completed in July 2018 by WSP. WSP advanced four (4) boreholes across the Site and recorded soil characteristics and strengths and groundwater elevations. The Site is predominantly a stiff Clayey Soil. Groundwater was recorded on average 1.6 metres below ground surface of each borehole. No bedrock was recorded during the geotechnical investigations. Per Soils of Grey County Ontario Soil Survey Report No. 17, the Site is predominantly Dunedin Clay soil, representing the observations recorded onsite during the geotechnical investigation. Excerpts from the geotechnical report are included under Appendix A.

Two (2) material stockpiles are located along the north portion of the Site, which were generated from previous civil servicing works for the Georgian Ridge Estates development. The south portion of the Site is currently undisturbed and heavily treed. A large drainage ditch traverses parallel to the proposed east property line and flows intermittently.

The Site naturally drains from the south to the north property line of the Site.

3.0 ROAD NETWORK

3.1 Existing Road Network

Currently there is no existing roadway within the Site limits.

George McCrae Road has been constructed to a 20 m wide public right of way (ROW). It consists of an 8.5 m wide paved urban roadway cross section, consisting of curb and gutter and storm sewer system. This roadway has been constructed to base course asphalt.

The Site can be accessed via a gravel construction access from the west terminus of George McCrae Road.

3.2 Proposed Road Network

George McCrae Road will be extended into and terminate along the west property limit of the Site. Roadways internal to the Site will consist of a 7 m wide asphalt platform private common element roadway. These roadways will maintain the urban cross section consisting of curb and gutter and storm sewer system. Internal roadways will consist of 3.5 m servicing easements on each side, resulting in a 15 m service corridor. Access to the Site will occur solely from George McCrae Road near the northeast corner of the Site. Roadways will be constructed to current TOBM Standards and recommendation presented in WSP's geotechnical investigation.

Drainage of the roadways will be managed via storm sewer system and overland flow contained within the roadway during minor and major (>5 year) storm events.

Preliminary roadway grading was completed by Crozier considering connections to existing/proposed roadways, preliminary drainage paths and existing grades along the property lines. Roadway grades range from 228.50 m to 238.00 m. Refer to Figure 1 for additional details.

4.0 POTABLE WATER SERVICING

4.1 Existing Water Distribution Network

Currently there is no watermain infrastructure within the Site limits.

A public watermain was installed along George McCrae Road and Maryward Crescent in 2006. These watermains consist of a combination of 150mm and 200mm dia. watermains and are located along the north side of George McCrae Road and the north, east and west side of Maryward Crescent. A 150mm dia. watermain is terminated, capped and braced immediately west of the previous phasing limits along George McCrae Road. Additionally, a 200mm dia. watermain is terminated, capped and braced at the west corner between Lots 24 and 25 along Maryward Crescent. Refer to Figure 2 for details regarding the existing connection stubs of the watermain.

A hydrant is located just east of George McCrae Road west terminus and north and east of the watermain stub located along Maryward Crescent.

4.2 Proposed Water Servicing Strategy

The Site water distribution system will be public and will be located along the north and west side of the internal roadways within the pavement structure and the system will be installed with all associated appurtenances per TOBM Standards. The proposed Site watermain will be looped and connected at the current George McCrae Road and Lot 24/25 Maryward Crescent watermain stubs. Terminations, consisting of capping and bracing, of the proposed watermain will occur at two (2) locations along the west property limit of the Site.

The watermains will be sized to service the single detached dwellings along the internal roadways based on the short method calculation for grouping of single detached dwellings per the Fire Underwriter's Survey (FUS) Note J. This calculation is presented in Appendix B. During the Detailed Design phase, the internal watermain network will be added to the TOBM water model to ensure it is sufficiently sized to provide required fire flows per TOBM Standards.

As per the current TOBM Standards and the Ministry of Environment, Conservation and Parks (MOECP) guidelines, Table 1 below presents the preliminary water demands for the average daily flow (ADD), maximum daily flow (MDD), peak hourly flow (PHD) and minimum hourly flow (MHD).

Table 1: Water Demands for Proposed Development

Demand Scenario	Total Demand (L/s)
ADD[1]	0.40
MHD[1]	0.04
MDD[1]	3.79
PHD[1]	5.71
Fire Flow[2]	67

1. ADD, MHD, MDD and PHD calculated using the MOECP Water Design Guidelines, including Table 3-3.
2. Fire flow excludes base demand and is calculated from the short method for a grouping of single detached dwellings per FUS Note J.

Refer to Appendix B for details regarding the water demand calculations.

Individual services will be installed for every single detached dwelling and the recreation facility. Hydrants will be installed as per TOBM Standards. Refer to Figure 2 regarding the alignment of the proposed Site watermains.

5.0 SANITARY SERVICING

5.1 Existing Sanitary Sewage System

A sanitary sewer was installed along George McCrae Road in 2006 as part of the civil servicing works for Georgian Ridge Estates. The sanitary sewer is a 200mm dia. gravity sewer that was terminated at SAN MH#1, which is located at the previous development limit along George McCrae Road. This sanitary sewer is aligned along the centreline of George McCrae Road.

Sewage from the Georgian Ridge Estates development (including the Site) drains to Camperdown Court/Clear Water Court and Camperdown Road intersection via gravity sewer system. The sewage is conveyed via gravity north from this intersection and discharges to the 375mm dia. trunk sanitary sewer located along the south side of Highway 26. Sewage is pumped from the Delphi sewage pumping station located along Highway 26 and eventually discharges to the Thornbury Wastewater Treatment Plant.

Per the Town's 2017 Year End Report, the Wastewater Treatment Plant is currently operating at 64% of its average daily flow rated capacity.

5.2 Proposed Sanitary Servicing Strategy

The present 2018 Draft Plan (as shown in the Figures section) includes thirty-one (31) residential single detached and one (1) recreation centre. The previous 2003 Draft Plan for the Georgian Ridge Estates development included a total of 41 units within 2.34 ha of Site area. Based on preliminary sewage generation calculations using current TOBM Standards, the overall sewage generated from the Site has decreased per the updated Draft Plan from 2.65 L/s to 2.16 L/s. Refer to Appendix C regarding sanitary sewer design flow calculations for the Site.

The proposed Site sanitary sewer system will consist of a private 200mm dia. gravity sanitary sewer discharging to SAN MH#1 located at the west terminus of George McCrae Road. Alignment of the sewers will follow the centreline of the proposed roadway. Individual gravity sanitary services will be installed for each unit as per TOBM Standards. The sanitary sewer will be extended and terminated via sanitary maintenance hole at two (2) locations along the west limit of the Site. Refer to Figure 2 for the alignment of the proposed internal sanitary sewer system.

6.0 STORMWATER MANAGEMENT & SITE DRAINAGE

Stormwater management for the Site will comply with the policies and standards of various agencies including the MOECP, TOBM and Grey Sauble Conservation Authority.

The stormwater management criteria that will be met within the proposed Site development are listed below:

- Water Quality Control
  - "Enhanced Protection" given Georgian Bay as the ultimate receiver
- Water Quantity / Peak Flow Control
  - No impacts to the downstream drainage network

The basis for the stormwater management strategy for the Site was identified by R.J. Burnside & Associates Ltd. ("Burnside") in the reports listed in Section 1.0. This report will confirm that the drainage designs for the Site will follow the previously approved strategy and will be in general conformance with the Burnside Master Drainage Report (2003).

6.1 Existing Drainage Conditions

Currently there is no storm sewer system within the Site to convey flows downstream of the Site. The Georgian Ridge Estates development is split into two (2) watershed areas: Watershed 31 and 32. Block 38 is entirely located within the Watershed 32 drainage area.

Previous modelling for the Camperdown Road watershed was completed by Burnside in April 2002 and updated in March 2003 per the Certificate of Approval (C of A) Review. In the minor storm events (up to and including the 5-year storm event) a majority of the Allan property (Georgian Ridge Estates and the Site) was proposed to drain via underground sewers to the SWM Pond 1 located at the Southwest corner of Camperdown Road and Highway 26 intersection within the Georgian Bay Club lands. In the major storm event (>5-year storm event), a portion of the Georgian Ridge Estates and the Site was proposed to drain through Watershed 32 along Watercourse 32 to a 3.10 m x 2.65 m CIP concrete box culvert crossing at Highway 26, bypassing attenuation controls. The Site and a portion of Georgian Ridge Estates was originally proposed to drain to the west tributary of Watercourse 32 during major storm events. Refer to Appendix D regarding the original drainage areas and modelling completed by Burnside.

Currently a 30 m wide drainage channel ("West Tributary") traverses along the east side of the Site. Based on the original catchment area delineation prepared by Crozier in the 2004 SWM Implementation Report, approximately 25.2 ha of external area drains to the West Tributary upstream of the Site. Refer to Appendix E regarding the drainage area of West Tributary upstream of the Site.

6.2 Proposed Drainage Conditions

The Site will drain towards George McCrae Road via storm sewer systems and overland flow routes in the minor and major (>5-year) storm events, respectively. Preliminary grading of the roadway has been completed for the Site. To conservatively assess the existing downstream stormwater systems and structures, it has been assumed that "rear to front" drainage occurs for all the proposed lots.

As our Site drains into existing storm systems downstream, we have completed preliminary capacity assessments of the following infrastructure:

1. George McCrae Road Storm Sewer Capacity;
2. SWM Pond 1 Capacity;
3. West Tributary Capacity;
4. George McCrae Road Culvert Crossing; and,
5. Downstream West Tributary Capacity Assessment.

Refer to Section 6.2.1 to 6.2.5 below regarding these preliminary assessments.

6.2.1 George McCrae Road Storm Sewer Capacity Assessment

A combination of 525mm and 600mm dia. trunk storm sewers exists along the south edge of pavement of George McCrae Road. The storm sewer downstream of the Georgian Ridge Estates development increases to a 750mm dia. at the outlet along Stone Zack Road. The original storm sewer sizing for the Site and Georgian Ridge Estates was completed by Crozier in the 2004 Stormwater Implementation Report using the Rational Method for the 5-year storm event as per

previous TOBM Standards. This storm sewer was sized based on the 2003 Draft Plan prepared by Malone Given Parsons Ltd. Refer to Appendix C regarding the original Draft Plan.

In the 2004 Stormwater Implementation Report, it was assumed that Block 38 (formally known as "Block 50") had a runoff coefficient ("C") of 0.4. Based on updated TOBM Standards (2009), Crozier has re-assessed the downstream storm sewer capacity using a weighted runoff coefficient of 0.45. Additionally, the rainfall intensity formula inputs used for the 5-year storm event were updated to reflect current TOBM Standards.

The storm sewer downstream of the Site will begin surcharging at STM DCBMH22 as per the updated storm sewer design sheet. To mitigate impacts on the downstream storm sewer, onsite controls will be necessary to control design flow rates from the Site in the 5-year storm event. The type of controls required to manage the release rate from the Site will be analyzed and vetted using Best Management Practices (BMPs) during Detailed Design phase. Some examples of BMPs would be oversized storm sewer or underground drainage cells. Refer to Appendix F for additional details regarding the updated storm sewer design sheet and proposed Site drainage areas.

6.2.2 SWM Pond 1 Capacity Assessment

SWM Pond 1 was previously sized by Burnside in 2002, with updated stormwater modelling completed in 2003 to support the MOECP (formally "Ministry of the Environment") C of A for SWM Pond 1. A majority of the Site was proposed to drain to SWM Pond 1 in the minor (up to 5-year) storm events in the Burnside model.

As per the Burnside modelling, SWM Pond 1 was sized adequately to capture and control stormwater runoff from developed areas upstream and control runoff from post- to pre-development conditions within Watershed 31. This included a majority of the Site. Refer to Table 2 for the pre- and post-development peak flow rates at the outlet of Watershed 31 per the 2003 Burnside report.

Table 2: Pre- and Post-Development Peak Flow Rates Watershed 31 at Outlet

Storm Events	Pre-Development (m^3/s)[1]	Post-Development (m^3/s)[1]
2 year	7.83	7.39
5 year	11.93	11.30
10 year	14.82	14.03
25 year	19.19	18.13
100 year	26.14	26.61

1. Peak flow rates simulated at the outlet of SWM Pond 1 as per 2003 Burnside C of A Review

From the Burnside model, it was concluded that SWM Pond 1 was sized to control post- to pre-development peak flow conditions, therefore stormwater management for the Site was included in SWM Pond 1 design for rainfall return periods up to and including the 5-year storm event. Refer to Appendix D regarding the modelling for Watershed 31 and SWM Pond 1 completed by Burnside.

6.2.3 West Tributary Capacity Assessment

The West Tributary of Watercourse 32 traverses along the east property line of the Site. As per Crozier's previous 2004 Stormwater Report, a total of approximately 32.3 ha of undeveloped area drains to the West Tributary of Watercourse 32.

To assess the capacity of the West Tributary, Crozier completed SWM HYMO modelling for the 100-year up to and including the Regional storm events to determine the peak flow rates flowing to the West Tributary (32.3 ha). Peak flow rates modelled along the West Tributary are shown in Table 3.

Table 3: Peak Flow Rates at the Site Outlet along Watercourse 32 West Tributary

Storm Events	External Drainage Area Peak Flow Rates – 24Hr SCS Type II (m^3/s)	External Drainage Area Peak Flow Rates – 6Hr Keifer Chu CHI (m^3/s)
100 year	4.42	3.99
Regional	3.40	

Four (4) cross sections were assessed using the governing storm event (100-year SCS) along the West Tributary: Three (3) upstream and one (1) downstream of the existing George McCrae Road culvert crossing. Based on the results presented in Appendix F, the Site will have to be graded to provide flood proofing for the proposed development along Lots 22 to 32 backing onto the West Tributary. The high water level (HWL) elevations range from 227.90 m to 237.79 m. Refer to Figure 3 for additional details regarding the water elevations along the West Tributary.

6.2.4 West Tributary Culvert Crossing Capacity Assessment

A 450mm dia. CSP Culvert crossing is currently installed beneath the construction road access to the Site. Discharge from this culvert eventually drains to Watercourse 32.

This existing cross culvert can convey approximately 0.09 m^3/s. Upgrades to this culvert will be required to convey the 25-year event peak flow rate under the proposed extension of George McCrae Road as per current TOBM Standards. Type and sizing of the culvert crossing will be completed during Detailed Design. Refer to Appendix F regarding the calculations for the existing culvert capacity.

6.2.5 West Tributary Downstream Capacity Assessment

As per the 2003 Burnside C of A report, the West Tributary drains and discharges to Watercourse 32. Watercourse 32 bypasses SWM Pond 1 and eventually drains to Highway 26.

A preliminary assessment of the peak flow rates occurring in the pre- and post-development conditions was completed by Crozier using the drainage areas delineated in the 2004 Stormwater Implementation Report. The peak flow rates at the Site outlet (West Tributary) were calculated for the 2, 5, 25 and 100-year SCS and CHI storm events and the Regional storm event using SWM HYMO. The peak flow rates at the outlet of the West Tributary are shown in Table 4.

Table 4: Pre- and Post-Development Peak Flow Rates at the Site Outlet

Storm Events	Pre-Development Peak Flow Rates (m^3/s)		Post-Development Peak Flow Rates (m^3/s)	
	24Hr SCS Type II	6Hr Keifer Chu CHI	24Hr SCS Type II	6Hr Keifer Chu CHI
25 year	3.22	3.00	3.20	3.02
100 year	4.42	3.99	4.36	4.00
Regional	3.40		3.37	

The peak flow rate in the post-development conditions results in a minimal increase from the pre-development flow rate in some of the storm events. All SCS storm events presented in Table 4 decrease in peak flow rate during the post-development conditions. Therefore, development of the

Site will not negatively impact drainage and existing capacity conditions downstream. Refer to Appendix F regarding the SWM HYMO model inputs and results.

Crozier has not completed an assessment of the entire downstream capacity of the drainage area to Watercourse 32 as part of this report.

6.3 Stormwater Quality Control

Water quality controls per the MOECP guidelines are provided by SWM Pond 1 in the Watercourse 31. Runoff discharging to Watercourse 32 will be treated via natural vegetation located within the Watercourse and associated tributaries.

7.0 UTILITIES

The Site will be serviced with telephone, cable TV, gas and hydro. All such utilities have been contacted, and each utility has confirmed that there are existing facilities available in the area to service the Site.

8.0 CONCLUSIONS

The qualitative and quantitative analysis presented herein provides a comprehensive servicing and stormwater management assessment and design of the servicing and storm systems for the Site. The following conclusions have been reached.

1. A 15 m wide servicing corridor (7 m wide asphalt platform) is proposed for the private roadways, including the George McCrae Road extension, and will consist of an urban cross section consisting of curb and gutter and storm sewer system.
2. Public watermains will be extended from the 150mm dia. stub located at the current west terminus of George McCrae Road and the 200mm dia. stub located between Lots 24 and 25 along Maryward Crescent. Sizing of the Site watermains will be completed during Detailed Design, and additional watermain modelling and hydrant testing may be required. Fire flows will be determined based on the short method calculation for grouping of single detached dwellings as per the FUS.
3. A private sanitary sewer will be extended from the west limits of the current George McCrae Road terminus into the Site. The existing 200mm dia. sanitary sewer downstream of the Site was originally sized to convey sewage generated from 41 units within the Site. A 200mm dia. sanitary sewer will be required to convey sewage from the Site.
4. Internal preliminary grading has been completed to maintain existing drainage patterns of the Site. It has been assumed that all lots/blocks will drain towards the proposed roadway and ultimately to SWM Pond 1 in the minor storm events as per the original drainage plan. Overall master grading will be completed during Detailed Design.
5. The existing 525mm dia. storm sewer downstream of the Site along George McCrae Road will begin surcharging downstream of STM CBMH22. Onsite controls will be required to maintain proposed peak flow rates downstream of the Site. Type and size of the controls will be analyzed during Detailed Design.
6. SWM Pond 1 was originally sized to control the 2 through to and including the 100-year storm events post- to pre-development conditions. Development of the Site was included in the original sizing of the SWM Pond 1 per the 2003 Burnside C of A up to and including the 5-year storm event.

7. Flood proofing of Lots 22 to 32 will be required along the West Tributary to convey the 100-year SCS storm event. Detailed grading of these lots will be completed to provide flood proofing along the West Tributary.
8. The existing George McCrae Road Culvert crossing will require an upgrade in order to convey the 25-year storm event under the roadway. Sizing of this culvert will be completed during Detailed Design.
9. Peak flow rates in the pre- and post-development conditions of the Site vary minimally. Therefore, development of the Site will not negatively impact the existing capacity conditions downstream of the Site.
10. Water quality controls for the Site will be provided by a combination of SWM Pond 1 in Watershed 31 and natural vegetation along Watercourse 32 and associated tributaries in Watershed 32.

Therefore, we recommend approval of the Planning Applications for the Site from the perspective of engineering services and drainage requirements.

Respectfully submitted,

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Appendix A

WSP Geotechnical Reporting

SOLCORP DEVELOPMENTS (PEAKS RIDGE) INC.

RIDGE ESTATES, CLARKSBURG, ONTARIO

GEOTECHNICAL INVESTIGATION

SEPTEMBER 19, 2018

4 SITE AND SUBSURFACE CONDITIONS

Details of the subsurface conditions encountered are presented on the Borehole Logs and summarized in the following sections. It is noted that subsurface conditions can change between boreholes and the details provided below refer to soil conditions that were encountered at the borehole locations only.

4.1 GENERAL SUBSURFACE CONDITIONS

Based on the results of the field investigation, the subsurface conditions at the borehole locations generally comprised topsoil overlying layers of silty clay, sandy silt, gravel and sand, gravelly clay and clayey silt. Possible weathered shale was encountered in the last sample of each borehole.

4.1.1 TOPSOIL

Topsoil was encountered in all four (4) of the boreholes, the topsoil was measured to range between 10 cm at BH18-1 and 30 cm in thickness at BH18-3 and BH18-4.

It should be noted that topsoil quantities should not be calculated from the borehole information, as large variations in depth may exist between boreholes. A detailed organic layer thickness survey is required to determine an accurate evaluation of quantity. The organic matter is generally dark brown to black in colour and moist.

4.1.2 COHESIVE DEPOSITS

A native silty clay deposit was encountered underlying the topsoil and extending to a depth of 0.7 mbgs in three (3) of the boreholes advanced at the site. The silty clay was brown to reddish brown, moist, and generally contains trace amounts of sand and gravel. The measured SPT 'N' values in the silty clay ranged from 5 blows per 0.3 m to 19 blows per 0.3 m, indicating that the silty clay varied from firm to very stiff. The natural moisture content of the silty clay ranged between 8% and 27%.

A deposit of gravelly clay was encountered in BH 18-1 at depths between 2.1 and 2.9 mbgs. The gravelly clay was reddish brown, wet and contained some silt. The measured SPT 'N' values in the gravelly clay was 48 blows per 0.3 m, indicating that it is a hard material. The natural moisture content of the gravelly clay was 17%.

Clayey silt deposits were encountered in each of the four (4) boreholes below depths between 1.4 (BH 18-2 and BH18-4) and 2.9 mbgs (BH18-1) with each borehole terminating in the clayey silt. The measured SPT 'N' values in the clayey silt ranged from 18 blows per 0.3 m to 50 blows per 0.08 m, indicating that the clayey silt varied from very stiff to hard. Possible weathered shale was encountered at the terminus of each borehole from 4.57 mbgs to 5.03 mbgs. This caused each borehole to terminate in hard material.

Grain size analyses of two (2) samples of the clayey silt was completed and the gradation curve is presented in ***Enclosure 5 and 6***. A review of the grain size analyses indicates the following ranges of clay, silt, sand and gravel percentages:

- Gravel: 2-4%
- Sand: 6-12%
- Silt: 51-54%
- Clay: 33-38%

4.1.3 NON-COHESIVE DEPOSITS

Non-cohesive deposits were encountered in each of the boreholes. The non-cohesive deposits are variable but generally consist of gravel and sand to sandy silt. The non-cohesive deposits were brown and reddish brown and contained trace to some silt and clay.

The measured SPT 'N' values in the non-cohesive deposits ranged from 10 blows per 0.3 m to 57 blows per 0.3 m, indicating that the non-cohesive deposits varied from compact to very dense.

The natural moisture content of the non-cohesive deposits ranged between 6% and 12%.

A grain size analysis of one (1) sample of the native non-cohesive deposits was completed and the gradation curve is presented in ***Enclosure 7***. A review of the grain size analyses indicates the following ranges of clay, silt, sand and gravel percentages:

- Gravel: 41%
- Sand: 38%
- Fines (Silt and Clay): 21%

4.2 GROUNDWATER

Groundwater was encountered in each of the boreholes on completion of drilling as well as in the monitoring wells after the field investigation. A summary of the groundwater levels measured at the site are summarized below.

BOREHOLE	DATE	GROUNDWATER DEPTH (MBGS)	GROUNDWATER ELEVATION (M)	MEASUREMENT SOURCE
BH18-01	July 5, 2018	4.3	232.5	Open Borehole
	July 13, 2018	1.5	235.3	Monitoring Well
	August 9, 2018	1.6	235.2	Monitoring Well
BH18-02	July 5, 2018	4.0	227.8	Open Borehole
	July 13, 2018	1.7	230.1	Monitoring well
	August 9, 2018	1.9	230.0	Monitoring well
BH18-03	July 5, 2018	3.5	226.6	Open Borehole
BH18-04	July 5, 2018	3.0	224.9	Open Borehole
	July 13, 2018	1.8	226.1	Monitoring well
	August 9, 2018	1.9	226.0	Monitoring well

It should be noted that the groundwater levels can vary and are subject to seasonal fluctuations in response to major weather events. In this regard, WSP is continuing with a groundwater monitoring program at the site through April 2019.

Appendix B

Preliminary Water Demand Calculations (Crozier 2018)

WATER SUPPLY
FOR
PUBLIC FIRE PROTECTION

1999

FIRE UNDERWRITERS SURVEY

A SERVICE TO INSURERS AND MUNICIPALITIES

Notes to Calculation

Note A: The guide is not expected to necessarily provide an adequate value for lumber yards, petroleum storage, refineries, grain elevators, and large chemical plants, but may indicate a minimum value for these hazards.

Note B: Judgment must be used for business, industrial, and other occupancies not specifically mentioned.

Note C: Consideration should be given to the configuration of the building(s) being considered and accessibility by the fire department.

Note D: Wood frame structures separated by less than 3 metres shall be considered as one fire area.

Note E: Fire Walls: - In determining floor areas, a fire wall that meets or exceeds the requirements of the current edition of the National Building Code of Canada (provided this necessitates a fire resistance rating of 2 or more hours) may be deemed to subdivide the building into more than one area or may, as a party wall, separate the building from an adjoining building.

Normally any unpierced party wall considered to form a boundary when determining floor areas may warrant up to a 10% exposure charge.

Note F: High one storey buildings: When a building is stated as 1=2, or more storeys, the number of storeys to be used in the formula depends upon the use being made of the building. For example, consider a 1=3 storey building. If the building is being used for high piled stock, or for rack storage, the building would probably be considered as 3 storeys and, in addition, an occupancy percentage increase may be warranted.

However, if the building is being used for steel fabrication and the extra height is provided only to facilitate movement of objects by a crane, the building would probably be considered as a one storey building and an occupancy credit percentage may be warranted.

Note G: If a building is exposed within 45 metres, normally some surcharge for exposure will be made.

Note H: Where wood shingle or shake roofs could contribute to spreading fires, add 2,000 L/min to 4,000 L/min in accordance with extent and condition.

Note I: Any non-combustible building is considered to warrant a 0.8 coefficient.

Note J: Dwellings: For groupings of detached one family and small two family dwellings not exceeding 2 stories in height, the following short method may be used. (For other residential buildings, the regular method should be used.)

Exposure distances	Suggested required fire flow	
	Wood Frame	Masonry or Brick
Less than 3m	See Note "D"	6,000 L/min
3 to 10m	4,000 L/min	4,000 L/min
10.1 to 30m	3,000 L/min	3,000 L/min
Over 30m	2,000 L/min	2,000 L/min

If the buildings are contiguous, use a minimum of 8,000 L/min. Also consider Note H.

OUTLINE OF PROCEDURE

A. Determine the type of construction.

B. Determine the ground floor area.

C. Determine the height in storeys.

D. Using the fire flow formula, determine the required fire flow to the nearest 1,000 L/min.

E. Determine the increase or decrease for occupancy and apply to the value obtained in D above. Do not round off the answer.

F. Determine the decrease, if any, for automatic sprinkler protection. Do not round off the value.

G. Determine the total increase for exposures, Do not round off the value.

H. To the answer obtained in E, subtract the value obtained in F and add the value obtained in G.

The final figure is customarily rounded off to the nearest 1,000 L/min.

Project: Ridge Estates Block 38
File: 685-3867
Date: September 7, 2018
By: A. Spencer
Revision Date: September 17, 2018
Revised By: A. Spencer

Ridge Estates Block 38 - Water Design Criteria

Number of Residential Units	Internal	31	units
	TOTAL:	**31**	**units**
Recreational Area	TOTAL:	**0.075**	**ha**
Person Per Residential Unit (per TOBM Engineering Standards,April 2009)		2.30	persons/unit
Residential Population		72	persons

Water Demand Rate

Average Daily Demand Rate (per TOBM Engineering Standards,April 2009)		450	L/capita/day
Institutional/Commercial Demand Rate (per MOECP Design Guidelines for Drinking Water Systems)		28	m^3/ha/day

Total Water Demand Flows

Average Daily Residential Demand		0.38	L/s
Average Daily Institutional/Commercial Demand		0.02	L/s
Average Daily Flow	TOTAL:	0.40	L/s
Minimum Hourly Factor (MOECP Design Guideslines for Drinking Water Systems, Table 3-3)		0.10	
Minimum Hourly Flow		0.04	L/s
Maximum Daily Peak Factor (per MOECP Design Guidelines for Drinking Water Systems, Table 3-3)		9.50	
Maximum Daily Flow		3.79	L/s
Peak Hourly Factor (per MOECP Design Guidelines for Drinking Water Systems, Table 3-3)		14.30	
Peak Hourly Flow		5.71	L/s
Fire Flow Demand (per Fire Underwriters Survey Note J)		67.00	L/s
Total Design Flow (per TOBM Engineering Standards,April 2009)		***70.79***	L/s

Appendix C

Preliminary Sanitary Sewage Generation Calculation Comparison (Crozier 2004 vs Crozier 2018)

Project: Ridge Estates Block 38
Project No: 685-3867
File: Peak Flow - Sanitary
Date: 22-Jul-18
By: A. Spencer
Revision Date: 28-Aug-18
Revised By: A. Spencer

Ridge Estates Block 38 - Sanitary Design Flows (Draft Plan 2018)

Developed Site Area		2.34	ha
Number of Residential Units	Single Family Detached	31	units
	Total	**31**	**units**
Number of Recreation Buildings	Recreation Centre	1	unit
	Total	**1**	**unit**
Person Per Residential Unit (per TOBM Engineering Standards,April 2009)		2.30	persons/unit
Residential Population		71	persons
Person Per Recreational Unit (per Ministry of Environment, Conservation & Parks Sewage Guidelines Table 5-3)		28	m^3/ha/day
Recreational Area		0.075	ha

Unit Sewage Flows

Average Residential Flow (per TOBM Engineering Standards, April 2009)		450	L/capita/day
Peak Infiltration Rate (per TOBM Engineering Standards, April 2009)		0.23	L/s/ha

Total Design Sewage Flows

Infiltration		0.54	L/s
Recreational		0.02	L/s
Residential Peak Factor	(Harmon Formula)	4.3	
Total Peak Daily Flow		**2.16**	**L/s**

Project: Ridge Estates Block 38
Project No: 685-3867
File: Peak Flow - Sanitary
Date: 22-Jul-18
By: A. Spencer
Revision Date: 17-Sep-18
Revised By: A. Spencer

Ridge Estates Block 38 - Sanitary Design Flows (Draft Plan 2003)

Developed Site Area		2.34	ha
Number of Residential Units	Single Family Detached	41	units
	Total	**41**	**units**
Person Per Residential Unit (per TOBM Engineering Standards,April 2009)		2.30	persons/unit
Residential Population		94	persons

Unit Sewage Flows

Average Residential Flow (per TOBM Engineering Standards, April 2009)	450	L/capita/day
Peak Infiltration Rate (per TOBM Engineering Standards, April 2009)	0.23	L/s/ha

Total Design Sewage Flows

Infiltration		0.54	L/s
Residential Peak Factor	(Harmon Formula)	4.3	
Total Peak Daily Flow		**2.65**	**L/s**

Revised Draft Plan of Subdivision 42T-89021

Part of Lot 25, Concession 7
Town of The Blue Mountains
County of Grey

Schedule of Land Use

Lot/Block	Land Use	Units	Area (ha)	Density (uph)
1-47	Single Family min. 24.3m (80ft)	20	7.66	7.2 uph
	▲ Single Family min. 30.5m (100ft)	27		
48-50	Condominium Blocks	65	3.81	16.6 uph
51-54	Open Space		6.60	
55	Future Road		0.02	
56	6.0m Walkway		0.06	
57	0.3m Reserve		0.01	
Street A,B	Roads		2.09	
Total		112	20.25	

Owner's Authorization

I hereby authorize Malone Given Parsons Ltd. to prepare and submit this Draft Plan of Subdivision to the Town of The Blue Mountains

SEE ORIGINAL SUBMISSION

Date:

Surveyor's Certificate

I hereby certify that the boundaries of the land to be subdivided and their relationship to the adjoining properties are correctly shown on this plan.

SEE ORIGINAL SUBMISSION

Date:

Additional Information

As required under section 51(17) of the Planning Act R.S.O. 1990.

(a)(b)(e)(f)(g)(j)(l)-As shown on this Plan.

(c)-As shown on this Draft and Key Plan

(d)-Land to be used in accordance with the Schedule of Land Use

(i)-Soil is Clay Loam.

(h)(k) Municipal services to be provided.

Note: Contours relate to Canadian Geodetic Datum.

Prepared by:

MALONE GIVEN PARSONS LTD.
140 Renfrew Drive, Suite 201
Markham, Ontario, L3R 6B3
Tel. (905) 513-0170
Fax. (905) 513-0177

FIGURE 2

Date: Nov 27, 2003
Project No. 02-1231

SCALE
0 25 50 75 100m

Key Plan

Appendix D

Burnside Modelling & Drainage Delineations

R.J.Burnside & Associates Limited 3 Ronell Crescent, Collingwood, Ontario, L9Y 4J6 Canada
telephone (705) 446-0515 fax (705) 446-2389 web www.rjburnside.com

CFC PG 022727

BURNSIDE

[The Difference is our People]

Via Courier

CF CROZIER & ASSOCIATES INC
LAND DEVELOPMENT ENGINEERS
110 PINE STREET
COLLINGWOOD ON
L9Y 2N9

March 13, 2003

Ministry of Environment
Environmental Assessment and Approvals Branch
12th Floor
2 St. Clair Ave. W.
Toronto, ON M4V 1L5

ATTN: **Mr. Stefanos Habtom, P.Eng.**

RE: **Certificate of Approval Review**
Stormwater Management Ponds 1, 2 and 3
Georgian Bay Club, Town of The Blue Mountains
RJB File No.: PG 02 2727

Dear Sir:

This is in response to your request for supplementary information pertaining to the review of the Certificate of Approval applications for stormwater management ponds 1, 2 and 3 for the Georgian Bay Club in the Town of The Blue Mountains.

As we discussed with you recently, Burnside have undertaken a review of the suitability of SWM Pond 1 to provide stormwater management treatment for an additional proposed subdivision (Barton Development), which is presently before the Ontario Municipal Board. The Barton Development (Draft Plan No. 42T-87017) is located on the east side of Camperdown Road. Through the course of the ongoing OMB mediation process, the Town of The Blue Mountains, Grey Sauble Conservation Authority and Niagara Escarpment Commission instructed Burnside to investigate the potential of accommodating the Barton stormwater within SWM Pond 1. In this manner, SWM Pond 1 would function as a regional stormwater management facility and provide treatment to not only the Georgian Bay Club lands, but also the proposed Allan Subdivision (Draft Plan No. 42T-89021) and the Barton Development. (It should be noted that the Allan development was originally incorporated into the design of SWM Pond 1 from the onset of the project.)

As a result of the extensive remodelling undertaken by Burnside and a review of the detailed design of the facility, we confirm that SWM Pond 1 will be capable of providing the necessary stormwater treatment from both a quantity and quality perspective for the Barton land, not to mention the CDMC and Allan properties. Minor modification to the sediment forbay of SWM Pond 1 will be required, specifically the deepening of the forbay, a minimum 0.5 metres.

We wish to also note that as a result of the extensive review of all material associated with the stormwater management, we have concluded that a minor revision to the low flow orifice within SWM Pond 3 is required. The orifice size should be changed to a 75mmϕ, from the 88mmϕ originally proposed. This will ensure that the extended detention draw down will

occur over at least 24 hours following a short duration 25mm event.

We enclose with this submission the following supplemental information, which reflects the revisions noted above to SWM Pond 1 and its tributary catchment area, as well as relevant information for the other stormwater facilities presently before the Ministry for approval:

- Drawing PG022727-SWM2: Post Development Drainage Plan
- Barton Development Draft Plan (dated Feb. 28, 2003)
- CDMC (Georgian Bay Club) Draft Plan (dated March 4, 2003)
- Allan Concept Plan (dated March 13, 2003)
- SWM Pond 1 summary tables, including stage storage discharge, and supporting calculations (Appendix A)
- SWM Pond 2 summary tables, stage storage discharge relationship and supporting calculations (Appendix B)
- SWM Pond 3 summary tables, stage storage discharge relationship and supporting calculations (Appendix C)
- Overall watershed modelling parameters and catchment descriptions (Appendix D)
- Revised hydrologic modelling for all watersheds (Appendix E)

We have reorganized this material to assist you in your review. All of the detailed hydrologic output has been subdivided into appropriate sections. Furthermore, Appendices A, B and C contain the summary information pertaining to the three stormwater management facilities to which we seek the Certificate of Approval.

Following confirmation from the Ministry that the enclosed information is satisfactory, we will gladly forward the detailed engineering drawings for SWM Pond 1 and 3 once again to the MOE which will reflect the minor modifications to the design, noted above.

If there are any questions or clarifications required, please do not hesitate to contact the undersigned or Mr. Thomas Dole of our office.

Yours truly,

R. J. BURNSIDE & ASSOCIATES LIMITED

Christopher Crozier, P.Eng.
Project Manager
CFC/dh
H:\2002\PG 02 2727\Letter\03132003moe.doc

Post-Development
Watershed 32
2 Year Event

```
00001> 2     Metric Units
00002> *************************************************************************
00003> *#  Project Name     : Watershed 32 Post-Development 2 Year
00004> *#  Project Number   : PG02 3948
00005> *#  Date            : 01-20-2003
00006> *#  Modeller        : A. van Leeuwen and Thomas Dole
00007> *#  Company         : R.J. Burnside and Associates
00008> *#  License #       : J846413
00009> *************************************************************************
00010> *  2 Year Post-Development Flows for Watershed 32
00011> *
00012> START                TZERO=[0.0],  METOUT=[2],  NSTORM=[0],  NRUN=[1]
00013> *                      |  | <--storm filename, one per line for NSTORM time
00014> * ------------------|-------------------------------------------------------------|
00015> *# 24 Hour Chicago Storm
00016> *# 2yr (513/1.5/0.754), 5yr (679/1.5/0.758), 10yr (781/1.5/0.759)
00017> *# 25yr (935/1.5/0.763), 100yr (1139/1.5/0.762)
00018> *# Precipitation quantities were obtained from Owen Sound MOE
00019> CHICAGO STORM        IUNITS=[2],  TD=[24](hrs), RTP=[0.333],  CSDT=[5](min),
00020>                      ICASEs=[1],
00021>                       A=[513],  B=[1.5], and C=[0.754],
00022> * ----------------- ----|-------------------------------------------------------|
00023>
00024> *#Catchment 32101 - External Area Enters as Stream 2
00025>
00026> DESIGN NASHYD         ID=[1], NHYD=["32201"], DT=[5]min, AREA=[250.7](ha),
00027>                       DWF=[0](cms), CN/C=[82.6], TP=[0.60]hrs,
00028>                       RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
00029> * ---------- ----------|-------------------------------------------------------|
00030>
00031> *#Catchment 32103 - External Area Enters as Sheet Flow West of Stream 2
00032>
00033> DESIGN NASHYD         ID=[3], NHYD=["32203"], DT=[1]min, AREA=[2](ha),
00034>                       DWF=[0](cms), CN/C=[86], TP=[0.13]hrs,
00035>                       RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
00036> * ---------- ---- --- |-------------------------------------------------------|
00037>
00038> *#Catchment 32104 - External Area Enters as Sheet Flow East of Stream 2
00039>
00040> DESIGN NASHYD         ID=[4], NHYD=["32204"], DT=[5]min, AREA=[20.4](ha),
00041>                       DWF=[0](cms), CN/C=[85.9], TP=[0.31]hrs,
00042>                       RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
00043> * ---------- ---|-------------------------------------------------------|
00044> *
00045> *#Catchment 32105 - Enters property as Tributary to Stream 2
00046>
00047> DESIGN NASHYD         ID=[5], NHYD=["32205"], DT=[5]min, AREA=[28.1](ha),
00048>                       DWF=[0](cms), CN/C=[83.6], TP=[0.17]hrs,
00049>                       RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
00050> * ---------- |-------------------------------------------------------|
00051>
00052> *#Catchment 31208 represents the Light Density Allan Subdivision Whose Minor
00053> *#flows Are directed from Watershed 32 into Watershed 31 and into the Georgian
00054> *#Bay Club SWM Pond 1. Major flows (above 5 year event) remain in Watershed 32.
00055>
00056> DESIGN STANDHYD       ID=[6], NHYD=["31208"], DT=[1]min, AREA=[7.2](ha),
00057>                       XIMP=[0.16], TIMP=[0.31], DWF=[0](cms), LOSS=[2], CN=[90],
00058>                       SLOPE=[5](%), PAINFALL=[ ,  ,  ,  ](mm/hr), END=-1
00059> * ---------- |-------------------------------------------------------|
00060> COMPUTE TIMEHYD      IDin=[6], CINLET=[1.933](cms), NINLET=[1],
00061>                       MAJID=[7], MajNHYD=["208maj"],
00062>                       MINID=[8], MinNHYD=["208min"],
00063>                       TMJSTO=[0](cu-m)
00064> * ---------- ----|-------------------------------------------------------|
00065>
00066> *#Catchment 32107 represents open space on the Allan Lands
00067>
00068> DESIGN NASHYD         ID=[8], NHYD=["32207"], DT=[1]min, AREA=[1.5](ha),
00069>                       DWF=[0](cms), CN/C=[86], TP=[0.094]hrs,
00070>                       RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
00071> * ---------- ---|-------------------------------------------------------|
00072>
00073> *#Catchment 32108 represents open space on the Allan Lands
00074>
00075> DESIGN NASHYD         ID=[9], NHYD=["32208"], DT=[1]min, AREA=[2.0](ha),
00076>                       DWF=[0](cms), CN/C=[86], TP=[0.09]hrs,
00077>                       RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
00078> * ---------- ----|-------------------------------------------------------|
00079>
00080> *#Add hydrographs 32201, 32202, 32203 and 32204 to determine flow in Stream 2
00081> *#at the downstream property line.
00082>
00083> ADD HYD              IDsum=[6], NHYD=["32pl"], IDs to add=[1+3+4+5+7+8+9]
00084> * ---------- ----------|-------------------------------------------------------|
00085>
00086> *#Route flow in Stream 2 (32201, 32202, 32203, 32204, 208maj) to the North Prope
00087> *#Line
00088>
00089> ROUTE CHANNEL         IDout=[7], NHYD=["1234rn"], IDin=[6],
00090>                       RDT=[1](min),
00091>                       CHLGTH=[1383](m),  CHSLOPE=[3.3]( ),
00092>                                          FPSLOPE=[3.3]( ),
00093>                       SECNUM=[3],          NSEG=[3]
00094>                       ( SEGROUGH, SEGDIST (m))=[0.080,15 +0.035,26.8 0.080,58.1] N
00095>                       ( DISTANCE (m), ELEVATION (m))=[0,     213]
00096>                                                     [12.4,   209]
00097>                                                     [15.     208]
00098>                                                     [15.8,   207.5]
00099>                                                     [26.8,   208]
00100>                                                     [44.4,   209]
00101>                                                     [49.7,   210]
00102>                                                     [54.1,   212]
00103>                                                     [58.1,   214]
00104> * ---------- ----------|-------------------------------------------------------|
00105>
00106> *#Watersh-d 32106 Enters the Property as Tributary to Stream 2
00107>
00108> DESIGN NASHYD         ID=[8], NHYD=["32206"], DT=[2]min, AREA=[29.2](ha),
00109>                       DWF=[0](cms), CN/C=[76.4], TP=[0.57]hrs,
00110>                       RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
00111> * ------ ---- --- ----------------------------------------------------------|
00112>
00113> *#Total flow exiting the property
00114>
00115> ADD HYD              IDsum=[9], NHYD=["flowot"], IDs to add=[7+8]
00116> * ------ ----------|-------------------------------------------------------|
00117> FINISH
00118>
00119>
00120>
00121>
00122>
00123>
00124>
```

```
SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999   55555 =========
S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  5     =========
SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  5      Ver.  3.1
    S   W W   M   M  H   H    Y    M   M  O   O       9999  5555  Oct. 1997
SSSSS   W W   M   M  H   H    Y    M   M   OOO           9      5 =========
                                                     9   9      5 # 3846413
     StormWater Management HYdrologic Model           999   5555  =========

*************************************************************************
*************************** SWMHYMO-95w Ver/3.1 *************************
*******  A single event and continuous hydrologic simulation model  *******
*******     based on the principles of HYMO and its successors      *******
*******                  OTTHYMO-83 and OTTHYMO-89.                 *******
*************************************************************************
******* Distributed by:  J.F. Sabourin and Associates Inc.          *******
*******                  Ottawa,  Ontario: (613) 727-5199          *******
*******                  Gatineau, Quebec: (819) 243-6858          *******
*******                  E-Mail: swmhymo@jfsa.Com                  *******
*************************************************************************

+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+++++++ Licensed user: R.J. Burnside and Associates                  +++++++
+++++++                Stayner              SERIAL#:3846413         +++++++
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

*************************************************************************
*******           ++++++ PROGRAM ARRAY DIMENSIONS ++++++            *******
*******           Maximum value for ID numbers  :     10           *******
*******           Max. number of rainfall points:   5000           *******
*******           Max. number of flow points    :   5000           *******
*************************************************************************


*******************   D E T A I L E D   O U T P U T   *******************
*************************************************************************
*       DATE: 2003-03-07     TIME: 09:35:15     RUN COUNTER: 000679       *
*************************************************************************
* Input   filename: F:\2002\PG0239~4\POST-D~1\2YEAR~1\2-32.DAT            *
* Output  filename: F:\2002\PG0239~4\POST-D~1\2YEAR~1\2-32.out            *
* Summary filename: F:\2002\PG0239~4\POST-D~1\2YEAR~1\2-32.sum            *
* User comments:                                                         *
* 1:_____________________________________________________________________*
* 2:_____________________________________________________________________*
* 3:_____________________________________________________________________*
*************************************************************************

-------------------------------------------------------------------------
001:0001----------------------------------------------------------------
*#*************************************************************************
*#  Project Name    : Watershed 32 Post-Development 2 Year
*#  Project Number  : PG02 3948
*#  Date            : 01-20-2003
*#  Modeller        : A. van Leeuwen and Thomas Dole
*#  Company         : R.J. Burnside and Associates
*#  License #       : 3846413
*#*************************************************************************
--------------------
| START            |  Project  dir.: F:\2002\PG0239~4\POST-D~1\2YEAR~1\
--------------------  Rainfall dir.: F:\2002\PG0239~4\POST-D~1\2YEAR~1\
    TZERO =    .00 hrs on        0
    METOUT=    2 (output = METRIC)
    NRUN  = 001
    NSTORM=    0
-------------------------------------------------------------------------
001:0002----------------------------------------------------------------
*# 24 Hour Chicago Storm
*# 2yr (513/1.5/0.754), 5yr (679/1.5/0.758), 10yr (781/1.5/0.759)
*# 25yr (939/1.5/0.763), 100yr (1139/1.5/0.762)
*# Precipitation quantities were obtained from Owen Sound MOE
```

CHICAGO STORM
Ptotal= 51.12 mm

IDF curve parameters: A= 513.000
B= 1.500
C= .754
used in: INTENSITY = A / (t + B)^C

Duration of storm = 24.00 hrs
Storm time step = 5.00 min
Time to peak ratio = .33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.08	.530	6.08	1.563	12.08	1.479	18.08	.745
.17	.534	6.17	1.617	12.17	1.456	18.17	.740
.25	.539	6.25	1.677	12.25	1.435	18.25	.736
.33	.543	6.33	1.741	12.33	1.414	18.33	.731
.42	.548	6.42	1.811	12.42	1.393	18.42	.727
.50	.552	6.50	1.889	12.50	1.374	18.50	.723
.58	.557	6.58	1.974	12.58	1.355	18.58	.718
.67	.562	6.67	2.069	12.67	1.336	18.67	.714
.75	.567	6.75	2.176	12.75	1.318	18.75	.710
.83	.572	6.83	2.296	12.83	1.301	18.83	.706
.92	.577	6.92	2.432	12.92	1.284	18.92	.702
1.00	.582	7.00	2.590	13.00	1.268	19.00	.698
1.08	.587	7.08	2.773	13.08	1.252	19.08	.694
1.17	.593	7.17	2.990	13.17	1.237	19.17	.690
1.25	.598	7.25	3.250	13.25	1.222	19.25	.686
1.33	.604	7.33	3.570	13.33	1.207	19.33	.682
1.42	.610	7.42	3.974	13.42	1.193	19.42	.678
1.50	.616	7.50	4.503	13.50	1.179	19.50	.675
1.58	.622	7.58	5.232	13.58	1.166	19.58	.671
1.67	.628	7.67	6.309	13.67	1.153	19.67	.667
1.75	.634	7.75	8.096	13.75	1.140	19.75	.664
1.83	.641	7.83	11.777	13.83	1.128	19.83	.660
1.92	.647	7.92	25.967	13.92	1.116	19.92	.657
2.00	.654	8.00	125.078	14.00	1.104	20.00	.653
2.08	.661	8.08	33.512	14.08	1.093	20.08	.650
2.17	.668	8.17	18.454	14.17	1.081	20.17	.646
2.25	.676	8.25	13.169	14.25	1.070	20.25	.643
2.33	.683	8.33	10.410	14.33	1.060	20.33	.640
2.42	.691	8.42	8.695	14.42	1.049	20.42	.637
2.50	.699	8.50	7.515	14.50	1.039	20.50	.633
2.58	.707	8.58	6.649	14.58	1.029	20.58	.630
2.67	.715	8.67	5.983	14.67	1.019	20.67	.627
2.75	.724	8.75	5.454	14.75	1.010	20.75	.624
2.83	.733	8.83	5.021	14.83	1.000	20.83	.621
2.92	.742	8.92	4.661	14.92	.991	20.92	.618
3.00	.751	9.00	4.356	15.00	.982	21.00	.615
3.08	.761	9.08	4.093	15.08	.974	21.08	.612
3.17	.771	9.17	3.864	15.17	.965	21.17	.609
3.25	.781	9.25	3.663	15.25	.956	21.25	.606
3.33	.792	9.33	3.485	15.33	.948	21.33	.603
3.42	.803	9.42	3.325	15.42	.940	21.42	.600
3.50	.814	9.50	3.182	15.50	.932	21.50	.598
3.58	.826	9.58	3.052	15.58	.924	21.58	.595
3.67	.838	9.67	2.934	15.67	.917	21.67	.592
3.75	.850	9.75	2.826	15.75	.909	21.75	.589
3.83	.863	9.83	2.727	15.83	.902	21.83	.587
3.92	.876	9.92	2.635	15.92	.895	21.92	.584
4.00	.890	10.00	2.550	16.00	.888	22.00	.581
4.08	.905	10.08	2.472	16.08	.881	22.08	.579
4.17	.920	10.17	2.399	16.17	.874	22.17	.576
4.25	.935	10.25	2.330	16.25	.867	22.25	.574
4.33	.951	10.33	2.266	16.33	.861	22.33	.571
4.42	.968	10.42	2.206	16.42	.854	22.42	.569
4.50	.986	10.50	2.150	16.50	.848	22.50	.566
4.58	1.004	10.58	2.097	16.58	.842	22.58	.564
4.67	1.023	10.67	2.046	16.67	.836	22.67	.561
4.75	1.043	10.75	1.999	16.75	.830	22.75	.559
4.83	1.064	10.83	1.954	16.83	.824	22.83	.556
4.92	1.086	10.92	1.911	16.92	.818	22.92	.554

5.00	1.109	11.00	1.870	17.00	.812	23.00	.552
5.08	1.133	11.08	1.832	17.08	.806	23.08	.549
5.17	1.158	11.17	1.795	17.17	.801	23.17	.547
5.25	1.185	11.25	1.760	17.25	.795	23.25	.545
5.33	1.213	11.33	1.726	17.33	.790	23.33	.543
5.42	1.243	11.42	1.694	17.42	.785	23.42	.540
5.50	1.275	11.50	1.663	17.50	.779	23.50	.538
5.58	1.308	11.58	1.633	17.58	.774	23.58	.536
5.67	1.344	11.67	1.605	17.67	.769	23.67	.534
5.75	1.382	11.75	1.578	17.75	.764	23.75	.532
5.83	1.422	11.83	1.552	17.83	.759	23.83	.530
5.92	1.466	11.92	1.527	17.92	.755	23.92	.528
6.00	1.513	12.00	1.502	18.00	.750	24.00	.526

001:0003----------

*#Catchment 32201 - External Area Enters as Stream 2

DESIGN NASHYD	Area (ha)= 250.70	Curve Number (CN)=82.60
01:32201 DT= 5.00	Ia (mm)= 1.500	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= .600	

Unit Hyd Qpeak (cms)= 15.959

PEAK FLOW (cms)= 5.919 (i)
TIME TO PEAK (hrs)= 8.667
RUNOFF VOLUME (mm)= 23.874
TOTAL RAINFALL (mm)= 51.119
RUNOFF COEFFICIENT = .467

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

001:0004----------

*#Catchment 32203 - External Area Enters as Sheet Flow West of Stream 2

DESIGN NASHYD	Area (ha)= 2.00	Curve Number (CN)=86.00
03:32203 DT= 1.00	Ia (mm)= 1.500	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= .130	

Unit Hyd Qpeak (cms)= .588

PEAK FLOW (cms)= .158 (i)
TIME TO PEAK (hrs)= 8.117
RUNOFF VOLUME (mm)= 27.065
TOTAL RAINFALL (mm)= 51.119
RUNOFF COEFFICIENT = .529

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

001:0005----------

*#Catchment 32204 - External Area Enters as Sheet Flow East of Stream 2

DESIGN NASHYD	Area (ha)= 20.40	Curve Number (CN)=85.90
04:32204 DT= 5.00	Ia (mm)= 1.500	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= .310	

Unit Hyd Qpeak (cms)= 2.513

PEAK FLOW (cms)= .889 (i)
TIME TO PEAK (hrs)= 8.333
RUNOFF VOLUME (mm)= 26.963
TOTAL RAINFALL (mm)= 51.119
RUNOFF COEFFICIENT = .527

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

001:0006----------

*#Catchment 32205 - Enters property as Tributary to Stream 2

```
----------------------
| DESIGN NASHYD      |   Area     (ha)=   28.10   Curve Number    (CN)=83.60
| 05:32205  DT= 5.00 |   Ia       (mm)=   1.500   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .170

     Unit Hyd Qpeak  (cms)=    6.313

     PEAK FLOW       (cms)=    1.635 (i)
     TIME TO PEAK    (hrs)=    8.167
     RUNOFF VOLUME    (mm)=   24.757
     TOTAL RAINFALL   (mm)=   51.119
     RUNOFF COEFFICIENT   =     .484

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

--------------------------------------------------------------------------------
001:0007----------------------------------------------------------------------
*#Catchment 31208 represents the Light Density Allan Subdivision whose Minor
*#flows are directed from Watershed 32 into Watershed 31 and into the Georgian
*#Bay Club SWM Pond 1. Major flows (above 5 year event) remain in Watershed 32.
----------------------
| DESIGN STANDHYD    |   Area     (ha)=    7.20
| 06:31208  DT= 1.00 |   Total Imp(%)=   31.00   Dir. Conn.(%)=   16.00
----------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area      (ha)=       2.23          4.97
     Dep. Storage      (mm)=        .80          1.50
     Average Slope      (%)=       5.00          5.00
     Length             (m)=     219.09         40.00
     Mannings n            =       .013          .250

     Max.eff.Inten.(mm/hr)=     125.08         75.29
               over (min)          2.00          8.00
     Storage Coeff.  (min)=       2.31 (ii)     8.31 (ii)
     Unit Hyd. Tpeak (min)=       2.00          8.00
     Unit Hyd. peak  (cms)=        .51           .14
                                                          *TOTALS*
     PEAK FLOW       (cms)=        .35           .64          .775 (iii)
     TIME TO PEAK    (hrs)=       8.00          8.10         8.083
     RUNOFF VOLUME    (mm)=      50.32         34.05        36.661
     TOTAL RAINFALL   (mm)=      51.12         51.12        51.119
     RUNOFF COEFFICIENT   =        .98           .67          .717

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  90.0     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.

--------------------------------------------------------------------------------
001:0008----------------------------------------------------------------------
----------------------
| COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =   1.933  (cms)
| TotalHyd 06:31208  |   Number of inlets in system [NINLET] =       1
----------------------   Total minor system capacity          =   1.933  (cms)
                         Total major system storage [TMJSTO] =       0.(cu.m.)

                 ID: NHYD        AREA      QPEAK     TPEAK      R.V.       DWF
                                 (ha)      (cms)     (hrs)      (mm)     (cms)
     TOTAL HYD.  06:31208        7.20       .775     8.083    36.661      .000
     ==========================================================================
     MAJOR SYST  07:208maj        .00       .000      .000      .000      .000
     MINOR SYST  08:208min       7.20       .775     8.083    36.661      .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0009----------------------------------------------------------------------
*#Catchment 32207 represents open space on the Allan Lands
----------------------
| DESIGN NASHYD      |   Area     (ha)=    1.50   Curve Number    (CN)=86.00
```

```
| 08:32207  DT= 1.00 |   Ia      (mm)=   1.500   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=    .094

     Unit Hyd Qpeak  (cms)=     .609

     PEAK FLOW       (cms)=     .144 (i)
     TIME TO PEAK    (hrs)=    8.067
     RUNOFF VOLUME    (mm)=   27.065
     TOTAL RAINFALL   (mm)=   51.119
     RUNOFF COEFFICIENT   =     .529

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

------------------------------------------------------------------------------
001:0010----------------------------------------------------------------------
*#Catchment 32208 represents open space on the Allan Lands
---------------------
| DESIGN NASHYD      |   Area    (ha)=    2.00   Curve Number   (CN)=86.00
| 09:32208  DT= 1.00 |   Ia      (mm)=   1.500   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=    .090

     Unit Hyd Qpeak  (cms)=     .849

     PEAK FLOW       (cms)=     .197 (i)
     TIME TO PEAK    (hrs)=    8.067
     RUNOFF VOLUME    (mm)=   27.065
     TOTAL RAINFALL   (mm)=   51.119
     RUNOFF COEFFICIENT   =     .529

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

------------------------------------------------------------------------------
001:0011----------------------------------------------------------------------
*#Add hydrographs 32201, 32202, 32203 and 32204 to determine flow in Stream 2
*#near the southern property line
--------------------
| ADD HYD (S2pl  ) | ID: NHYD     AREA      QPEAK    TPEAK    R.V.     DWF
--------------------              (ha)      (cms)    (hrs)    (mm)    (cms)
                ID1 01:32201    250.70     5.919     8.67   23.87     .000
               +ID2 03:32203      2.00      .158     8.12   27.06     .000
               +ID3 04:32204     20.40      .889     8.33   26.96     .000
               +ID4 05:32205     28.10     1.635     8.17   24.76     .000
               +ID5 07:208maj      .00      .000      .00     .00     .000 **DRY**
               +ID6 08:32207      1.50      .144     8.07   27.06     .000
               +ID7 09:32208      2.00      .197     8.07   27.06     .000
                ==========================================================
                SUM 06:S2pl     304.70     7.112     8.50   24.22     .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
001:0012----------------------------------------------------------------------
*#Route Flow in Stream 2 (32201, 32202, 32203, 32204, 108maj) to the North Prope
*#Line
--------------------
| ROUTE CHANNEL    |     Routing time step (min) =  1.00
|  IN> 06:S2pl     |     Number of SEGMENTS =  3
| OUT< 07:1234rn   |     Slopes (%), CHANNEL=3.30   FLOODPLAIN=3.30
--------------------                 LENGTH = 1383.00     (m)

               <------ DATA FOR SECTION (   3.0) ------>
               Distance      Elevation       Manning
                    .00         213.00         .0800
                  12.40         209.00         .0800
                  15.00         208.00     .0800 / .0350  Main Channel
                  15.80         207.50         .0350      Main Channel
                  26.80         208.00     .0350 / .0800  Main Channel
                  44.60         209.00         .0800
                  49.70         210.00         .0800
                  54.10         212.00         .0800
                  58.10         214.00         .0800
```

<-------------------------- TRAVEL TIME TABLE -------------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)	D x V (m2/s)
.250	207.750	.102E+04	.949	1.286	17.92	.322
.500	208.000	.408E+04	6.024	2.042	11.29	1.021
.794	208.294	.101E+05	22.574	3.091	7.46	2.455
1.088	208.588	.186E+05	48.770	3.634	6.34	3.955
1.382	208.882	.295E+05	85.078	3.994	5.77	5.521
1.676	209.176	.425E+05	133.055	4.325	5.33	7.252
1.971	209.471	.567E+05	192.176	4.686	4.92	9.234
2.265	209.765	.719E+05	261.439	5.030	4.58	11.392
2.559	210.059	.880E+05	341.080	5.360	4.30	13.715
2.853	210.353	.105E+06	432.103	5.697	4.05	16.255
3.147	210.647	.122E+06	532.844	6.021	3.83	18.948
3.441	210.941	.141E+06	643.161	6.329	3.64	21.779
3.735	211.235	.159E+06	762.958	6.623	3.48	24.738
4.029	211.529	.179E+06	892.175	6.903	3.34	27.816
4.324	211.824	.199E+06	1030.779	7.171	3.21	31.006
4.618	212.118	.219E+06	1178.939	7.429	3.10	34.306
4.912	212.412	.241E+06	1336.735	7.679	3.00	37.716
5.206	212.706	.263E+06	1503.890	7.918	2.91	41.223
5.500	213.000	.285E+06	1680.422	8.149	2.83	44.822

	AREA (ha)	<---- hydrograph ----> QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 6:S2pl	304.70	7.112	8.50	24.221	.519	2.089
OUTFLOW: ID= 7:1234rn	304.70	6.833	8.70	24.220	.514	2.075

001:0013----------

*#Watershed 32206 Enters the Property as Tributary to Stream 2

DESIGN NASHYD	Area (ha)= 29.20	Curve Number (CN)=76.40
08:32206 DT= 2.00	Ia (mm)= 1.500	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= .570	

Unit Hyd Qpeak (cms)= 1.957

PEAK FLOW (cms)= .555 (i)
TIME TO PEAK (hrs)= 8.667
RUNOFF VOLUME (mm)= 19.223
TOTAL RAINFALL (mm)= 51.119
RUNOFF COEFFICIENT = .376

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

001:0014----------

*#Total flow exiting the property

ADD HYD (flowot)	ID: NHYD	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	DWF (cms)
ID1	07:1234rn	304.70	6.833	8.70	24.22	.000
+ID2	08:32206	29.20	.555	8.67	19.22	.000
SUM	09:flowot	333.90	7.386	8.70	23.78	.000

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

001:0015----------

FINISH

****

WARNINGS / ERRORS / NOTES

Simulation ended on 2003-03-07 at 09:35:17

==========

Post-Development
Watershed 32
5 Year Event

```
00001> 2     Metric Units
00002> *#*************************************************************************
00003> *#  Project Name      : Watershed 32 Post-Development 5 Year
00004> *#  Project Number    : PG02 3948
00005> *#  Date              : 01-20-2003
00006> *#  Modeller          : A. van Leeuwen and Thomas Dole
00007> *#  Company           : R.J. Burnside and Associates
00008> *#  License #         : 3846413
00009> *#*************************************************************************
00010> *  5 Year Post-Development Flows for Watershed 32
00011> *
00012> START                 TZERO=[0.0],   METOUT=[2],   NSTORM=[0],   NRUN=[1]
00013> *                      ( ] <--storm filename, one per line for NSTORM time
00014> * ------------------|-------------------------------------------------------|
00015> *# 24 Hour Chicago Storm
00016> *# 2yr (513/1.5/0.754), 5yr (679/1.5/0.758), 10yr (781/1.5/0.759)
00017> *# 25yr (939/1.5/0.760), 100yr (1139/1.5/0.762)
00018> *# Precipitation quantities were obtained from Owen Sound MOE
00019> CHICAGO STORM         IUNITS=[2],   TD=[24](hrs), RTF=[0.333],   CSDT=[5](min),
00020>                       ICASEcs=[1],
00021>                        A=[679],   B=[1.5], and C=[0.758],
00022> * ------------------|-------------------------------------------------------|
00023>
00024> *#Catchment 32201 - External Area Enters as Stream 2
00025>
00026> DESIGN NASHYD         ID=[1], NHYD=["32201"], DT=[5]min, AREA=[250.7](ha),
00027>                       UHF=[0](cms), CN/C=[82.6], TP=[0.60]hrs,
00028>                       RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
00029> * ------------------|-------------------------------------------------------|
00030>
00031> *#Catchment 32203 - External Area Enters as Sheet Flow West of Stream 2
00032>
00033> DESIGN NASHYD         ID=[3], NHYD=["32203"], DT=[1]min, AREA=[2](ha),
00034>                       DWF=[0](cms), CN/C=[86], TP=[0.12]hrs,
00035>                       RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
00036> * -------  ---------|-------------------------------------------------------|
00037>
00038> *#Catchment 32204 - External Area Enters as Sheet Flow East of Stream 2
00039>
00040> DESIGN NASHYD         ID=[4], NHYD=["32204"], DT=[5]min, AREA=[20.4](ha),
00041>                       DWF=[0](cms), CN/C=[85.9], TP=[0.31]hrs,
00042>                       RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
00043> * -------  ---------|-------------------------------------------------------|
00044>
00045> *#Catchment 32205 - Enters property as Tributary to Stream 2
00046>
00047> DESIGN NASHYD         ID=[5], NHYD=["32205"], DT=[5]min, AREA=[28.1](ha),
00048>                       DWF=[0](cms), CN/C=[83.6], TP=[0.17]hrs,
00049>                       RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
00050> * ------------  -----|-------------------------------------------------------|
00051>
00052> *#Catchment 31208 represents the Light Density Allan Subdivision whose Minor
00053> *#flows are directed from Watershed 32 into Watershed 31 and into the Georgian
00054> *#Bay Club SWM Pond 1. Major flows (above 5 year event) remain in Watershed 32.
00055> *
00056> DESIGN STANDHYD       ID=[6], NHYD=["31208"], DT=[1]min, AREA=[7.2](ha),
00057>                       XIMP=[0.16], TIMP=[0.31], DWF=[0](cms), LOSS=[2], CN=[90],
00058>                       SLOPE=[5](%), RAINFALL=[ ,  ,  ,  ](mm/hr), END=-1
00059> * ------  ------------|-------------------------------------------------------|
00060> COMPUTE DUALHYD       IDin=[6], CINLET=[1.933](cms), NINLET=[1],
00061>                       MAJID=[7], MajNHYD=["208maj"],
00062>                       MINID=[8], MinNHYD=["208min"],
00063>                       TMJSTO=[0](cu-m)
00064> * ---------------  ---|-------------------------------------------------------|
00065>
00066> *#Catchment 32207 represents open space on the Allan Lands
00067>
00068> DESIGN NASHYD         ID=[8], NHYD=["32207"], DT=[1]min, AREA=[1.5](ha),
00069>                       DWF=[0](cms), CN/C=[86], TP=[0.094]hrs,
00070>                       RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
00071> * ------  ----------|-------------------------------------------------------|
00072>
00073> *#Catchment 32208 represents open space on the Allan Lands
00074>
00075> DESIGN NASHYD         ID=[9], NHYD=["32208"], DT=[1]min, AREA=[2.0](ha),
00076>                       DWF=[0](cms), CN/C=[86], TP=[0.09]hrs,
00077>                       RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
00078> * ------------------|-------------------------------------------------------|
00079>
00080> *#Add hydrographs 32201, 32202, 32203 and 32204 to determine flow in Stream 2
00081> *#near the southern property line
00082>
00083> ADD HYD               IDsum=[6], NHYD=["S2pl"], IDs to add=[1+3+4+5+7+8+9]
00084> * ------------------|-------------------------------------------------------|
00085>
00086> *#Route Flow in Stream 2 (32201, 32202, 32203, 32204, 208maj) to the North Prope
00087> *#Line
00088>
00089> ROUTE CHANNEL         IDout=[7], NHYD=["1234rn"], IDin=[6],
00090>                       RDT=[1](min),
00091>                       CHLGTH=[1383](m),   CHSLOPE=[3.3]( ),
00092>                                            FPSLOPE=[3.3]( ),
00093>                       SECNUM=[3],        NSEG=[3]
00094>                       ' SEGROUGH, SEGDIST (m))=[0.080,15 -0.035,26.8 0.080,58.1] N
00095>                       ' DISTANCE (m), ELEVATION (m))=[0,       213)
00096>                                                     [12.4,    209]
00097>                                                     [15,      208]
00098>                                                     [15.8,    207.5]
00099>                                                     [26.8,    208]
00100>                                                     [44.6,    209]
00101>                                                     [49.7,    210]
00102>                                                     [54.1,    212]
00103>                                                     [58.1,    214]
00104> * ------------------|-------------------------------------------------------|
00105>
00106> *#Watershed 32206 Enters the Property as Tributary to Stream 2
00107>
00108> DESIGN NASHYD         ID=[8], NHYD=["32206"], DT=[2]min, AREA=[29.2](ha),
00109>                       DWF=[0](cms), CN/C=[76.6], TP=[0.57]hrs,
00110>                       RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
00111> * ------------------|-------------------------------------------------------|
00112>
00113> *#Total flow exiting the property
00114>
00115> ADD HYD               IDsum=[9], NHYD=["flowot"], IDs to add=[7+8]
00116> * ------------------|-------------------------------------------------------|
00117> FINISH
00118>
00119>
00120>
00121>
00122>
00123>
00124>
```

```
SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999   55555 =========
S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  5     =========
SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  5     Ver.  3.1
    S   W W   M   M  H   H    Y    M   M  O   O       9999  5555  Oct. 1997
SSSSS   W W   M   M  H   H    Y    M   M   OOO           9      5 =========
                                                     9   9      5 # 3846413
     StormWater Management HYdrologic Model           999   5555  =========

**************************************************************************
************************** SWMHYMO-95w Ver/3.1 ***************************
*******  A single event and continuous hydrologic simulation model  *******
*******     based on the principles of HYMO and its successors      *******
*******                  OTTHYMO-83 and OTTHYMO-89.                 *******
**************************************************************************
******* Distributed by:  J.F. Sabourin and Associates Inc.          *******
*******                  Ottawa,  Ontario: (613) 727-5199          *******
*******                  Gatineau, Quebec: (819) 243-6858          *******
*******                  E-Mail: swmhymo@jfsa.Com                  *******
**************************************************************************

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+++++++ Licensed user: R.J. Burnside and Associates                 +++++++
+++++++                Stayner              SERIAL#:3846413        +++++++
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

**************************************************************************
*******           ++++++ PROGRAM ARRAY DIMENSIONS ++++++           *******
*******           Maximum value for ID numbers  :     10          *******
*******           Max. number of rainfall points:   5000          *******
*******           Max. number of flow points    :   5000          *******
**************************************************************************


********************   D E T A I L E D   O U T P U T   ********************
**************************************************************************
*       DATE: 2003-03-07      TIME: 09:36:08      RUN COUNTER: 000680      *
**************************************************************************
* Input   filename: F:\2002\PG0239~4\POST-D~1\5YEAR~1\5-32.DAT              *
* Output  filename: F:\2002\PG0239~4\POST-D~1\5YEAR~1\5-32.out              *
* Summary filename: F:\2002\PG0239~4\POST-D~1\5YEAR~1\5-32.sum              *
* User comments:                                                           *
* 1:_____________________________________________________________________*
* 2:_____________________________________________________________________*
* 3:_____________________________________________________________________*
**************************************************************************

--------------------------------------------------------------------------
001:0001----------------------------------------------------------------------
*#**********************************************************************
*#  Project Name    : Watershed 32 Post-Development 5 Year
*#  Project Number  : PG02 3948
*#  Date            : 01-20-2003
*#  Modeller        : A. van Leeuwen and Thomas Dole
*#  Company         : R.J. Burnside and Associates
*#  License #       : 3846413
*#**********************************************************************
--------------------
| START            |  Project  dir.: F:\2002\PG0239~4\POST-D~1\5YEAR~1\
--------------------  Rainfall dir.: F:\2002\PG0239~4\POST-D~1\5YEAR~1\
    TZERO =   .00 hrs on        0
    METOUT=   2 (output = METRIC)
    NRUN  = 001
    NSTORM=   0
--------------------------------------------------------------------------
001:0002----------------------------------------------------------------------
*# 24 Hour Chicago Storm
*# 2yr (513/1.5/0.754), 5yr (679/1.5/0.758), 10yr (781/1.5/0.759)
*# 25yr (939/1.5/0.763), 100yr (1139/1.5/0.762)
*# Precipitation quantities were obtained from Owen Sound MOE
```

CHICAGO STORM
Ptotal= 65.72 mm

IDF curve parameters: A= 679.000
B= 1.500
C= .758
used in: INTENSITY = A / (t + B)^C

Duration of storm = 24.00 hrs
Storm time step = 5.00 min
Time to peak ratio = .33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.08	.671	6.08	1.989	12.08	1.881	18.08	.944
.17	.676	6.17	2.058	12.17	1.852	18.17	.938
.25	.681	6.25	2.134	12.25	1.824	18.25	.932
.33	.687	6.33	2.216	12.33	1.798	18.33	.927
.42	.693	6.42	2.306	12.42	1.772	18.42	.921
.50	.699	6.50	2.405	12.50	1.746	18.50	.916
.58	.705	6.58	2.515	12.58	1.722	18.58	.910
.67	.711	6.67	2.637	12.67	1.699	18.67	.905
.75	.717	6.75	2.773	12.75	1.676	18.75	.899
.83	.723	6.83	2.927	12.83	1.654	18.83	.894
.92	.730	6.92	3.103	12.92	1.632	18.92	.889
1.00	.736	7.00	3.305	13.00	1.611	19.00	.884
1.08	.743	7.08	3.540	13.08	1.591	19.08	.879
1.17	.750	7.17	3.818	13.17	1.572	19.17	.874
1.25	.757	7.25	4.152	13.25	1.552	19.25	.869
1.33	.764	7.33	4.564	13.33	1.534	19.33	.864
1.42	.772	7.42	5.084	13.42	1.516	19.42	.859
1.50	.779	7.50	5.766	13.50	1.498	19.50	.854
1.58	.787	7.58	6.705	13.58	1.481	19.58	.850
1.67	.795	7.67	8.095	13.67	1.465	19.67	.845
1.75	.803	7.75	10.405	13.75	1.448	19.75	.840
1.83	.811	7.83	15.179	13.83	1.433	19.83	.836
1.92	.820	7.92	33.689	13.92	1.417	19.92	.831
2.00	.828	8.00	164.317	14.00	1.402	20.00	.827
2.08	.837	8.08	43.555	14.08	1.387	20.08	.823
2.17	.846	8.17	23.865	14.17	1.373	20.17	.818
2.25	.856	8.25	16.985	14.25	1.359	20.25	.814
2.33	.865	8.33	13.404	14.33	1.345	20.33	.810
2.42	.875	8.42	11.180	14.42	1.332	20.42	.806
2.50	.885	8.50	9.653	14.50	1.319	20.50	.802
2.58	.896	8.58	8.534	14.58	1.306	20.58	.798
2.67	.906	8.67	7.674	14.67	1.294	20.67	.794
2.75	.917	8.75	6.991	14.75	1.282	20.75	.790
2.83	.929	8.83	6.433	14.83	1.270	20.83	.786
2.92	.940	8.92	5.969	14.92	1.258	20.92	.782
3.00	.952	9.00	5.575	15.00	1.247	21.00	.778
3.08	.964	9.08	5.237	15.08	1.235	21.08	.775
3.17	.977	9.17	4.942	15.17	1.224	21.17	.771
3.25	.990	9.25	4.684	15.25	1.214	21.25	.767
3.33	1.004	9.33	4.454	15.33	1.203	21.33	.763
3.42	1.018	9.42	4.249	15.42	1.193	21.42	.760
3.50	1.032	9.50	4.065	15.50	1.183	21.50	.756
3.58	1.047	9.58	3.898	15.58	1.173	21.58	.753
3.67	1.062	9.67	3.746	15.67	1.163	21.67	.749
3.75	1.078	9.75	3.608	15.75	1.154	21.75	.746
3.83	1.095	9.83	3.480	15.83	1.144	21.83	.742
3.92	1.112	9.92	3.363	15.92	1.135	21.92	.739
4.00	1.129	10.00	3.254	16.00	1.126	22.00	.736
4.08	1.148	10.08	3.153	16.08	1.117	22.08	.732
4.17	1.167	10.17	3.059	16.17	1.109	22.17	.729
4.25	1.186	10.25	2.972	16.25	1.100	22.25	.726
4.33	1.207	10.33	2.890	16.33	1.092	22.33	.723
4.42	1.229	10.42	2.813	16.42	1.083	22.42	.719
4.50	1.251	10.50	2.740	16.50	1.075	22.50	.716
4.58	1.274	10.58	2.672	16.58	1.067	22.58	.713
4.67	1.299	10.67	2.608	16.67	1.059	22.67	.710
4.75	1.324	10.75	2.547	16.75	1.052	22.75	.707
4.83	1.351	10.83	2.489	16.83	1.044	22.83	.704
4.92	1.379	10.92	2.434	16.92	1.037	22.92	.701

5.00	1.408	11.00	2.382	17.00	1.029	23.00	.698
5.08	1.439	11.08	2.333	17.08	1.022	23.08	.695
5.17	1.471	11.17	2.285	17.17	1.015	23.17	.692
5.25	1.505	11.25	2.240	17.25	1.008	23.25	.689
5.33	1.541	11.33	2.197	17.33	1.001	23.33	.687
5.42	1.580	11.42	2.156	17.42	.995	23.42	.684
5.50	1.620	11.50	2.117	17.50	.988	23.50	.681
5.58	1.663	11.58	2.079	17.58	.981	23.58	.678
5.67	1.708	11.67	2.043	17.67	.975	23.67	.675
5.75	1.757	11.75	2.008	17.75	.969	23.75	.673
5.83	1.809	11.83	1.974	17.83	.962	23.83	.670
5.92	1.865	11.92	1.942	17.92	.956	23.92	.667
6.00	1.924	12.00	1.911	18.00	.950	24.00	.665

001:0003----------

*#Catchment 32201 - External Area Enters as Stream 2

DESIGN NASHYD	Area (ha)= 250.70	Curve Number (CN)=82.60
01:32201 DT= 5.00	Ia (mm)= 1.500	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= .600	

Unit Hyd Qpeak (cms)= 15.959

PEAK FLOW (cms)= 9.042 (i)
TIME TO PEAK (hrs)= 8.667
RUNOFF VOLUME (mm)= 35.032
TOTAL RAINFALL (mm)= 65.720
RUNOFF COEFFICIENT = .533

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

001:0004----------

*#Catchment 32203 - External Area Enters as Sheet Flow West of Stream 2

DESIGN NASHYD	Area (ha)= 2.00	Curve Number (CN)=86.00
03:32203 DT= 1.00	Ia (mm)= 1.500	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= .130	

Unit Hyd Qpeak (cms)= .588

PEAK FLOW (cms)= .239 (i)
TIME TO PEAK (hrs)= 8.117
RUNOFF VOLUME (mm)= 39.067
TOTAL RAINFALL (mm)= 65.720
RUNOFF COEFFICIENT = .594

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

001:0005----------

*#Catchment 32204 - External Area Enters as Sheet Flow East of Stream 2

DESIGN NASHYD	Area (ha)= 20.40	Curve Number (CN)=85.90
04:32204 DT= 5.00	Ia (mm)= 1.500	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= .310	

Unit Hyd Qpeak (cms)= 2.513

PEAK FLOW (cms)= 1.338 (i)
TIME TO PEAK (hrs)= 8.333
RUNOFF VOLUME (mm)= 38.940
TOTAL RAINFALL (mm)= 65.720
RUNOFF COEFFICIENT = .593

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

001:0006----------

*#Catchment 32205 - Enters property as Tributary to Stream 2

```
----------------------
| DESIGN NASHYD      |   Area    (ha)=   28.10   Curve Number   (CN)=83.60
| 05:32205  DT= 5.00 |   Ia      (mm)=   1.500   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .170

     Unit Hyd Qpeak  (cms)=    6.313

     PEAK FLOW       (cms)=    2.500 (i)
     TIME TO PEAK    (hrs)=    8.167
     RUNOFF VOLUME    (mm)=   36.162
     TOTAL RAINFALL   (mm)=   65.720
     RUNOFF COEFFICIENT   =     .550

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

------------------------------------------------------------------------------
001:0007--------------------------------------------------------------------
*#Catchment 31208 represents the Light Density Allan Subdivision whose Minor
*#flows are directed from Watershed 32 into Watershed 31 and into the Georgian
*#Bay Club SWM Pond 1. Major flows (above 5 year event) remain in Watershed 32.
----------------------
| DESIGN STANDHYD    |   Area    (ha)=    7.20
| 06:31208  DT= 1.00 |   Total Imp(%)=   31.00   Dir. Conn.(%)=   16.00
----------------------
                              IMPERVIOUS     PERVIOUS (i)
     Surface Area     (ha)=       2.23          4.97
     Dep. Storage     (mm)=        .80          1.50
     Average Slope     (%)=       5.00          5.00
     Length            (m)=     219.09         40.00
     Mannings n           =       .013          .250

     Max.eff.Inten.(mm/hr)=     164.32        118.24
               over (min)         2.00          7.00
     Storage Coeff.  (min)=       2.07 (ii)     7.08 (ii)
     Unit Hyd. Tpeak (min)=       2.00          7.00
     Unit Hyd. peak  (cms)=        .55           .16
                                                      *TOTALS*
     PEAK FLOW       (cms)=        .47          1.02          1.209 (iii)
     TIME TO PEAK    (hrs)=       8.00          8.08          8.067
     RUNOFF VOLUME    (mm)=      64.92         47.43         50.233
     TOTAL RAINFALL   (mm)=      65.72         65.72         65.720
     RUNOFF COEFFICIENT   =        .99           .72           .764

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  90.0    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.

------------------------------------------------------------------------------
001:0008--------------------------------------------------------------------
----------------------
| COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =   1.933  (cms)
| TotalHyd 06:31208  |   Number of inlets in system [NINLET] =       1
----------------------   Total minor system capacity          =   1.933  (cms)
                         Total major system storage [TMJSTO] =       0.(cu.m.)

                 ID: NHYD        AREA      QPEAK     TPEAK      R.V.       DWF
                                 (ha)      (cms)     (hrs)      (mm)      (cms)
     TOTAL HYD.  06:31208        7.20      1.209     8.067    50.233      .000
     ==========================================================================
     MAJOR SYST  07:208maj        .00       .000      .000      .000      .000
     MINOR SYST  08:208min       7.20      1.209     8.067    50.233      .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
001:0009--------------------------------------------------------------------
*#Catchment 32207 represents open space on the Allan Lands
----------------------
| DESIGN NASHYD      |   Area    (ha)=    1.50   Curve Number   (CN)=86.00
```

```
| 08:32207  DT= 1.00 |   Ia      (mm)=   1.500   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=    .094

     Unit Hyd Qpeak  (cms)=     .609

     PEAK FLOW       (cms)=     .219 (i)
     TIME TO PEAK    (hrs)=    8.067
     RUNOFF VOLUME    (mm)=   39.067
     TOTAL RAINFALL   (mm)=   65.720
     RUNOFF COEFFICIENT   =     .594

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

------------------------------------------------------------------------------
001:0010--------------------------------------------------------------------------
*#Catchment 32208 represents open space on the Allan Lands
----------------------
| DESIGN NASHYD      |   Area    (ha)=    2.00   Curve Number   (CN)=86.00
| 09:32208  DT= 1.00 |   Ia      (mm)=   1.500   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .090

     Unit Hyd Qpeak  (cms)=     .849

     PEAK FLOW       (cms)=     .299 (i)
     TIME TO PEAK    (hrs)=    8.067
     RUNOFF VOLUME    (mm)=   39.067
     TOTAL RAINFALL   (mm)=   65.720
     RUNOFF COEFFICIENT   =     .594

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

------------------------------------------------------------------------------
001:0011--------------------------------------------------------------------------
*#Add hydrographs 32201, 32202, 32203 and 32204 to determine flow in Stream 2
*#near the southern property line
--------------------
| ADD HYD (S2pl  ) | ID: NHYD     AREA      QPEAK    TPEAK    R.V.     DWF
--------------------                (ha)      (cms)    (hrs)    (mm)     (cms)
                  ID1 01:32201    250.70     9.042     8.67    35.03     .000
                 +ID2 03:32203      2.00      .239     8.12    39.07     .000
                 +ID3 04:32204     20.40     1.338     8.33    38.94     .000
                 +ID4 05:32205     28.10     2.500     8.17    36.16     .000
                 +ID5 07:208maj      .00      .000      .00      .00     .000 **DRY**
                 +ID6 08:32207      1.50      .219     8.07    39.07     .000
                 +ID7 09:32208      2.00      .299     8.07    39.07     .000
                  ==========================================================
                  SUM 06:S2pl     304.70    10.847     8.50    35.47     .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
001:0012--------------------------------------------------------------------------
*#Route Flow in Stream 2 (32201, 32202, 32203, 32204, 108maj) to the North Prope
*#Line
--------------------
| ROUTE CHANNEL    |     Routing time step (min) =  1.00
|  IN> 06:S2pl     |     Number of SEGMENTS =  3
| OUT< 07:1234rn   |     Slopes (%), CHANNEL=3.30   FLOODPLAIN=3.30
--------------------                 LENGTH = 1383.00     (m)

               <------ DATA FOR SECTION (   3.0) ------>
               Distance      Elevation       Manning
                   .00         213.00         .0800
                 12.40         209.00         .0800
                 15.00         208.00      .0800 / .0350  Main Channel
                 15.80         207.50         .0350       Main Channel
                 26.80         208.00      .0350 / .0800  Main Channel
                 44.60         209.00         .0800
                 49.70         210.00         .0800
                 54.10         212.00         .0800
                 58.10         214.00         .0800
```

<-------------------------- TRAVEL TIME TABLE -------------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)	D x V (m2/s)
.250	207.750	.102E+04	.949	1.286	17.92	.322
.500	208.000	.408E+04	6.024	2.042	11.29	1.021
.794	208.294	.101E+05	22.574	3.091	7.46	2.455
1.088	208.588	.186E+05	48.770	3.634	6.34	3.955
1.382	208.882	.295E+05	85.078	3.994	5.77	5.521
1.676	209.176	.425E+05	133.055	4.325	5.33	7.252
1.971	209.471	.567E+05	192.176	4.686	4.92	9.234
2.265	209.765	.719E+05	261.439	5.030	4.58	11.392
2.559	210.059	.880E+05	341.080	5.360	4.30	13.715
2.853	210.353	.105E+06	432.103	5.697	4.05	16.255
3.147	210.647	.122E+06	532.844	6.021	3.83	18.948
3.441	210.941	.141E+06	643.161	6.329	3.64	21.779
3.735	211.235	.159E+06	762.958	6.623	3.48	24.738
4.029	211.529	.179E+06	892.175	6.903	3.34	27.816
4.324	211.824	.199E+06	1030.779	7.171	3.21	31.006
4.618	212.118	.219E+06	1178.939	7.429	3.10	34.306
4.912	212.412	.241E+06	1336.735	7.679	3.00	37.716
5.206	212.706	.263E+06	1503.890	7.918	2.91	41.223
5.500	213.000	.285E+06	1680.422	8.149	2.83	44.822

	<---- hydrograph ---->				<-pipe / channel->	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 6:S2pl	304.70	10.847	8.50	35.472	.586	2.266
OUTFLOW: ID= 7:1234rn	304.70	10.438	8.68	35.471	.578	2.243

001:0013----------

*#Watershed 32206 Enters the Property as Tributary to Stream 2

DESIGN NASHYD	Area (ha)= 29.20	Curve Number (CN)=76.40
08:32206 DT= 2.00	Ia (mm)= 1.500	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= .570	

Unit Hyd Qpeak (cms)= 1.957

PEAK FLOW (cms)= .868 (i)
TIME TO PEAK (hrs)= 8.667
RUNOFF VOLUME (mm)= 28.905
TOTAL RAINFALL (mm)= 65.720
RUNOFF COEFFICIENT = .440

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

001:0014----------

*#Total flow exiting the property

ADD HYD (flowot)	ID: NHYD	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	DWF (cms)
ID1	07:1234rn	304.70	10.438	8.68	35.47	.000
+ID2	08:32206	29.20	.868	8.67	28.91	.000
SUM	09:flowot	333.90	11.304	8.68	34.90	.000

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

001:0015----------

FINISH

****

WARNINGS / ERRORS / NOTES

Simulation ended on 2003-03-07 at 09:36:10

==========

Post-Development
Watershed 32
10 Year Event

```
00001> 2     Metric units
00002> *#*****************************************************************************
00003> *#  Project Name      : Watershed 32 Post-Development 10 Year
00004> *#  Project Number    : PG02 3948
00005> *#  Date              : 01-20-2003
00006> *#  Modeller          : A. van Leeuwen and Thomas Dole
00007> *#  Company           : R.J. Burnside and Associates
00008> *#  License #         : 3846413
00009> *#*****************************************************************************
00010> *   10 Year Post-Development Flows for Watershed 32
00011> *
00012> START                 TZERO=[0.0],  METOUT=[2],  NSTORM=[0],  NRUN=[1]
00013> '                      [  ] <--storm filename, one per line for NSTORM time
00014> * ------------------|-------------------------------------------------------|
00015> *# 24 Hour Chicago Storm
00016> *# 2yr (513/1.5/0.754), 5yr (679/1.5/0.758), 10yr (781/1.5/0.759)
00017> *# 25yr (939/1.5/0.763), 100yr (1139/1.5/0.762)
00018> *# Precipitation quantities were obtained from Owen Sound MOE
00019> CHICAGO STORM         IUNITS=[2],  TD=[24](hrs), RTP=[0.333],  CSDT=[5](min),
00020>                       ICASEcs=[1],
00021>                        A=[781],  B=[1.5], and C=[0.759],
00022> * ------------------|-------------------------------------------------------|
00023>
00024> *#Catchment 32201 - External Area Enters as Stream 2
00025>
00026> DESIGN NASHYD         ID=[1], NHYD=["32201"], DT=[5]min, AREA=[250.7](ha),
00027>                       DWF=[0](cms), CN/C=[82.6], TP=[0.60]hrs,
00028>                       RAINFALL=[ ,  ,  ,  ,  ](mm/hr), END=-1
00029> * ------------------|-------------------------------------------------------|
00030>
00031> *#Catchment 32203 - External Area Enters as Sheet Flow West of Stream 2
00032>
00033> DESIGN NASHYD         ID=[3], NHYD=["32203"], DT=[1]min, AREA=[2](ha),
00034>                       DWF=[0](cms), CN/C=[86], TP=[0.13]hrs,
00035>                       RAINFALL=[ ,  ,  ,  ,  ](mm/hr), END=-1
00036> * ------------------|-------------------------------------------------------|
00037>
00038> *#Catchment 32204 - External Area Enters as Sheet Flow East of Stream 2
00039>
00040> DESIGN NASHYD         ID=[4], NHYD=["32204"], DT=[5]min, AREA=[20.4](ha),
00041>                       DWF=[0](cms), CN/C=[85.9], TP=[0.31]hrs,
00042>                       RAINFALL=[ ,  ,  ,  ,  ](mm/hr), END=-1
00043> * ------------------|-------------------------------------------------------|
00044>
00045> *#Catchment 32205 - Enters property as Tributary to Stream 2
00046>
00047> DESIGN NASHYD         ID=[5], NHYD=["32205"], DT=[5]min, AREA=[28.1](ha),
00048>                       DWF=[0](cms), CN/C=[83.6], TP=[0.17]hrs,
00049>                       RAINFALL=[ ,  ,  ,  ,  ](mm/hr), END=-1
00050> * ------------------|-------------------------------------------------------|
00051>
00052> *#Catchment 31208 represents the Light Density Allan Subdivision whose Minor
00053> *#flows are directed from Watershed 32 into Watershed 31 and into the Georgian
00054> *#Bay Club SWM Pond 1. Major flows (above 5 year event) remain in Watershed 32.
00055>
00056> DESIGN STANDHYD       ID=[6], NHYD=["31208"], DT=[1]min, AREA=[7.2](ha),
00057>                       XIMP=[0.16], TIMP=[0.31], DWF=[0](cms), LOSS=[2], CN=[90],
00058>                       SLOPE=[5](%), RAINFALL=[ ,  ,  ,  ,  ](mm/hr), END=-1
00059> * ------------------|-------------------------------------------------------|
00060> COMPUTE DUALHYD       IDin=[6], CINLET=[1.933](cms), MINLET=[1],
00061>                       MAJID=[7], MajNHYD=["208maj"],
00062>                       MINID=[8], MinNHYD=["208min"],
00063>                       TMJSTO=[0](cu-m)
00064> * ------------------|-------------------------------------------------------|
00065>
00066> *#Catchment 32207 represents open space on the Allan Lands
00067>
00068> DESIGN NASHYD         ID=[8], NHYD=["32207"], DT=[1]min, AREA=[1.5](ha),
00069>                       DWF=[0](cms), CN/C=[86], TP=[0.094]hrs,
00070>                       RAINFALL=[ ,  ,  ,  ,  ](mm/hr), END=-1
00071> * ------------------|-------------------------------------------------------|
00072>
00073> *#Catchment 32208 represents open space on the Allan Lands
00074>
00075> DESIGN NASHYD         ID=[9], NHYD=["32208"], DT=[1]min, AREA=[2.0](ha),
00076>                       DWF=[0](cms), CN/C=[86], TP=[0.09]hrs,
00077>                       RAINFALL=[ ,  ,  ,  ,  ](mm/hr), END=-1
00078> * ------------------|-------------------------------------------------------|
00079>
00080> *#Add hydrographs 32201, 32202, 32203 and 32204 to determine flow in Stream 2
00081> *near the southern property line
00082>
00083> ADD HYD              IDsum=[6], NHYD=["S2pl"], IDs to add=[1+3+4+5+7+8+9]
00084> ' ------------------|-------------------------------------------------------|
00085>
00086> *#Route Flow in Stream 2 (32201, 32202, 32203, 32204, 208maj) to the North Prope
00087> *#Line
00088>
00089> ROUTE CHANNEL         IDout=[7], NHYD=["1234rn"], IDin=[6],
00090>                       RDT=[1](min),
00091>                       CHLGTH=[1383](m),  CHSLOPE=[3.3](%),
00092>                                          FPSLOPE=[3.3](%),
00093>                       SECNUM=[3],        NSEG=[3]
00094>                       ( SEGROUGH, SEGDIST (m))=[0.080,15 -0.035,26.8 0.080,58.1] N
00095>                       ( DISTANCE (m), ELEVATION (m))=[0,      213]
00096>                                                     [12.4,    209]
00097>                                                     [15,      208]
00098>                                                     [15.8,    207.5]
00099>                                                     [26.8,    208]
00100>                                                     [44.6,    209]
00101>                                                     [49.7,    210]
00102>                                                     [54.1,    212]
00103>                                                     [58.1,    214]
00104> * ------------------|-------------------------------------------------------|
00105>
00106> *#Watershed 32206 Enters the Property as Tributary to Stream 2
00107>
00108> DESIGN NASHYD         ID=[8], NHYD=["32206"], DT=[2]min, AREA=[29.2](ha),
00109>                       DWF=[0](cms), CN/C=[76.4], TP=[0.57]hrs,
00110>                       RAINFALL=[ ,  ,  ,  ,  ](mm/hr), END=-1
00111> * ------------------|-------------------------------------------------------|
00112>
00113> *#Total flow exiting the property
00114>
00115> ADD HYD              IDsum=[9], NHYD=["flowot"], IDs to add=[7+8]
00116> * ------------------|-------------------------------------------------------|
00117> FINISH
00118>
00119>
00120>
00121>
00122>
00123>
00124>
```

```
SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999   55555 =========
S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  5     =========
SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  5     Ver.  3.1
    S   W W   M   M  H   H    Y    M   M  O   O       9999  5555  Oct. 1997
SSSSS   W W   M   M  H   H    Y    M   M   OOO           9      5 =========
                                                     9   9      5 # 3846413
     StormWater Management HYdrologic Model           999   5555  =========

*************************************************************************
************************** SWMHYMO-95w Ver/3.1 **************************
*******  A single event and continuous hydrologic simulation model  *******
*******     based on the principles of HYMO and its successors      *******
*******                  OTTHYMO-83 and OTTHYMO-89.                 *******
*************************************************************************
******* Distributed by:  J.F. Sabourin and Associates Inc.          *******
*******                  Ottawa,  Ontario: (613) 727-5199          *******
*******                  Gatineau, Quebec: (819) 243-6858          *******
*******                  E-Mail: swmhymo@jfsa.Com                  *******
*************************************************************************

+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+++++++ Licensed user: R.J. Burnside and Associates                +++++++
+++++++                Stayner              SERIAL#:3846413       +++++++
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

*************************************************************************
*******           ++++++ PROGRAM ARRAY DIMENSIONS ++++++           *******
*******           Maximum value for ID numbers  :     10          *******
*******           Max. number of rainfall points:   5000          *******
*******           Max. number of flow points    :   5000          *******
*************************************************************************


********************   D E T A I L E D   O U T P U T   ********************
*************************************************************************
*       DATE: 2003-03-07     TIME: 09:37:02     RUN COUNTER: 000681       *
*************************************************************************
* Input   filename: F:\2002\PG0239~4\POST-D~1\10YEAR~1\10-32.DAT          *
* Output  filename: F:\2002\PG0239~4\POST-D~1\10YEAR~1\10-32.out          *
* Summary filename: F:\2002\PG0239~4\POST-D~1\10YEAR~1\10-32.sum          *
* User comments:                                                         *
* 1:_____________________________________________________________________*
* 2:_____________________________________________________________________*
* 3:_____________________________________________________________________*
*************************************************************************

-------------------------------------------------------------------------
001:0001----------------------------------------------------------------
*#************************************************************************
*#  Project Name    : Watershed 32 Post-Development 10 Year
*#  Project Number  : PG02 3948
*#  Date            : 01-20-2003
*#  Modeller        : A. van Leeuwen and Thomas Dole
*#  Company         : R.J. Burnside and Associates
*#  License #       : 3846413
*#************************************************************************
--------------------
| START            |  Project  dir.: F:\2002\PG0239~4\POST-D~1\10YEAR~1\
--------------------  Rainfall dir.: F:\2002\PG0239~4\POST-D~1\10YEAR~1\
    TZERO =    .00 hrs on        0
    METOUT=    2 (output = METRIC)
    NRUN  = 001
    NSTORM=    0
-------------------------------------------------------------------------
001:0002----------------------------------------------------------------
*# 24 Hour Chicago Storm
*# 2yr (513/1.5/0.754), 5yr (679/1.5/0.758), 10yr (781/1.5/0.759)
*# 25yr (939/1.5/0.763), 100yr (1139/1.5/0.762)
*# Precipitation quantities were obtained from Owen Sound MOE
```

CHICAGO STORM
Ptotal= 75.04 mm

IDF curve parameters: A= 781.000
B= 1.500
C= .759
used in: INTENSITY = A / (t + B)^C

Duration of storm = 24.00 hrs
Storm time step = 5.00 min
Time to peak ratio = .33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.08	.763	6.08	2.265	12.08	2.142	18.08	1.074
.17	.769	6.17	2.344	12.17	2.109	18.17	1.067
.25	.775	6.25	2.431	12.25	2.078	18.25	1.061
.33	.781	6.33	2.525	12.33	2.047	18.33	1.054
.42	.788	6.42	2.627	12.42	2.017	18.42	1.048
.50	.795	6.50	2.740	12.50	1.989	18.50	1.042
.58	.801	6.58	2.865	12.58	1.961	18.58	1.035
.67	.808	6.67	3.004	12.67	1.934	18.67	1.029
.75	.815	6.75	3.160	12.75	1.908	18.75	1.023
.83	.823	6.83	3.336	12.83	1.883	18.83	1.017
.92	.830	6.92	3.536	12.92	1.858	18.92	1.011
1.00	.838	7.00	3.766	13.00	1.835	19.00	1.005
1.08	.845	7.08	4.035	13.08	1.812	19.08	1.000
1.17	.853	7.17	4.352	13.17	1.789	19.17	.994
1.25	.861	7.25	4.734	13.25	1.767	19.25	.988
1.33	.869	7.33	5.204	13.33	1.746	19.33	.983
1.42	.878	7.42	5.798	13.42	1.726	19.42	.977
1.50	.886	7.50	6.577	13.50	1.706	19.50	.972
1.58	.895	7.58	7.649	13.58	1.686	19.58	.966
1.67	.904	7.67	9.239	13.67	1.667	19.67	.961
1.75	.913	7.75	11.881	13.75	1.649	19.75	.956
1.83	.923	7.83	17.343	13.83	1.631	19.83	.951
1.92	.932	7.92	38.555	13.92	1.613	19.92	.946
2.00	.942	8.00	188.647	14.00	1.596	20.00	.941
2.08	.952	8.08	49.869	14.08	1.579	20.08	.936
2.17	.963	8.17	27.290	14.17	1.563	20.17	.931
2.25	.973	8.25	19.410	14.25	1.547	20.25	.926
2.33	.984	8.33	15.311	14.33	1.531	20.33	.921
2.42	.996	8.42	12.767	14.42	1.516	20.42	.917
2.50	1.007	8.50	11.020	14.50	1.501	20.50	.912
2.58	1.019	8.58	9.740	14.58	1.487	20.58	.907
2.67	1.031	8.67	8.757	14.67	1.473	20.67	.903
2.75	1.044	8.75	7.976	14.75	1.459	20.75	.898
2.83	1.056	8.83	7.339	14.83	1.445	20.83	.894
2.92	1.070	8.92	6.809	14.92	1.432	20.92	.890
3.00	1.083	9.00	6.359	15.00	1.419	21.00	.885
3.08	1.097	9.08	5.973	15.08	1.406	21.08	.881
3.17	1.112	9.17	5.636	15.17	1.394	21.17	.877
3.25	1.127	9.25	5.341	15.25	1.381	21.25	.872
3.33	1.142	9.33	5.079	15.33	1.369	21.33	.868
3.42	1.158	9.42	4.845	15.42	1.358	21.42	.864
3.50	1.174	9.50	4.634	15.50	1.346	21.50	.860
3.58	1.191	9.58	4.444	15.58	1.335	21.58	.856
3.67	1.209	9.67	4.271	15.67	1.324	21.67	.852
3.75	1.227	9.75	4.112	15.75	1.313	21.75	.848
3.83	1.246	9.83	3.967	15.83	1.302	21.83	.844
3.92	1.265	9.92	3.833	15.92	1.292	21.92	.840
4.00	1.285	10.00	3.709	16.00	1.281	22.00	.837
4.08	1.306	10.08	3.593	16.08	1.271	22.08	.833
4.17	1.328	10.17	3.486	16.17	1.261	22.17	.829
4.25	1.350	10.25	3.386	16.25	1.252	22.25	.825
4.33	1.374	10.33	3.293	16.33	1.242	22.33	.822
4.42	1.398	10.42	3.205	16.42	1.233	22.42	.818
4.50	1.424	10.50	3.122	16.50	1.224	22.50	.815
4.58	1.450	10.58	3.044	16.58	1.214	22.58	.811
4.67	1.478	10.67	2.971	16.67	1.206	22.67	.808
4.75	1.507	10.75	2.901	16.75	1.197	22.75	.804
4.83	1.538	10.83	2.836	16.83	1.188	22.83	.801
4.92	1.569	10.92	2.773	16.92	1.180	22.92	.797

5.00	1.603	11.00	2.714	17.00	1.171	23.00	.794
5.08	1.638	11.08	2.657	17.08	1.163	23.08	.791
5.17	1.675	11.17	2.603	17.17	1.155	23.17	.787
5.25	1.714	11.25	2.552	17.25	1.147	23.25	.784
5.33	1.755	11.33	2.503	17.33	1.139	23.33	.781
5.42	1.798	11.42	2.456	17.42	1.132	23.42	.778
5.50	1.844	11.50	2.411	17.50	1.124	23.50	.774
5.58	1.893	11.58	2.368	17.58	1.117	23.58	.771
5.67	1.945	11.67	2.326	17.67	1.109	23.67	.768
5.75	2.001	11.75	2.287	17.75	1.102	23.75	.765
5.83	2.060	11.83	2.248	17.83	1.095	23.83	.762
5.92	2.123	11.92	2.212	17.92	1.088	23.92	.759
6.00	2.192	12.00	2.176	18.00	1.081	24.00	.756

001:0003----------

*#Catchment 32201 - External Area Enters as Stream 2

DESIGN NASHYD	Area (ha)= 250.70	Curve Number (CN)=82.60
01:32201 DT= 5.00	Ia (mm)= 1.500	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= .600	

Unit Hyd Qpeak (cms)= 15.959

PEAK FLOW (cms)= 11.169 (i)
TIME TO PEAK (hrs)= 8.667
RUNOFF VOLUME (mm)= 42.572
TOTAL RAINFALL (mm)= 75.045
RUNOFF COEFFICIENT = .567

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

001:0004----------

*#Catchment 32203 - External Area Enters as Sheet Flow West of Stream 2

DESIGN NASHYD	Area (ha)= 2.00	Curve Number (CN)=86.00
03:32203 DT= 1.00	Ia (mm)= 1.500	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= .130	

Unit Hyd Qpeak (cms)= .588

PEAK FLOW (cms)= .293 (i)
TIME TO PEAK (hrs)= 8.117
RUNOFF VOLUME (mm)= 47.077
TOTAL RAINFALL (mm)= 75.045
RUNOFF COEFFICIENT = .627

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

001:0005----------

*#Catchment 32204 - External Area Enters as Sheet Flow East of Stream 2

DESIGN NASHYD	Area (ha)= 20.40	Curve Number (CN)=85.90
04:32204 DT= 5.00	Ia (mm)= 1.500	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= .310	

Unit Hyd Qpeak (cms)= 2.513

PEAK FLOW (cms)= 1.642 (i)
TIME TO PEAK (hrs)= 8.250
RUNOFF VOLUME (mm)= 46.937
TOTAL RAINFALL (mm)= 75.045
RUNOFF COEFFICIENT = .625

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

001:0006----------

*#Catchment 32205 - Enters property as Tributary to Stream 2

```
---------------------
| DESIGN NASHYD      |   Area     (ha)=   28.10   Curve Number    (CN)=83.60
| 05:32205  DT= 5.00 |   Ia       (mm)=   1.500   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=    .170

     Unit Hyd Qpeak  (cms)=    6.313

     PEAK FLOW       (cms)=    3.097 (i)
     TIME TO PEAK    (hrs)=    8.083
     RUNOFF VOLUME    (mm)=   43.842
     TOTAL RAINFALL   (mm)=   75.045
     RUNOFF COEFFICIENT   =     .584

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

--------------------------------------------------------------------------------
001:0007----------------------------------------------------------------------
*#Catchment 31208 represents the Light Density Allan Subdivision whose Minor
*#flows are directed from Watershed 32 into Watershed 31 and into the Georgian
*#Bay Club SWM Pond 1. Major flows (above 5 year event) remain in Watershed 32.
---------------------
| DESIGN STANDHYD    |   Area     (ha)=    7.20
| 06:31208  DT= 1.00 |   Total Imp(%)=   31.00   Dir. Conn.(%)=   16.00
---------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.23          4.97
     Dep. Storage     (mm)=        .80          1.50
     Average Slope     (%)=       5.00          5.00
     Length            (m)=     219.09         40.00
     Mannings n           =       .013          .250

     Max.eff.Inten.(mm/hr)=     188.65        141.77
               over (min)          2.00          7.00
     Storage Coeff.  (min)=       1.96 (ii)     6.62 (ii)
     Unit Hyd. Tpeak (min)=       2.00          7.00
     Unit Hyd. peak  (cms)=        .57           .17
                                                      *TOTALS*
     PEAK FLOW       (cms)=        .55          1.26      1.477 (iii)
     TIME TO PEAK    (hrs)=       8.00          8.08      8.067
     RUNOFF VOLUME    (mm)=      74.24         56.16     59.063
     TOTAL RAINFALL   (mm)=      75.05         75.05     75.045
     RUNOFF COEFFICIENT   =        .99           .75       .787

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  90.0    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.

--------------------------------------------------------------------------------
001:0008----------------------------------------------------------------------
---------------------
| COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =   1.933  (cms)
| TotalHyd 06:31208  |   Number of inlets in system [NINLET] =       1
---------------------   Total minor system capacity          =   1.933  (cms)
                        Total major system storage [TMJSTO] =       0.(cu.m.)

                ID: NHYD        AREA      QPEAK     TPEAK      R.V.       DWF
                                (ha)      (cms)     (hrs)      (mm)      (cms)
     TOTAL HYD.   06:31208      7.20      1.477     8.067    59.063      .000
     ==========================================================================
     MAJOR SYST   07:208maj      .00       .000      .000      .000      .000
     MINOR SYST   08:208min     7.20      1.477     8.067    59.063      .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0009----------------------------------------------------------------------
*#Catchment 32207 represents open space on the Allan Lands
---------------------
| DESIGN NASHYD      |   Area     (ha)=    1.50   Curve Number    (CN)=86.00
```

```
| 08:32207  DT= 1.00 |   Ia      (mm)=   1.500   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=    .094

     Unit Hyd Qpeak  (cms)=     .609

     PEAK FLOW       (cms)=     .269 (i)
     TIME TO PEAK    (hrs)=    8.067
     RUNOFF VOLUME    (mm)=   47.077
     TOTAL RAINFALL   (mm)=   75.045
     RUNOFF COEFFICIENT   =     .627

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

------------------------------------------------------------------------------
001:0010--------------------------------------------------------------------------
*#Catchment 32208 represents open space on the Allan Lands
----------------------
| DESIGN NASHYD      |   Area    (ha)=    2.00   Curve Number   (CN)=86.00
| 09:32208  DT= 1.00 |   Ia      (mm)=   1.500   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=    .090

     Unit Hyd Qpeak  (cms)=     .849

     PEAK FLOW       (cms)=     .367 (i)
     TIME TO PEAK    (hrs)=    8.067
     RUNOFF VOLUME    (mm)=   47.077
     TOTAL RAINFALL   (mm)=   75.045
     RUNOFF COEFFICIENT   =     .627

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

------------------------------------------------------------------------------
001:0011--------------------------------------------------------------------------
*#Add hydrographs 32201, 32202, 32203 and 32204 to determine flow in Stream 2
*#near the southern property line
--------------------
| ADD HYD (S2pl  ) | ID: NHYD     AREA      QPEAK    TPEAK    R.V.     DWF
--------------------              (ha)      (cms)    (hrs)    (mm)    (cms)
                  ID1 01:32201    250.70    11.169    8.67   42.57    .000
                 +ID2 03:32203      2.00     .293     8.12   47.08    .000
                 +ID3 04:32204     20.40    1.642     8.25   46.94    .000
                 +ID4 05:32205     28.10    3.097     8.08   43.84    .000
                 +ID5 07:208maj      .00     .000      .00     .00    .000 **DRY**
                 +ID6 08:32207      1.50     .269     8.07   47.08    .000
                 +ID7 09:32208      2.00     .367     8.07   47.08    .000
                  ==========================================================
                  SUM 06:S2pl     304.70   13.389     8.50   43.06    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
001:0012--------------------------------------------------------------------------
*#Route Flow in Stream 2 (32201, 32202, 32203, 32204, 108maj) to the North Prope
*#Line
--------------------
| ROUTE CHANNEL    |     Routing time step (min) =  1.00
|  IN> 06:S2pl     |     Number of SEGMENTS =  3
| OUT< 07:1234rn   |     Slopes (%), CHANNEL=3.30   FLOODPLAIN=3.30
--------------------                   LENGTH = 1383.00     (m)

               <------ DATA FOR SECTION (   3.0) ------>
               Distance      Elevation       Manning
                    .00         213.00         .0800
                  12.40         209.00         .0800
                  15.00         208.00     .0800 / .0350  Main Channel
                  15.80         207.50         .0350      Main Channel
                  26.80         208.00     .0350 / .0800  Main Channel
                  44.60         209.00         .0800
                  49.70         210.00         .0800
                  54.10         212.00         .0800
                  58.10         214.00         .0800
```

<---------- TRAVEL TIME TABLE ---------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)	D x V (m2/s)
.250	207.750	.102E+04	.949	1.286	17.92	.322
.500	208.000	.408E+04	6.024	2.042	11.29	1.021
.794	208.294	.101E+05	22.574	3.091	7.46	2.455
1.088	208.588	.186E+05	48.770	3.634	6.34	3.955
1.382	208.882	.295E+05	85.078	3.994	5.77	5.521
1.676	209.176	.425E+05	133.055	4.325	5.33	7.252
1.971	209.471	.567E+05	192.176	4.686	4.92	9.234
2.265	209.765	.719E+05	261.439	5.030	4.58	11.392
2.559	210.059	.880E+05	341.080	5.360	4.30	13.715
2.853	210.353	.105E+06	432.103	5.697	4.05	16.255
3.147	210.647	.122E+06	532.844	6.021	3.83	18.948
3.441	210.941	.141E+06	643.161	6.329	3.64	21.779
3.735	211.235	.159E+06	762.958	6.623	3.48	24.738
4.029	211.529	.179E+06	892.175	6.903	3.34	27.816
4.324	211.824	.199E+06	1030.779	7.171	3.21	31.006
4.618	212.118	.219E+06	1178.939	7.429	3.10	34.306
4.912	212.412	.241E+06	1336.735	7.679	3.00	37.716
5.206	212.706	.263E+06	1503.890	7.918	2.91	41.223
5.500	213.000	.285E+06	1680.422	8.149	2.83	44.822

	AREA (ha)	<---- hydrograph ----> QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 6:S2pl	304.70	13.389	8.50	43.064	.631	2.405
OUTFLOW: ID= 7:1234rn	304.70	12.948	8.67	43.063	.622	2.377

001:0013----------

*#Watershed 32206 Enters the Property as Tributary to Stream 2

DESIGN NASHYD	08:32206 DT= 2.00

Area (ha)= 29.20 Curve Number (CN)=76.40
Ia (mm)= 1.500 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= .570

Unit Hyd Qpeak (cms)= 1.957

PEAK FLOW (cms)= 1.088 (i)
TIME TO PEAK (hrs)= 8.625
RUNOFF VOLUME (mm)= 35.583
TOTAL RAINFALL (mm)= 75.045
RUNOFF COEFFICIENT = .474

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

001:0014----------

*#Total flow exiting the property

ADD HYD (flowot)	ID: NHYD	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	DWF (cms)
ID1	07:1234rn	304.70	12.948	8.67	43.06	.000
+ID2	08:32206	29.20	1.088	8.63	35.58	.000
SUM	09:flowot	333.90	14.035	8.67	42.41	.000

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

001:0015----------

FINISH

****

WARNINGS / ERRORS / NOTES

Simulation ended on 2003-03-07 at 09:37:03

==========

Post-Development
Watershed 32
25 Year Event

```
00001> 2     Metric units
00002> *#*************************************************************************
00003> *#  Project Name     : Watershed 32 Post-Development 25 Year
00004> *#  Project Number   : PG02 3940
00005> *#  Date            : 01-20-2003
00006> *#  Modeller        : A. van Leeuwen and Thomas Dole
00007> *#  Company         : R.J. Burnside and Associates
00008> *#  License #       : 3846413
00009> *#*************************************************************************
00010> *  25 Year Post-Development Flows for Watershed 32
00011> *
00012> START                TZERO=[0.0],   METOUT=[2],   NSTORM=[0],   NRUN=[1]
00013> *                     [   ] <--storm filename, one per line for NSTORM time
00014> * ---------- ---- ----|----------|----------|----------|----------|-------|
00015> *# 24 Hour Chicago Storm
00016> *# 2yr (513/1.5/0.754), 5yr (679/1.5/0.758), 10yr (781/1.5/0.759)
00017> *# 25yr (939/1.5/0.763), 100yr (1139/1.5/0.762)
00018> *# Precipitation quantities were obtained from Owen Sound MOE
00019> CHICAGO STORM        IUNITS=[2],  TD=[24](hrs), RTP=[0.333],  CSDT=[5](min),
00020>                      ICASEcs=[1],
00021>                       A=[939],  B=[1.5], and C=[0.763],
00022> * ----------------|----------|----------|----------|----------|-------|
00023>
00024> *#Catchment 32201 - External Area Enters as Stream 2
00025>
00026> DESIGN NASHYD        ID=[1], NHYD=["32201"], DT=[5]min, AREA=[250.7](ha),
00027>                      DWF=[0](cms), CN/C=[82.6], TP=[0.60]hrs,
00028>                      RAINFALL=[ ,  ,  ,  ,  ](mm/hr), END=-1
00029> * ---------- ---- ----|----------|----------|----------|----------|-------|
00030>
00031> *#Catchment 32203 - External Area Enters as Sheet Flow West of Stream 2
00032>
00033> DESIGN NASHYD        ID=[3], NHYD=["32203"], DT=[1]min, AREA=[2](ha),
00034>                      DWF=[0](cms), CN/C=[86], TP=[0.13]hrs,
00035>                      RAINFALL=[ ,  ,  ,  ,  ](mm/hr), END=-1
00036> * ---------- ---------|----------|----------|----------|----------|-------|
00037>
00038> *#Catchment 32204 - External Area Enters as Sheet Flow East of Stream 2
00039>
00040> DESIGN NASHYD        ID=[4], NHYD=["32204"], DT=[5]min, AREA=[20.4](ha),
00041>                      DWF=[0](cms), CN/C=[85.9], TP=[0.31]hrs,
00042>                      RAINFALL=[ ,  ,  ,  ,  ](mm/hr), END=-1
00043> * ----------------|----------|----------|----------|----------|-------|
00044>
00045> *#Catchment 32205 - Enters property as Tributary to Stream 2
00046>
00047> DESIGN NASHYD        ID=[5], NHYD=["32205"], DT=[5]min, AREA=[28.1](ha),
00048>                      DWF=[0](cms), CN/C=[83.1], TP=[0.17]hrs,
00049>                      RAINFALL=[ ,  ,  ,  ,  ](mm/hr), END=-1
00050> * ---------- ---- ----|----------|----------|----------|----------|-------|
00051>
00052> *#Catchment 31208 represents the Light Density Allan Subdivision whose Minor
00053> *#flows are directed from Watershed 32 into Watershed 31 and into the Georgian
00054> *#Bay Flow SWM Pond 1. Major flows (above 5 year event) remain in Watershed 32.
00055>
00056> DESIGN STANDHYD       ID=[6], NHYD=["31208"], DT=[1]min, AREA=[7.2](ha),
00057>                      XIMP=[0.16], TIMP=[0.31], DWF=[0](cms), LOSS=[2], CN=[90],
00058>                      SLOPE=[5](%), RAINFALL=[ ,  ,  ,  ,  ](mm/hr), END=-1
00059> * ----------------|----------|----------|----------|----------|-------|
00060> COMPUTE DUALHYD      IDin=[6], CINLET=[1.933](cms), NINLET=[1],
00061>                      MAJID=[7], MajNHYD=["208maj"],
00062>                      MINID=[8], MinNHYD=["208min"],
00063>                      TMJSTO=[0](cu-m)
00064> * ----------------|----------|----------|----------|----------|-------|
00065>
00066> *#Catchment 32207 represents open space on the Allan Lands
00067>
00068> DESIGN NASHYD        ID=[8], NHYD=["32207"], DT=[1]min, AREA=[1.5](ha),
00069>                      DWF=[0](cms), CN/C=[86], TP=[0.094]hrs,
00070>                      RAINFALL=[ ,  ,  ,  ,  ](mm/hr), END=-1
00071> * ---------- ---- ----|----------|----------|----------|----------|-------|
00072>
00073> *#Catchment 32208 represents open space on the Allan Lands
00074>
00075> DESIGN NASHYD        ID=[9], NHYD=["32208"], DT=[1]min, AREA=[2.0](ha),
00076>                      DWF=[0](cms), CN/C=[86], TP=[0.09]hrs,
00077>                      RAINFALL=[ ,  ,  ,  ,  ](mm/hr), END=-1
00078> * ----------------|----------|----------|----------|----------|-------|
00079>
00080> *#Add hydrographs 32201, 32202, 32203 and 32204 to determine flow in Stream 2
00081> *#near the southern property line
00082>
00083> ADD HYD              IDsum=[6], NHYD=["32pl"], IDs to add=[1+3+4+5+7+8+9]
00084> * ----------------|----------|----------|----------|----------|-------|
00085>
00086> *#Route Flow in Stream 2 (32201, 32202, 32203, 32204, 208maj) to the North Prope
00087> *#Line
00088>
00089> ROUTE CHANNEL        IDout=[7], NHYD=["1234rn"], IDin=[6],
00090>                      RDT=[1](min),
00091>                      CHLGTH=[1383](m),  CHSLOPE=[3.3](%),
00092>                                          FPSLOPE=[3.3](%),
00093>                      ZECHUM=[3],       NSEG=[3]
00094>                      * SEGROUGH, SEGDIST (m)|=[0.080,15 -0.035,26.8 0.080,58.1] N
00095>                      * DISTANCE (m), ELEVATION (m)|=[0.       213)
00096>                                                    [12.4,    209]
00097>                                                    [15.      208]
00098>                                                    [15.8,    207.5]
00099>                                                    [26.8,    208]
00100>                                                    [44.6,    209]
00101>                                                    [49.7,    210]
00102>                                                    [54.1,    212]
00103>                                                    [58.1,    214]
00104> * ----------------|----------|----------|----------|----------|-------|
00105>
00106> *#Watershed 32208 Enters the Property as Tributary to Stream 2
00107>
00108> DESIGN NASHYD        ID=[8], NHYD=["32208"], DT=[2]min, AREA=[29.2](ha),
00109>                      DWF=[0](cms), CN/C=[78.4], TP=[0.57]hrs,
00110>                      RAINFALL=[ ,  ,  ,  ,  ](mm/hr), END=-1
00111> * ---------- ---- ----|----------|----------|----------|----------|-------|
00112>
00113> *#Total flow exiting the property
00114>
00115> ADD HYD              IDsum=[9], NHYD=["flower"], IDs to add=[7+8]
00116> * ----------------|----------|----------|----------|----------|-------|
00117> FINISH
00118>
00119>
00120>
00121>
00122>
00123>
00124>
```

```
SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999   55555 =========
S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  5     =========
SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  5     Ver.  3.1
    S   W W   M   M  H   H    Y    M   M  O   O       9999  5555  Oct. 1997
SSSSS   W W   M   M  H   H    Y    M   M   OOO           9      5 =========
                                                     9   9      5 # 3846413
     StormWater Management HYdrologic Model           999   5555  =========

*****************************************************************************
************************** SWMHYMO-95w Ver/3.1 **************************
*******  A single event and continuous hydrologic simulation model  *******
*******     based on the principles of HYMO and its successors      *******
*******                  OTTHYMO-83 and OTTHYMO-89.                 *******
*****************************************************************************
******* Distributed by:  J.F. Sabourin and Associates Inc.          *******
*******                  Ottawa,  Ontario: (613) 727-5199          *******
*******                  Gatineau, Quebec: (819) 243-6858          *******
*******                  E-Mail: swmhymo@jfsa.Com                  *******
*****************************************************************************

+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+++++++ Licensed user: R.J. Burnside and Associates                    +++++++
+++++++                Stayner              SERIAL#:3846413           +++++++
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

*****************************************************************************
*******           ++++++ PROGRAM ARRAY DIMENSIONS ++++++            *******
*******           Maximum value for ID numbers  :     10           *******
*******           Max. number of rainfall points:   5000           *******
*******           Max. number of flow points    :   5000           *******
*****************************************************************************


*******************   D E T A I L E D   O U T P U T   ********************
*****************************************************************************
*       DATE: 2003-03-07     TIME: 09:37:55     RUN COUNTER: 000682       *
*****************************************************************************
* Input   filename: F:\2002\PG0239~4\POST-D~1\25YEAR~1\25-32.DAT             *
* Output  filename: F:\2002\PG0239~4\POST-D~1\25YEAR~1\25-32.out             *
* Summary filename: F:\2002\PG0239~4\POST-D~1\25YEAR~1\25-32.sum             *
* User comments:                                                            *
* 1:_____________________________________________________________________   *
* 2:_____________________________________________________________________   *
* 3:_____________________________________________________________________   *
*****************************************************************************

-----------------------------------------------------------------------------
001:0001--------------------------------------------------------------------
*#############################################################################
*#  Project Name     : Watershed 32 Post-Development 25 Year
*#  Project Number   : PG02 3948
*#  Date             : 01-20-2003
*#  Modeller         : A. van Leeuwen and Thomas Dole
*#  Company          : R.J. Burnside and Associates
*#  License #        : 3846413
*#############################################################################
--------------------
| START            |  Project  dir.: F:\2002\PG0239~4\POST-D~1\25YEAR~1\
--------------------  Rainfall dir.: F:\2002\PG0239~4\POST-D~1\25YEAR~1\
    TZERO =    .00 hrs on        0
    METOUT=    2 (output = METRIC)
    NRUN  = 001
    NSTORM=    0
-----------------------------------------------------------------------------
001:0002--------------------------------------------------------------------
*# 24 Hour Chicago Storm
*# 2yr (513/1.5/0.754), 5yr (679/1.5/0.758), 10yr (781/1.5/0.759)
*# 25yr (939/1.5/0.763), 100yr (1139/1.5/0.762)
*# Precipitation quantities were obtained from Owen Sound MOE
```

CHICAGO STORM
Ptotal= 87.64 mm

IDF curve parameters: A= 939.000
B= 1.500
C= .763
used in: INTENSITY = A / (t + B)^C

Duration of storm = 24.00 hrs
Storm time step = 5.00 min
Time to peak ratio = .33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.08	.876	6.08	2.617	12.08	2.474	18.08	1.236
.17	.883	6.17	2.709	12.17	2.436	18.17	1.228
.25	.890	6.25	2.809	12.25	2.399	18.25	1.221
.33	.898	6.33	2.919	12.33	2.364	18.33	1.213
.42	.905	6.42	3.038	12.42	2.329	18.42	1.206
.50	.913	6.50	3.169	12.50	2.296	18.50	1.198
.58	.921	6.58	3.315	12.58	2.264	18.58	1.191
.67	.929	6.67	3.477	12.67	2.233	18.67	1.184
.75	.937	6.75	3.658	12.75	2.202	18.75	1.177
.83	.945	6.83	3.862	12.83	2.173	18.83	1.170
.92	.954	6.92	4.096	12.92	2.145	18.92	1.163
1.00	.963	7.00	4.364	13.00	2.117	19.00	1.156
1.08	.971	7.08	4.677	13.08	2.091	19.08	1.150
1.17	.981	7.17	5.047	13.17	2.065	19.17	1.143
1.25	.990	7.25	5.493	13.25	2.039	19.25	1.137
1.33	.999	7.33	6.042	13.33	2.015	19.33	1.130
1.42	1.009	7.42	6.735	13.42	1.991	19.42	1.124
1.50	1.019	7.50	7.646	13.50	1.968	19.50	1.118
1.58	1.029	7.58	8.902	13.58	1.945	19.58	1.112
1.67	1.039	7.67	10.765	13.67	1.923	19.67	1.105
1.75	1.050	7.75	13.867	13.75	1.902	19.75	1.099
1.83	1.061	7.83	20.298	13.83	1.881	19.83	1.093
1.92	1.072	7.92	45.432	13.92	1.860	19.92	1.088
2.00	1.084	8.00	225.119	14.00	1.840	20.00	1.082
2.08	1.095	8.08	58.869	14.08	1.821	20.08	1.076
2.17	1.107	8.17	32.053	14.17	1.802	20.17	1.070
2.25	1.120	8.25	22.737	14.25	1.784	20.25	1.065
2.33	1.132	8.33	17.903	14.33	1.766	20.33	1.059
2.42	1.145	8.42	14.908	14.42	1.748	20.42	1.054
2.50	1.158	8.50	12.856	14.50	1.731	20.50	1.049
2.58	1.172	8.58	11.353	14.58	1.714	20.58	1.043
2.67	1.186	8.67	10.200	14.67	1.698	20.67	1.038
2.75	1.201	8.75	9.285	14.75	1.681	20.75	1.033
2.83	1.215	8.83	8.539	14.83	1.666	20.83	1.028
2.92	1.231	8.92	7.918	14.92	1.650	20.92	1.023
3.00	1.247	9.00	7.392	15.00	1.635	21.00	1.018
3.08	1.263	9.08	6.940	15.08	1.620	21.08	1.013
3.17	1.279	9.17	6.547	15.17	1.606	21.17	1.008
3.25	1.297	9.25	6.201	15.25	1.592	21.25	1.003
3.33	1.314	9.33	5.895	15.33	1.578	21.33	.998
3.42	1.333	9.42	5.622	15.42	1.564	21.42	.993
3.50	1.352	9.50	5.376	15.50	1.551	21.50	.989
3.58	1.371	9.58	5.154	15.58	1.538	21.58	.984
3.67	1.392	9.67	4.952	15.67	1.525	21.67	.979
3.75	1.413	9.75	4.767	15.75	1.512	21.75	.975
3.83	1.434	9.83	4.598	15.83	1.500	21.83	.970
3.92	1.457	9.92	4.441	15.92	1.488	21.92	.966
4.00	1.480	10.00	4.297	16.00	1.476	22.00	.961
4.08	1.504	10.08	4.163	16.08	1.464	22.08	.957
4.17	1.530	10.17	4.038	16.17	1.453	22.17	.953
4.25	1.556	10.25	3.921	16.25	1.442	22.25	.949
4.33	1.583	10.33	3.812	16.33	1.430	22.33	.944
4.42	1.611	10.42	3.710	16.42	1.420	22.42	.940
4.50	1.641	10.50	3.614	16.50	1.409	22.50	.936
4.58	1.672	10.58	3.523	16.58	1.398	22.58	.932
4.67	1.704	10.67	3.438	16.67	1.388	22.67	.928
4.75	1.737	10.75	3.357	16.75	1.378	22.75	.924
4.83	1.773	10.83	3.280	16.83	1.368	22.83	.920
4.92	1.810	10.92	3.208	16.92	1.358	22.92	.916

5.00	1.848	11.00	3.139	17.00	1.349	23.00	.912
5.08	1.889	11.08	3.073	17.08	1.339	23.08	.908
5.17	1.932	11.17	3.010	17.17	1.330	23.17	.904
5.25	1.977	11.25	2.950	17.25	1.321	23.25	.901
5.33	2.025	11.33	2.893	17.33	1.311	23.33	.897
5.42	2.075	11.42	2.839	17.42	1.303	23.42	.893
5.50	2.129	11.50	2.786	17.50	1.294	23.50	.889
5.58	2.185	11.58	2.736	17.58	1.285	23.58	.886
5.67	2.246	11.67	2.688	17.67	1.277	23.67	.882
5.75	2.310	11.75	2.642	17.75	1.268	23.75	.879
5.83	2.379	11.83	2.598	17.83	1.260	23.83	.875
5.92	2.452	11.92	2.555	17.92	1.252	23.92	.872
6.00	2.532	12.00	2.514	18.00	1.244	24.00	.868

001:0003----------

*#Catchment 32201 - External Area Enters as Stream 2

DESIGN NASHYD	Area (ha)= 250.70	Curve Number (CN)=82.60
01:32201 DT= 5.00	Ia (mm)= 1.500	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= .600	

Unit Hyd Qpeak (cms)= 15.959

PEAK FLOW (cms)= 14.327 (i)
TIME TO PEAK (hrs)= 8.667
RUNOFF VOLUME (mm)= 53.135
TOTAL RAINFALL (mm)= 87.640
RUNOFF COEFFICIENT = .606

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

001:0004----------

*#Catchment 32203 - External Area Enters as Sheet Flow West of Stream 2

DESIGN NASHYD	Area (ha)= 2.00	Curve Number (CN)=86.00
03:32203 DT= 1.00	Ia (mm)= 1.500	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= .130	

Unit Hyd Qpeak (cms)= .588

PEAK FLOW (cms)= .375 (i)
TIME TO PEAK (hrs)= 8.117
RUNOFF VOLUME (mm)= 58.202
TOTAL RAINFALL (mm)= 87.640
RUNOFF COEFFICIENT = .664

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

001:0005----------

*#Catchment 32204 - External Area Enters as Sheet Flow East of Stream 2

DESIGN NASHYD	Area (ha)= 20.40	Curve Number (CN)=85.90
04:32204 DT= 5.00	Ia (mm)= 1.500	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= .310	

Unit Hyd Qpeak (cms)= 2.513

PEAK FLOW (cms)= 2.095 (i)
TIME TO PEAK (hrs)= 8.250
RUNOFF VOLUME (mm)= 58.045
TOTAL RAINFALL (mm)= 87.640
RUNOFF COEFFICIENT = .662

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

001:0006----------

*#Catchment 32205 - Enters property as Tributary to Stream 2

```
----------------------
| DESIGN NASHYD      |   Area     (ha)=   28.10   Curve Number    (CN)=83.60
| 05:32205  DT= 5.00 |   Ia       (mm)=   1.500   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .170
```

Tp = 10 mins

Tc = 15 mins

```
     Unit Hyd Qpeak  (cms)=     6.313

     PEAK FLOW       (cms)=     3.999 (i)
     TIME TO PEAK    (hrs)=     8.083
     RUNOFF VOLUME    (mm)=    54.572
     TOTAL RAINFALL   (mm)=    87.640
     RUNOFF COEFFICIENT   =      .623

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

--------------------------------------------------------------------------------
001:0007----------------------------------------------------------------------
*#Catchment 31208 represents the Light Density Allan Subdivision whose Minor
*#flows are directed from Watershed 32 into Watershed 31 and into the Georgian
*#Bay Club SWM Pond 1. Major flows (above 5 year event) remain in Watershed 32.
----------------------
| DESIGN STANDHYD    |   Area     (ha)=    7.20
| 06:31208  DT= 1.00 |   Total Imp(%)=   31.00   Dir. Conn.(%)=   16.00
----------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area      (ha)=       2.23          4.97
     Dep. Storage      (mm)=        .80          1.50
     Average Slope      (%)=       5.00          5.00
     Length             (m)=     219.09         40.00
     Mannings n            =       .013          .250

     Max.eff.Inten.(mm/hr)=     225.12        195.73
               over (min)          2.00          6.00
     Storage Coeff.  (min)=       1.82 (ii)     5.92 (ii)
     Unit Hyd. Tpeak (min)=       2.00          6.00
     Unit Hyd. peak  (cms)=        .59           .19
                                                      *TOTALS*
     PEAK FLOW       (cms)=        .67          1.68      1.984 (iii)
     TIME TO PEAK    (hrs)=       8.00          8.07      8.050
     RUNOFF VOLUME    (mm)=      86.83         68.12     71.123
     TOTAL RAINFALL   (mm)=      87.64         87.64     87.640
     RUNOFF COEFFICIENT   =        .99           .78       .812

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  90.0     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.

--------------------------------------------------------------------------------
001:0008----------------------------------------------------------------------
----------------------
| COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =   1.933  (cms)
| TotalHyd 06:31208  |   Number of inlets in system [NINLET] =       1
----------------------   Total minor system capacity          =   1.933  (cms)
                         Total major system storage [TMJSTO] =      0.(cu.m.)

                 ID: NHYD        AREA      QPEAK     TPEAK      R.V.       DWF
                                 (ha)      (cms)     (hrs)      (mm)      (cms)
     TOTAL HYD.  06:31208        7.20      1.984     8.050    71.123      .000
     ================================================================================
     MAJOR SYST  07:208maj        .01       .051     8.050    71.123      .000
     MINOR SYST  08:208min       7.19      1.933     8.017    71.123      .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0009----------------------------------------------------------------------
*#Catchment 32207 represents open space on the Allan Lands
----------------------
| DESIGN NASHYD      |   Area     (ha)=    1.50   Curve Number    (CN)=86.00
```

```
| 08:32207  DT= 1.00 |   Ia       (mm)=    1.500   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=     .094

     Unit Hyd Qpeak  (cms)=      .609

     PEAK FLOW       (cms)=      .344 (i)
     TIME TO PEAK    (hrs)=     8.067
     RUNOFF VOLUME    (mm)=    58.202
     TOTAL RAINFALL   (mm)=    87.640
     RUNOFF COEFFICIENT   =      .664

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

------------------------------------------------------------------------------
001:0010----------------------------------------------------------------------
*#Catchment 32208 represents open space on the Allan Lands
---------------------
| DESIGN NASHYD      |   Area     (ha)=     2.00   Curve Number    (CN)=86.00
| 09:32208  DT= 1.00 |   Ia       (mm)=    1.500   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=     .090

     Unit Hyd Qpeak  (cms)=      .849

     PEAK FLOW       (cms)=      .470 (i)
     TIME TO PEAK    (hrs)=     8.067
     RUNOFF VOLUME    (mm)=    58.202
     TOTAL RAINFALL   (mm)=    87.640
     RUNOFF COEFFICIENT   =      .664

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

------------------------------------------------------------------------------
001:0011----------32205-------------------------------------------------------
*#Add hydrographs 32201, 32202, 32203 and 32204 to determine flow in Stream 2
*#near the southern property line
--------------------
| ADD HYD (S2pl  ) | ID: NHYD      AREA      QPEAK    TPEAK    R.V.     DWF
--------------------                (ha)      (cms)    (hrs)    (mm)     (cms)
                ID1 01:32201     250.70    14.327     8.67    53.13     .000
               +ID2 03:32203       2.00      .375     8.12    58.20     .000
               +ID3 04:32204      20.40     2.095     8.25    58.05     .000
               +ID4 05:32205      28.10     3.999     8.08    54.57     .000
               +ID5 07:208maj       .01      .051     8.05    71.12     .000
               +ID6 08:32207       1.50      .344     8.07    58.20     .000
               +ID7 09:32208       2.00      .470     8.07    58.20     .000
                ==========================================================
                SUM 06:S2pl      304.71    17.158     8.50    53.69     .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
001:0012----------------------------------------------------------------------
*#Route Flow in Stream 2 (32201, 32202, 32203, 32204, 108maj) to the North Prope
*#Line
--------------------
| ROUTE CHANNEL    |     Routing time step (min) =  1.00
|  IN> 06:S2pl     |     Number of SEGMENTS =  3
| OUT< 07:1234rn   |     Slopes (%), CHANNEL=3.30   FLOODPLAIN=3.30
--------------------                  LENGTH = 1383.00     (m)

                <------ DATA FOR SECTION (   3.0) ------>
                Distance      Elevation       Manning
                     .00         213.00         .0800
                   12.40         209.00         .0800
                   15.00         208.00     .0800 / .0350  Main Channel
                   15.80         207.50         .0350      Main Channel
                   26.80         208.00     .0350 / .0800  Main Channel
                   44.60         209.00         .0800
                   49.70         210.00         .0800
                   54.10         212.00         .0800
                   58.10         214.00         .0800
```

<-------------------------- TRAVEL TIME TABLE -------------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)	D x V (m2/s)
.250	207.750	.102E+04	.949	1.286	17.92	.322
.500	208.000	.408E+04	6.024	2.042	11.29	1.021
.794	208.294	.101E+05	22.574	3.091	7.46	2.455
1.088	208.588	.186E+05	48.770	3.634	6.34	3.955
1.382	208.882	.295E+05	85.078	3.994	5.77	5.521
1.676	209.176	.425E+05	133.055	4.325	5.33	7.252
1.971	209.471	.567E+05	192.176	4.686	4.92	9.234
2.265	209.765	.719E+05	261.439	5.030	4.58	11.392
2.559	210.059	.880E+05	341.080	5.360	4.30	13.715
2.853	210.353	.105E+06	432.103	5.697	4.05	16.255
3.147	210.647	.122E+06	532.844	6.021	3.83	18.948
3.441	210.941	.141E+06	643.161	6.329	3.64	21.779
3.735	211.235	.159E+06	762.958	6.623	3.48	24.738
4.029	211.529	.179E+06	892.175	6.903	3.34	27.816
4.324	211.824	.199E+06	1030.779	7.171	3.21	31.006
4.618	212.118	.219E+06	1178.939	7.429	3.10	34.306
4.912	212.412	.241E+06	1336.735	7.679	3.00	37.716
5.206	212.706	.263E+06	1503.890	7.918	2.91	41.223
5.500	213.000	.285E+06	1680.422	8.149	2.83	44.822

	AREA (ha)	<---- hydrograph ----> QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 6:S2pl	304.71	17.158	8.50	53.690	.698	2.646
OUTFLOW: ID= 7:1234rn	304.71	16.709	8.62	53.689	.687	2.605

001:0013----------

*#Watershed 32206 Enters the Property as Tributary to Stream 2

DESIGN NASHYD	Area (ha)= 29.20	Curve Number (CN)=76.40
08:32206 DT= 2.00	Ia (mm)= 1.500	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= .570	

Unit Hyd Qpeak (cms)= 1.957

PEAK FLOW (cms)= 1.420 (i)
TIME TO PEAK (hrs)= 8.625
RUNOFF VOLUME (mm)= 45.079
TOTAL RAINFALL (mm)= 87.640
RUNOFF COEFFICIENT = .514

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

001:0014----------

*#Total flow exiting the property

ADD HYD (flowot)	ID: NHYD	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	DWF (cms)
ID1	07:1234rn	304.71	16.709	8.62	53.69	.000
+ID2	08:32206	29.20	1.420	8.63	45.08	.000
SUM	09:flowot	333.91	18.128	8.62	52.94	.000

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

001:0015----------

FINISH

****

WARNINGS / ERRORS / NOTES

Simulation ended on 2003-03-07 at 09:37:56

==========

Post-Development
Watershed 32
100 Year Event

```
00001> 2     Metric units
00002> *#*************************************************************************
00003> *#  Project Name     : Watershed 32 Post-Development 100 Year
00004> *#  Project Number   : PG02 3948
00005> *#  Date            : 01-20-2003
00006> *#  Modeller        : A. van Leeuwen and Thomas Dole
00007> *#  Company         : R.J. Burnside and Associates
00008> *#  License #       : 3846413
00009> *#*************************************************************************
00010> *  100 Year Post-Development Flows for Watershed 32
00011> *
00012> START                TZERO=[0.0],  METOUT=[2],  NSTORM=[0],  NRUN=[1]
00013> *                      [  ] <--storm filename, one per line for NSTORM time
00014> *-------------------|-------------------------------------------------------|
00015> *# 24 Hour Chicago Storm
00016> *# 2yr (513/1.5/0.754), 5yr (679/1.5/0.758), 10yr (781/1.5/0.759)
00017> *# 25yr (939/1.5/0.763), 100yr (1139/1.5/0.762)
00018> *# Precipitation quantities were obtained from Owen Sound MOE
00019> CHICAGO STORM        IUNITS=[2],  TD=[24](hrs), RTP=[0.333],  CSDT=[5](min),
00020>                      ICASEcs=[1],
00021>                       A=[1139],  B=[1.5], and C=[0.762].
00022> *-------------------|-------------------------------------------------------|
00023>
00024> *#Catchment 32201 - External Area Enters as Stream 2
00025>
00026> DESIGN NASHYD        ID=[1], NHYD=["32201"], DT=[5]min, AREA=[250.7](ha),
00027>                      DWF=[0](cms), CN/C=[82.6], TP=[0.60]hrs,
00028>                      RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
00029> *-------------------|-------------------------------------------------------|
00030>
00031> *#Catchment 32203 - External Area Enters as Sheet Flow West of Stream 2
00032>
00033> DESIGN NASHYD        ID=[3], NHYD=["32203"], DT=[1]min, AREA=[2](ha),
00034>                      DWF=[0](cms), CN/C=[86], TP=[0.13]hrs,
00035>                      RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
00036> *-------------------|-------------------------------------------------------|
00037>
00038> *#Catchment 32204 - External Area Enters as Sheet Flow East of Stream 2
00039>
00040> DESIGN NASHYD        ID=[4], NHYD=["32204"], DT=[5]min, AREA=[20.4](ha),
00041>                      DWF=[0](cms), CN/C=[85.5], TP=[0.31]hrs,
00042>                      RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
00043> *-------------------|-------------------------------------------------------|
00044>
00045> *#Catchment 32205 - Enters property as Tributary to Stream 2
00046>
00047> DESIGN NASHYD        ID=[5], NHYD=["32205"], DT=[5]min, AREA=[28.1](ha),
00048>                      DWF=[0](cms), CN/C=[83.6], TP=[0.17]hrs,
00049>                      RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
00050> *-------------------|-------------------------------------------------------|
00051>
00052> *#Catchment 31208 represents the Light Density Allan Subdivision whose Minor
00053> *#flows are directed from Watershed 32 into Watershed 31 and into the Georgian
00054> *#Bay Club SWM Pond 1. Major flows (above 5 year event) remain in Watershed 32.
00055>
00056> DESIGN STANDHYD      ID=[6], NHYD=["31208"], DT=[1]min, AREA=[7.2](ha),
00057>                      XIMP=[0.16], TIMP=[0.31], DWF=[0](cms), LOSS=[2], CN=[90],
00058>                      SLOPE=[5](%), RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
00059> *-------------------|-------------------------------------------------------|
00060> COMPUTE DUALHYD      IDin=[6], CINLET=[1.933](cms), NINLET=[1],
00061>                      MAJID=[7], MajNHYD=["208maj"],
00062>                      MINID=[8], MinNHYD=["208min"],
00063>                      TMJSTO=[0](cu-m)
00064> *-------------------|-------------------------------------------------------|
00065>
00066> *#Catchment 32207 represents open space on the Allan Lands
00067>
00068> DESIGN NASHYD        ID=[8], NHYD=["32207"], DT=[1]min, AREA=[1.5](ha),
00069>                      DWF=[0](cms), CN/C=[86], TP=[0.094]hrs,
00070>                      RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
00071> *-------------------|-------------------------------------------------------|
00072>
00073> *#Catchment 32208 represents open space on the Allan Lands
00074>
00075> DESIGN NASHYD        ID=[9], NHYD=["32208"], DT=[1]min, AREA=[2.0](ha),
00076>                      DWF=[0](cms), CN/C=[86], TP=[0.09]hrs,
00077>                      RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
00078> *-------------------|-------------------------------------------------------|
00079>
00080> *#Add hydrographs 32201, 32202, 32203 and 32204 to determine flow in Stream 2
00081> *#near the southern property line
00082>
00083> ADD HYD              IDsum=[6], NHYD=["S2pl"], IDs to add=[1+3+4+5+7+8+9]
00084> *-------------------|-------------------------------------------------------|
00085>
00086> *#Route Flow in Stream 2 (32201, 32202, 32203, 32204, 108maj) to the North Prope
00087> *#Line
00088>
00089> ROUTE CHANNEL        IDout=[7], NHYD=["1234rn"], IDin=[6],
00090>                      RDT=[1](min),
00091>                      CHLGTH=[1383](m),  CHSLOPE=[3.3](%),
00092>                                          FPSLOPE=[3.3](%),
00093>                      SECNUM=[3],       NSEG=[3]
00094>                      ! SEGROUGH, SEGDIST (m))=[0.080,15 -0.035,26.8 0.080,58.1] N
00095>                      ! DISTANCE (m), ELEVATION (m))=[0,      213]
00096>                                                    [12.4,   209]
00097>                                                    [15,     208]
00098>                                                    [15.8,   207.5]
00099>                                                    [26.8,   208]
00100>                                                    [44.6,   209]
00101>                                                    [49.7,   210]
00102>                                                    [54.1,   212]
00103>                                                    [58.1,   214]
00104> *-------------------|-------------------------------------------------------|
00105>
00106> *#Watershed 32206 Enters the Property as Tributary to Stream 2
00107>
00108> DESIGN NASHYD        ID=[8], NHYD=["32206"], DT=[2]min, AREA=[29.2](ha),
00109>                      DWF=[0](cms), CN/C=[76.4], TP=[0.57]hrs,
00110>                      RAINFALL=[ ,  ,  ,  , ](mm/hr), END=-1
00111> *-------------------|-------------------------------------------------------|
00112>
00113> *#Total flow exiting the property
00114>
00115> ADD HYD              IDsum=[9], NHYD=["flowot"], IDs to add=[7+8]
00116> *-------------------|-------------------------------------------------------|
00117> FINISH
00118>
00119>
00120>
00121>
00122>
00123>
```

32205

No??

```
SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999   55555 ==========
S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  5     ==========
SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  5     Ver.  3.1
    S   W W   M   M  H   H    Y    M   M  O   O       9999  5555  Oct. 1997
SSSSS   W W   M   M  H   H    Y    M   M   OOO           9      5 ==========
                                                     9   9      5 # 3846413
     StormWater Management HYdrologic Model           999   5555  ==========

*************************************************************************
************************** SWMHYMO-95w Ver/3.1 **************************
*******  A single event and continuous hydrologic simulation model  *******
*******     based on the principles of HYMO and its successors      *******
*******                  OTTHYMO-83 and OTTHYMO-89.                 *******
*************************************************************************
******* Distributed by:  J.F. Sabourin and Associates Inc.          *******
*******                  Ottawa,  Ontario: (613) 727-5199          *******
*******                  Gatineau, Quebec: (819) 243-6858          *******
*******                  E-Mail: swmhymo@jfsa.Com                  *******
*************************************************************************

+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+++++++ Licensed user: R.J. Burnside and Associates                +++++++
+++++++           -    Stayner               SERIAL#:3846413       +++++++
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

*************************************************************************
*******          ++++++ PROGRAM ARRAY DIMENSIONS ++++++            *******
*******            Maximum value for ID numbers  :     10          *******
*******            Max. number of rainfall points:   5000          *******
*******            Max. number of flow points    :   5000          *******
*************************************************************************


********************   D E T A I L E D   O U T P U T   ********************
*************************************************************************
*       DATE: 2003-03-07     TIME: 09:38:55     RUN COUNTER: 000683       *
*************************************************************************
* Input   filename: F:\2002\PG0239~4\POST-D~1\100YEA~1\100-32.DAT          *
* Output  filename: F:\2002\PG0239~4\POST-D~1\100YEA~1\100-32.out          *
* Summary filename: F:\2002\PG0239~4\POST-D~1\100YEA~1\100-32.sum          *
* User comments:                                                          *
* 1:_____________________________________________________________________*
* 2:_____________________________________________________________________*
* 3:_____________________________________________________________________*
*************************************************************************

-------------------------------------------------------------------------------
001:0001-----------------------------------------------------------------------
*#*****************************************************************************
*#  Project Name    : Watershed 32 Post-Development 100 Year
*#  Project Number  : PG02 3948
*#  Date            : 01-20-2003
*#  Modeller        : A. van Leeuwen and Thomas Dole
*#  Company         : R.J. Burnside and Associates
*#  License #       : 3846413
*#*****************************************************************************
--------------------
| START            |  Project  dir.: F:\2002\PG0239~4\POST-D~1\100YEA~1\
--------------------  Rainfall dir.: F:\2002\PG0239~4\POST-D~1\100YEA~1\
    TZERO =    .00 hrs on        0
    METOUT=    2 (output = METRIC)
    NRUN  = 001
    NSTORM=    0
-------------------------------------------------------------------------------
001:0002-----------------------------------------------------------------------
*# 24 Hour Chicago Storm
*# 2yr (513/1.5/0.754), 5yr (679/1.5/0.758), 10yr (781/1.5/0.759)
*# 25yr (939/1.5/0.763), 100yr (1139/1.5/0.762)
*# Precipitation quantities were obtained from Owen Sound MOE
```

CHICAGO STORM
Ptotal=107.08 mm

IDF curve parameters: A=1139.000
B= 1.500
C= .762
used in: INTENSITY = A / (t + B)^C

Duration of storm = 24.00 hrs
Storm time step = 5.00 min
Time to peak ratio = .33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.08	1.075	6.08	3.206	12.08	3.032	18.08	1.516
.17	1.083	6.17	3.319	12.17	2.985	18.17	1.506
.25	1.092	6.25	3.442	12.25	2.940	18.25	1.497
.33	1.101	6.33	3.575	12.33	2.896	18.33	1.488
.42	1.111	6.42	3.721	12.42	2.854	18.42	1.479
.50	1.120	6.50	3.882	12.50	2.813	18.50	1.470
.58	1.130	6.58	4.060	12.58	2.774	18.58	1.461
.67	1.140	6.67	4.258	12.67	2.736	18.67	1.452
.75	1.150	6.75	4.479	12.75	2.699	18.75	1.443
.83	1.160	6.83	4.730	12.83	2.663	18.83	1.435
.92	1.170	6.92	5.015	12.92	2.628	18.92	1.427
1.00	1.181	7.00	5.343	13.00	2.595	19.00	1.418
1.08	1.192	7.08	5.726	13.08	2.562	19.08	1.410
1.17	1.203	7.17	6.178	13.17	2.530	19.17	1.402
1.25	1.214	7.25	6.723	13.25	2.499	19.25	1.394
1.33	1.226	7.33	7.393	13.33	2.469	19.33	1.386
1.42	1.238	7.42	8.241	13.42	2.440	19.42	1.379
1.50	1.250	7.50	9.353	13.50	2.412	19.50	1.371
1.58	1.262	7.58	10.887	13.58	2.384	19.58	1.363
1.67	1.275	7.67	13.160	13.67	2.357	19.67	1.356
1.75	1.288	7.75	16.946	13.75	2.331	19.75	1.349
1.83	1.301	7.83	24.788	13.83	2.305	19.83	1.341
1.92	1.315	7.92	55.387	13.92	2.280	19.92	1.334
2.00	1.329	8.00	273.580	14.00	2.256	20.00	1.327
2.08	1.343	8.08	71.736	14.08	2.232	20.08	1.320
2.17	1.358	8.17	39.108	14.17	2.209	20.17	1.313
2.25	1.373	8.25	27.760	14.25	2.186	20.25	1.306
2.33	1.389	8.33	21.868	14.33	2.164	20.33	1.299
2.42	1.405	8.42	18.216	14.42	2.143	20.42	1.293
2.50	1.421	8.50	15.713	14.50	2.122	20.50	1.286
2.58	1.438	8.58	13.879	14.58	2.101	20.58	1.280
2.67	1.455	8.67	12.472	14.67	2.081	20.67	1.273
2.75	1.472	8.75	11.354	14.75	2.061	20.75	1.267
2.83	1.491	8.83	10.443	14.83	2.042	20.83	1.261
2.92	1.509	8.92	9.685	14.92	2.023	20.92	1.254
3.00	1.529	9.00	9.042	15.00	2.005	21.00	1.248
3.08	1.549	9.08	8.490	15.08	1.986	21.08	1.242
3.17	1.569	9.17	8.010	15.17	1.969	21.17	1.236
3.25	1.590	9.25	7.588	15.25	1.951	21.25	1.230
3.33	1.612	9.33	7.214	15.33	1.934	21.33	1.224
3.42	1.634	9.42	6.880	15.42	1.918	21.42	1.219
3.50	1.658	9.50	6.580	15.50	1.901	21.50	1.213
3.58	1.682	9.58	6.309	15.58	1.885	21.58	1.207
3.67	1.706	9.67	6.061	15.67	1.870	21.67	1.201
3.75	1.732	9.75	5.836	15.75	1.854	21.75	1.196
3.83	1.759	9.83	5.628	15.83	1.839	21.83	1.190
3.92	1.786	9.92	5.437	15.92	1.824	21.92	1.185
4.00	1.815	10.00	5.261	16.00	1.810	22.00	1.180
4.08	1.845	10.08	5.097	16.08	1.795	22.08	1.174
4.17	1.875	10.17	4.944	16.17	1.781	22.17	1.169
4.25	1.907	10.25	4.802	16.25	1.767	22.25	1.164
4.33	1.941	10.33	4.668	16.33	1.754	22.33	1.159
4.42	1.975	10.42	4.543	16.42	1.741	22.42	1.153
4.50	2.011	10.50	4.426	16.50	1.728	22.50	1.148
4.58	2.049	10.58	4.315	16.58	1.715	22.58	1.143
4.67	2.089	10.67	4.210	16.67	1.702	22.67	1.138
4.75	2.130	10.75	4.111	16.75	1.690	22.75	1.133
4.83	2.173	10.83	4.018	16.83	1.677	22.83	1.129
4.92	2.218	10.92	3.929	16.92	1.665	22.92	1.124

5.00	2.266	11.00	3.844	17.00	1.654	23.00	1.119
5.08	2.315	11.08	3.764	17.08	1.642	23.08	1.114
5.17	2.368	11.17	3.687	17.17	1.631	23.17	1.110
5.25	2.423	11.25	3.614	17.25	1.619	23.25	1.105
5.33	2.481	11.33	3.544	17.33	1.608	23.33	1.100
5.42	2.543	11.42	3.478	17.42	1.597	23.42	1.096
5.50	2.609	11.50	3.414	17.50	1.587	23.50	1.091
5.58	2.678	11.58	3.352	17.58	1.576	23.58	1.087
5.67	2.752	11.67	3.293	17.67	1.566	23.67	1.082
5.75	2.831	11.75	3.237	17.75	1.555	23.75	1.078
5.83	2.915	11.83	3.183	17.83	1.545	23.83	1.074
5.92	3.005	11.92	3.130	17.92	1.535	23.92	1.069
6.00	3.102	12.00	3.080	18.00	1.526	24.00	1.065

001:0003----------

*#Catchment 32201 - External Area Enters as Stream 2

DESIGN NASHYD	Area (ha)= 250.70	Curve Number (CN)=82.60
01:32201 DT= 5.00	Ia (mm)= 1.500	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= .600	

Unit Hyd Qpeak (cms)= 15.959

PEAK FLOW (cms)= 19.143 (i)
TIME TO PEAK (hrs)= 8.667
RUNOFF VOLUME (mm)= 70.072
TOTAL RAINFALL (mm)= 107.082
RUNOFF COEFFICIENT = .654

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

001:0004----------

*#Catchment 32203 - External Area Enters as Sheet Flow West of Stream 2

DESIGN NASHYD	Area (ha)= 2.00	Curve Number (CN)=86.00
03:32203 DT= 1.00	Ia (mm)= 1.500	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= .130	

Unit Hyd Qpeak (cms)= .588

PEAK FLOW (cms)= .494 (i)
TIME TO PEAK (hrs)= 8.100
RUNOFF VOLUME (mm)= 75.870
TOTAL RAINFALL (mm)= 107.082
RUNOFF COEFFICIENT = .709

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

001:0005----------

*#Catchment 32204 - External Area Enters as Sheet Flow East of Stream 2

DESIGN NASHYD	Area (ha)= 20.40	Curve Number (CN)=85.90
04:32204 DT= 5.00	Ia (mm)= 1.500	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= .310	

Unit Hyd Qpeak (cms)= 2.513

PEAK FLOW (cms)= 2.768 (i)
TIME TO PEAK (hrs)= 8.250
RUNOFF VOLUME (mm)= 75.693
TOTAL RAINFALL (mm)= 107.082
RUNOFF COEFFICIENT = .707

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

001:0006----------

*#Catchment 32205 - Enters property as Tributary to Stream 2

```
----------------------
| DESIGN NASHYD      |   Area     (ha)=   28.10   Curve Number    (CN)=83.60
| 05:32205  DT= 5.00 |   Ia       (mm)=   1.500   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .170

     Unit Hyd Qpeak  (cms)=    6.313

     PEAK FLOW       (cms)=    5.347 (i)
     TIME TO PEAK    (hrs)=    8.083
     RUNOFF VOLUME    (mm)=   71.730
     TOTAL RAINFALL   (mm)=  107.082
     RUNOFF COEFFICIENT   =     .670

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

--------------------------------------------------------------------------------
001:0007----------------------------------------------------------------------
*#Catchment 31208 represents the Light Density Allan Subdivision whose Minor
*#flows are directed from Watershed 32 into Watershed 31 and into the Georgian
*#Bay Club SWM Pond 1. Major flows (above 5 year event) remain in Watershed 32.
----------------------
| DESIGN STANDHYD    |   Area    (ha)=    7.20
| 06:31208  DT= 1.00 |   Total Imp(%)=   31.00   Dir. Conn.(%)=   16.00
----------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area      (ha)=      2.23          4.97
     Dep. Storage      (mm)=       .80          1.50
     Average Slope      (%)=      5.00          5.00
     Length             (m)=    219.09         40.00
     Mannings n            =      .013          .250

     Max.eff.Inten.(mm/hr)=    273.58        283.82
               over (min)        2.00          5.00
     Storage Coeff.  (min)=      1.69 (ii)     5.22 (ii)
     Unit Hyd. Tpeak (min)=      2.00          5.00
     Unit Hyd. peak  (cms)=       .62           .22
                                                        *TOTALS*
     PEAK FLOW       (cms)=       .82          2.32       2.848 (iii)
     TIME TO PEAK    (hrs)=      8.00          8.05       8.017
     RUNOFF VOLUME    (mm)=    106.28         86.82      89.945
     TOTAL RAINFALL   (mm)=    107.08        107.08     107.082
     RUNOFF COEFFICIENT   =       .99           .81        .840

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  90.0    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.

--------------------------------------------------------------------------------
001:0008----------------------------------------------------------------------
----------------------
| COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =   1.933  (cms)
| TotalHyd 06:31208  |   Number of inlets in system [NINLET] =       1
----------------------   Total minor system capacity          =   1.933  (cms)
                         Total major system storage [TMJSTO] =      0.(cu.m.)

                 ID: NHYD        AREA     QPEAK     TPEAK      R.V.      DWF
                                 (ha)     (cms)     (hrs)      (mm)     (cms)
     TOTAL HYD.  06:31208        7.20     2.848     8.017    89.945     .000
     ==========================================================================
     MAJOR SYST  07:208maj        .31      .915     8.017    89.945     .000
     MINOR SYST  08:208min       6.89     1.933     7.983    89.945     .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0009----------------------------------------------------------------------
*#Catchment 32207 represents open space on the Allan Lands
----------------------
| DESIGN NASHYD      |   Area    (ha)=    1.50   Curve Number    (CN)=86.00
```

```
| 08:32207  DT= 1.00 |   Ia      (mm)=    1.500   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=     .094

     Unit Hyd Qpeak  (cms)=      .609

     PEAK FLOW       (cms)=      .454 (i)
     TIME TO PEAK    (hrs)=     8.067
     RUNOFF VOLUME    (mm)=    75.870
     TOTAL RAINFALL   (mm)=   107.082
     RUNOFF COEFFICIENT    =     .709

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

------------------------------------------------------------------------------
001:0010--------------------------------------------------------------------
*#Catchment 32208 represents open space on the Allan Lands
----------------------
| DESIGN NASHYD      |   Area    (ha)=     2.00   Curve Number    (CN)=86.00
| 09:32208  DT= 1.00 |   Ia      (mm)=    1.500   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=     .090

     Unit Hyd Qpeak  (cms)=      .849

     PEAK FLOW       (cms)=      .619 (i)
     TIME TO PEAK    (hrs)=     8.067
     RUNOFF VOLUME    (mm)=    75.870
     TOTAL RAINFALL   (mm)=   107.082
     RUNOFF COEFFICIENT    =     .709

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

------------------------------------------------------------------------------
001:0011--------------------------------------------------------------------
*#Add hydrographs 32201, 32202, 32203 and 32204 to determine flow in Stream 2
*#near the southern property line
--------------------
| ADD HYD (S2pl  ) |
--------------------

                ID: NHYD      AREA     QPEAK    TPEAK    R.V.     DWF
                              (ha)     (cms)    (hrs)    (mm)     (cms)
  ID1 01:32201    250.70    19.143     8.67    70.07     .000
 +ID2 03:32203      2.00      .494     8.10    75.87     .000
 +ID3 04:32204     20.40     2.768     8.25    75.69     .000
 +ID4 05:32205     28.10     5.347     8.08    71.73     .000
 +ID5 07:208maj      .31      .915     8.02    89.94     .000
 +ID6 08:32207     1.50      .454     8.07    75.87     .000
 +ID7 09:32208     2.00      .619     8.07    75.87     .000
 ==========================================================
 SUM 06:S2pl     305.01    22.903     8.50    70.73     .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
001:0012--------------------------------------------------------------------
*#Route Flow in Stream 2 (32201, 32202, 32203, 32204, 108maj) to the North Prope
*#Line
--------------------
| ROUTE CHANNEL    |     Routing time step (min) =  1.00
|  IN> 06:S2pl     |     Number of SEGMENTS =  3
| OUT< 07:1234rn   |     Slopes (%), CHANNEL=3.30   FLOODPLAIN=3.30
--------------------                 LENGTH = 1383.00     (m)

              <------ DATA FOR SECTION (   3.0) ------>
              Distance      Elevation       Manning
                 .00         213.00          .0800
               12.40         209.00          .0800
               15.00         208.00     .0800 / .0350  Main Channel
               15.80         207.50          .0350     Main Channel
               26.80         208.00     .0350 / .0800  Main Channel
               44.60         209.00          .0800
               49.70         210.00          .0800
               54.10         212.00          .0800
               58.10         214.00          .0800
```

<-------------------------- TRAVEL TIME TABLE -------------------------->

DEPTH (m)	ELEV (m)	VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)	D x V (m2/s)
.250	207.750	.102E+04	.949	1.286	17.92	.322
.500	208.000	.408E+04	6.024	2.042	11.29	1.021
.794	208.294	.101E+05	22.574	3.091	7.46	2.455
1.088	208.588	.186E+05	48.770	3.634	6.34	3.955
1.382	208.882	.295E+05	85.078	3.994	5.77	5.521
1.676	209.176	.425E+05	133.055	4.325	5.33	7.252
1.971	209.471	.567E+05	192.176	4.686	4.92	9.234
2.265	209.765	.719E+05	261.439	5.030	4.58	11.392
2.559	210.059	.880E+05	341.080	5.360	4.30	13.715
2.853	210.353	.105E+06	432.103	5.697	4.05	16.255
3.147	210.647	.122E+06	532.844	6.021	3.83	18.948
3.441	210.941	.141E+06	643.161	6.329	3.64	21.779
3.735	211.235	.159E+06	762.958	6.623	3.48	24.738
4.029	211.529	.179E+06	892.175	6.903	3.34	27.816
4.324	211.824	.199E+06	1030.779	7.171	3.21	31.006
4.618	212.118	.219E+06	1178.939	7.429	3.10	34.306
4.912	212.412	.241E+06	1336.735	7.679	3.00	37.716
5.206	212.706	.263E+06	1503.890	7.918	2.91	41.223
5.500	213.000	.285E+06	1680.422	8.149	2.83	44.822

	AREA (ha)	<---- hydrograph ----> QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	<-pipe / channel-> MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 6:S2pl	305.01	22.903	8.50	70.728	.798	3.097
OUTFLOW: ID= 7:1234rn	305.01	22.675	8.58	70.726	.794	3.091

001:0013----------
*#Watershed 32206 Enters the Property as Tributary to Stream 2

DESIGN NASHYD	Area (ha)= 29.20	Curve Number (CN)=76.40
08:32206 DT= 2.00	Ia (mm)= 1.500	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= .570	

Unit Hyd Qpeak (cms)= 1.957

PEAK FLOW (cms)= 1.940 (i)
TIME TO PEAK (hrs)= 8.625
RUNOFF VOLUME (mm)= 60.571
TOTAL RAINFALL (mm)= 107.082
RUNOFF COEFFICIENT = .566

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

001:0014----------
*#Total flow exiting the property

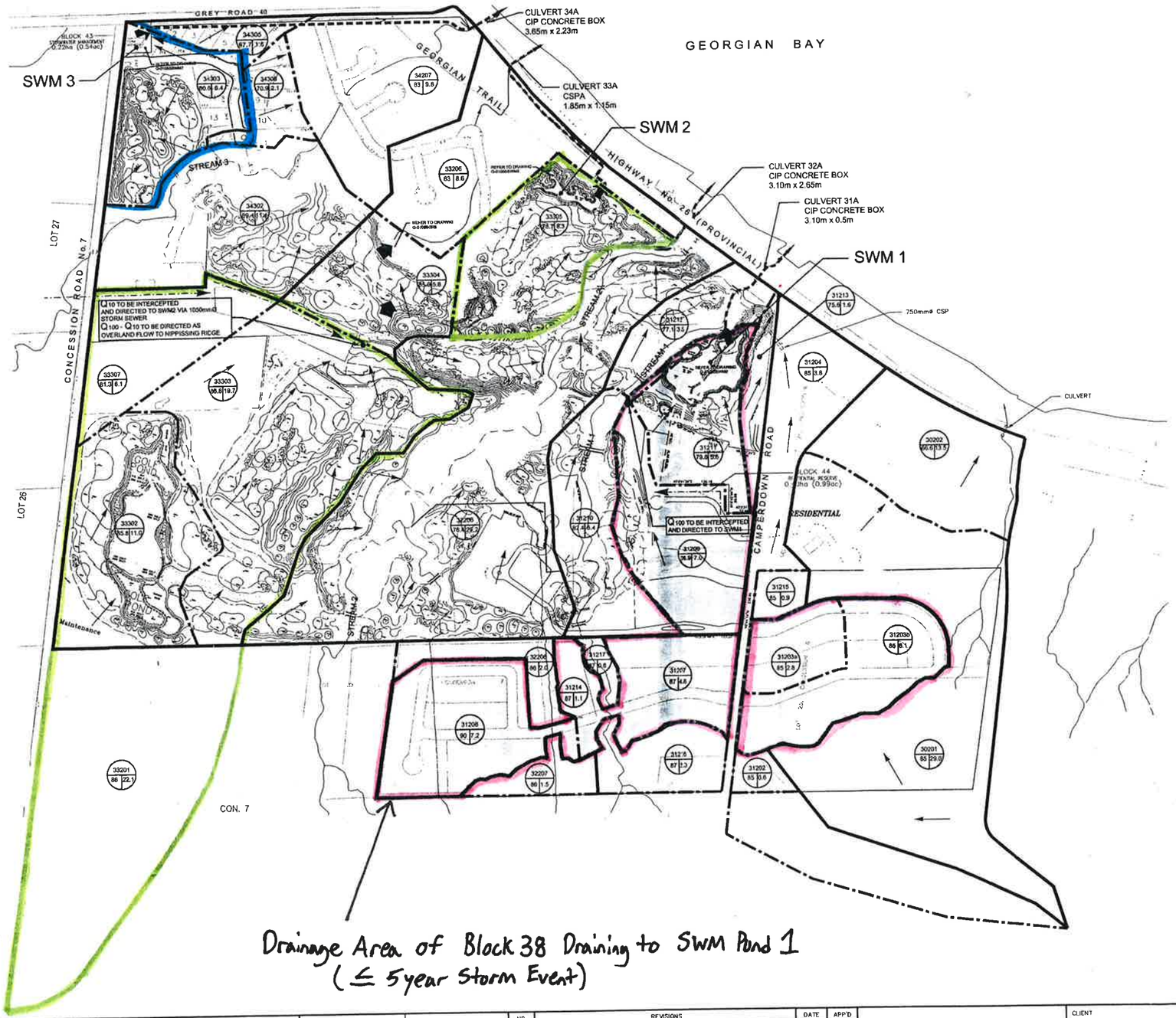
ADD HYD (flowot)	ID: NHYD	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	DWF (cms)
ID1	07:1234rn	305.01	22.675	8.58	70.73	.000
+ID2	08:32206	29.20	1.940	8.63	60.57	.000
SUM	09:flowot	334.21	24.607	8.58	69.84	.000

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

001:0015----------
FINISH

****
WARNINGS / ERRORS / NOTES

Simulation ended on 2003-03-07 at 09:38:56
==========



Drainage Area of Block 38 Draining to SWM Pond 1
(≤ 5 year Storm Event)

LEGEND

- DRAINAGE FLOW DIRECTION
- OVERLAND FLOW DIRECTION TO NIPISSING RIDGE
- DISCHARGE LOCATION FROM SWM PONDS
- INTERCEPTOR DITCHES

CATCHMENT No.
CN No. — AREA (ha.)

- WATERSHED LIMITS
- CATCHMENT LIMITS
- SWM1
- SWM2
- SWM3
- OUTLET

NOTES
1. SEE FIGURE 6 FOR EXTERNAL AREA DELINEATION.

BENCHMARK

NO.	REVISIONS	DATE	APP'D
1	TENDER SUBMISSION	APR.11/03	

Town of the Blue Mountains

CLIENT: CANADIAN DEVELOPMENT MANAGEMENT CORPORATION

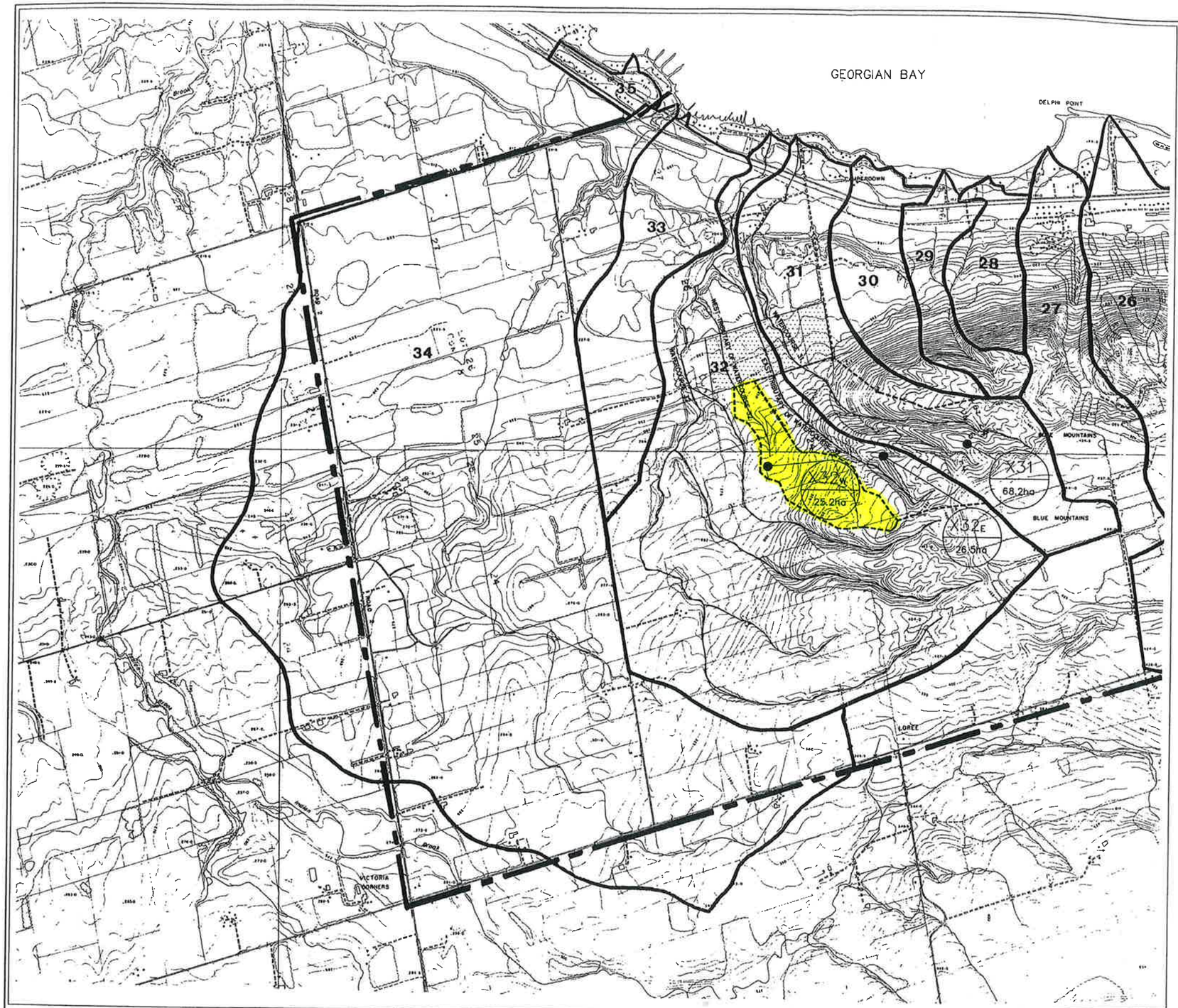
TITLE: POST DEVELOPMENT DRAINAGE PLAN

Burnside Golf Services
A DIVISION OF R.J. BURNSIDE & ASSOCIATES LIMITED
ENGINEERS - HYDROGEOLOGISTS - ENVIRONMENTAL CONSULTANTS
GEORGIAN BAY OFFICE, 3 RONELL CRESCENT, COLLINGWOOD, ONTARIO L9Y 4J6
TELEPHONE: (705)-446-0515 FAX: (705)-446-2389
E-MAIL: collingwood@burnside.com

DRAWN	RFN
DESIGNED	C.C.
REVIEWED	C.C.
DRAWING NO.	PG 02 2727-SWM2
SCALE	~~1: 1000~~ NTS
DATE	MAR 2003

Appendix E

Pre- & Post-Development Stormwater Drainage Areas (Crozier 2004)



BASEPLAN PER RJ BURNSIDE & ASSOCIATES LTD.

N

LEGEND

X32E / 26.5ha — IDENTIFICATION / AREA

SUBJECT LANDS

DRAINAGE AREA LIMITS

WATERCOURSE

SUBWATERSHED DRAINAGE BOUNDARY

External Drainage Area to West Tributary (Undeveloped) = 25.2ha

Date: Sept 19/18

By: A. Spencer

CF CROZIER & ASSOCIATES INC
LAND DEVELOPMENT ENGINEERS
110 PINE STREET
COLLINGWOOD ON
L9Y 2N9
T. 705-446-3510
F. 705-446-3520
CFCROZIER.CA

PROJECT: GEORGIAN RIDGE ESTATES TOWN of THE BLUE MOUNTAINS	DRAWN BY: R.C.G	PROJECT No.: 102-2502
	DATE: 06/28/2004	SCALE: NTS
TITLE: PRE-DEVELOPMENT WATERSHED PLAN	DRAWING No.:	

TO WATERCOURSE 32

TO WATERCOURSE 32

CDMC

32202
7.1ha

32201
4.9ha

31102
6.9ha

31101
1.7ha

WEST TRIBUTARY OF WATERCOURSE 32

EAST TRIBUTARY OF WATERCOURSE 32

WATERCOURSE 31

CAMPERDOWN ROAD

LEGEND

193 — EXISTING CONTOURS

31101
2.2 ha — IDENTIFICATION / AREA (HECTARES)

DRAINAGE AREA BOUNDARY

FLOW DIRECTION

Proposed Drainage Area West Tributary (Undeveloped Area)

Date: Sept 19/18

By: A. Spencer

NOTE: TOPOGRAPHIC SURVEY PER BURNSIDE (2003)

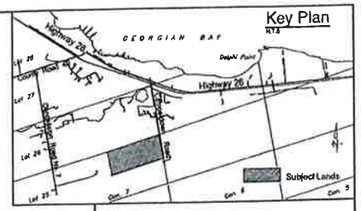
CF CROZIER & ASSOCIATES INC
LAND DEVELOPMENT ENGINEERS
110 PINE STREET
COLLINGWOOD ON
L9Y 2N9
T. 705-446-3510
F. 705-446-3520
CFCROZIER.CA

PROJECT: GEORGIAN RIDGE ESTATES TOWN OF THE BLUE MOUNTAINS	DRAWN BY: R.C.G	PROJECT No.: 102-2502
	DATE: 06/28/2004	SCALE: NTS
TITLE: SITE PRE-DEVELOPMENT DRAINAGE PLAN	DRAWING No.:	

Proposed Drainage to West Tributary (Developed Area)

Date: Sept 19/18

By: A. Spencer

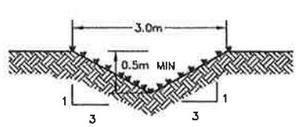


LEGEND

- CATCHBASIN MANHOLE
- DOUBLE CATCHBASIN MANHOLE
- CATCHBASIN
- DOUBLE CATCHBASIN
- STORM MANHOLE
- STORM SEWER
- MINOR STORM FLOW DIRECTION
- MAJOR STORM FLOW CATCHMENT
- DRAINAGE AREA CATCHMENT
- RUNOFF COEFFICIENT
- AREA (ha)
- INTERCEPTOR SWALE

NOTE: FOR SEDIMENT CONTROL REFER TO DWG SEDP1.

TYPICAL INTERCEPTOR SWALE



NOTE: SIDESLOPES & BOTTOM OF DITCH TO BE FINISHED WITH 75mm OF TOPSOIL & HYDROSEED & MULCH (SUGGESTED ALTERNATIVE OF AIRGANIX).

SEE SWM REPORT APPENDIX C FOR DELINEATION EXTERNAL OF DRAINAGE AREA.

FIGURE 5

GEODETIC BENCHMARKS

BM# 1
NAIL & WASHER IN EAST FACE OF HYDRO POLE 180m SOUTH OF CAMPERDOWN RD. & CAMPERDOWN COURT INTERSECTION, LOCATED ON WEST SIDE OF CAMPERDOWN RD. ELEV. = 227.570m

TEMPORARY BENCHMARKS

BM# 2
8" SPIKE IN EAST FACE OF HYDRO POLE, LOCATED ON WEST SIDE OF CAMPERDOWN RD., THIRD HYDRO POLE SOUTH OR 250m SOUTH OF BM#1 ELEV. = 241.715

No.	Issue / Revision	Date
0	Issued for Review	06/28/04

Project: GEORGIAN RIDGE ESTATES
TOWN of THE blue MOUNTAINS

Drawing: STORM DRAINAGE PLAN

CF CROZIER & ASSOCIATES INC
LAND DEVELOPMENT ENGINEERS
110 PINE STREET T.7054463310
COLLINGWOOD ON F.7054463320
L9Y 2N9 CFCROZIER.CA

Drawn By	L.T.M. & R.C.C	Check By	K.A.N.	Project No.	102-2502
Scale	N.T.S	Date	08/26/2004	Drawing No.	STM1

Appendix F

SWM HYMO Modelling & Capacity Assessments (Crozier 2018)

CF CROZIER & ASSOCIATES INC
LAND DEVELOPMENT ENGINEERS

GEORGIAN RIDGE ESTATES - STORM SEWER DESIGN SHEET

FREQUENCY: 5 YEARS - Owen Sound IDF — Coef. A= 29.1, Coef. B= -0.724 | 100 YEARS - Owen Sound IDF — Coef. A= 47.7, Coef. B= -0.738

PROJECT: Ridge Estates Block 38
PROJECT No.: 685-3867

Design: Ian McCutcheon
Date: 06/28/04 Revised: 29-Aug-18 AS

TIME OF CONCENTRATION 10.00 MANNINGS "n" 0.013

FILE: storm sewer design

location	FR MH NO	TO MH NO	AREA (A) Ha	RUN-OFF COEFF	A x C	Cummul. A x C	TIME OF CONC. min	I mm/hr	Q l/sec	SLOPE %	PIPE DIA. mm	VEL. m/sec	LENGTH m	TIME OF FLOW min	CAPACITY l/sec	FALL m	GROUND ELEV. UPPER END	GROUND ELEV. LOWER END	PIPE INV. ELEV. UPPER END	PIPE INV. ELEV. LOWER END	COVER UPPER END	COVER LOWER END
STREET A																						
(WEST)	Block 38	22	2.37	0.45	1.07	1.067	10.00	106.48	315.70	0.50	525	1.40	5.4	0.06	304.10	0.03	228.50	228.49	226.577	226.550	1.40	1.42
	22	21	0.31	0.30	0.09	1.160	10.06	105.99	341.65	0.50	525	1.40	46.4	0.55	304.10	0.23	228.49	229.34	226.520	226.288	1.45	2.53
	21	20	0.00	0.30	0.00	1.577	10.61	101.98	446.95	0.50	600	1.54	18.6	0.20	434.17	0.09	229.34	229.71	226.213	226.120	2.53	2.99
	20	19	0.29	0.30	0.09	1.664	10.82	100.60	465.23	0.50	600	1.54	40.4	0.44	434.17	0.20	229.71	230.08	226.090	225.888	3.02	3.59
	19	16	0.00	0.30	0.00	1.664	11.25	97.75	452.03	0.50	600	1.54	17.5	0.19	435.41	0.09	230.08	229.86	225.828	225.740	3.65	3.52
	18	17	0.22	0.30	0.07	0.066	10.00	106.48	19.54	8.00	300	3.87	17.7	0.08	273.51	1.42	231.11	230.61	229.476	228.060	1.33	2.25
	17	16	0.00	0.30	0.00	0.474	10.46	103.06	135.80	5.54	300	3.22	35.4	0.18	227.54	1.96	230.61	229.86	228.000	226.040	2.31	3.52
Lot 34/35	16	15	0.32	0.30	0.10	2.234	11.44	96.57	599.63	1.00	600	2.17	8.5	0.07	614.01	0.09	229.86	229.86	225.680	225.595	3.58	3.67
Easement	15	14	0.00	0.30	0.00	2.234	11.51	96.18	597.17	1.00	600	2.17	5.8	0.04	614.01	0.06	229.86	229.70	225.565	225.507	3.70	3.59
	14	13	0.00	0.30	0.00	2.234	11.55	95.91	595.50	1.56	600	2.71	51.6	0.32	766.44	0.80	229.70	227.32	225.447	224.643	3.65	2.08
	13	1	0.00	0.30	0.00	2.234	11.87	94.05	583.94	0.30	750	1.38	97.8	1.18	610.39	0.29	227.32	227.34	224.493	224.199	2.08	2.39
STREET B																						
	25	24	0.72	0.30	0.22	0.216	10.00	106.48	63.94	7.50	300	3.75	60.0	0.27	264.83	4.50	235.28	231.02	233.700	229.200	1.28	1.52
	24	23	0.45	0.30	0.14	0.351	10.27	104.47	101.94	4.50	300	2.90	51.4	0.30	205.13	2.31	231.02	229.30	229.170	226.857	1.55	2.14
	23	21	0.22	0.30	0.07	0.417	10.56	102.35	118.65	3.65	300	2.61	8.6	0.05	184.78	0.31	229.30	229.42	226.827	226.513	2.17	2.61
	29	28	0.79	0.30	0.24	0.237	10.00	106.48	70.16	6.00	300	3.35	41.7	0.21	236.87	2.50	235.68	233.31	234.000	231.498	1.38	1.51
	28	27	0.25	0.30	0.08	0.312	10.21	104.91	91.00	8.00	300	3.87	26.5	0.11	273.51	2.12	233.31	231.16	231.468	229.348	1.54	1.51
	27	26	0.00	0.30	0.00	0.312	10.32	104.07	90.27	5.00	300	3.06	15.2	0.08	216.23	0.76	231.16	230.42	229.288	228.528	1.57	1.59
	26	17	0.32	0.30	0.10	0.408	10.40	103.47	117.36	4.42	300	2.88	9.9	0.06	203.40	0.44	230.42	230.61	228.498	228.060	1.62	2.25
STREET A																						
(EAST)	12	11	0.61	0.30	0.18	0.183	10.00	106.48	54.17	0.50	300	0.97	47.4	0.82	68.32	0.24	235.17	235.90	233.580	233.343	1.29	2.26
	11	10	0.00	0.30	0.00	0.183	10.82	100.59	51.18	0.50	300	0.97	30.7	0.53	68.58	0.15	235.90	235.91	233.283	233.129	2.32	2.48
	10	9	0.00	0.30	0.00	0.183	11.34	97.19	49.44	0.50	300	0.97	28.0	0.48	68.38	0.14	235.91	235.49	233.069	232.929	2.54	2.26
	9	8	0.36	0.30	0.11	0.291	11.83	94.30	76.29	1.00	300	1.37	50.0	0.61	96.89	0.50	235.49	234.54	232.869	232.367	2.32	1.87
	8	6	0.46	0.30	0.14	0.429	12.44	90.94	108.46	3.50	300	2.56	57.2	0.37	180.91	2.00	234.54	233.17	232.337	230.335	1.90	2.53
	6	5	0.92	0.30	0.28	0.705	12.81	89.02	174.46	0.50	450	1.27	70.5	0.93	201.74	0.35	233.17	233.22	230.185	229.832	2.53	2.94
	5	4	0.06	0.30	0.02	0.723	13.73	84.63	170.10	0.40	450	1.13	26.8	0.39	180.15	0.11	233.22	232.69	229.772	229.665	3.00	2.58
	4	3	0.00	0.30	0.00	1.099	14.13	82.91	253.31	0.95	450	1.75	28.6	0.27	278.04	0.27	232.69	231.98	229.635	229.363	2.61	2.17
BLOCK 48																						
	3	2	0.13	0.30	0.04	1.138	14.40	81.77	258.69	3.50	450	3.35	55.1	0.27	533.45	1.93	231.98	229.53	229.303	227.374	2.23	1.71
	2	1	0.29	0.40	0.12	1.254	14.67	80.66	281.20	7.48	450	4.90	38.0	0.13	779.97	2.84	229.53	227.34	227.344	224.500	1.74	2.39
	1	GBEL 13	0.23	0.40	0.09	3.580	14.80	80.15	797.61	0.48	750	1.74	9.0	0.09	769.51	0.04	227.34	227.00	224.139	224.096	2.45	2.15
BLOCK 49																						
	Block 49	4	0.94	0.40	0.38	0.376	10.00	106.48	111.30	8.69	300	4.03	60.0	0.25	285.09	5.22	237.00	232.69	235.000	229.785	1.70	2.61

```
00001> 2     Metric units
00002> *#************************************************************************
00003> *#  Project Name: (Pre Development Block 38 West Tributary Assessment)
00004> *#  Project Number:(685-3867)
00005> *#  Date         : September 20, 2018
00006> *#  Modeller     : (A. Spencer)
00007> *#  Company      : C.F. Crozier & Associates Inc.
00008> *#  License #    : 3737016
00009> *#************************************************************************
00010> *#  Filename     :  Continuous Model
00011> *#  Continuous Model
00012> *#************************************************************************
00013> *#************************************************************************
00014> *#************************************************************************
00015>
00016> *%-----------------|---------------------------------------------------|
00017> START               TZERO=[0.0],  METOUT=[2],  NSTORM=[0],  NRUN=[0]
00018> *%                   [  ] <--storm filename, one per line for NSTORM time
00019> *%-----------------|---------------------------------------------------|
00020> *#************************************************************************
00021> *#**********************25 year Chicago 6Hr Keifer Chu Storm**************
00022> *#************************************************************************
00023> *%-----------------|---------------------------------------------------|
00024> READ STORM          STORM_FILENAME=["25yr.stm"]
00025> *%-----------------|---------------------------------------------------|
00026> CALIB NASHYD       ID=[1], NHYD=["X32w+202"], DT=[1]min, AREA=[32.3](ha),
00027>                     DWF=[0](cms),  CN/C=[85.9], IA=[7.5](mm),
00028>                     N=[3], TP=[0.31]hrs,
00029>                     RAINFALL=[ ,  ,  ,  ,  ](mm/hr),  END=-1
00030> *%-----------------|---------------------------------------------------|
00031> *#************************************************************************
00032> *#**********************100 year Chicago 6Hr Keifer Chu Storm*************
00033> *#************************************************************************
00034> *%-----------------|---------------------------------------------------|
00035> READ STORM          STORM_FILENAME=["100yr.stm"]
00036> *%-----------------|---------------------------------------------------|
00037> CALIB NASHYD       ID=[1], NHYD=["X32w+202"], DT=[1]min, AREA=[32.3](ha),
00038>                     DWF=[0](cms),  CN/C=[85.9], IA=[7.5](mm),
00039>                     N=[3], TP=[0.31]hrs,
00040>                     RAINFALL=[ ,  ,  ,  ,  ](mm/hr),  END=-1
00041> *%-----------------|---------------------------------------------------|
00042> *#************************************************************************
00043> *#**********************25 year SCS 24HR HII Storm************************
00044> *#************************************************************************
00045> *%-----------------|---------------------------------------------------|
00046> MASS STORM         PTOTAL=[86.4](mm), CSDT=[1](min),
00047>                     CURVE_FILENAME=["scs24HII.mst"]
00048> *%-----------------|---------------------------------------------------|
00049> CALIB NASHYD       ID=[1], NHYD=["X32w+202"], DT=[1]min, AREA=[32.3](ha),
00050>                     DWF=[0](cms),  CN/C=[85.9], IA=[7.5](mm),
00051>                     N=[3], TP=[0.31]hrs,
00052>                     RAINFALL=[ ,  ,  ,  ,  ](mm/hr),  END=-1
00053> *%-----------------|---------------------------------------------------|
00054> *#************************************************************************
00055> *#**********************100 year SCS 24HR HII Storm***********************
00056> *#************************************************************************
00057> *%-----------------|---------------------------------------------------|
00058> MASS STORM         PTOTAL=[108.0](mm), CSDT=[1](min),
00059>                     CURVE_FILENAME=["scs24HII.mst"]
00060> *%-----------------|---------------------------------------------------|
00061> CALIB NASHYD       ID=[1], NHYD=["X32w+202"], DT=[1]min, AREA=[32.3](ha),
00062>                     DWF=[0](cms),  CN/C=[85.9], IA=[7.5](mm),
00063>                     N=[3], TP=[0.31]hrs,
00064>                     RAINFALL=[ ,  ,  ,  ,  ](mm/hr),  END=-1
00065> *%-----------------|---------------------------------------------------|
00066> *#************************************************************************
00067> *#****************************Regional Storm******************************
00068> *#************************************************************************
00069> *%-----------------|---------------------------------------------------|
00070> READ STORM          STORM_FILENAME=["tim.stm"]
00071> *%-----------------|---------------------------------------------------|
00072> CALIB NASHYD       ID=[1], NHYD=["X32w+202"], DT=[1]min, AREA=[32.3](ha),
00073>                     DWF=[0](cms),  CN/C=[85.9], IA=[7.5](mm),
00074>                     N=[3], TP=[0.31]hrs,
00075>                     RAINFALL=[ ,  ,  ,  ,  ](mm/hr),  END=-1
00076> *%-----------------|---------------------------------------------------|
00077> *%-----------------|---------------------------------------------------|
00078> FINISH
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00109>
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00001> ********************************************************************************
00002>
00003>    SSSSS  W    W  M    M  H    H  Y    Y  M    M   OOO        999    999      *********
00004>   S       W    W  MM  MM  H    H   Y  Y   MM  MM  O   O      9   9  9   9     *********
00005>    SSSSS  W W W W  M MM M  HHHHH    Y     M M M M  O   O  ##  9   9  9   9  Ver  4.05
00006>        S  W W W W  M    M  H    H    Y     M  M  M  O   O       9999   9999  Sept 2011
00007>   SSSSS   W W W W  M    M  H    H    Y     M     M   OOO         9      9     *********
00008>                                                                 9   9  9   9  # 3737016
00009>          StormWater Management HYdrologic Model                  999    999    *********
00010>
00011> ********************************************************************************
00012> ************************** SWMHYMO Ver/4.05  ***************************************
00013> *********  A single event and continuous hydrologic simulation model  *********
00014> *********      based on the principles of HYMO and its successors      *********
00015> *********                 OTTHYMO-83 and OTTHYMO-89.                   *********
00016> ********************************************************************************
00017> ********* Distributed by:  J.F. Sabourin and Associates Inc.           *********
00018> *********                  Ottawa,  Ontario: (613) 836-3884            *********
00019> *********                  Gatineau, Quebec: (819) 243-6858            *********
00020> *********                  E-Mail: swmhymo@jfsa.com                    *********
00021> ********************************************************************************
00022>
00023> ********************************************************************************
00024> +++++++++ Licensed user: C.F. Crozier & Associates Inc.                +++++++++
00025> +++++++++                 Collingwood           SERIAL#:3737016       +++++++++
00026> ********************************************************************************
00027>
00028> ********************************************************************************
00029> *********          ++++++ PROGRAM ARRAY DIMENSIONS ++++++              *********
00030> *********          Maximum value for ID numbers  :     10              *********
00031> *********          Max. number of rainfall points: 105408              *********
00032> *********          Max. number of flow points    : 105408              *********
00033> ********************************************************************************
00034>
00035> ***** DESCRIPTION SUMMARY TABLE HEADERS (units depend on METOUT in START) *****
00036> *****-------------------------------------------------------------------*****
00037> *****    ID:  Hydrograph IDentification numbers, (1-10).                *****
00038> *****  NHYD:  Hydrograph reference numbers, (6 digits or characters).   *****
00039> *****  AREA:  Drainage area associated with hydrograph, (ac.) or (ha.). *****
00040> ***** QPEAK:  Peak flow of simulated hydrograph, (ft^3/s) or (m^3/s).   *****
00041> ***** TpeakDate_hh:mm is the date and time of the peak flow.            *****
00042> *****  R.V.:  Runoff Volume of simulated hydrograph, (in) or (mm).      *****
00043> *****  R.C.:  Runoff Coefficient of simulated hydrograph, (ratio).      *****
00044> *****     *:  see WARNING or NOTE message printed at end of run.        *****
00045> *****    **:  see  ERROR  message printed at end of run.                *****
00046> ********************************************************************************
00047> ********************************************************************************
00048>
00049> !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
00050>
00051> ********************************************************************************
00052>
00053> ************************  S U M M A R Y   O U T P U T  ************************
00054> ********************************************************************************
00055> *         DATE: 2018-09-20     TIME: 11:27:07     RUN COUNTER: 000344         *
00056> ********************************************************************************
00057> * Input   filename: C:\BLOCK3-1\SWMHYM-1\PRE-DE-1\Pre.dat                      *
00058> * Output  filename: C:\BLOCK3-1\SWMHYM-1\PRE-DE-1\Pre.out                     *
00059> * Summary filename: C:\BLOCK3-1\SWMHYM-1\PRE-DE-1\Pre.sum                     *
00060> * User comments:                                                             *
00061> * 1:_____________________________________________________________________     *
00062> * 2:_____________________________________________________________________     *
00063> * 3:_____________________________________________________________________     *
00064> ********************************************************************************
00065>
00066>
00067> #*******************************************************************************
00068> #  Project Name: [Pre Development Block 38 West Tributary Assessment]
00069> #  Project Number:[685-3867]
00070> #  Date        : September 20, 2018
00071> #  Modeller    : [A. Spencer]
00072> #  Company     : C.F. Crozier & Associates Inc.
00073> #  License #   :  3737016
00074> #*******************************************************************************
00075> #  Filename    :  Continuous Model
00076> #  Continuous Model
00077> #*******************************************************************************
00078> #*******************************************************************************
00079> #*******************************************************************************
00080>  RUN:COMMAND#
00081>  001:0001----------------------------------------------------------------------
00082>      START
00083>       [TZERO =    .00 hrs on       0]
00084>       [METOUT=   2    (1=imperial, 2=metric output)]
00085>       [NSTORM=   0 ]
00086>       [NRUN  =   1 ]
00087> #*******************************************************************************
00088> #**********************25 year Chicago 6Hr Keifer Chu Storm**********************
00089> #*******************************************************************************
00090>  001:0002----------------------------------------------------------------------
00091>      READ STORM
00092>       Filename = 25yr.stm
00093>       Comment  =
00094>       [SDT=60.00:SDUR=   6.00:PTOT=  77.90]
00095>  001:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00096>      CALIB NASHYD       01:X32w+202       32.30    2.995 No_date    3:05   44.22
00097>       [CN= 85.9: N= 3.00]
00098>       [Tp=  .31:DT= 1.00]
00099> #*******************************************************************************
00100> #*********************100 year Chicago 6Hr Keifer Chu Storm**********************
00101> #*******************************************************************************
00102>  001:0004----------------------------------------------------------------------
00103>      READ STORM
00104>       Filename = 100yr.stm
00105>       Comment  =
00106>       [SDT=60.00:SDUR=   6.00:PTOT=  96.00]
00107>  001:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00108>      CALIB NASHYD       01:X32w+202       32.30    3.988 No_date    3:05   60.16
00109>       [CN= 85.9: N= 3.00]
00110>       [Tp=  .31:DT= 1.00]
00111> #*******************************************************************************
00112> #**************************25 year SCS 24HR HII Storm*****************************
00113> #*******************************************************************************
00114>  001:0006----------------------------------------------------------------------
00115>      MASS STORM
00116>       Filename = C:\BLOCK3-1\SWMHYM-1\PRE-DE-1\scs24HII.mst
00117>       Comment  = 24 hour SCS II storm mass curve
00118>       [SDT= 1.00:SDUR=  24.00:PTOT=  86.40]
00119>  001:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00120>      CALIB NASHYD       01:X32w+202       32.30    3.221 No_date   12:24   51.62
00121>       [CN= 85.9: N= 3.00]
00122>       [Tp=  .31:DT= 1.00]
00123> #*******************************************************************************
00124> #*************************100 year SCS 24HR HII Storm*****************************
00125> #*******************************************************************************
00126>  001:0008----------------------------------------------------------------------
00127>      MASS STORM
00128>       Filename = C:\BLOCK3-1\SWMHYM-1\PRE-DE-1\scs24HII.mst
00129>       Comment  = 24 hour SCS II storm mass curve
00130>       [SDT= 1.00:SDUR=  24.00:PTOT= 108.00]
00131>  001:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00132>      CALIB NASHYD       01:X32w+202       32.30    4.423 No_date   12:24   71.03
00133>       [CN= 85.9: N= 3.00]
00134>       [Tp=  .31:DT= 1.00]
00135> #*******************************************************************************
00136> #**************************Regional Storm*****************************************
00137> #*******************************************************************************
00138>  001:0010----------------------------------------------------------------------
00139>      RRAD STORM
00140>       Filename = tim.stm
00141>       Comment  =
00142>       [SDT=60.00:SDUR=  12.00:PTOT= 193.00]
00143>  001:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00144>      CALIB NASHYD       01:X32w+202       32.30    3.400 No_date    7:03  151.46
00145>       [CN= 85.9: N= 3.00]
00146>       [Tp=  .31:DT= 1.00]
00147>  001:0012----------------------------------------------------------------------
00148>       FINISH
00149> ----------------------------------------------------------------------
00150> ********************************************************************************
00151>     WARNINGS / ERRORS / NOTES
00152>     -------------------------
00153>   Simulation ended on 2018-09-20     at 11:27:08
00154> ================================================================================
00155>
00156>
```

```
00001> 2     Metric units
00002> *#************************************************************************
00003> *#  Project Name: [Post Development Block 38 West Tributary Assessment]
00004> *#  Project Number:[685-1867]
00005> *#  Date        : September 20, 2018
00006> *#  Modeller    : [A. Spencer]
00007> *#  Company     : C.F. Crozier & Associates Inc.
00008> *#  License #   :  3737016
00009> *#************************************************************************
00010> *#  Filename    :  Continuous Model
00011> *#  Continuous Model
00012> *#************************************************************************
00013> *#************************************************************************
00014> *#************************************************************************
00015>
00016> *%-----------------|-------------------------------------------------------|
00017> START               TZERO=[0.0],  METOUT=[2],  NSTORM=[0],   NRUN=[0]
00018> *%                   [ ] <--storm filename, one per line for NSTORM time
00019> *%-----------------|-------------------------------------------------------|
00020> *#*****************************************************************
00021> *#*********************25 year Chicago 6Hr Keifer Chu Storm**********************
00022> *#*****************************************************************
00023> *%-----------------|-------------------------------------------------------|
00024> READ STORM          STORM_FILENAME=["25yr.stm"]
00025> *%-----------------|-------------------------------------------------------|
00026> CALIB NASHYD       ID=[1], NHYD=["X32w+202"], DT=[1]min, AREA=[26.1](ha),
00027>                     DWF=[0](cms),  CN/C=[85.9], IA=[7.5](mm),
00028>                     N=[3], TP=[0.31]hrs,
00029>                     RAINFALL=[ ,  ,  ,  ,  ](mm/hr),  END=-1
00030> *%-----------------|-------------------------------------------------------|
00031> CALIB STANDHYD     ID=[2], NHYD=["B37+W"], DT=[1](min), AREA=[5.62](ha),
00032>                     XIMP=[0.35], TIMP=[0.50], DWF=[0](cms), LOSS=[2],
00033>                     SCS curve number CN=[84],
00034>                     Pervious   surfaces: IAper=[5](mm), SLPP=[2.0](%),
00035>                                          LGP=[40](m), MNP=[0.3], SCP=[0](min),
00036>                     Impervious surfaces: IAimp=[2](mm), SLPI=[1.0](%),
00037>                                          LGI=[194](m), MNI=[0.013], SCI=[0](min)
00038>                     RAINFALL=[ ,  ,  ,  ,  ](mm/hr) ,  END=-1
00039> *%-----------------|-------------------------------------------------------|
00040> ADD HYD            IDsum=[3], NHYD=["Out32"], IDs to add=[1+2]
00041> *%-----------------|-------------------------------------------------------|
00042> *#*****************************************************************
00043> *#*********************100 year Chicago 6Hr Keifer Chu Storm*********************
00044> *#*****************************************************************
00045> *%-----------------|-------------------------------------------------------|
00046> READ STORM          STORM_FILENAME=["100yr.stm"]
00047> *%-----------------|-------------------------------------------------------|
00048> CALIB NASHYD       ID=[1], NHYD=["X32w+202"], DT=[1]min, AREA=[26.1](ha),
00049>                     DWF=[0](cms),  CN/C=[85.9], IA=[7.5](mm),
00050>                     N=[3], TP=[0.31]hrs,
00051>                     RAINFALL=[ ,  ,  ,  ,  ](mm/hr),  END=-1
00052> *%-----------------|-------------------------------------------------------|
00053> CALIB STANDHYD     ID=[2], NHYD=["B37+W"], DT=[1](min), AREA=[5.62](ha),
00054>                     XIMP=[0.35], TIMP=[0.50], DWF=[0](cms), LOSS=[2],
00055>                     SCS curve number CN=[84],
00056>                     Pervious   surfaces: IAper=[5](mm), SLPP=[2.0](%),
00057>                                          LGP=[40](m), MNP=[0.3], SCP=[0](min),
00058>                     Impervious surfaces: IAimp=[2](mm), SLPI=[1.0](%),
00059>                                          LGI=[194](m), MNI=[0.013], SCI=[0](min)
00060>                     RAINFALL=[ ,  ,  ,  ,  ](mm/hr) ,  END=-1
00061> *%-----------------|-------------------------------------------------------|
00062> ADD HYD            IDsum=[3], NHYD=["Out32"], IDs to add=[1+2]
00063> *%-----------------|-------------------------------------------------------|
00064> *#*****************************************************************
00065> *#*********************25 year SCS 24HR HII Storm**********************
00066> *#*****************************************************************
00067> *%-----------------|-------------------------------------------------------|
00068> MASS STORM          PTOTAL=[86.4](mm), CSDT=[1](min),
00069>                     CURVE_FILENAME=["scs24HII.mst"]
00070> *%-----------------|-------------------------------------------------------|
00071> CALIB NASHYD       ID=[1], NHYD=["X32w+202"], DT=[1]min, AREA=[26.1](ha),
00072>                     DWF=[0](cms),  CN/C=[85.9], IA=[7.5](mm),
00073>                     N=[3], TP=[0.31]hrs,
00074>                     RAINFALL=[ ,  ,  ,  ,  ](mm/hr),  END=-1
00075> *%-----------------|-------------------------------------------------------|
00076> CALIB STANDHYD     ID=[2], NHYD=["B37+W"], DT=[1](min), AREA=[5.62](ha),
00077>                     XIMP=[0.35], TIMP=[0.50], DWF=[0](cms), LOSS=[2],
00078>                     SCS curve number CN=[84],
00079>                     Pervious   surfaces: IAper=[5](mm), SLPP=[2.0](%),
00080>                                          LGP=[40](m), MNP=[0.3], SCP=[0](min),
00081>                     Impervious surfaces: IAimp=[2](mm), SLPI=[1.0](%),
00082>                                          LGI=[194](m), MNI=[0.013], SCI=[0](min)
00083>                     RAINFALL=[ ,  ,  ,  ,  ](mm/hr) ,  END=-1
00084> *%-----------------|-------------------------------------------------------|
00085> ADD HYD            IDsum=[3], NHYD=["Out32"], IDs to add=[1+2]
00086> *%-----------------|-------------------------------------------------------|
00087> *#*****************************************************************
00088> *#*********************100 year SCS 24HR HII Storm**********************
00089> *#*****************************************************************
00090> *%-----------------|-------------------------------------------------------|
00091> MASS STORM          PTOTAL=[108.0](mm), CSDT=[1](min),
00092>                     CURVE_FILENAME=["scs24HII.mst"]
00093> *%-----------------|-------------------------------------------------------|
00094> CALIB NASHYD       ID=[1], NHYD=["X32w+202"], DT=[1]min, AREA=[26.1](ha),
00095>                     DWF=[0](cms),  CN/C=[85.9], IA=[7.5](mm),
00096>                     N=[3], TP=[0.31]hrs,
00097>                     RAINFALL=[ ,  ,  ,  ,  ](mm/hr),  END=-1
00098> *%-----------------|-------------------------------------------------------|
00099> CALIB STANDHYD     ID=[2], NHYD=["B37+W"], DT=[1](min), AREA=[5.62](ha),
00100>                    XIMP=[0.35], TIMP=[0.50], DWF=[0](cms), LOSS=[2],
00101>                    SCS curve number CN=[84],
00102>                    Pervious   surfaces: IAper=[5](mm), SLPP=[2.0](%),
00103>                                         LGP=[40](m), MNP=[0.3], SCP=[0](min),
00104>                    Impervious surfaces: IAimp=[2](mm), SLPI=[1.0](%),
00105>                                         LGI=[194](m), MNI=[0.013], SCI=[0](min)
00106>                    RAINFALL=[ ,  ,  ,  ,  ](mm/hr) ,  END=-1
00107> *%-----------------|-------------------------------------------------------|
00108> ADD HYD            IDsum=[3], NHYD=["Out32"], IDs to add=[1+2]
00109> *%-----------------|-------------------------------------------------------|
00110> *#*****************************************************************
00111> *#*********************Regional Storm**********************
00112> *#*****************************************************************
00113> *%-----------------|-------------------------------------------------------|
00114> READ STORM          STORM_FILENAME=["tim.stm"]
00115> *%-----------------|-------------------------------------------------------|
00116> CALIB NASHYD       ID=[1], NHYD=["X32w+202"], DT=[1]min, AREA=[26.1](ha),
00117>                     DWF=[0](cms),  CN/C=[85.9], IA=[7.5](mm),
00118>                     N=[3], TP=[0.31]hrs,
00119>                     RAINFALL=[ ,  ,  ,  ,  ](mm/hr),  END=-1
00120> *%-----------------|-------------------------------------------------------|
00121> CALIB STANDHYD     ID=[2], NHYD=["B37+W"], DT=[1](min), AREA=[5.62](ha),
00122>                     XIMP=[0.35], TIMP=[0.50], DWF=[0](cms), LOSS=[2],
00123>                     SCS curve number CN=[84],
00124>                     Pervious   surfaces: IAper=[5](mm), SLPP=[2.0](%),
00125>                                          LGP=[40](m), MNP=[0.3], SCP=[0](min),
00126>                     Impervious surfaces: IAimp=[2](mm), SLPI=[1.0](%),
00127>                                          LGI=[194](m), MNI=[0.013], SCI=[0](min)
00128>                     RAINFALL=[ ,  ,  ,  ,  ](mm/hr) ,  END=-1
00129> *%-----------------|-------------------------------------------------------|
00130> ADD HYD            IDsum=[3], NHYD=["Out32"], IDs to add=[1+2]
00131> *%-----------------|-------------------------------------------------------|
00132> *%-----------------|-------------------------------------------------------|
00133> FINISH
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00001> ================================================================================
00002>
00003>    SSSSS  W    W  M    M  H    H  Y    Y  M    M   OOO         999    999    *********
00004>    S      W W W  MM  MM  H    H  Y Y    MM MM  O   O       9   9  9   9
00005>    SSSSS  W W W  M M M  HHHHH    Y     M M M  O   O  ##   9   9  9   9   Ver  4.05
00006>        S  W W W  M    M  H    H  Y     M    M  O   O       9999   9999   Sept 2011
00007>    SSSSS   W W   M    M  H    H  Y     M    M   OOO            9      9   =========
00008>                                                             9   9  9   9  # 3737016
00009>          StormWater Management HYdrologic Model              999    999    *********
00010>
00011> ********************************************************************************
00012> ****************************** SWMHYMO Ver/4.05  ******************************
00013> *********  A single event and continuous hydrologic simulation model  *********
00014> *********     based on the principles of HYMO and its successors      *********
00015> *********                 OTTHYMO-83 and OTTHYMO-89                   *********
00016> ********************************************************************************
00017> *********  Distributed by:  J.F. Sabourin and Associates Inc.          *********
00018> *********                   Ottawa,  Ontario: (613) 836-3884           *********
00019> *********                   Gatineau, Quebec: (819) 243-6858           *********
00020> *********                   E-Mail: swmhymo@jfsa.com                   *********
00021> ********************************************************************************
00022>
00023> ********************************************************************************
00024> *********  Licensed user: C.F. Crozier & Associates Inc.               *********
00025> *********                 Collingwood          SERIAL#:3737016        *********
00026> ********************************************************************************
00027>
00028> ********************************************************************************
00029> *********          ++++++ PROGRAM ARRAY DIMENSIONS ++++++              *********
00030> *********          Maximum value for ID numbers  :     10             *********
00031> *********          Max. number of rainfall points: 105408             *********
00032> *********          Max. number of flow points    : 105408             *********
00033> ********************************************************************************
00034>
00035> ***** DESCRIPTION SUMMARY TABLE HEADERS (units depend on METOUT in START) *****
00036> *****-------------------------------------------------------------------*****
00037> *****     ID:  Hydrograph IDentification numbers, (1-10).               *****
00038> *****  NHYD:  Hydrograph reference numbers, (6 digits or characters).   *****
00039> *****  AREA:  Drainage area associated with hydrograph, (ac.) or (ha.). *****
00040> ***** QPEAK:  Peak flow of simulated hydrograph, (ft^3/s) or (m^3/s).   *****
00041> ***** TpeakDate_hh:mm is the date and time of the peak flow.            *****
00042> *****  R.V.:  Runoff Volume of simulated hydrograph, (in) or (mm).     *****
00043> *****  R.C.:  Runoff Coefficient of simulated hydrograph, (ratio).     *****
00044> *****     *:  see WARNING or NOTE message printed at end of run.       *****
00045> *****    **:  see  ERROR  message printed at end of run.               *****
00046> *****-------------------------------------------------------------------*****
00047> ********************************************************************************
00048>
00049> !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
00050>
00051> ********************************************************************************
00052>
00053> ***********************   S U M M A R Y   O U T P U T   ************************
00054> ********************************************************************************
00055> *          DATE: 2018-09-20      TIME: 11:25:43      RUN COUNTER: 000343       *
00056> ********************************************************************************
00057> * Input   filename: C:\BLOCK3-1\SWMHYM-1\POST-D~1\Post.dat                      *
00058> * Output  filename: C:\BLOCK3-1\SWMHYM-1\POST-D~1\Post.out                     *
00059> * Summary filename: C:\BLOCK3-1\SWMHYM-1\POST-D~1\Post.sum                     *
00060> * User comments:                                                              *
00061> * 1:                                                                          *
00062> * 2:                                                                          *
00063> * 3:                                                                          *
00064> ********************************************************************************
00065>
00066>
00067> #*******************************************************************************
00068> #  Project Name: [Post Development Block 38 West Tributary Assessment]
00069> #  Project Number:[685-3867]
00070> #  Date        : September 20, 2018
00071> #  Modeller    : [A. Spencer]
00072> #  Company     : C.F. Crozier & Associates Inc.
00073> #  License #   :  3737016
00074> #*******************************************************************************
00075> #  Filename    :  Continuous Model
00076> #  Continuous Model
00077> #*******************************************************************************
00078> #*******************************************************************************
00079> #*******************************************************************************
00080>  RUN:COMMAND#
00081>  001:0001--------------------------------------------------------------------
00082>       START
00083>        [TZERO =    .00 hrs on        0]
00084>        [METOUT=    2    (1=imperial, 2=metric output)]
00085>        [NSTORM=    0 ]
00086>        [NRUN  =    1 ]
00087> #*******************************************************************************
00088> #*********************25 year Chicago 6Hr Keifer Chu Storm**********************
00089> #*******************************************************************************
00090>  001:0002--------------------------------------------------------------------
00091>       READ STORM
00092>        Filename = 25yr.stm
00093>        Comment  =
00094>        [SDT=60.00:SDUR=   6.00:PTOT=  77.90]
00095>  001:0003---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00096>       CALIB NASHYD        01:X32W+202       26.10     2.420 No_date     3:05    44.22
00097>        [CN= 85.9: N= 3.00]
00098>        [Tp=  .31:DT= 1.00]
00099>  001:0004---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00100>       CALIB STANDHYD      02:B37+W           5.62      .648 No_date     3:00    58.60
00101>        [XIMP=.35:TIMP=.50]
00102>        [LOSS= 2 :CN= 84.0]
00103>        [Pervious     area: IAper= 5.00:SLPP=2.00:LGP=  40.:MNP=.300:SCP=    .0]
00104>        [Impervious   area: IAimp= 2.00:SLPI=1.00:LGI= 194.:MNI=.013:SCI=    .0]
00105>  001:0005---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00106>       ADD HYD             01:X32w+202       26.10     2.420 No_date     3:05    44.22
00107>                         + 02:B37+W           5.62      .648 No_date     3:00    58.60
00108>        [DT= 1.00]  SUM=   03:Out32          31.72     3.020 No_date     3:02    46.76
00109> #*******************************************************************************
00110> #*******************100 year Chicago 6Hr Keifer Chu Storm***********************
00111> #*******************************************************************************
00112>  001:0006--------------------------------------------------------------------
00113>       READ STORM
00114>        Filename = 100yr.stm
00115>        Comment  =
00116>        [SDT=60.00:SDUR=   6.00:PTOT=  96.00]
00117>  001:0007---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00118>       CALIB NASHYD        01:X32w+202       26.10     3.222 No_date     3:05    60.16
00119>        [CN= 85.9: N= 3.00]
00120>        [Tp=  .31:DT= 1.00]
00121>  001:0008---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00122>       CALIB STANDHYD      02:B37+W           5.62      .831 No_date     3:00    75.57
00123>        [XIMP=.35:TIMP=.50]
00124>        [LOSS= 2 :CN= 84.0]
00125>        [Pervious     area: IAper= 5.00:SLPP=2.00:LGP=  40.:MNP=.300:SCP=    .0]
00126>        [Impervious   area: IAimp= 2.00:SLPI=1.00:LGI= 194.:MNI=.013:SCI=    .0]
00127>  001:0009---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00128>       ADD HYD             01:X32w+202       26.10     3.222 No_date     3:05    60.16
00129>                         + 02:B37+W           5.62      .831 No_date     3:00    75.57
00130>        [DT= 1.00]  SUM=   03:Out32          31.72     4.004 No_date     3:02    62.89
00131> #*******************************************************************************
00132> #*********************25 year SCS 24HR HII Storm********************************
00133> #*******************************************************************************
00134>  001:0010--------------------------------------------------------------------
00135>       MASS STORM
00136>        Filename = C:\BLOCK3-1\SWMHYM-1\POST-D-1\scs24HII.mst
00137>        Comment  = 24 hour SCS II storm mass curve
00138>        [SDT= 1.00:SDUR=  24.00:PTOT=  86.40]
00139>  001:0011---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00140>       CALIB NASHYD        01:X32w+202       26.10     2.603 No_date    12:24    51.62
00141>        [CN= 85.9: N= 3.00]
00142>        [Tp=  .31:DT= 1.00]
00143>  001:0012---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00144>       CALIB STANDHYD      02:B37+W           5.62      .958 No_date    12:13    66.53
00145>        [XIMP=.35:TIMP=.50]
00146>        [LOSS= 2 :CN= 84.0]
00147>        [Pervious     area: IAper= 5.00:SLPP=2.00:LGP=  40.:MNP=.300:SCP=    .0]
00148>        [Impervious   area: IAimp= 2.00:SLPI=1.00:LGI= 194.:MNI=.013:SCI=    .0]
00149>  001:0013---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00150>       ADD HYD             01:X32w+202       26.10     2.603 No_date    12:24    51.62
00151>                         + 02:B37+W           5.62      .958 No_date    12:13    66.53
00152>        [DT= 1.00]  SUM=   03:Out32          31.72     3.198 No_date    12:21    54.26
00153> #*******************************************************************************
00154> #*********************100 year SCS 24HR HII Storm*******************************
00155> #*******************************************************************************
00156>  001:0014--------------------------------------------------------------------
00157>       MASS STORM
00158>        Filename = C:\BLOCK3-1\SWMHYM-1\POST-D-1\scs24HII.mst
00159>        Comment  = 24 hour SCS II storm mass curve
00160>        [SDT= 1.00:SDUR=  24.00:PTOT= 108.00]
00161>  001:0015---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00162>       CALIB NASHYD        01:X32w+202       26.10     3.574 No_date    12:24    71.03
00163>        [CN= 85.9: N= 3.00]
00164>        [Tp=  .31:DT= 1.00]
00165>  001:0016---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00166>       CALIB STANDHYD      02:B37+W           5.62     1.297 No_date    12:13    86.98
00167>        [XIMP=.35:TIMP=.50]
00168>        [LOSS= 2 :CN= 84.0]
00169>        [Pervious     area: IAper= 5.00:SLPP=2.00:LGP=  40.:MNP=.300:SCP=    .0]
00170>        [Impervious   area: IAimp= 2.00:SLPI=1.00:LGI= 194.:MNI=.013:SCI=    .0]
00171>  001:0017---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00172>       ADD HYD             01:X32w+202       26.10     3.574 No_date    12:24    71.03
00173>                         + 02:B37+W           5.62     1.297 No_date    12:13    86.98
00174>        [DT= 1.00]  SUM=   03:Out32          31.72     4.356 No_date    12:21    73.86
00175> #*******************************************************************************
00176> #*********************Regional Storm********************************************
00177> #*******************************************************************************
00178>  001:0018--------------------------------------------------------------------
00179>       READ STORM
00180>        Filename = tim.stm
00181>        Comment  =
00182>        [SDT=60.00:SDUR=  12.00:PTOT= 193.00]
00183>  001:0019---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00184>       CALIB NASHYD        01:X32w+202       26.10     2.748 No_date     7:03   151.46
00185>        [CN= 85.9: N= 3.00]
00186>        [Tp=  .31:DT= 1.00]
00187>  001:0020---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00188>       CALIB STANDHYD      02:B37+W           5.62      .628 No_date     7:00   169.59
00189>        [XIMP=.35:TIMP=.50]
00190>        [LOSS= 2 :CN= 84.0]
00191>        [Pervious     area: IAper= 5.00:SLPP=2.00:LGP=  40.:MNP=.300:SCP=    .0]
00192>        [Impervious   area: IAimp= 2.00:SLPI=1.00:LGI= 194.:MNI=.013:SCI=    .0]
00193>  001:0021---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-
00194>       ADD HYD             01:X32w+202       26.10     2.748 No_date     7:03   151.46
00195>                         + 02:B37+W           5.62      .628 No_date     7:00   169.59
00196>        [DT= 1.00]  SUM=   03:Out32          31.72     3.367 No_date     7:01   154.67
00197>  001:0022--------------------------------------------------------------------
00198>       FINISH
00199> --------------------------------------------------------------------------------
00200> ********************************************************************************
00201>       WARNINGS / ERRORS / NOTES
00202>       -------------------------
00203>    Simulation ended on 2018-09-20     at 11:25:43
00204> ================================================================================
00205>
00206>
```

Worksheet for 100 Yr SCS Section A-A

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.05400	m/m
Discharge	4.42	m³/s

Section Definitions

Station (m)	Elevation (m)
0+00	237.90
0+00	237.75
0+12	237.60
0+14	237.55
0+16	237.60
0+30	237.80

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 237.90)	(0+30, 237.80)	0.045

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.24	m
Elevation Range	237.55 to 237.90 m	
Flow Area	3.51	m²
Wetted Perimeter	29.12	m
Hydraulic Radius	0.12	m
Top Width	29.07	m
Normal Depth	0.24	m

Worksheet for 100 Yr SCS Section A-A

Results

Critical Depth		0.26	m
Critical Slope		0.03914	m/m
Velocity		1.26	m/s
Velocity Head		0.08	m
Specific Energy		0.32	m
Froude Number		1.16	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	m
Length	0.00	m
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	m
Profile Description		
Profile Headloss	0.00	m
Downstream Velocity	Infinity	m/s
Upstream Velocity	Infinity	m/s
Normal Depth	0.24	m
Critical Depth	0.26	m
Channel Slope	0.05400	m/m
Critical Slope	0.03914	m/m

Cross Section for 100 Yr SCS Section A-A

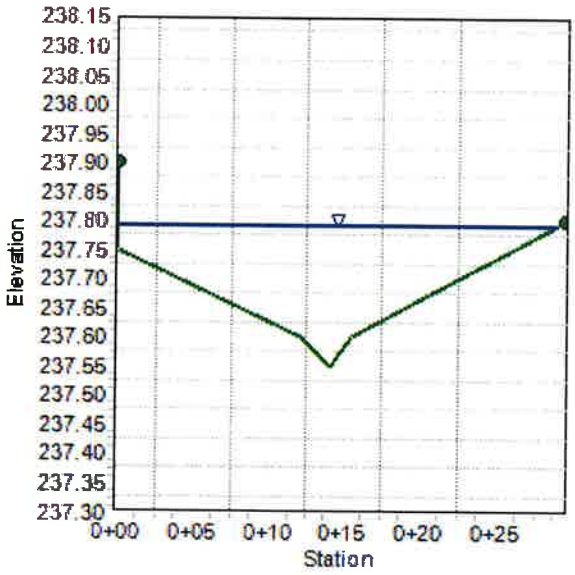
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.05400	m/m
Normal Depth	0.24	m
Discharge	4.42	m³/s

Cross Section Image



Worksheet for 100 Yr SCS Section B-B

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.04500	m/m
Discharge	4.42	m³/s

Section Definitions

Station (m)	Elevation (m)
0+00	232.70
0+00	232.50
0+12	232.50
0+14	232.00
0+16	232.50
0+29	232.75

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 232.70)	(0+29, 232.75)	0.045

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.63	m
Elevation Range	232.00 to 232.75 m	
Flow Area	3.36	m²
Wetted Perimeter	22.84	m
Hydraulic Radius	0.15	m
Top Width	22.56	m
Normal Depth	0.63	m

Worksheet for 100 Yr SCS Section B-B

Results

Critical Depth		0.64	m
Critical Slope		0.03756	m/m
Velocity		1.31	m/s
Velocity Head		0.09	m
Specific Energy		0.72	m
Froude Number		1.09	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	m
Length	0.00	m
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	m
Profile Description		
Profile Headloss	0.00	m
Downstream Velocity	Infinity	m/s
Upstream Velocity	Infinity	m/s
Normal Depth	0.63	m
Critical Depth	0.64	m
Channel Slope	0.04500	m/m
Critical Slope	0.03756	m/m

Cross Section for 100 Yr SCS Section B-B

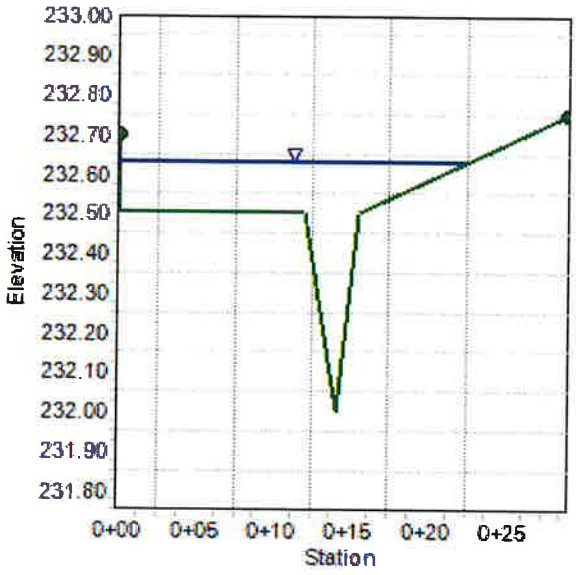
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.04500	m/m
Normal Depth	0.63	m
Discharge	4.42	m³/s

Cross Section Image



Worksheet for 100 Yr SCS Section C-C

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.05600	m/m
Discharge	4.42	m³/s

Section Definitions

Station (m)	Elevation (m)
0+00	228.50
0+12	228.25
0+14	228.14
0+16	228.25
0+31	228.65

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 228.50)	(0+31, 228.65)	0.045

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.33	m
Elevation Range	228.14 to 228.65 m	
Flow Area	3.13	m²
Wetted Perimeter	22.51	m
Hydraulic Radius	0.14	m
Top Width	22.50	m
Normal Depth	0.33	m
Critical Depth	0.35	m

Worksheet for 100 Yr SCS Section C-C

Results

Critical Slope		0.03742	m/m
Velocity		1.41	m/s
Velocity Head		0.10	m
Specific Energy		0.43	m
Froude Number		1.21	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	m
Length	0.00	m
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	m
Profile Description		
Profile Headloss	0.00	m
Downstream Velocity	Infinity	m/s
Upstream Velocity	Infinity	m/s
Normal Depth	0.33	m
Critical Depth	0.35	m
Channel Slope	0.05600	m/m
Critical Slope	0.03742	m/m

Cross Section for 100 Yr SCS Section C-C

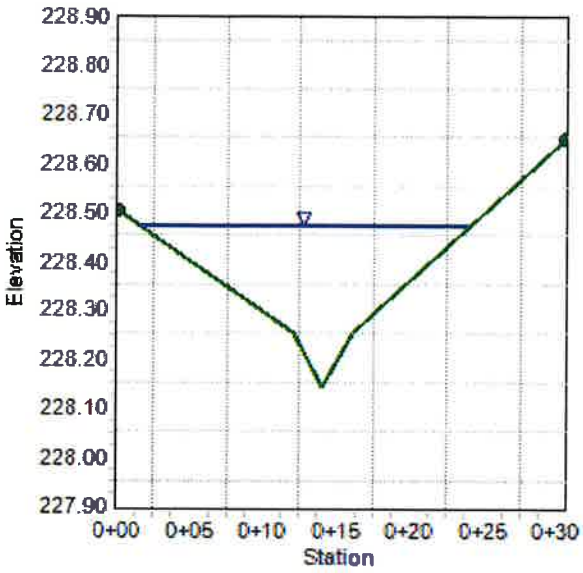
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.05600	m/m
Normal Depth	0.33	m
Discharge	4.42	m³/s

Cross Section Image



Worksheet for 100 Yr SCS Section D-D

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.04200	m/m
Discharge	4.42	m³/s

Section Definitions

Station (m)	Elevation (m)
0+00	227.90
0+13	227.60
0+14	227.50
0+15	227.60
0+21	228.00
0+30	228.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 227.90)	(0+30, 228.20)	0.045

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.40	m
Elevation Range	227.50 to 228.20 m	
Flow Area	3.18	m²
Wetted Perimeter	18.89	m
Hydraulic Radius	0.17	m
Top Width	18.86	m
Normal Depth	0.40	m

Worksheet for 100 Yr SCS Section D-D

Results

Critical Depth		0.41	m
Critical Slope		0.03554	m/m
Velocity		1.39	m/s
Velocity Head		0.10	m
Specific Energy		0.49	m
Froude Number		1.08	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	m
Length	0.00	m
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	m
Profile Description		
Profile Headloss	0.00	m
Downstream Velocity	Infinity	m/s
Upstream Velocity	Infinity	m/s
Normal Depth	0.40	m
Critical Depth	0.41	m
Channel Slope	0.04200	m/m
Critical Slope	0.03554	m/m

Cross Section for 100 Yr SCS Section D-D

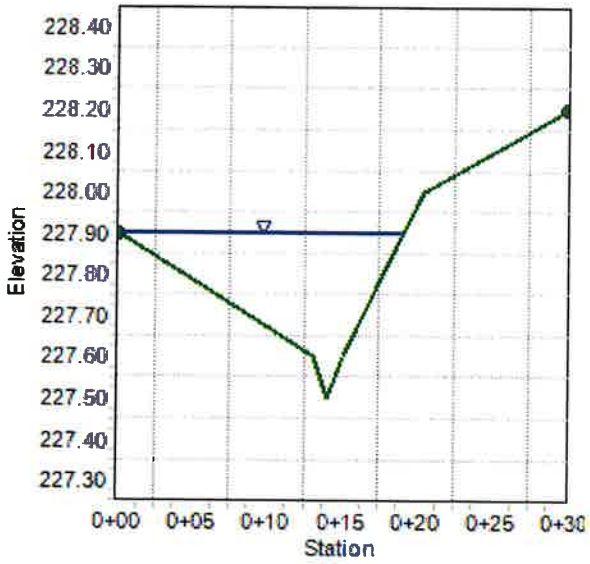
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.04200	m/m
Normal Depth	0.40	m
Discharge	4.42	m^3/s

Cross Section Image



Worksheet for 25 Yr SCS Section D-D

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.04200	m/m
Discharge	3.22	m³/s

Section Definitions

Station (m)	Elevation (m)
0+00	227.90
0+13	227.60
0+14	227.50
0+15	227.60
0+21	228.00
0+30	228.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 227.90)	(0+30, 228.20)	0.045

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.36	m
Elevation Range	227.50 to 228.20 m	
Flow Area	2.51	m²
Wetted Perimeter	16.72	m
Hydraulic Radius	0.15	m
Top Width	16.69	m
Normal Depth	0.36	m

Worksheet for 25 Yr SCS Section D-D

Results

Critical Depth		0.36	m
Critical Slope		0.03715	m/m
Velocity		1.29	m/s
Velocity Head		0.08	m
Specific Energy		0.44	m
Froude Number		1.06	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	m
Length	0.00	m
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	m
Profile Description		
Profile Headloss	0.00	m
Downstream Velocity	Infinity	m/s
Upstream Velocity	Infinity	m/s
Normal Depth	0.36	m
Critical Depth	0.36	m
Channel Slope	0.04200	m/m
Critical Slope	0.03715	m/m

Culvert Calculator Report
Existing George McCrae Road Culvert Crossing

Solve For: Discharge

Culvert Summary			
Allowable HW Elevation	228.50 m	Headwater Depth/Height	0.79
Computed Headwater Elev	228.50 m	Discharge	0.0911 m³/s
Inlet Control HW Elev.	228.44 m	Tailwater Elevation	227.86 m
Outlet Control HW Elev.	228.50 m	Control Type	Entrance Control

Grades			
Upstream Invert	228.14 m	Downstream Invert	227.50 m
Length	12.00 m	Constructed Slope	0.053333 m/m

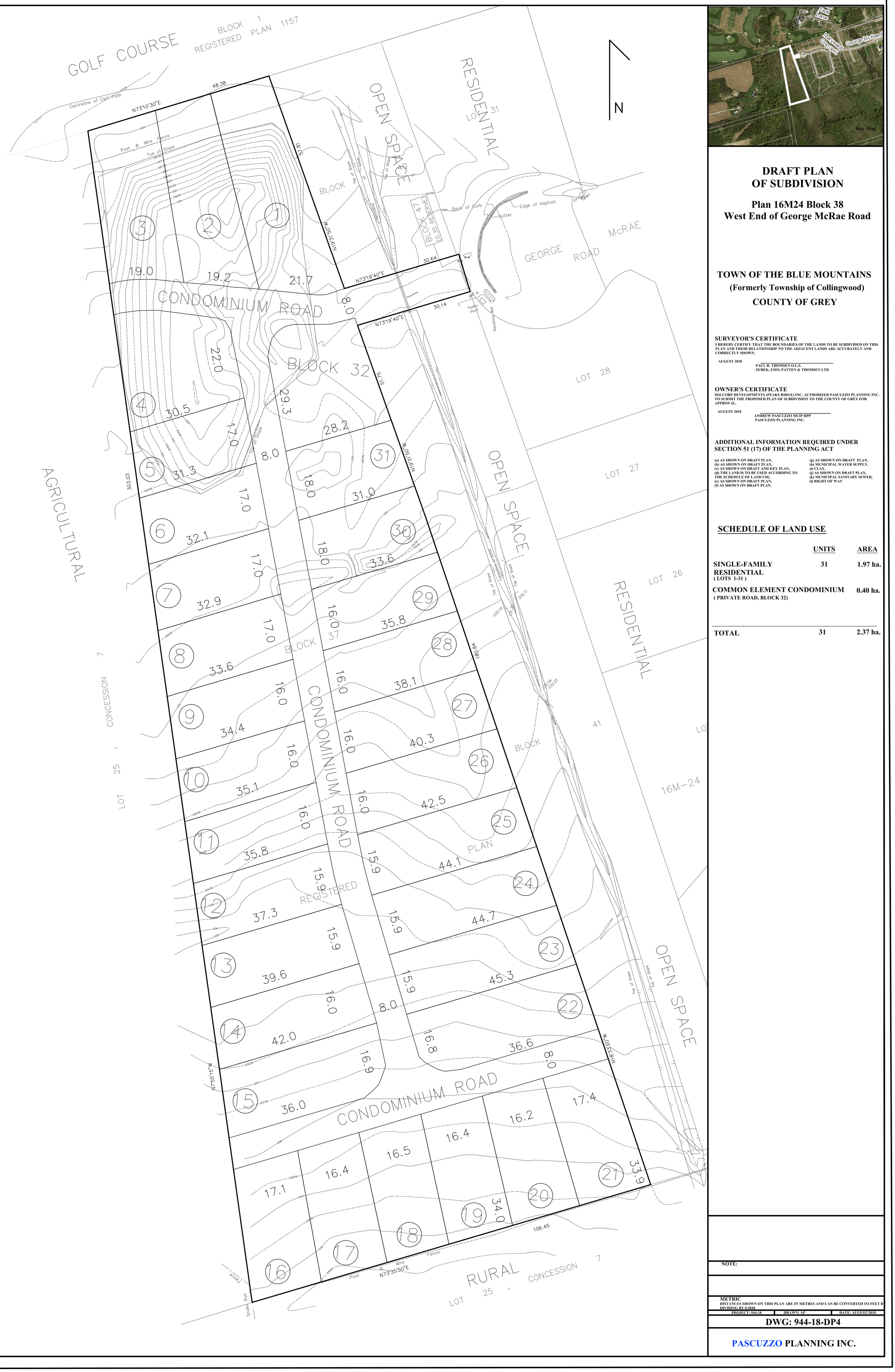
Hydraulic Profile			
Profile	CompositeS1S2	Depth, Downstream	0.36 m
Slope Type	Steep	Normal Depth	0.15 m
Flow Regime	N/A	Critical Depth	0.21 m
Velocity Downstream	0.66 m/s	Critical Slope	0.017663 m/m

Section			
Section Shape	Circular	Mannings Coefficient	0.024
Section Material	CMP	Span	0.46 m
Section Size	450 mm	Rise	0.46 m
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	228.50 m	Upstream Velocity Head	0.08 m
Ke	0.90	Entrance Loss	0.07 m

Inlet Control Properties			
Inlet Control HW Elev.	228.44 m	Flow Control	N/A
Inlet Type	Projecting	Area Full	0.2 m²
K	0.03400	HDS 5 Chart	2
M	1.50000	HDS 5 Scale	3
C	0.05530	Equation Form	1
Y	0.54000		

List of Figures



DRAFT PLAN OF SUBDIVISION

Plan 16M24 Block 38
West End of George McRae Road

TOWN OF THE BLUE MOUNTAINS
(Formerly Township of Collingwood)
COUNTY OF GREY

SURVEYOR'S CERTIFICATE

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

AUGUST 2018

PAUL R. THOMSEN O.L.S.
ZUBEK, EMO, PATTEN & THOMSEN LTD

OWNER'S CERTIFICATE

SOLCORP DEVELOPMENTS (PEAKS RIDGE) INC. AUTHORIZED PASCUZZO PLANNING INC. TO SUBMIT THE PROPOSED PLAN OF SUBDIVISION TO THE COUNTY OF GREY FOR APPROVAL..

AUGUST 2018

ANDREW PASCUZZO MCIP RPP
PASCUZZO PLANNING INC.

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51 (17) OF THE PLANNING ACT

(a) AS SHOWN ON DRAFT PLAN,
(b) AS SHOWN ON DRAFT PLAN,
(c) AS SHOWN ON DRAFT AND KEY PLAN,
(d) THE LAND IS TO BE USED ACCORDING TO THE SCHEDULE OF LAND USE,
(e) AS SHOWN ON DRAFT PLAN,
(f) AS SHOWN ON DRAFT PLAN,
(g) AS SHOWN ON DRAFT PLAN,
(h) MUNICIPAL WATER SUPPLY,
(i) CLAY,
(j) AS SHOWN ON DRAFT PLAN,
(k) MUNICIPAL SANITARY SEWER,
(l) RIGHT OF WAY

SCHEDULE OF LAND USE

	UNITS	AREA
SINGLE-FAMILY RESIDENTIAL (LOTS 1-31)	31	1.97 ha.
COMMON ELEMENT CONDOMINIUM (PRIVATE ROAD, BLOCK 32)		0.40 ha.
TOTAL	31	2.37 ha.

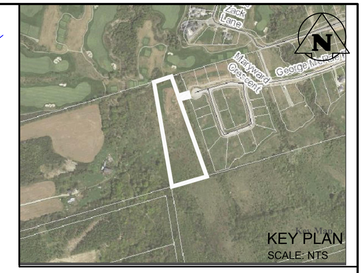
NOTE:

METRIC
DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

PROJECT: 944-18	DRAWN: AP	DATE: AUGUST/2018

DWG: 944-18-DP4

PASCUZZO PLANNING INC.



LEGEND

EX. ELEVATION\CONTOUR 237.75

PR. ELEVATION × 237.75

DRAINAGE DIRECTION 0.0%

WEST TRIBUTARY

OPEN SPACE

RESIDENTIAL

LIMITS OF ROADWAY

CONDOMINIUM ROAD

BLOCK 32

AGRICULTURAL

EX. POST & WIRE FANCE

GOLF COURSE

RURAL

SCALE: 1:500

1. THIS DRAWING IS THE EXCLUSIVE PROPERTY OF C.F. CROZIER & ASSOCIATES INC. AND THE REPRODUCTION OF ANY PART WITHOUT PRIOR WRITTEN CONSENT OF THIS OFFICE IS STRICTLY PROHIBITED.
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4. DO NOT SCALE THE DRAWINGS.
5. ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

TEMPORARY BENCHMARKS

TBM#1–
TBM#2–
TBM#3–

Town

No.	ISSUE	DATE: MM/DD/YYYY
0	ISSUED FOR DRAFT PLAN APPROVAL	09/21/2018

Engineer

FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

Engineer

PROFESSIONAL ENGINEER PROVINCE OF ONTARIO

Project

RIDGE ESTATES BLOCK 38
TOWN OF THE BLUE MOUNTAINS

Drawing

PRELIMINARY SITE GRADING PLAN

CROZIER CONSULTING ENGINEERS
THE HARBOUREDGE BUILDING,
40 HURON STREET, SUITE 301,
COLLINGWOOD, ON L9Y 4R3
705 446-3510 T
705 446-3520 F
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA

Drawn By	Design By	Project	Drawing
B.K.	A.J.S.	685–3867	FIG 1
Check By	Check By	Scale	
K.A.M.		1:500	

J:\600\685 - Glenn Solomon\3867 - Ridge Estates Due Diligence\CAD\CIVIL\15HEET\3867-700.dwg 9/21/2018 11:41:48 AM DWG To PDF.pc3

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TEMPORARY BENCHMARKS

TBM#1–
TBM#2–
TBM#3–

Town

No.	ISSUE	DATE: MM/DD/YYYY
0	ISSUED FOR DRAFT PLAN APPROVAL	09/21/2018

Engineer

FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

Engineer

PROFESSIONAL ENGINEER PROVINCE OF ONTARIO

Project

RIDGE ESTATES BLOCK 38
TOWN OF THE BLUE MOUNTAINS

Drawing

PRELIMINARY SITE SERVICING PLAN

CROZIER CONSULTING ENGINEERS
THE HARBOUREDGE BUILDING,
40 HURON STREET, SUITE 301,
COLLINGWOOD, ON L9Y 4R3
705 446-3510 T
705 446-3520 F
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA

Drawn By	Design By	Project	
B.K.	A.J.S.		685–3867
Check By	Check By	Scale	Drawing
K.A.M.		1:500	FIG 2

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TEMPORARY BENCHMARKS

TBM#1–
TBM#2–
TBM#3–

Town

No.	ISSUE	DATE: MM/DD/YYYY
0	ISSUED FOR DRAFT PLAN APPROVAL	09/21/2018

Engineer

FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

Project

RIDGE ESTATES BLOCK 38
TOWN OF THE BLUE MOUNTAINS

Drawing

WEST TRIBUTARY HIGH WATER LEVELS
(100 YEAR SCS)

CROZIER
CONSULTING ENGINEERS
THE HARBOUREDGE BUILDING, 40 HURON STREET, SUITE 301, COLLINGWOOD, ON L9Y 4R3
705 446-3510 T
705 446-3520 F
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA

Drawn By	B.K.	Design By	A.J.S.	Project	685–3867
Check By	K.A.M.	Check By		Scale 1:500	Drawing FIG 3