

STORMWATER MANAGEMENT PLAN
575 QUAKER ROAD & CLARE AVENUE
CITY OF WELLAND

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Revised April 2025

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- Appendix A Existing Conditions MIDUSS Output File
- Appendix B Stage 1 Stormwater Management Facility Calculations (P40)
Stage 2 Stormwater Management Facility Calculations (P40)
- Appendix C Stage 1 Conditions MIDUSS Output Files
- Appendix D Stage 2 Conditions MIDUSS Output File

REFERENCES

1. Stormwater Management Planning and Design Manual
Ontario Ministry of Environment (March 2003)
2. Soils of the Regional Municipality of Niagara Soil Survey Report No. 60 of the Ontario
Institute of Pedology. (1989)
3. Northwest Welland Stormwater Management Implementation Plan
Upper Canada Consultants (October 2022)

STORMWATER MANAGEMENT PLAN

575 Quaker Road & Clare Avenue

CITY OF WELLAND

1.0 INTRODUCTION

1.1 Study Area

Upper Canada Consultants (UCC) has been retained by landowners 575 Quaker Road and the property fronting on the east side of Clare Avenue between Harvest Oak Drive and Quaker Road to prepare a Stormwater Management Plan to address the stormwater management needs for the proposed subdivision developments located within the aforementioned properties.

The proposed subdivisions are located in the south-western portion of the Northwest Welland Secondary Plan (NWWSP) area in the City of Welland, situated south of Quaker Road, west of Rice Road, east of Clare Avenue, and north of Northwood Drive.

UCC has previously prepared a Stormwater Management Implementation Plan for the entirety of the NWWSP Area. This Plan identified the preferred locations of future stormwater management (SWM) Facilities within the developable areas in the Secondary Plan in support of the realignment of the Towpath Drain, which flows through the proposed subdivision lands, and identified the existing stormwater flows through each segment of the existing watercourse.

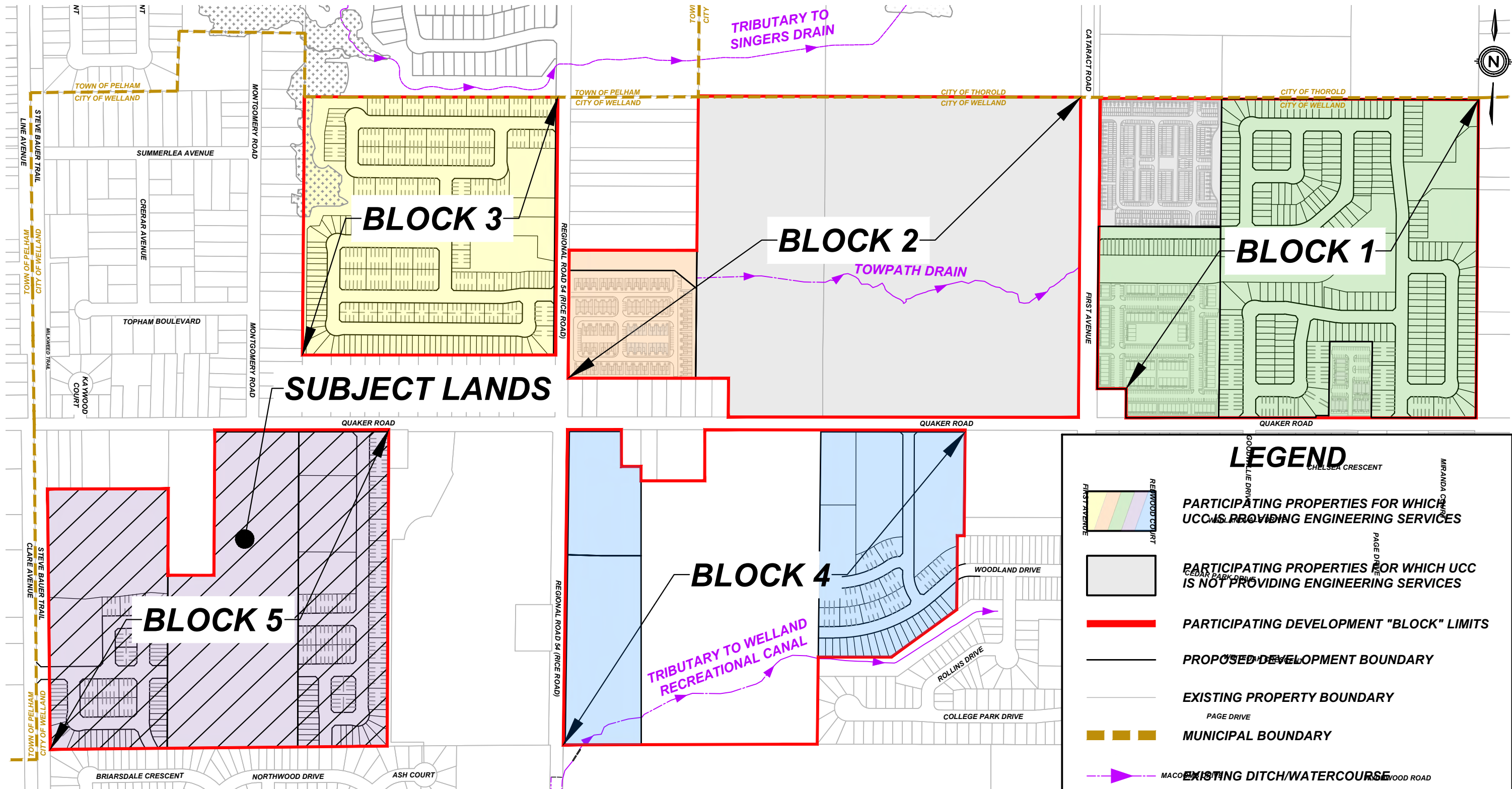
It was identified in the Implementation Plan that a single SWM Facility is to be constructed within the proposed subdivision lands and on the adjacent future development lands at 607 Quaker Road. This proposed facility will provide stormwater management quality and quantity controls for the entire 'Block' of development area, bound by Quaker Road on the north, Clare Avenue on the west, to the eastern limit of the Niagara Catholic District School Board property, and north Northwood Drive as shown in Figure 1 as Block 5. Therefore, this Block (Block 5) will hereafter be referred to as 'subject lands' in this report.

The subject lands are approximately 23.27 hectares and will consist of a mix of subdivision and condominium developments, comprising of an overall mix of residential single detached, street townhouse, stacked townhouse, and back-to-back townhouse dwellings. The subject lands will be developed to include associated asphalt roadways, concrete curb, catch basins, storm sewers, sanitary sewers, and watermain.

1.2 Objectives

The objectives of this study are as follows:

1. Establish specific criteria for the management of stormwater from this site.
2. Determine the impact of development on the stormwater peak flow & volume of stormwater from the drainage area.
3. Investigate alternatives for controlling the quality of stormwater discharging from the site.
4. Establish the property requirements to construct stormwater management facilities for the Draft Plan of Subdivision.



1.3 Existing & Proposed Conditions

a) Existing Conditions

The topography of the subject lands is relatively flat with a general easterly slope towards the existing roadside ditches along Quaker Road and Rice Road, which then outlet to the Towpath Drain. The Towpath Drain conveys stormwater flows through the City of Welland and the City of Thorold, prior to ultimately outletting into the Welland Canal, with multiple crossings at Municipal and Regional roads, and Highway 406.

Existing stormwater flows and the delineation of existing stormwater drainage areas for the Towpath Drain were assessed as part of the Implementation Plan to the culvert crossing at Regional Road 50 (Niagara Street) and will be the basis for future peak flow targets for all stormwater management facilities constructed within the Secondary Plan Area.

As part of the realignment of the Towpath Drain, twin 2.4 x 1.8m concrete box culverts will be constructed crossing Regional Road 50 (Niagara Street), a 1.8 x 1.2m concrete box culvert will be constructed crossing Regional Road 54 (Rice Road), and the existing 1800mm diameter culvert crossing First Avenue will remain, but is planned to be upgraded in the future. Upgrades to the First Avenue Culvert will be subject to a future NPCA Work Permit.

b) Proposed Conditions

The subject lands are approximately 23.27 hectares and will consist of a mix of subdivision and condominium developments, comprising of an overall mix of residential single detached, street townhouse, stacked townhouse, and back-to-back townhouse dwellings.

The subject lands will include associated asphalt roadways, concrete curb, catch basins, storm sewers, sanitary sewers, and watermain.

It is proposed to convey all future Stormwater flows from the subject lands to the Towpath Drain through proposed storm sewers constructed on Quaker Road and Rice Road, as identified in the Implementation Plan.

UCC has been retained as the engineering consultant for the majority of the developing landowners in the NWWSP, as shown in Figure 1. For the purpose of maintaining consistency between the various Draft Plan of Subdivision submissions within the Secondary Plan Area, the “Proposed Conditions” stormwater modelling will include the future SWM Facilities designed for each respective Block in the NWWSP.

For lands where Planning Act Applications are not expected to be submitted in the near future as of the writing of this Stormwater Management Plan, where UCC has not been retained as the engineering consultant, or a stormwater management alternative has not yet been selected, future stormwater flows have been allocated to the Towpath Drain at the existing levels identified in the Implementation Plan.

To accommodate varying development schedules within the subject lands, it is proposed to construct the proposed stormwater management facility in two stages.

Stage 1 will account for the proposed facility being constructed solely within the 575 Quaker Road property and will receive future stormwater flows from the 575 Quaker Road property and the property on the western limit of the subject lands, fronting on Clare Avenue, assuming fully developed conditions within each property (70% Impervious). The 607 Quaker Road property will be assumed at existing conditions for Stage 1 (0%). Through detailed engineering design, a servicing easement will be provided within 607 Quaker Road to permit the extension of new municipal watermains, sanitary sewers and storm sewers between the 575 Quaker Road and Clare Avenue properties.

Stage 2 will be the expansion of the Stage 1 facility westward onto the neighbouring 607 Quaker Road property and will include this property at fully developed conditions.

The existing conditions MIDUSS modelling output file provided in the Implementation Plan has been included in Appendix A for reference.

2.0 STORMWATER MANAGEMENT CRITERIA

New developments are required to provide stormwater management in accordance with provincial and municipal policies including:

- Stormwater Quality Guidelines for New Development (MECP/MNRF, May 1991)
- Stormwater Management Planning and Design Manual (MECP, March 2003)

Based on the comments and outstanding policies from the City of Welland, Regional Municipality of Niagara, Niagara Peninsula Conservation Authority (NPCA), and the Ministry of the Environment, Conservation and Parks (MECP), the following site-specific considerations were identified:

- Per City of Welland requirements, stormwater **quality** improvements must be provided to a minimum of Enhanced Protection (80% TSS Removal).
- Per the Northwest Welland Stormwater Management Implementation Plan prepared by Upper Canada Consultants, future stormwater management facilities within the Secondary Plan Area will be required to provide **quantity** controls up to and including the 100 year design storm event before outletting to the Towpath Drain.
- **Erosion control** to be provided in accordance with MECP guidelines. The guidelines require an extended detention volume to be detained for 24 hours.

Based on above policies and site specific considerations, the following stormwater management criteria have been established for this site:

- Stormwater **quality** controls are to be provided for the more frequent storm events to provide Enhanced Protection (80% TSS Removal), prior to discharging to the receiving watercourse (Towpath Drain).
- To maintain existing water surface elevations in the Towpath Drain, stormwater **quantity controls** will be provided up to and including the 100 year design storm event.
- **Erosion protection** will be provided in accordance with MECP guidelines. The guidelines require an extended detention volume to be detained for 24 hours.

3.0 STORMWATER ANALYSIS

Stormwater for the existing and proposed conditions was estimated using the MIDUSS computer modelling program. This program was selected because it is applicable to both urban and rural drainage areas like the study area. It is relatively easy to use and modify for the future drainage conditions and control facilities. It readily allows for design storm hyetographs for the various return periods being investigated.

3.1 Design Storms

Design storm hyetographs for the storm system design uses a Chicago distribution based on the City of Welland Intensity-Duration-Frequency (IDF) curves. Hyetographs for the 2, 5, 10, 25, and 100 year events were developed using the City of Welland IDF Curve parameters for a 4 hour Chicago distribution. The 25mm design storm event parameters were derived using a standard IDF curve and a 4-hour Chicago distribution. Table 1 summarizes the rainfall data applied in the stormwater modelling.

Table 1. Rainfall Data				
Design Storm (Return Period)	Chicago Distribution Parameters $i = \frac{a}{(t + b)^c}$			Duration (minutes)
	a	b	c	
25mm	512	6.0	0.800	240
2 Year	755	8.0	0.789	240
5 Year	830	7.3	0.777	240
10 Year	860	6.5	0.763	240
25 Year	900	5.2	0.745	240
100 Year	1020	4.7	0.731	240

3.2 Existing Conditions

Existing conditions within the Towpath Drain were assessed as part of the Implementation Plan to determine the existing the peak flows within the watercourse at existing and future roadway crossings. The existing catchment areas as provided in Figure 2 of the Implementation Plan have been included as Figure 2 in this Stormwater Management Plan for reference.

For consistency between the Stormwater Management Plans submitted by UCC in the NWWSP, Outlets A through D have been identified at specific locations along the Towpath Drain to demonstrate that the existing flows identified in the Implementation Plan are maintained at all locations within the watercourse under future conditions. The locations of Outlets A through D can be found on Figure 3 and the summary of the existing flows at each Outlet have been summarized in Table 2 below.

Table 2. Existing Peak Stormwater Flows – Towpath Drain					
Location	Peak Flow (m³/s)				
	2 Year	5 Year	10 Year	25 Year	100 Year
Outlet A1	1.317	1.589	1.800	2.099	2.558
Outlet A2	3.301	4.194	4.777	5.619	6.987
Outlet B (*)	3.425	4.367	4.977	5.863	7.305
Outlet C	4.035	5.176	5.914	7.005	8.781
Outlet D	4.509	5.835	6.678	7.938	9.995
Note (*) : Outlet B was not specified as a location where peak flows were evaluated within the Implementation Plan. Therefore, the change in existing peak flow across the 803m width of Drainage Area A6 (between Rice Road and First Avenue) was prorated to the location of Outlet B (at 205m east of Rice Road) for the peak flow at Outlet B for each design storm event.					

3.3 Proposed (Stage 1) Conditions

It is proposed to construct a single stormwater management wet pond facility to provide stormwater quality and quantity controls for Block 5, as identified in the Implementation Plan.

The proposed Block 5 wet pond facility will be constructed in two phases; Stage 1 being constructed solely within the 575 Quaker Road property, and Stage 2 being an expansion westward onto the neighbouring 607 Quaker Road property.

For the purpose of maintaining consistency between the various Draft Plan of Subdivision submissions within the NWWSP Area, the Stage 1 and Stage 2 conditions stormwater modelling will include the future SWM Facilities designed for each other respective Block in the NWWSP.

For lands where Planning Act Applications are not expected to be submitted in the near future, as of the writing of this Stormwater Management Plan, or where UCC has not been retained as the engineering consultant, future stormwater flows have been allocated to the Towpath Drain at existing levels.

The Stage 1 stormwater drainage areas for the NWWSP Area are shown in Figure 3, and a schematic of the Stage 1 hydrologic modelling is provided as Figure 4.

As shown in Figure 3, the Stage 1 wet pond will receive future stormwater flows from the proposed development areas (Drainage Areas A43 and A45) and existing stormwater flows from the remaining Block 5 areas.

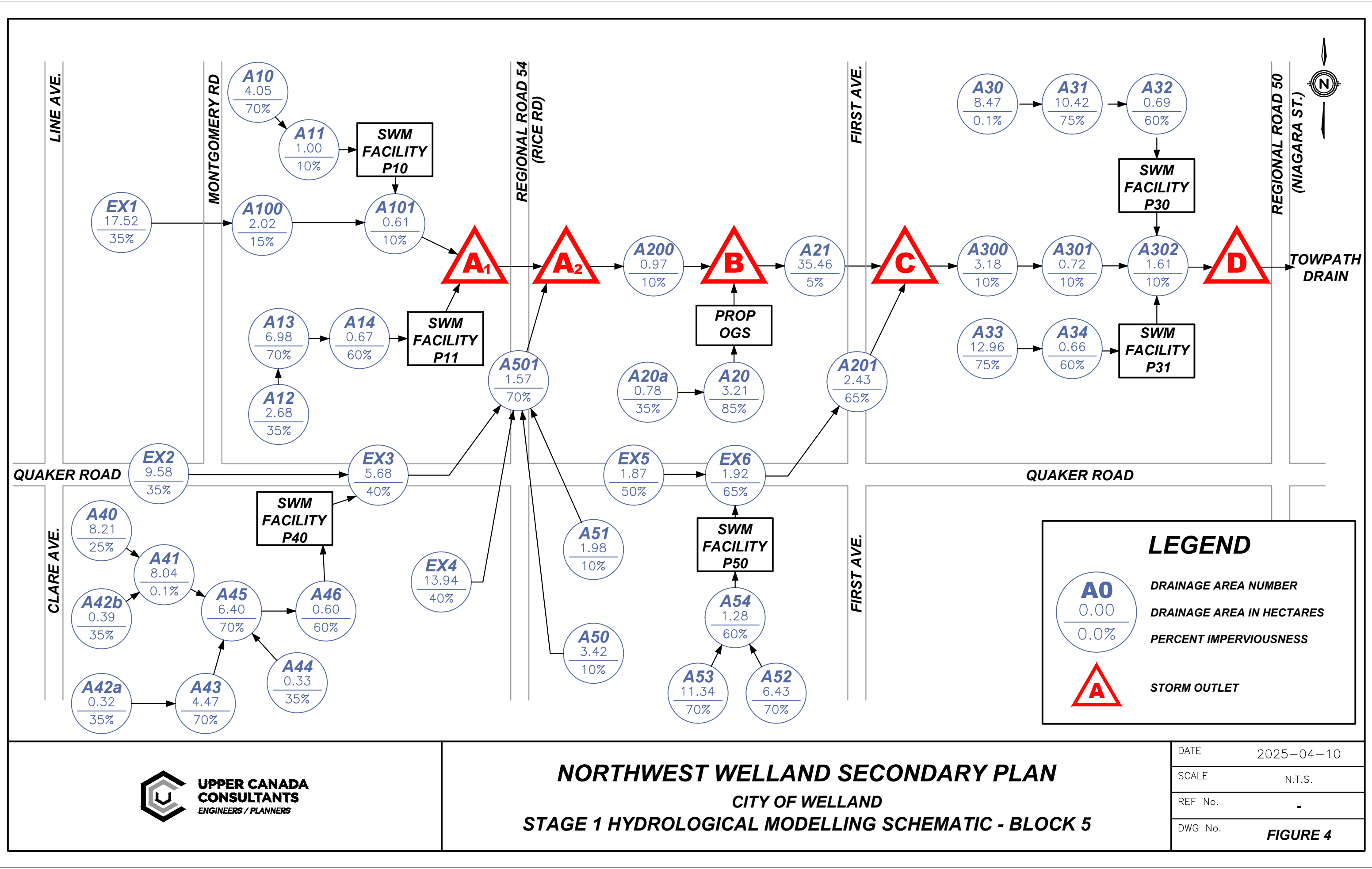
Table 3 below provides a summary of the Stage 1 catchment areas shown in Figure 3 and associated hydrological parameters used for the Stage 1 conditions MIDUSS software model.

The Stage 1 conditions MIDUSS modelling output file has been enclosed in Appendix C for reference.

Table 3. Hydrologic Parameters for Block 5 Stage 1 Conditions								
Area No.	Area (ha)	Length (m)	Slope (%)	Manning – “n”		Soil Type	SCS CN	Percent Impervious
				Perv.	Imperv.			
EX1	17.52	343	1.0	0.25	0.015	CD	74	35%
A100	2.02	116	0.4	0.25	0.015	CD	74	15%
A10	4.05	164	1.0	0.25	0.015	CD	74	70%
A11	1.00	82	1.0	0.25	0.015	CD	74	10%
A101	0.61	64	1.0	0.25	0.015	CD	74	10%
A12	2.68	134	1.0	0.25	0.015	CD	74	35%
A13	6.98	216	1.0	0.25	0.015	CD	74	70%
A14	0.67	67	1.0	0.25	0.015	CD	74	60%
A40	8.21	234	1.0	0.25	0.015	CD	74	25%
A41	8.04	226	1.0	0.25	0.015	CD	74	0.1%
A42a	0.32	46	1.0	0.25	0.015	CD	74	35%
A42b	0.39	51	1.0	0.25	0.015	CD	74	35%
A43	4.47	173	1.0	0.25	0.015	CD	74	70%
A44	0.33	47	1.0	0.25	0.015	CD	74	35%
A45	6.40	207	1.0	0.25	0.015	CD	74	70%
A46	0.60	63	1.0	0.25	0.015	CD	74	60%
EX2	9.58	245	1.0	0.25	0.015	CD	74	35%
EX3	5.68	195	1.0	0.25	0.015	CD	74	40%
EX4	13.94	305	1.0	0.25	0.015	CD	74	40%
A50	3.42	151	1.0	0.25	0.015	CD	74	10%
A51	1.98	115	1.0	0.25	0.015	CD	74	10%
A501	1.57	102	1.0	0.25	0.015	CD	74	70%
A20a	0.78	72	1.0	0.25	0.015	CD	74	35%
A20	3.21	146	1.0	0.25	0.015	CD	74	85%

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A200	0.97	80	1.0	0.25	0.015	CD	74	10%
A21	35.46	487	0.2	0.25	0.015	CD	74	5%
A52	6.43	207	1.0	0.25	0.015	CD	74	70%
A53	11.34	275	1.0	0.25	0.015	CD	74	70%
A54	1.28	92	1.0	0.25	0.015	CD	74	60%
EX5	1.87	112	1.0	0.25	0.015	CD	74	50%
EX6	1.92	113	0.2	0.25	0.015	CD	74	65%
A201	2.43	127	1.0	0.25	0.015	CD	74	65%
A300	3.18	146	0.2	0.25	0.015	CD	74	15%
A301	0.72	69	0.2	0.25	0.015	CD	74	10%
A30	8.47	238	0.2	0.25	0.015	CD	74	0.1%
A31	10.42	264	1.0	0.25	0.015	CD	74	75%
A32	0.69	68	1.0	0.25	0.015	CD	74	60%
A33	12.96	294	1.0	0.25	0.015	CD	74	75%
A34	0.66	66	1.0	0.25	0.015	CD	74	60%
A302	1.61	104	0.2	0.25	0.015	CD	74	10%
204.86		Total Area (ha)						



3.4 Ultimate (Stage 2) Conditions

The Stage 2 stormwater drainage areas for the NWWSP Area are shown in Figure 5, and a schematic of the Stage 2 hydrologic modelling is provided as Figure 6.

As shown in Figure 5, the Stage 2 “ultimate” wet pond will account for the fully developed conditions within Block 5. Drainage Areas A40, A42, and A44 will remain at existing conditions.

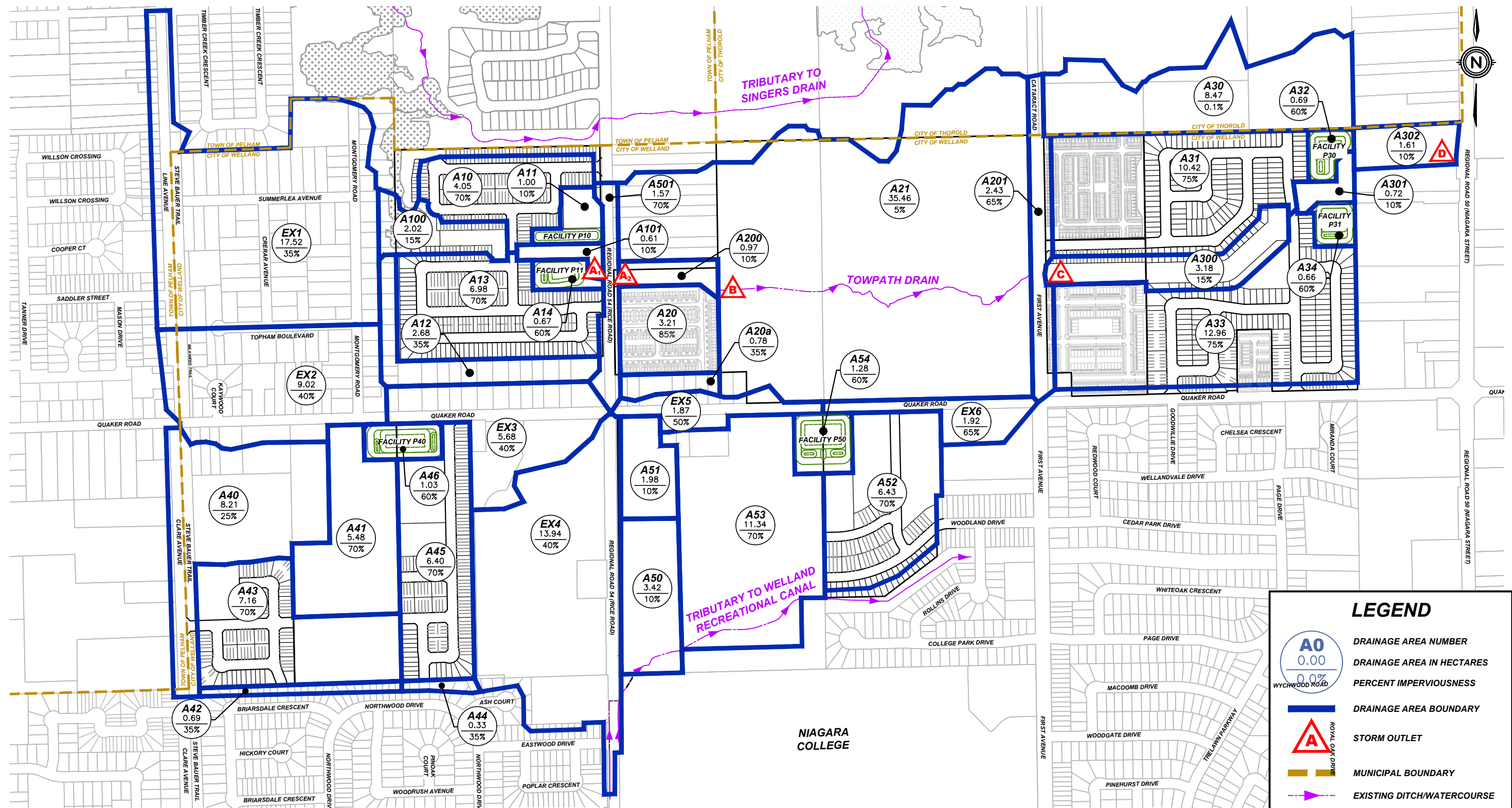
Table 4 below provides a summary of the Stage 2 catchment areas shown in Figure 5 and associated hydrological parameters used for the Stage 2 conditions MIDUSS software model.

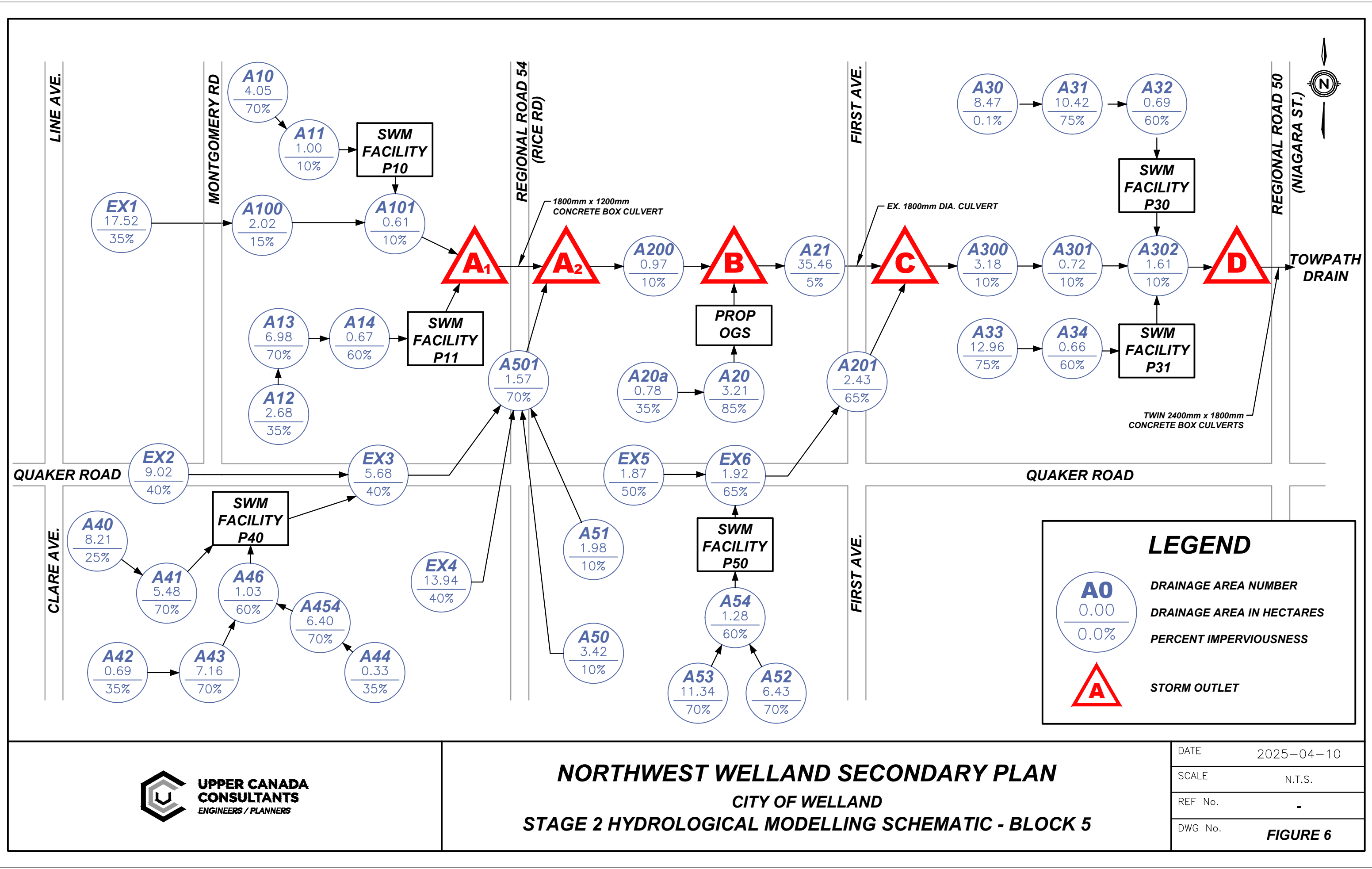
The Stage 2 conditions MIDUSS modelling output file has been enclosed in Appendix D for reference.

Table 4. Hydrologic Parameters for Block 5 Stage 2 Conditions								
Area No.	Area (ha)	Length (m)	Slope (%)	Manning – “n”		Soil Type	SCS CN	Percent Impervious
				Perv.	Imperv.			
EX1	17.52	343	1.0	0.25	0.015	CD	74	35%
A100	2.02	116	0.4	0.25	0.015	CD	74	15%
A10	4.05	164	1.0	0.25	0.015	CD	74	70%
A11	1.00	82	1.0	0.25	0.015	CD	74	10%
A101	0.61	64	1.0	0.25	0.015	CD	74	10%
A12	2.68	134	1.0	0.25	0.015	CD	74	35%
A13	6.98	216	1.0	0.25	0.015	CD	74	70%
A14	0.67	67	1.0	0.25	0.015	CD	74	60%
A40	8.21	234	1.0	0.25	0.015	CD	74	25%
A41	5.48	191	1.0	0.25	0.015	CD	74	70%
A42	0.69	68	1.0	0.25	0.015	CD	74	35%
A43	7.16	218	1.0	0.25	0.015	CD	74	70%
A44	0.33	47	1.0	0.25	0.015	CD	74	35%
A45	6.40	207	1.0	0.25	0.015	CD	74	70%
A46	1.03	83	1.0	0.25	0.015	CD	74	60%
EX2	9.02	245	1.0	0.25	0.015	CD	74	40%
EX3	5.68	195	1.0	0.25	0.015	CD	74	40%
EX4	13.94	305	1.0	0.25	0.015	CD	74	40%

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A50	3.42	151	1.0	0.25	0.015	CD	74	10%
A51	1.98	115	1.0	0.25	0.015	CD	74	10%
A501	1.57	102	1.0	0.25	0.015	CD	74	70%
A20a	0.78	72	1.0	0.25	0.015	CD	74	35%
A20	3.21	146	1.0	0.25	0.015	CD	74	85%
A200	0.97	80	1.0	0.25	0.015	CD	74	10%
A21	35.46	487	0.2	0.25	0.015	CD	74	5%
A52	6.43	207	1.0	0.25	0.015	CD	74	70%
A53	11.34	275	1.0	0.25	0.015	CD	74	70%
A54	1.28	92	1.0	0.25	0.015	CD	74	60%
EX5	1.87	112	1.0	0.25	0.015	CD	74	50%
EX6	1.92	113	0.2	0.25	0.015	CD	74	65%
A201	2.43	127	1.0	0.25	0.015	CD	74	65%
A300	3.18	146	0.2	0.25	0.015	CD	74	15%
A301	0.72	69	0.2	0.25	0.015	CD	74	10%
A30	8.47	238	0.2	0.25	0.015	CD	74	0.1%
A31	10.42	264	1.0	0.25	0.015	CD	74	75%
A32	0.69	68	1.0	0.25	0.015	CD	74	60%
A33	12.96	294	1.0	0.25	0.015	CD	74	75%
A34	0.66	66	1.0	0.25	0.015	CD	74	60%
A302	1.61	104	0.2	0.25	0.015	CD	74	10%
204.84		Total Area (ha)						





4.0 STORMWATER MANAGEMENT ALTERNATIVES

4.1 Screening of Stormwater Management Alternatives

A variety of stormwater management alternatives are available to control the quantity and quality of stormwater, most of which are described in the Stormwater Management Planning and Design Manual (MECP, March 2003). Alternatives for the proposed and ultimate developments were considered in the following broad categories: lot level, vegetative, infiltration, and end-of-pipe controls. General comments on each category are provided below. Individual alternatives for the proposed development are listed in Table 5 with comments on their effectiveness and applicability to the proposed outlet.

a) Lot Level Controls

Lot level controls are not generally suitable as the primary control facility for quality control. They are generally used to enhance stormwater quality in conjunction with other types of control facilities.

b) Vegetative Alternatives

Vegetative stormwater management practices are not generally suitable as the primary control facility for quality control. They are generally used to enhance stormwater quality in conjunction with other types of control facilities.

c) Infiltration Alternatives

Where soils are suitable, infiltration techniques can be very effective in providing quantity and quality control. However, the very small amount of surface area on this site dedicated to permeable surfaces such as greenspace and landscaping make this an impractical option. Therefore, infiltration techniques will not be considered for this development.

d) End-of-Pipe Alternatives

Surface storage techniques can be very effective in providing quality and quantity control. Wet facilities are effective practices for stormwater erosion, quality and quantity control for large drainage areas (>5 ha).

Table 5. Evaluation of Stormwater Management Practices

575 Quaker Road & Clare Avenue	Criteria for Implementation of Stormwater Management Practices (SWMP)					Technical Effectiveness (10 high)	Recommend Implementation Yes / No	Comments
	Topography	Soils	Bedrock	Groundwater	Area			
	<i>Flat ±1%</i>	<i>Variable ±15 mm/hr</i>	<i>Shallow</i>	<i>At Considerable Depth</i>	<i>± 29.30ha</i>			
Site Conditions								
Lot Level Controls								
Lot Grading	<5%	nlc	nlc	nlc	nlc	2	Yes	Quality/quantity benefits
Roof Leaders to Surface	nlc	nlc	nlc	nlc	nlc	2	Yes	Quality/quantity benefits
Roof Ldrs.to Soakaway Pits	nlc	loam, infiltr. > 15 mm/hr	>1m Below Bottom	>1m Below Bottom	< 0.5 ha	6	Yes	Quality/quantity benefits
Sump Pump Fdtn. Drains	nlc	nlc	nlc	nlc	nlc	2	No	Unsuitable site conditions
Vegetative								
Grassed Swales	< 5 %	nlc	nlc	nlc	nlc	7	Yes	Quality/quantity benefits
Filter Strips(Veg. Buffer)	< 10 %	nlc	nlc	>.5m Below Bottom	< 2 ha	5	No	Unsuitable site conditions
Infiltration								
Infiltration Basins	nlc	loam, infiltr. > 15 mm/hr	>1m Below Bottom	>1m Below Bottom	< 5 ha	2	No	Unsuitable site conditions
Infiltration Trench	nlc	loam, infiltr. > 15 mm/hr	>1m Below Bottom	>1m Below Bottom	< 2 ha	4	No	Unsuitable site conditions
Rear Yard Infiltration	< 2.0 %	loam, infiltr. > 15 mm/hr	>1m Below Bottom	>1m Below Bottom	< 0.5 ha	7	No	Unsuitable site conditions
Perforated Pipes	nlc	loam, infiltr. > 15 mm/hr	>1m Below Bottom	>1m Below Bottom	nlc	4	No	Unsuitable site conditions
Pervious Catch basins	nlc	loam, infiltr. > 15 mm/hr	>1m Below Bottom	>1m Below Bottom	nlc	3	No	Unsuitable site conditions
Sand Filters	nlc	nlc	nlc	>.5m Below Bottom	< 5 ha	5	No	High maintenance/poor aesthetics
Surface Storage								
Dry Ponds	nlc	nlc	nlc	nlc	> 5 ha	7	No	No quality control
Wet Ponds	nlc	nlc	nlc	nlc	> 5 ha	9	Yes	Very effective quality/quantity control
Wetlands	nlc	nlc	nlc	nlc	> 5 ha	6	No	Very effective quality control
Other								
Oil/Grit Separator	nlc	nlc	nlc	nlc	<2 ha	3	No	Limited benefit/area too large

Reference: Stormwater Management Practices Planning and Design Manual - 2003
nlc - No Limiting Criteria

4.2 Selection of Stormwater Management Alternatives

Stormwater management alternatives were screened based on technical effectiveness, physical suitability for this site, and their ability to meet the stormwater management criteria established for proposed and future development areas. The following stormwater management alternatives are recommended for implementation on the proposed development:

- **Lot grading** to be kept as flat as practical in order to slow down stormwater and encourage infiltration.
- **Roof leaders to be discharged to the ground surface** in order to slow down stormwater and encourage infiltration.
- **Grassed swales** to be used to collect rear lot drainage. Grassed swales tend to filter sediments and slow down the rate of stormwater.
- A **wet pond facility** is to be constructed to provide stormwater quality and quantity controls.

5.0 STORMWATER MANAGEMENT PLAN

A MIDUSS model was created to assess existing and future flows generated within the subject lands. The stormwater management facility was sized according to MECP Guidelines (MECP, March 2003) as follows:

5.1 Stage 1 Stormwater Management Facility 'P40'

5.1.1 Stormwater Quality Control

The stormwater drainage outlet for the Stage 1 Wet Pond 'P40' is the Towpath Drain, where *Enhanced* protection will be provided. Based on Table 3.2 of SWMP & Design Manual, the Enhanced water quality storage requirement for wet pond facilities in a development with an overall 26% impervious area is approximately 119 m³/ha. The wet pond facility will provide stormwater quality controls for a drainage area of approximately 28.76 hectares (Areas 40 to 46 in Figure 3) as shown in Table 6.

For the purposes of calculating the quality control volumes for the proposed stormwater management facility, the “impervious area” has been considered as the areas which will contribute to the overall total suspended solid (TSS) loading at the proposed wet pond facility.

Drainage Areas A42a, A42b and A44 will consist of existing rearyard drainage and Drainage Area A46 consists of the SWM facility itself, where TSS will not be generated. Drainage Area A40 will be conveyed through approximately 780m of grassed ditches at slopes below 0.5% before reaching Drainage Area A45. Therefore, these areas have been allocated an “impervious area” of 0% for the purposes of calculating future TSS loading and the required quality control volumes.

Table 6. Stage 1 Facility 'P40' - Stormwater Quality Volume Calculations	
Total Water Quality Volume	Reference: Table 3.2, SWMP & Design Manual (MECP 2003)
= 28.76 ha x 119 m ³ /ha	
= 3,412 m ³	
Permanent Pool Volume	Extended Detention Volume
= 28.76 ha x 79 m ³ /ha	= 28.76 ha x 40 m ³ /ha
= 2,262 m ³	= 1,150 m ³

5.1.2 Erosion Control

Using the MIDUSS hydrological model, the stormwater volume from the 25mm - 4 hour design storm event for the overall 28.76 hectare drainage area (Areas A40 to A46) to the proposed facility is 2,542 m³.

The following table shows the stormwater storage volumes required using both the water quality and erosion control guidelines.

Table 7. Stage 1 Facility 'P40' – Stormwater Quality Volume Requirements	
A. Permanent Pool Volume	2,262 m ³
B. Extended Detention Volume	1,150 m ³
C. Stormwater Volume from 25mm – 4-hour rainfall event	2,542 m ³
D. Minimum Extended Detention Volume (greater of B & C)	2,542 m ³
Total Quality and Extended Detention Volume (A + D)	4,804 m³

5.1.3 Stage 1 Stormwater Management Facility 'P40' Configuration

As shown in Figure 7, it is proposed to construct a three-stage control outlet for the proposed stormwater management facility. The first stage of control consists of a reverse slope pipe acting as a tubular control orifice to detain the extended detention volume and release it slowly over an extended period of time. The second stage of control consists of a ditch inlet catch basin and outlet pipe which provides an outlet for flows exceeding the extended detention volume. The third stage consists of an emergency spillway to provide an outlet for greater storm events.

The proposed bottom elevation of the facility is 185.00 m, and the permanent pool water level is proposed at 187.00 m, for a permanent water depth of 2.0 metres. The configuration of the facility provides 4,116 m³ of permanent pool volume, which is more than the required 2,262 m³. The proposed top of pond is at an elevation of 189.00 m which provides a total active volume of 8,856 m³ with 5:1 side slopes.

Based on the configuration of the proposed facility, it was determined that a 150 mm diameter quality orifice at an invert of 187.00 m can provide 29 hours of extended detention for the 25mm design storm event, which has a corresponding water surface elevation of 187.53m within the proposed facility.

The proposed ditch inlet catchbasin will be constructed with the rim at an elevation of 188.30 m which will provide an extended detention volume of 5,273 m³, which is greater than the minimum volume of 2,542 m³ specified in Table 7.

The outflow pipe from the stormwater management facility is to be 450mm in diameter and will convey the stormwater flows from the ditch inlet to the proposed storm sewers on Quaker Road and Rice Road, outletting to the Towpath Drain. A stage-storage-discharge relationship was determined for the facility and is included in Appendix B for reference purposes.

Major overland flows within the northern portion of the subject lands directed to the proposed wetpond facility, and then to the Towpath Drain through the Quaker Road and Rice Road road allowances.

A sediment forebay has been sized for this facility to minimize the transport of heavy sediment throughout the facility and to localize maintenance activities. Calculations for the forebay sizing follow MECP Guidelines and is shown in Table 8.

Table 8. Stage 1 SWM Facility 'P40' Forebay Sizing

a) Forebay Settling Length (MOE SWMP&D, Equation 4.5)

$Settling\ Length = \sqrt{\left(\frac{r \times Q}{V_s}\right)}$	r =	7.9	:1	(Length:Width Ratio)
	Q _p =	0.027	m ³ /s	(Weighted 25mm Stm Pond Discharge)
	V _s =	0.0003	m/s	(Settling Velocity)
Settling Length = 26.75 m				

b) Dispersion Length (MOE SWMP&D, Equation 4.6)

$Dispersion\ Length = \frac{8 \times Q}{D \times V_f}$	Q =	1.777	m ³ /s	(5 Yr Stm Sew Design Inflow)
	D =	1.20	m	(Depth of Perm. Pool in the Forebay)
	V _f =	0.5	m/s	(Desired Velocity)
Dispersion Length = 23.69 m				

c) Minimum Forebay Deep Zone Bottom Width (MOE SWMP&D), Equation 4.7)

$Width = \frac{Min. Forebay Length}{8}$	26.75 m	(minimum required length)
Width = 3.34 m (minimum required width)		

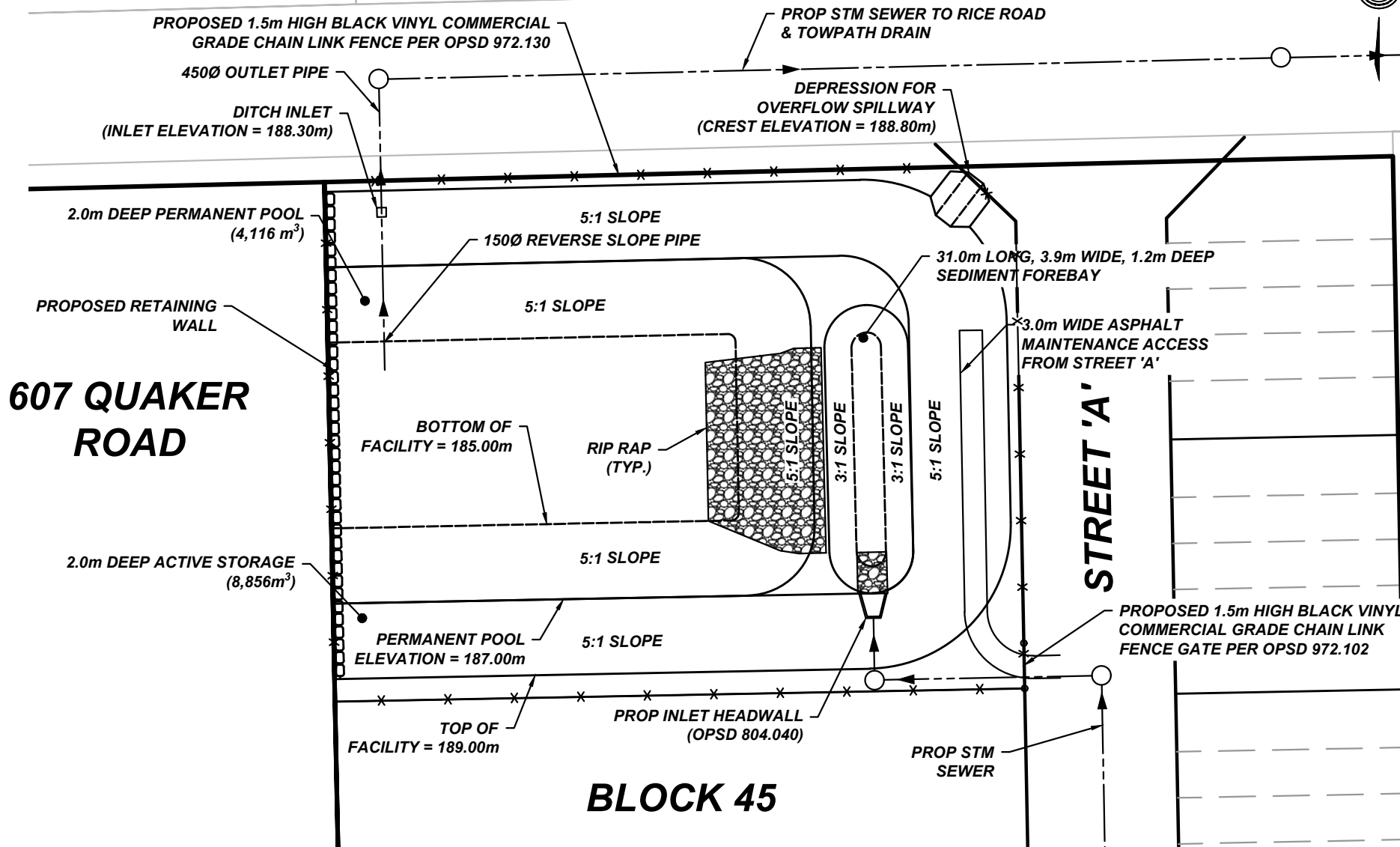
d) Average Velocity of Flow

$Average\ Velocity = \frac{Q}{A}$	Q =	0.969	m ³ /s	(25mm Storm Design Inflow)
	A =	9.00	m ²	(Cross Sectional Area)
	D =	1.20	m	(Depth of Forebay)
	W =	3.90	m	(Proposed Bottom Width)
	SS =	3	:1	(Side Slopes - Minimum)
Average Velocity = 0.11 m/s				
Is this Acceptable? Yes (Maximum velocity of flow = 0.15 m/s)				

e) Cleanout Frequency

Is this Acceptable? Yes	L =	31.0	m	(Proposed Bottom Length)
	ASL =	0.6	m ³ /ha	(Annual Sediment Loading)
	A =	28.72	ha	(Drainage Area)
	FRC =	80	%	(Facility Removal Efficiency)
	FV =	327.0	m ³	(Forebay Volume)
Cleanout Frequency = 23.7 Years				
Is this Acceptable? Yes (10 Year Minimum Cleanout Frequency)				

QUAKER ROAD



**UPPER CANADA
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575 QUAKER ROAD

CITY OF WELLAND

STAGE 1 STORMWATER MANAGEMENT POND P40

DATE	2025-04-10
SCALE	1:750 m
REF No.	2204
DWG No.	FIGURE 7

Table 9 summarizes the peak inflows and outflows for the stage 1 stormwater management facility along with corresponding pond elevations. Based on the MIDUSS model, the maximum wet pond elevation is 188.87 m, and an active storage volume is 8,128 m³ for the 100-year design storm event.

Table 9. Stage 1 SWM Facility 'P40' Characteristics				
Design Storm	Peak Flows (L/s)		Maximum Elevation (m)	Maximum Storage (m3)
	Inflow	Outflow		
25mm	969	27	187.53	2,023
2 Year	1,494	47	188.01	3,998
5 Year	1,777	53	188.27	5,153
10 Year	1,998	144	188.43	5,874
25 Year	2,341	193	188.62	6,850
100 Year	2,889	464	188.87	8,128

Table 10. Stage 1 Facility 'P40' – MECP Quality Requirements Comparison		
SWM Facility Characteristic	MECP Requirement	Provided by SWM Facility
Permanent Pool Volume (m ³) - <i>minimum</i>	2,262 (min)	4,116
Extended Detention Volume (m ³) – <i>minimum</i>	2,542 (min)	5,273
Total Quality + Detention Storage (m ³) – <i>minimum</i>	4,804 (min)	9,389
Drawdown Time (hr) – <i>minimum</i>	24 (min)	29
Forebay Length (m) – <i>minimum</i>	26.75 (min)	31.00
Forebay Width (m) – <i>minimum</i>	3.34 (min)	3.90
Average Forebay Velocity (m/s) – <i>maximum</i>	0.15 (max)	0.11
Cleanout Frequency (years) - <i>minimum</i>	10 (min)	24

As shown in Table 10, the proposed stormwater management facility configuration satisfies the quality control requirements for the associated drainage area.

5.2 Stage 2 Stormwater Management Facility ‘P40’

5.2.1 Stormwater Quality Control

The required water quality storage volumes have been recalculated to include the ultimate stormwater conditions for the Stage 2 wet pond facility. Based on Table 3.2 of SWMP & Design Manual, the Enhanced water quality storage requirement for wet pond facilities in a development with 54% impervious area is approximately 187 m³/ha. The wet pond facility will provide stormwater quality controls for a drainage area of approximately 29.30 hectares (Areas A40 to A46) as shown in Table 11.

Drainage Areas A40, A42, A44, and A46 have been allocated an “impervious area” of 0% for the purposes of calculating future TSS loading and the required quality control volumes.

Table 11. Stage 2 Facility ‘P40’ - Stormwater Quality Volume Calculations	
Total Water Quality Volume = 29.30 ha x 187 m ³ /ha = 5,479 m ³	
Reference: Table 3.2, SWMP & Design Manual (MECP 2003)	
Permanent Pool Volume = 29.30 ha x 147 m ³ /ha = 4,307 m ³	Extended Detention Volume = 29.30 ha x 40 m ³ /ha = 1,172 m ³

5.1.2 Erosion Control

Using the MIDUSS hydrological model, the stormwater volume from the 25mm - 4 hour design storm event for the overall 29.30 hectare area (Areas A40 to A46) is 3,605 m³.

The following table shows the stormwater storage volumes required using both the water quality and erosion control guidelines.

Table 12. Stage 2 Facility ‘P40’ – Stormwater Quality Volume Requirements	
A. Permanent Pool Volume (m ³)	4,307 m ³
B. Extended Detention Volume (m ³)	1,172 m ³
C. Stormwater Volume from 25mm – 4-hour rainfall event	3,605 m ³
D. Minimum Extended Detention Volume (greater of B & C)	3,605 m ³
Total Quality and Extended Detention Volume (A + D)	7,912 m³

5.1.3 Stage 2 Stormwater Management Facility 'P40' Configuration

As shown in Figure 8, it is proposed to expand the Stage 1 Wet Pond Facility westward within the adjacent 607 Quaker Road property to accommodate the future development in these lands. It is also proposed to maintain the existing 150mm diameter tubular orifice, 450mm diameter outlet control orifice, ditch inlet and overflow spillway for the expanded facility.

It is proposed to maintain the Stage 1 elevations for top of pond (189.00m), permanent pool (187.00m), and bottom of pond (185.00m). The expanded facility provides 5,939 m³ of permanent pool volume, which is more than the required 4,307 m³, and a total active volume of 13,993 m³ while maintaining 5:1 side slopes.

The 150 mm diameter quality orifice at an invert of 187.00 m can now provide 46 hours of extended detention for the 25mm design storm event, which has a corresponding water surface elevation of 187.53m within the expanded facility.

The expanded facility will provide an extended detention volume of 8,282 m³, which is greater than the minimum volume of 3,605 m³ specified in Table 12.

The stage-storage-discharge relationship for the expanded facility is included in Appendix B for reference.

Major overland flows within the northern portion of the subject lands directed to the proposed wetpond facility, and then to the Towpath Drain through the Quaker Road and Rice Road road allowances.

It is proposed to construct a second sediment forebay on the west side of the facility to minimize the transport of heavy sediment from Areas A40 and A41 throughout the facility and to localize maintenance activities.

The dimensions of the existing forebay on the east side of the facility will remain unchanged, however will only receive stormwater flows from Areas A42 to A45. Calculations for both forebays follow MECP Guidelines and are shown in Table 13 and 14.

Table 13. Stage 2 SWM Facility 'P40' West Forebay Sizing

a) Forebay Settling Length (MOE SWMP&D, Equation 4.5)

$$Settling\ Length = \sqrt{\left(\frac{r \times Q}{V_s}\right)}$$

	r =	6.7	:1	(Length:Width Ratio)
	Q _p =	0.010	m ³ /s	(Weighted 25mm Stm Pond Discharge)
	V _s =	0.0003	m/s	(Settling Velocity)

Settling Length = **14.91 m**

b) Dispersion Length (MOE SWMP&D, Equation 4.6)

$$Dispersion\ Length = \frac{8 \times Q}{D \times V_f}$$

	Q =	1.013	m ³ /s	(5 Yr Stm Sew Design Inflow)
	D =	1.20	m	(Depth of Perm. Pool in the Forebay)
	V _f =	0.5	m/s	(Desired Velocity)

Dispersion Length = **13.51 m**

c) Minimum Forebay Deep Zone Bottom Width (MOE SWMP&D), Equation 4.7)

$$Width = \frac{Min.\ Forebay\ Length}{8}$$

14.91 m (minimum required length)

Width = **1.86 m** (minimum required width)

d) Average Velocity of Flow

$$Average\ Velocity = \frac{Q}{A}$$

	Q =	0.558	m ³ /s	(25mm Storm Design Inflow)
	A =	7.92	m ²	(Cross Sectional Area)
	D =	1.20	m	(Depth of Forebay)
	W =	3.00	m	(Proposed Bottom Width)
	SS =	3	:1	(Side Slopes - Minimum)

Average Velocity = **0.07 m/s**

Is this Acceptable? **Yes** (Maximum velocity of flow = 0.15 m/s)

e) Cleanout Frequency

Is this Acceptable?	Yes	L =	20.0	m	(Proposed Bottom Length)
		ASL =	1.1	m ³ /ha	(Annual Sediment Loading)
		A =	13.69	ha	(Drainage Area)
		FRC =	80	%	(Facility Removal Efficiency)
		FV =	202.5	m ³	(Forebay Volume)

Cleanout Frequency = **16.8 Years**

Is this Acceptable? **Yes** (10 Year Minimum Cleanout Frequency)

Table 14. Stage 2 SWM Facility 'P40' East Forebay Sizing

a) Forebay Settling Length (MOE SWMP&D, Equation 4.5)

$$Settling\ Length = \sqrt{\left(\frac{r \times Q}{V_s}\right)}$$

	r =	7.9	:1	(Length:Width Ratio)
	Q _p =	0.017	m ³ /s	(Weighted 25mm Stm Pond Discharge)
	V _s =	0.0003	m/s	(Settling Velocity)

Settling Length = **21.22 m**

b) Dispersion Length (MOE SWMP&D, Equation 4.6)

$$Dispersion\ Length = \frac{8 \times Q}{D \times V_f}$$

	Q =	1.676	m ³ /s	(5 Yr Stm Sew Design Inflow)
	D =	1.20	m	(Depth of Perm. Pool in the Forebay)
	V _f =	0.5	m/s	(Desired Velocity)

Dispersion Length = **22.35 m**

c) Minimum Forebay Deep Zone Bottom Width (MOE SWMP&D), Equation 4.7)

$$Width = \frac{Min.\ Forebay\ Length}{8}$$

22.35 m (minimum required length)

Width = **2.79 m** (minimum required width)

d) Average Velocity of Flow

$$Average\ Velocity = \frac{Q}{A}$$

	Q =	0.927	m ³ /s	(25mm Storm Design Inflow)
	A =	9.00	m ²	(Cross Sectional Area)
	D =	1.20	m	(Depth of Forebay)
	W =	3.90	m	(Proposed Bottom Width)
	SS =	3	:1	(Side Slopes - Minimum)

Average Velocity = **0.10 m/s**

Is this Acceptable? **Yes** (Maximum velocity of flow = 0.15 m/s)

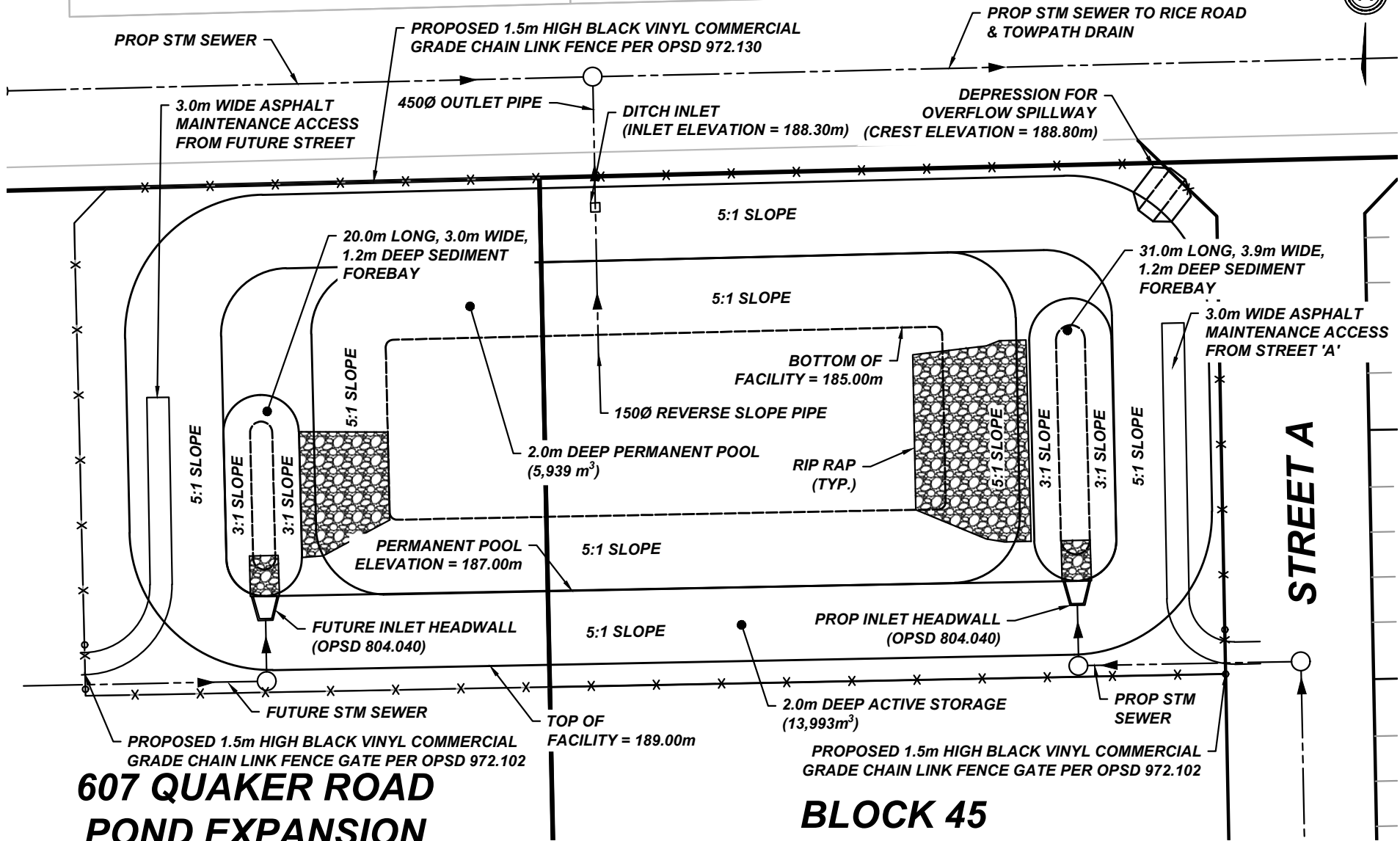
e) Cleanout Frequency

Is this Acceptable?	Yes	L =	31.0	m	(Proposed Bottom Length)
		ASL =	2.7	m ³ /ha	(Annual Sediment Loading)
		A =	14.58	ha	(Drainage Area)
		FRC =	80	%	(Facility Removal Efficiency)
		FV =	327.0	m ³	(Forebay Volume)

Cleanout Frequency = **10.5 Years**

Is this Acceptable? **Yes** (10 Year Minimum Cleanout Frequency)

QUAKER ROAD



607 QUAKER ROAD
POND EXPANSION

BLOCK 45



UPPER CANADA
CONSULTANTS
ENGINEERS / PLANNERS

575 QUAKER ROAD
CITY OF WELLAND
STAGE 2 STORMWATER MANAGEMENT POND P40

DATE	2025-04-10
SCALE	1:750 m
REF No.	2204
DWG No.	FIGURE 8

Table 15 summarizes the peak inflows and outflows for the stage 2 stormwater management facility along with corresponding pond elevations. Based on the MIDUSS model, Table 15 shows the maximum wet pond elevation of 188.76 m, and an active storage volume of 11,916 m³ for the 100-year design storm event.

Table 15. Stage 2 SWM Facility 'P40' Characteristics				
Design Storm	Peak Flows (L/s)		Maximum Elevation (m)	Maximum Storage (m3)
	Future Inflow	Future Outflow		
25mm	1,541	27	187.53	3,161
2 Year	2,348	45	187.94	5,740
5 Year	2,784	50	188.14	7,131
10 Year	3,115	55	188.30	8,297
25 Year	3,622	141	188.48	9,674
100 Year	4,399	243	188.76	11,916

Table 16. Stage 2 Facility 'P40' – MECP Quality Requirements Comparison		
SWM Facility Characteristic	MECP Requirement	Provided by SWM Facility
Permanent Pool Volume (m ³) - <i>minimum</i>	4,307 (min)	5,939
Extended Detention Volume (m ³) – <i>minimum</i>	3,605 (min)	8,282
Total Quality + Detention Storage (m ³) – <i>minimum</i>	7,912 (min)	14,221
Drawdown Time (hr) – <i>minimum</i>	24 (min)	46
West Forebay		
Forebay Length (m) – <i>minimum</i>	14.91 (min)	20.00
Forebay Width (m) – <i>minimum</i>	1.86 (min)	3.00
Average Forebay Velocity (m/s) – <i>maximum</i>	0.15 (max)	0.07
Cleanout Frequency (years) - <i>minimum</i>	10 (min)	17
East Forebay		
Forebay Length (m) – <i>minimum</i>	22.35 (min)	31.00
Forebay Width (m) – <i>minimum</i>	2.79 (min)	3.90
Average Forebay Velocity (m/s) – <i>maximum</i>	0.15 (max)	0.10
Cleanout Frequency (years) - <i>minimum</i>	10 (min)	11

As shown in Table 16, the proposed stormwater management facility configuration satisfies the quality control requirements for the associated drainage area.

5.3 Overall Stormwater Management Plan

As previously discussed, UCC has prepared a comprehensive Future conditions MIDUSS model to include all of the proposed stormwater management facilities to be constructed within the properties for which UCC is providing engineering services. The facilities included in the model are SWM Facilities P10 through P50, as shown in Figures 5 and 6.

Within properties where there are no Planning Act Applications forthcoming at the time of writing this report, that UCC is not providing engineering services, or a stormwater management alternative has not been selected, existing conditions were assumed in accordance with the Implementation Plan (see Figure 2).

As part of the Planning Act Applications on the properties where UCC is providing engineering services, separate Stormwater Management Reports will be submitted to outline the detailed calculations for each proposed facility. For the purposes of this Stormwater Management Plan, Tables 15 through 21 have been including providing the summary of the characteristics of each SWMF designed by UCC in the NWWSP Area.

5.3.1 Block 1

As shown in Figure 1, Block 1 consists of lands owned by multiple owners and will include two communal wet pond SWM Facilities (P30 and P31) providing quality and quantity controls for the Areas A30 to A34. A separate SWM Plan will be submitted outlining the detailed calculations for this Block.

Table 17 to 20 below summarize the design characteristics for Facilities P30 and P31.

Table 17. Stormwater Management Wet Pond Facility ‘P30’ Characteristics				
Design Storm	Peak Flows (L/s)		Maximum Elevation (m)	Maximum Storage (m3)
	Inflow	Outflow		
25mm	760	25	179.28	1,460
2 Year	1,210	34	179.64	2,856
5 Year	1,401	38	179.85	3,675
10 Year	1,576	42	180.03	4,365
25 Year	1,840	114	180.19	5,104
100 Year	2,246	250	180.38	5,999

Table 18. SWM Facility 'P30' – MECP Quality Requirements Comparison		
SWM Facility Characteristic	MECP Requirement	Provided by SWM Facility
Permanent Pool Volume (m ³) - <i>minimum</i>	2,011 (min)	2,221
Extended Detention Volume (m ³) – <i>minimum</i>	1,924 (min)	4,649
Total Quality + Detention Storage (m ³) – <i>minimum</i>	3,935 (min)	6,870
Drawdown Time (hr) – <i>minimum</i>	24 (min)	29
Forebay Length (m) – <i>minimum</i>	17.08 (min)	21.00
Forebay Width (m) – <i>minimum</i>	2.13 (min)	6.00
Average Forebay Velocity (m/s) – <i>maximum</i>	0.15 (max)	0.05
Cleanout Frequency (years) - <i>minimum</i>	10 (min)	11

Table 19. Stormwater Management Wet Pond Facility 'P31' Characteristics				
Design Storm	Peak Flows (L/s)		Maximum Elevation (m)	Maximum Storage (m3)
	Future Inflow	Future Outflow		
25mm	922	32	178.84	1,746
2 Year	1,478	43	179.20	3,116
5 Year	1,765	48	179.39	3,856
10 Year	1,983	52	179.54	4,465
25 Year	2,245	107	179.71	5,183
100 Year	2,731	221	179.88	5,982

Table 20. SWM Facility ‘P31’ – MECP Quality Requirements Comparison		
SWM Facility Characteristic	MECP Requirement	Provided by SWM Facility
Permanent Pool Volume (m ³) - <i>minimum</i>	2,501 (min)	2,733
Extended Detention Volume (m ³) – <i>minimum</i>	2,114 (min)	4,692
Total Quality + Detention Storage (m ³) – <i>minimum</i>	4,615 (min)	7,425
Drawdown Time (hr) – <i>minimum</i>	24 (min)	26
Forebay Length (m) – <i>minimum</i>	29.30 (min)	33.00
Forebay Width (m) – <i>minimum</i>	3.66 (min)	4.10
Average Forebay Velocity (m/s) – <i>maximum</i>	0.15 (max)	0.07
Cleanout Frequency (years) - <i>minimum</i>	10 (min)	10

As shown in the above tables, Facilities P30 and P31 have adequate capacity to provide stormwater management quantity and quality controls in accordance with MECP requirements and the requirements of the Implementation Plan.

5.3.2 Block 2

As shown in Figure 1, Block 2 consists of a property where UCC is providing the engineering services (450 Rice Road) and the remaining property where UCC is not providing engineering services.

The 450 Rice Road will provide only stormwater management quality controls (Facility P20) which will be via an Oil/Grit Separator as the tributary drainage area (Areas A20 and A20a) is below 5.0 hectares. A separate SWM Plan will be submitted outlining the detailed calculations for this Block.

The adjacent lands where UCC is not providing engineering services have been assumed at existing conditions for the purposes of identifying future stormwater flows within the realigned watercourse. A separate SWM Plan will be submitted by the owner’s engineering consultant addressing the future stormwater management within this property.

5.3.3 Block 3

As shown in Figure 1, Block 3 consists of lands owned by a single owner for which UCC is providing engineering services and will include two stormwater management facilities (P10 and P11). Facility P10 will be comprised of a dry pond and Oil/Grit Separator as the tributary drainage area to the Oil/Grit Separator (Areas A10) is below 5.0 hectares, and Facility P11 will be comprised of a single wet pond providing quality and quantity controls for areas A12, A13, and A14. A separate SWM Plan will be submitted outlining the detailed calculations for this Block.

Table 21, 22, and 23 below summarize the design characteristics for Facilities P10 and P11.

Table 21. Stormwater Management Dry Pond Facility 'P10' Characteristics				
Design Storm	Peak Flows (L/s)		Maximum Elevation (m)	Maximum Storage (m3)
	Future Inflow	Future Outflow		
25mm	273	23	185.94	390
2 Year	422	25	186.13	803
5 Year	497	26	186.26	1,035
10 Year	1,229	26	186.30	1,229
25 Year	0.644	27	186.41	1,531
100 Year	0.783	105	186.51	1,804

Table 22. Stormwater Management Wet Pond Facility 'P11' Characteristics				
Design Storm	Peak Flows (L/s)		Maximum Elevation (m)	Maximum Storage (m3)
	Future Inflow	Future Outflow		
25mm	584	14	185.31	1,163
2 Year	889	18	185.63	2,132
5 Year	1,052	20	185.81	2,641
10 Year	1,177	22	185.95	3,066
25 Year	1,367	48	186.14	3,650
100 Year	1,659	143	186.28	4,180

Table 23. SWM Facility 'P11' – MECP Quality Requirements Comparison		
SWM Facility Characteristic	MECP Requirement	Provided by SWM Facility
Permanent Pool Volume (m ³) - <i>minimum</i>	1,565 (min)	1,616
Extended Detention Volume (m ³) – <i>minimum</i>	1,350 (min)	3,519
Total Quality + Detention Storage (m ³) – <i>minimum</i>	2,915 (min)	5,135
Drawdown Time (hr) – <i>minimum</i>	24 (min)	40
Forebay Length (m) – <i>minimum</i>	19.80 (min)	21.00
Forebay Width (m) – <i>minimum</i>	2.41 (min)	2.50
Average Forebay Velocity (m/s) – <i>maximum</i>	0.15 (max)	0.06
Cleanout Frequency (years) - <i>minimum</i>	10 (min)	11

As shown in the above tables, Facilities P10 and P11 have adequate capacity to provide stormwater management quantity and quality controls in accordance with MECP requirements and the requirements of the Implementation Plan.

5.3.4 Block 4

As shown in Figure 1, Block 4 consists of multiple properties owned by a single owner for which UCC is providing engineering services separated by a property for which there is not expected to be a future Planning Act Application submitted in the near future.

The area fronting on Rice Road will be consolidated into multiple properties that will be subject to separate applications for Site Plan Approval. The stormwater management facility characteristics for quantity control (storage) within these areas are not presently known and have therefore been included at existing conditions. Stormwater management quality controls will also be provided in accordance with the Implementation Plan.

For the area fronting onto Quaker Road, it is proposed to construct a single communal wet pond SWM Facility (P50) to provide quality and quantity controls for Areas A52, A53, and A54 prior to discharging to the Towpath Drain.

Additionally, there is an existing catchment area within these lands that drain to the existing unnamed tributary to the Welland Recreational Canal that was constructed as part of the College Park Subdivision.

For the purposes of this Stormwater Management Plan, it was assumed that the majority of this area will convey future stormwater flows to the Towpath Drain. However, a separate SWM Plan will be submitted outlining the detailed calculations for this Block to ensure that future stormwater flows to each watercourse are controlled to existing levels.

Table 24 and 25 below summarize the design characteristics for Facility P50.

Table 24. Stormwater Management Wet Pond Facility 'P50' Characteristics				
Design Storm	Peak Flows (L/s)		Maximum Elevation (m)	Maximum Storage (m³)
	Future Inflow	Future Outflow		
25mm	1,227	9	182.40	2,607
2 Year	1,923	17	182.70	4,589
5 Year	2,285	20	182.85	5,617
10 Year	2,514	21	182.96	6,474
25 Year	2,924	23	183.13	7,762
100 Year	3,539	132	183.33	9,342

Table 25. SWM Facility 'P50' – MECP Quality Requirements Comparison		
SWM Facility Characteristic	MECP Requirement	Provided by SWM Facility
Permanent Pool Volume (m ³) - <i>minimum</i>	3,287 (min)	5,743
Extended Detention Volume (m ³) – <i>minimum</i>	2,782 (min)	7,895
Total Quality + Detention Storage (m ³) – <i>minimum</i>	6,072 (min)	13,638
Drawdown Time (hr) – <i>minimum</i>	24 (min)	99
West Forebay		
Forebay Length (m) – <i>minimum</i>	12.42 (min)	18.50
Forebay Width (m) – <i>minimum</i>	1.55 (min)	3.80
Average Forebay Velocity (m/s) – <i>maximum</i>	0.15 (max)	0.04
Cleanout Frequency (years) - <i>minimum</i>	10 (min)	11
East Forebay		
Forebay Length (m) – <i>minimum</i>	6.98 (min)	18.50
Forebay Width (m) – <i>minimum</i>	0.87 (min)	3.80
Average Forebay Velocity (m/s) – <i>maximum</i>	0.15 (max)	0.03
Cleanout Frequency (years) - <i>minimum</i>	10 (min)	20

As shown in the above tables, Facility P50 has adequate capacity to provide stormwater management quantity and quality controls in accordance with MECP requirements and the requirements of the Implementation Plan.

5.3.5 Existing and Future Peak Flow Comparison

As summarized in Tables 26 and 27 below, the proposed SWM Facilities (P10 through P50) can provide adequate stormwater quantity controls to control future flows to the existing levels identified in the Implementation Plan at each identified outlet along the Towpath Drain during each storm event for both Stage 1 and Stage 2 conditions for Pond P40.

Table 26. Impacts of SWM Facilities at Outlets A through D (Stage 1 Conditions)			
Design Storm	Peak Flow (m³/s)		
	Existing	Future with SWM	Change
Upstream of Rice Road Culvert Crossing – Outlet A1			
2 Year	1.317	0.983	-25.4%
5 Year	1.589	1.185	-25.4%
10 Year	1.800	1.344	-25.3%
25 Year	2.099	1.583	-24.6%
100 Year	2.558	1.908	-25.4%
Downstream of Rice Road Culvert Crossing – Outlet A2			
2 Year	3.301	2.873	-13.0%
5 Year	4.194	3.449	-17.8%
10 Year	4.777	3.899	-18.4%
25 Year	5.619	4.551	-19.0%
100 Year	6.987	5.585	-20.1%
Towpath Drain Upstream of Existing PSW – Outlet B			
2 Year	3.425	3.310	-3.4%
5 Year	4.367	3.962	-9.3%
10 Year	4.977	4.472	-10.1%
25 Year	5.863	5.214	-11.1%
100 Year	7.305	6.387	-12.6%
Downstream of First Avenue Culvert Crossing – Outlet C			
2 Year	4.035	3.974	-1.5%
5 Year	5.176	4.764	-8.0%
10 Year	5.914	5.388	-8.9%
25 Year	7.005	6.310	-9.9%
100 Year	8.781	7.776	-11.4%
Upstream of Niagara Street Culvert Crossing – Outlet D			
2 Year	4.509	4.120	-8.6%
5 Year	5.835	4.946	-15.2%
10 Year	6.678	5.598	-16.2%
25 Year	7.938	6.557	-17.4%
100 Year	9.995	8.083	-19.1%

Table 27. Impacts of SWM Facilities at Outlets A through D (Stage 2 Conditions)			
Design Storm	Peak Flow (m³/s)		
	Existing	Future with SWM	Change
Upstream of Rice Road Culvert Crossing – Outlet A1			
2 Year	1.317	0.983	-25.4%
5 Year	1.589	1.185	-25.4%
10 Year	1.800	1.344	-25.3%
25 Year	2.099	1.583	-24.6%
100 Year	2.558	1.908	-25.4%
Downstream of Rice Road Culvert Crossing – Outlet A2			
2 Year	3.301	2.907	-11.9%
5 Year	4.194	3.491	-16.8%
10 Year	4.777	3.945	-17.4%
25 Year	5.619	4.604	-18.1%
100 Year	6.987	5.644	-19.2%
Towpath Drain Upstream of Existing PSW – Outlet B			
2 Year	3.425	3.344	-2.4%
5 Year	4.367	4.004	-8.3%
10 Year	4.977	4.518	-9.2%
25 Year	5.863	5.267	-10.2%
100 Year	7.305	6.446	-11.8%
Downstream of First Avenue Culvert Crossing – Outlet C			
2 Year	4.035	4.022	-0.3%
5 Year	5.176	4.823	-6.8%
10 Year	5.914	5.453	-7.8%
25 Year	7.005	6.385	-8.9%
100 Year	8.781	7.863	-10.5%
Upstream of Niagara Street Culvert Crossing – Outlet D			
2 Year	4.509	4.168	-7.6%
5 Year	5.835	5.005	-14.2%
10 Year	6.678	5.663	-15.2%
25 Year	7.938	6.632	-16.5%
100 Year	9.995	8.170	-18.3%

6.0 SEDIMENT AND EROSION CONTROL

Sediment controls are required during construction. The proposed extended detention facility can be used for this purpose. Therefore, the proposed constructed wet pond facility should be constructed prior to the facility for sediment control during construction.

The following additional erosion and sediment controls will also be implemented during construction:

- Install silt control fencing along the limits of construction where overland flows will flow beyond the limits of the development or into downstream watercourse.
- Re-vegetate disturbed areas as soon as possible after grading works have been completed.
- Lot grading and siltation controls plans will be provided with sediment and erosion control measures to the appropriate agencies for approval during the final design stage.
- The Stormwater management facility be cleaned after construction prior to assumption by municipality.

7.0 STORMWATER MANAGEMENT FACILITY MAINTENANCE

Maintenance is a necessary and important aspect of urban stormwater quality and quantity measures such as constructed wetlands. Many pollutants (i.e. nutrients, metals, bacteria, etc.) bind to sediment and therefore removal of sediment on a scheduled basis is required.

The wet pond for this development is subject to frequent wetting and deposition of sediments as a result of frequent low intensity storm event. The purpose of the wet pond is to improve post development sediment and contaminant loadings by detaining the 'first flush' flow for a 24 hour period. For the initial operation period of the stormwater management facility, the required frequency of maintenance is not definitively known and many of the maintenance tasks will be performed on an 'as required' basis. For example, during the home construction phase of the development there will be a greater potential for increased maintenance frequency, which depends on the effectiveness of sediment and erosion control techniques employed.

Inspections of the wet pond will indicate whether or not maintenance is required. Inspections should be made after every significant storm during the first two years of operation or until all development is completed to ensure the wet pond is functioning properly. This may translate into an average of six inspections per year. Once all building activity is finalized, inspections shall be performed annually. The following points should be addressed during inspections of the facility.

- a) Standing water above the inlet storm sewer invert a day or more after a storm may indicate a blockage in the reverse slope pipe or orifice. The blockage may be caused by trash or sediment and a visual inspection would be required to determine the cause.
- b) The vegetation around the wet pond should be inspected to ensure its function and aesthetics. Visual inspections will indicate whether replacement of plantings are required. A decline in vegetation habitat may indicate that other aspects of the constructed wet pond are operating improperly, such as the detention times may be inadequate or excessive.
- c) The accumulation of sediment and debris at the wet pond inlet sediment forebay or around the high water line of the wet pond should be inspected. This will indicate the need for sediment removal or debris clean up.
- d) The wet pond has been created by excavating a detention area. The integrity of the embankments should be periodically checked to ensure that it remains watertight and the side slopes have not sloughed.

Grass cutting is a maintenance activity that is done solely for aesthetic purposes. It is recommended that grass cutting be eliminated. It should be noted that municipal by-laws may require regular grass maintenance for weed control.

Trash removal is an integral part of maintenance and an annual clean-up, usually in the spring, is a minimum requirement. After this, trash removal is performed as required basis on observation of trash build-up during inspections.

To ensure long term effectiveness, the sediment that accumulates in the forebay area should be removed periodically to ensure that sediment is not deposited throughout the facility. For sediment removal operations, typical grading/excavating equipment should be used to remove sediment from the inlet forebay and detention areas. Care should be taken to ensure that limited damage occurs to existing vegetation and habitat.

Generally, the sediment which is removed from the detention pond will not be contaminated to the point that it would be classified as hazardous waste. However, the sediment should be tested to determine the disposal options.

8.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of this study, the following conclusions are offered:

- Infiltration techniques are not suitable for this site as the primary control facility due to the low soil infiltration rates.
- A single proposed stormwater management wet pond facility will provide stormwater quality, quantity and erosion controls to the proposed development. This facility can be constructed in two stages to accommodate varying development timelines
- Multiple stormwater management facilities external to the subject lands will provide stormwater quality, quantity and erosion controls for the respective catchment areas, to be addressed in separate SWM Reports as part of forthcoming Planning Act Applications.
- Various lot level vegetative stormwater management practices can be implemented to enhance stormwater quality.
- This report was prepared in accordance with the provincial guidelines contained in "Stormwater Management Planning and Design Manual, March 2003".

The above conclusions lead to the following recommendations:

- That the stormwater management criteria established in this report be accepted.
- That the stormwater management wet pond facility be constructed to provide stormwater quality protection to MECP *Enhanced* Protection levels and quantity controls as outlined in this report.
- That the external SWM Facilities be constructed to the criteria established in the separately submitted SWM Reports.
- That additional lot level controls and vegetative stormwater management practices as described previously in this report be implemented.
- That sediment and erosion controls during construction as described in this report be implemented.

Respectfully Submitted,

B. Kapteyn

April 10, 2025

Brendan Kapteyn, P.Eng.



APPENDICES

APPENDIX A

Existing Conditions MIDUSS Output File

Output File (4.7) EX.OUT opened 2024-04-03 15:59
Units used are defined by G = 9.810
24 144 10.000 are MAXDT MAXHYD & DTMIN values
Licensee: UPPER CANADA CONSULTANTS
35 COMMENT
4 line(s) of comment
STORMWATER MANAGEMENT PLAN
QUAKER ROAD
CITY OF WELLAND
EXISTING CONDITIONS
35 COMMENT
3 line(s) of comment

25mm STORM EVENT

2 STORM
1 1=Chicago;2=Huff;3=User;4=Cdn1hr;5=Historic
512.000 Coefficient a
6.000 Constant b (min)
.800 Exponent c
.450 Fraction to peak r
240.000 Duration 240 min
25.035 mm Total depth
3 IMPERVIOUS
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.015 Manning "n"
98.000 SCS Curve No or C
.100 Ia/S Coefficient
.518 Initial Abstraction
35 COMMENT
3 line(s) of comment

AREA NORTH OF QUAKER

4 CATCHMENT
1.000 ID No. 99999
15.820 Area in hectares
325.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
325.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.499 .000 .000 .000 c.m/s
.098 .805 .346 C perv/imperv/total
15 ADD RUNOFF
.499 .499 .000 .000 c.m/s
4 CATCHMENT
2.000 ID No. 99999
13.570 Area in hectares
301.000 Length (PERV) metres
1.000 Gradient (%)
25.000 Per cent Impervious
301.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.309 .499 .000 .000 c.m/s
.098 .802 .274 C perv/imperv/total
35 COMMENT
3 line(s) of comment

FLOW AT RICE ROAD

15 ADD RUNOFF
.309 .808 .000 .000 c.m/s
4 CATCHMENT
3.000 ID No. 99999
14.520 Area in hectares
311.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
311.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.461 .808 .000 .000 c.m/s
.098 .803 .345 C perv/imperv/total
15 ADD RUNOFF
.461 1.269 .000 .000 c.m/s
4 CATCHMENT
4.000 ID No. 99999
45.500 Area in hectares
551.000 Length (PERV) metres
1.000 Gradient (%)
21.000 Per cent Impervious
551.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.611 1.269 .000 .000 c.m/s
.098 .804 .247 C perv/imperv/total
15 ADD RUNOFF
.611 1.879 .000 .000 c.m/s
35 COMMENT
3 line(s) of comment

AREA SOUTH OF QUAKER

4 CATCHMENT
5.000 ID No. 99999
5.310 Area in hectares
188.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
188.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.051 1.879 .000 .000 c.m/s
.098 .806 .169 C perv/imperv/total
15 ADD RUNOFF
.051 1.930 .000 .000 c.m/s
4 CATCHMENT
6.000 ID No. 99999
43.410 Area in hectares
538.000 Length (PERV) metres
1.000 Gradient (%)
9.000 Per cent Impervious
538.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.255 1.930 .000 .000 c.m/s
.098 .803 .162 C perv/imperv/total
35 COMMENT
3 line(s) of comment

TOTAL FLOW AT FIRST AVENUE

15 ADD RUNOFF
.255 2.185 .000 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.255 2.185 2.185 .000 c.m/s
17 COMBINE
1 Junction Node No.
.255 2.185 2.185 2.185 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment

AREA SOUTH OF QUAKER

4 CATCHMENT
7.000 ID No. 99999
16.470 Area in hectares
331.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
331.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.149 .000 2.185 2.185 c.m/s
.098 .805 .169 C perv/imperv/total
15 ADD RUNOFF
.149 .149 2.185 2.185 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.149 .149 .149 2.185 c.m/s
17 COMBINE
1 Junction Node No.
.149 .149 .149 2.334 c.m/s
18 CONFLUENCE
1 Junction Node No.
.149 2.334 .149 .000 c.m/s
4 CATCHMENT
8.000 ID No. 99999
42.190 Area in hectares
530.000 Length (PERV) metres
1.000 Gradient (%)
9.000 Per cent Impervious
530.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.250 2.334 .149 .000 c.m/s
.098 .803 .162 C perv/imperv/total
35 COMMENT
3 line(s) of comment

TOTAL FLOW AT NIAGARA STREET

15 ADD RUNOFF
.250 2.584 .149 .000 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .1074966E+05 c.m
14 START
1 1=Zero; 2=Define

```

35 COMMENT
3 line(s) of comment
*****
2-YEAR STORM EVENT
*****
2 STORM
1 1=Chicago;2=Huff;3=User;4=Cdn1hr;5=Historic
755.000 Coefficient a
8.000 Constant b (min)
.789 Exponent c
.450 Fraction to peak r
240.000 Duration 240 min
38.971 mm Total depth
3 IMPERVIOUS
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.015 Manning "n"
98.000 SCS Curve No or C
.100 Ia/S Coefficient
.518 Initial Abstraction
35 COMMENT
3 line(s) of comment
*****
AREA NORTH OF QUAKER
*****
4 CATCHMENT
1.000 ID No. 99999
15.820 Area in hectares
325.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
325.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.813 .000 .149 .000 c.m/s
.194 .859 .427 C perv/imperv/total
15 ADD RUNOFF
.813 .813 .149 .000 c.m/s
4 CATCHMENT
2.000 ID No. 99999
13.570 Area in hectares
301.000 Length (PERV) metres
1.000 Gradient (%)
25.000 Per cent Impervious
301.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.504 .813 .149 .000 c.m/s
.194 .862 .361 C perv/imperv/total
35 COMMENT
3 line(s) of comment
*****
FLOW AT RICE ROAD
*****
15 ADD RUNOFF
.504 1.317 .149 .000 c.m/s
4 CATCHMENT
3.000 ID No. 99999
14.520 Area in hectares
311.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
311.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.749 1.317 .149 .000 c.m/s
.194 .861 .428 C perv/imperv/total
15 ADD RUNOFF
.749 2.066 .149 .000 c.m/s
4 CATCHMENT
4.000 ID No. 99999
45.500 Area in hectares
551.000 Length (PERV) metres
1.000 Gradient (%)
21.000 Per cent Impervious
551.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.153 2.066 .149 .000 c.m/s
.194 .868 .336 C perv/imperv/total
15 ADD RUNOFF
1.153 3.219 .149 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
AREA SOUTH OF QUAKER
*****

```

```

4 CATCHMENT
5.000 ID No. 99999
5.310 Area in hectares
188.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
188.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.082 3.219 .149 .000 c.m/s
.194 .863 .261 C perv/imperv/total
15 ADD RUNOFF
.082 3.301 .149 .000 c.m/s
4 CATCHMENT
6.000 ID No. 99999
43.410 Area in hectares
538.000 Length (PERV) metres
1.000 Gradient (%)
9.000 Per cent Impervious
538.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.485 3.301 .149 .000 c.m/s
.194 .868 .255 C perv/imperv/total
35 COMMENT
3 line(s) of comment
*****
TOTAL FLOW AT FIRST AVENUE
*****
15 ADD RUNOFF
.485 3.786 .149 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.485 3.786 3.786 .000 c.m/s
17 COMBINE
1 Junction Node No.
.485 3.786 3.786 3.786 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
AREA SOUTH OF QUAKER
*****
4 CATCHMENT
7.000 ID No. 99999
16.470 Area in hectares
331.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
331.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.249 .000 3.786 3.786 c.m/s
.194 .858 .261 C perv/imperv/total
15 ADD RUNOFF
.249 .249 3.786 3.786 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.249 .249 .249 3.786 c.m/s
17 COMBINE
1 Junction Node No.
.249 .249 .249 4.035 c.m/s
18 CONFLUENCE
1 Junction Node No.
.249 4.035 .249 .000 c.m/s
4 CATCHMENT
8.000 ID No. 99999
42.190 Area in hectares
530.000 Length (PERV) metres
1.000 Gradient (%)
9.000 Per cent Impervious
530.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.474 4.035 .249 .000 c.m/s
.194 .867 .255 C perv/imperv/total
35 COMMENT
3 line(s) of comment
*****
TOTAL FLOW AT NIAGARA STREET
*****
15 ADD RUNOFF
.474 4.509 .249 .000 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .2362202E+05 c.m
14 START
1 1=Zero; 2=Define

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35 COMMENT
3 line(s) of comment
*****
5-YEAR STORM EVENT
*****
2 STORM
1 1=Chicago;2=Huff;3=User;4=Cdn1hr;5=Historic
830.000 Coefficient a
7.300 Constant b (min)
.777 Exponent c
.450 Fraction to peak r
240.000 Duration 240 min
45.874 mm Total depth
3 IMPERVIOUS
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.015 Manning "n"
98.000 SCS Curve No or C
.100 Ia/S Coefficient
.518 Initial Abstraction
35 COMMENT
3 line(s) of comment
*****
AREA NORTH OF QUAKER
*****
4 CATCHMENT
1.000 ID No. 99999
15.820 Area in hectares
325.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
325.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.980 .000 .249 .000 c.m/s
.236 .880 .461 C perv/imperv/total
15 ADD RUNOFF
.980 .980 .249 .000 c.m/s
4 CATCHMENT
2.000 ID No. 99999
13.570 Area in hectares
301.000 Length (PERV) metres
1.000 Gradient (%)
25.000 Per cent Impervious
301.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.608 .980 .249 .000 c.m/s
.236 .883 .398 C perv/imperv/total
35 COMMENT
3 line(s) of comment
*****
FLOW AT RICE ROAD
*****
15 ADD RUNOFF
.608 1.589 .249 .000 c.m/s
4 CATCHMENT
3.000 ID No. 99999
14.520 Area in hectares
311.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
311.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.902 1.589 .249 .000 c.m/s
.236 .882 .462 C perv/imperv/total
15 ADD RUNOFF
.902 2.491 .249 .000 c.m/s
4 CATCHMENT
4.000 ID No. 99999
45.500 Area in hectares
551.000 Length (PERV) metres
1.000 Gradient (%)
21.000 Per cent Impervious
551.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.602 2.491 .249 .000 c.m/s
.236 .885 .372 C perv/imperv/total
15 ADD RUNOFF
1.602 4.093 .249 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
AREA SOUTH OF QUAKER
*****
4 CATCHMENT
5.000 ID No. 99999
5.310 Area in hectares
188.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
188.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.101 4.093 .249 .000 c.m/s
.236 .875 .300 C perv/imperv/total
15 ADD RUNOFF
.101 4.194 .249 .000 c.m/s
4 CATCHMENT
6.000 ID No. 99999
43.410 Area in hectares
538.000 Length (PERV) metres
1.000 Gradient (%)
9.000 Per cent Impervious
538.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.676 4.194 .249 .000 c.m/s
.236 .885 .294 C perv/imperv/total
35 COMMENT
3 line(s) of comment
*****
TOTAL FLOW AT FIRST AVENUE
*****
15 ADD RUNOFF
.676 4.870 .249 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
17 COMBINE
.676 4.870 4.870 .000 c.m/s
1 Junction Node No.
.676 4.870 4.870 4.870 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
AREA SOUTH OF QUAKER
*****
4 CATCHMENT
7.000 ID No. 99999
16.470 Area in hectares
331.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
331.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.306 .000 4.870 4.870 c.m/s
.236 .880 .300 C perv/imperv/total
15 ADD RUNOFF
.306 .306 4.870 4.870 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
17 COMBINE
.306 .306 .306 4.870 c.m/s
1 Junction Node No.
.306 .306 .306 5.176 c.m/s
18 CONFLUENCE
1 Junction Node No.
.306 5.176 .306 .000 c.m/s
4 CATCHMENT
8.000 ID No. 99999
42.190 Area in hectares
530.000 Length (PERV) metres
1.000 Gradient (%)
9.000 Per cent Impervious
530.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.659 5.176 .306 .000 c.m/s
.236 .885 .294 C perv/imperv/total
35 COMMENT
3 line(s) of comment
*****
TOTAL FLOW AT NIAGARA STREET
*****
15 ADD RUNOFF
.659 5.835 .306 .000 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .3122033E+05 c.m
14 START
1 1=Zero; 2=Define

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35 COMMENT
3 line(s) of comment
*****
10-YEAR STORM EVENT
*****
2 STORM
1 1=Chicago;2=Huff;3=User;4=Cdn1hr;5=Historic
860.000 Coefficient a
6.500 Constant b (min)
.763 Exponent c
.450 Fraction to peak r
240.000 Duration 240 min
51.471 mm Total depth
3 IMPERVIOUS
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.015 Manning "n"
98.000 SCS Curve No or C
.100 Ia/S Coefficient
.518 Initial Abstraction
35 COMMENT
3 line(s) of comment
*****
AREA NORTH OF QUAKER
*****
4 CATCHMENT
1.000 ID No. 99999
15.820 Area in hectares
325.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
325.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.110 .000 .306 .000 c.m/s
.267 .894 .486 C perv/imperv/total
15 ADD RUNOFF
1.110 1.110 .306 .000 c.m/s
4 CATCHMENT
2.000 ID No. 99999
13.570 Area in hectares
301.000 Length (PERV) metres
1.000 Gradient (%)
25.000 Per cent Impervious
301.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.690 1.110 .306 .000 c.m/s
.267 .896 .424 C perv/imperv/total
35 COMMENT
3 line(s) of comment
*****
FLOW AT RICE ROAD
*****
15 ADD RUNOFF
.690 1.800 .306 .000 c.m/s
4 CATCHMENT
3.000 ID No. 99999
14.520 Area in hectares
311.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
311.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.020 1.800 .306 .000 c.m/s
.267 .896 .487 C perv/imperv/total
15 ADD RUNOFF
1.020 2.820 .306 .000 c.m/s
4 CATCHMENT
4.000 ID No. 99999
45.500 Area in hectares
551.000 Length (PERV) metres
1.000 Gradient (%)
21.000 Per cent Impervious
551.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.840 2.820 .306 .000 c.m/s
.267 .896 .399 C perv/imperv/total
15 ADD RUNOFF
1.840 4.660 .306 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
AREA SOUTH OF QUAKER
*****

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4 CATCHMENT
5.000 ID No. 99999
5.310 Area in hectares
188.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
188.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.117 4.660 .306 .000 c.m/s
.267 .883 .328 C perv/imperv/total
15 ADD RUNOFF
.117 4.777 .306 .000 c.m/s
4 CATCHMENT
6.000 ID No. 99999
43.410 Area in hectares
538.000 Length (PERV) metres
1.000 Gradient (%)
9.000 Per cent Impervious
538.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.784 4.777 .306 .000 c.m/s
.267 .896 .323 C perv/imperv/total
35 COMMENT
3 line(s) of comment
*****
TOTAL FLOW AT FIRST AVENUE
*****
15 ADD RUNOFF
.784 5.561 .306 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.784 5.561 5.561 .000 c.m/s
17 COMBINE
1 Junction Node No.
.784 5.561 5.561 5.561 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
AREA SOUTH OF QUAKER
*****
4 CATCHMENT
7.000 ID No. 99999
16.470 Area in hectares
331.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
331.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.353 .000 5.561 5.561 c.m/s
.267 .894 .329 C perv/imperv/total
15 ADD RUNOFF
.353 .353 5.561 5.561 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.353 .353 .353 5.561 c.m/s
17 COMBINE
1 Junction Node No.
.353 .353 .353 5.914 c.m/s
18 CONFLUENCE
1 Junction Node No.
.353 5.914 .353 .000 c.m/s
4 CATCHMENT
8.000 ID No. 99999
42.190 Area in hectares
530.000 Length (PERV) metres
1.000 Gradient (%)
9.000 Per cent Impervious
530.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.764 5.914 .353 .000 c.m/s
.267 .896 .323 C perv/imperv/total
35 COMMENT
3 line(s) of comment
*****
TOTAL FLOW AT NIAGARA STREET
*****
15 ADD RUNOFF
.764 6.678 .353 .000 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .3783245E+05 c.m
14 START
1 1=Zero; 2=Define

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35 COMMENT
3 line(s) of comment

25-YEAR STORM EVENT

2 STORM
1 1=Chicago;2=Huff;3=User;4=Cdn1hr;5=Historic
900.000 Coefficient a
5.200 Constant b (min)
.745 Exponent c
.450 Fraction to peak r
240.000 Duration 240 min
59.713 mm Total depth

3 IMPERVIOUS
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.015 Manning "n"
98.000 SCS Curve No or C
.100 Ia/S Coefficient
.518 Initial Abstraction

35 COMMENT
3 line(s) of comment

AREA NORTH OF QUAKER

4 CATCHMENT
1.000 ID No. 99999
15.820 Area in hectares
325.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
325.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.306 .000 .353 .000 c.m/s
.308 .910 .519 C perv/imperv/total

15 ADD RUNOFF
1.306 1.306 .353 .000 c.m/s

4 CATCHMENT
2.000 ID No. 99999
13.570 Area in hectares
301.000 Length (PERV) metres
1.000 Gradient (%)
25.000 Per cent Impervious
301.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.793 1.306 .353 .000 c.m/s
.308 .910 .459 C perv/imperv/total

35 COMMENT
3 line(s) of comment

FLOW AT RICE ROAD

15 ADD RUNOFF
.793 2.099 .353 .000 c.m/s

4 CATCHMENT
3.000 ID No. 99999
14.520 Area in hectares
311.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
311.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.164 2.099 .353 .000 c.m/s
.308 .910 .519 C perv/imperv/total

15 ADD RUNOFF
1.164 3.263 .353 .000 c.m/s

4 CATCHMENT
4.000 ID No. 99999
45.500 Area in hectares
551.000 Length (PERV) metres
1.000 Gradient (%)
21.000 Per cent Impervious
551.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
2.211 3.263 .353 .000 c.m/s
.308 .907 .434 C perv/imperv/total

15 ADD RUNOFF
2.211 5.473 .353 .000 c.m/s

35 COMMENT
3 line(s) of comment

AREA SOUTH OF QUAKER

4 CATCHMENT
5.000 ID No. 99999
5.310 Area in hectares
188.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
188.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.146 5.473 .353 .000 c.m/s
.308 .892 .367 C perv/imperv/total

15 ADD RUNOFF
.146 5.619 .353 .000 c.m/s

4 CATCHMENT
6.000 ID No. 99999
43.410 Area in hectares
538.000 Length (PERV) metres
1.000 Gradient (%)
9.000 Per cent Impervious
538.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.957 5.619 .353 .000 c.m/s
.308 .906 .362 C perv/imperv/total

35 COMMENT
3 line(s) of comment

TOTAL FLOW AT FIRST AVENUE

15 ADD RUNOFF
.957 6.576 .353 .000 c.m/s

9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.957 6.576 6.576 .000 c.m/s

17 COMBINE
1 Junction Node No.
.957 6.576 6.576 6.576 c.m/s

14 START
1 1=Zero; 2=Define

35 COMMENT
3 line(s) of comment

AREA SOUTH OF QUAKER

4 CATCHMENT
7.000 ID No. 99999
16.470 Area in hectares
331.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
331.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.429 .000 6.576 6.576 c.m/s
.308 .909 .369 C perv/imperv/total

15 ADD RUNOFF
.429 .429 6.576 6.576 c.m/s

9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.429 .429 .429 6.576 c.m/s

17 COMBINE
1 Junction Node No.
.429 .429 .429 7.005 c.m/s

18 CONFLUENCE
1 Junction Node No.
.429 7.005 .429 .000 c.m/s

4 CATCHMENT
8.000 ID No. 99999
42.190 Area in hectares
530.000 Length (PERV) metres
1.000 Gradient (%)
9.000 Per cent Impervious
530.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.933 7.005 .429 .000 c.m/s
.308 .906 .362 C perv/imperv/total

35 COMMENT
3 line(s) of comment

TOTAL FLOW AT NIAGARA STREET

15 ADD RUNOFF
.933 7.938 .429 .000 c.m/s

27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .4820893E+05 c.m
START
1 1=Zero; 2=Define

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35 COMMENT
3 line(s) of comment
*****
100-YEAR STORM EVENT
*****
2 STORM
1 1=Chicago;2=Huff;3=User;4=Cdn1hr;5=Historic
1020.000 Coefficient a
4.700 Constant b (min)
.731 Exponent c
.450 Fraction to peak r
240.000 Duration 240 min
73.203 mm Total depth
3 IMPERVIOUS
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.015 Manning "n"
98.000 SCS Curve No or C
.100 Ia/S Coefficient
.518 Initial Abstraction
35 COMMENT
3 line(s) of comment
*****
AREA NORTH OF QUAKER
*****
4 CATCHMENT
1.000 ID No. 99999
15.820 Area in hectares
325.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
325.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.566 .000 .429 .000 c.m/s
.368 .924 .562 C perv/imperv/total
15 ADD RUNOFF
1.566 1.566 .429 .000 c.m/s
4 CATCHMENT
2.000 ID No. 99999
13.570 Area in hectares
301.000 Length (PERV) metres
1.000 Gradient (%)
25.000 Per cent Impervious
301.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.992 1.566 .429 .000 c.m/s
.367 .923 .506 C perv/imperv/total
35 COMMENT
3 line(s) of comment
*****
FLOW AT RICE ROAD
*****
15 ADD RUNOFF
.992 2.558 .429 .000 c.m/s
4 CATCHMENT
3.000 ID No. 99999
14.520 Area in hectares
311.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
311.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.440 2.558 .429 .000 c.m/s
.367 .923 .562 C perv/imperv/total
15 ADD RUNOFF
1.440 3.998 .429 .000 c.m/s
4 CATCHMENT
4.000 ID No. 99999
45.500 Area in hectares
551.000 Length (PERV) metres
1.000 Gradient (%)
21.000 Per cent Impervious
551.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
2.790 3.998 .429 .000 c.m/s
.368 .916 .483 C perv/imperv/total
15 ADD RUNOFF
2.790 6.789 .429 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
AREA SOUTH OF QUAKER
*****

```

```

4 CATCHMENT
5.000 ID No. 99999
5.310 Area in hectares
188.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
188.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.199 6.789 .429 .000 c.m/s
.367 .904 .421 C perv/imperv/total
15 ADD RUNOFF
.199 6.987 .429 .000 c.m/s
4 CATCHMENT
6.000 ID No. 99999
43.410 Area in hectares
538.000 Length (PERV) metres
1.000 Gradient (%)
9.000 Per cent Impervious
538.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.246 6.987 .429 .000 c.m/s
.368 .915 .417 C perv/imperv/total
35 COMMENT
3 line(s) of comment
*****
TOTAL FLOW AT FIRST AVENUE
*****
15 ADD RUNOFF
1.246 8.233 .429 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
1.246 8.233 8.233 .000 c.m/s
17 COMBINE
1 Junction Node No.
1.246 8.233 8.233 8.233 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
AREA SOUTH OF QUAKER
*****
4 CATCHMENT
7.000 ID No. 99999
16.470 Area in hectares
331.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
331.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.548 .000 8.233 8.233 c.m/s
.368 .925 .423 C perv/imperv/total
15 ADD RUNOFF
.548 .548 8.233 8.233 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.548 .548 .548 8.233 c.m/s
17 COMBINE
1 Junction Node No.
.548 .548 .548 8.781 c.m/s
18 CONFLUENCE
1 Junction Node No.
.548 8.781 .548 .000 c.m/s
4 CATCHMENT
8.000 ID No. 99999
42.190 Area in hectares
530.000 Length (PERV) metres
1.000 Gradient (%)
9.000 Per cent Impervious
530.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.214 8.781 .548 .000 c.m/s
.368 .916 .417 C perv/imperv/total
35 COMMENT
3 line(s) of comment
*****
TOTAL FLOW AT NIAGARA STREET
*****
15 ADD RUNOFF
1.214 9.995 .548 .000 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .6645652E+05 c.m
14 START
1 1=Zero; 2=Define

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APPENDIX B

Stage 1 Stormwater Management Facility Calculations (P40)
Stage 2 Stormwater Management Facility Calculations (P40)

Upper Canada Consultants
3-30 Hannover Drive
St. Catharines, ON, L2W 1A3
PROJECT NAME: 575 QUAKER ROAD
PROJECT NO.: 2204

STAGE 1 WET POND CALCULATIONS (POND A40)

Quality Requirements	Quality Orifice	Outlet Weir	Overflow Spillway	Outflow Pipe Orifice
Drainage Area (ha) = 28.76	Diameter (m) = 0.150	Perimeter Length (m) = 0.60	Length (m) = 2.50	Diameter (m) = 0.300
Enhanced (m3/ha) = 119	Cd = 0.63	Inlet Elevation (m) = 188.30	Slopes (X:1) = 10.00	Cd = 0.65
Perm Pool (m3/ha) = 79	Invert (m) = 187.00		Invert (m) = 188.80	Invert (m) = 187.00
Perm Pool Vol (m3) = 2,262				Obvert (m) = 187.30
Ext. Deten. Vol (m3) 1,150				Top of Pipe (m) = 187.40
25mm MOE Volume = 2,542		Pond Drawdown Time Calculation (MOE, 2003)		
Water Level Elev. = 187.00 m		Water Surface Elevation during 25mm Design Storm Event =	187.53	
		MOE Equation 4.11 Drawdown Coefficient 'C2' =	1,044	
		MOE Equation 4.11 Drawdown Coefficient 'C3' =	3,360	
		MOE Equation 4.11 Drawdown Time (h) =	29	

				Average						Max			
Elevation	Increment Depth (m)	Active Depth (m)	Surface Area (m2)	Surface Area (m2)	Increment Volume (m3)	Permanent Volume (m3)	Active Volume (m3)	Quality Orifice (m3/s)	Ditch Inlet (m3/s)	Pipe Orifice (m3/s)	Overflow Spillway (m3/s)	Total Outflow (m3/s)	Average Discharge (m3/s)
185.00		-2.00	1,331			0							
5:1 SLOPE	1.00			1,685	1,685								
186.00		-1.00	2,038			1,685							
5:1 SLOPE	1.00			2,431	2,431								
187.00		0.00	2,824			4,116							
187.00		0.00	3,418				0	0.000	0.000	0.000	0.000	0.000	
5:1 SLOPE	0.80			3,807	3,045								0.061
187.80		0.80	4,195				3,045	0.041	0.000	0.158	0.000	0.041	
5:1 SLOPE	0.50			4,455	2,227								0.082
188.30		1.30	4,714				5,273	0.054	0.000	0.213	0.000	0.054	
5:1 SLOPE	0.20			4,821	964								0.154
188.50		1.50	4,927				6,237	0.058	0.092	0.232	0.000	0.150	
5:1 SLOPE	0.30			5,090	1,527								0.429
188.80		1.80	5,252				7,764	0.064	0.362	0.257	0.000	0.257	
5:1 SLOPE	0.20			5,459	1,092								0.569
189.00		2.00	5,667				8,856	0.068	0.599	0.273	0.607	0.880	

Notes	1. Quality Orifice flow is the orifice controlling for the 24 hour detention period and uses an orifice formula.
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2. Pipe Orifice flow is calculated using an orifice formula on the pipe from the ditch inlet to the outlet and uses the total head on the orifice.
3. Overflow Weir flow is calculated using a trapezondial weir to convey outflow for less frequent storms through the embankment with an emergency spillway.
4. Total Outflow is calculated by adding the Overflow Spillway with the lowest of Quality Orifice plus Ditch Inlet or Max Pipe Orifice.

Upper Canada Consultants

3-30 Hannover Drive

St. Catharines, ON, L2W 1A3

PROJECT NAME: 575 QUAKER ROAD

PROJECT NO.: 2204

STAGE 2 WET POND CALCULATIONS (POND A40)

Quality Requirements	Quality Orifice	Outlet Weir	Overflow Spillway	Outflow Pipe Orifice
Drainage Area (ha) = 29.30	Diameter (m) = 0.150	Perimeter Length (m) = 0.60	Length (m) = 2.50	Diameter (m) = 0.300
Enhanced (m3/ha) = 187	Cd = 0.63	Inlet Elevation (m) = 188.30	Slopes (X:1) = 10.00	Cd = 0.65
Perm Pool (m3/ha) = 147	Invert (m) = 187.00		Invert (m) = 188.80	Invert (m) = 187.00
Perm Pool Vol (m3) = 4,307				Obvert (m) = 187.30
Active Vol (m3) 1,172				Top of Pipe (m) = 187.40
25mm MOE Volume = 3,605	Pond Drawdown Time Calculation (MOE, 2003)			
Water Level Elev. = 187.00 m	Water Surface Elevation during 25mm Design Storm Event =		187.53	
	MOE Equation 4.11 Drawdown Coefficient 'C2' =		1,750	
	MOE Equation 4.11 Drawdown Coefficient 'C3' =		5,198	
	MOE Equation 4.11 Drawdown Time (h) =		46	

Elevation	Increment Depth (m)	Active Depth (m)	Surface Area (m2)	Average Surface Area (m2)	Increment Volume (m3)	Permanent Volume (m3)	Active Volume (m3)	Quality Orifice (m3/s)	Ditch Inlet (m3/s)	Max Pipe Orifice (m3/s)	Overflow Spillway (m3/s)	Total Outflow (m3/s)	Average Discharge (m3/s)
185.00		-2.00	1,843			0							
5:1 SLOPE	1.00			2,387	2,387								
186.00		-1.00	2,931			2,387							
5:1 SLOPE	1.00			3,551	3,551								
187.00		0.00	4,172			5,939							
187.00		0.00	5,315				0	0.000	0.000	0.000	0.000	0.000	
5:1 SLOPE	0.80			5,957	4,766								0.061
187.80		0.80	6,599				4,766	0.041	0.000	0.158	0.000	0.041	
5:1 SLOPE	0.50			7,033	3,517								0.082
188.30		1.30	7,468				8,282	0.054	0.000	0.213	0.000	0.054	
5:1 SLOPE	0.20			7,647	1,529								0.154
188.50		1.50	7,826				9,812	0.058	0.092	0.232	0.000	0.150	
5:1 SLOPE	0.30			8,101	2,430								0.429
188.80		1.80	8,375				12,242	0.064	0.362	0.257	0.000	0.257	
5:1 SLOPE	0.20			8,756	1,751								0.569
189.00		2.00	9,137				13,993	0.068	0.599	0.273	0.607	0.880	

Notes

1. Quality Orifice flow is the orifice controlling for the 24 hour detention period and uses an orifice formula.
2. Pipe Orifice flow is calculated using an orifice formula on the pipe from the ditch inlet to the outlet and uses the total head on the orifice.
3. Overflow Weir flow is calculated using a trapezondial weir to convey outflow for less frequent storms through the embankment with an emergency spillway.
4. Total Outflow is calculated by adding the Overflow Spillway with the lowest of Quality Orifice plus Ditch Inlet or Max Pipe Orifice.

APPENDIX C

Stage 1 Conditions MIDUSS Output File

Stage 1 Conditions with SWM

Output File (4.7) 25MM.OUT opened 2024-12-16 16:42
Units used are defined by G = 9.810
24 144 10.000 are MAXDT MAXHYD & DTMIN values
Licensee: UPPER CANADA CONSULTANTS
35 COMMENT
4 line(s) of comment
STORMWATER MANAGEMENT PLAN
QUAKER ROAD
CITY OF WELLAND
FUTURE CONDITIONS WITH SWM
35 COMMENT
3 line(s) of comment

25mm STORM EVENT

2 STORM
1 1=Chicago;2=Huff;3=User;4=Cdn1hr;5=Historic
512.000 Coefficient a
6.000 Constant b (min)
.800 Exponent c
.450 Fraction to peak r
240.000 Duration d 240 min
25.035 mm Total depth
3 IMPERVIOUS
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.015 Manning "n"
98.000 SCS Curve No or C
.100 Ia/S Coefficient
.518 Initial Abstraction
35 COMMENT
3 line(s) of comment

PROP DEVELOPMENT NORTH OF SEGMENT 1 - POND P10

4 CATCHMENT
10.000 ID No.6 99999
4.050 Area in hectares
164.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
164.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.264 .000 .000 .000 c.m/s
.098 .806 .594 C perv/imperv/total
15 ADD RUNOFF
.264 .264 .000 .000 c.m/s
4 CATCHMENT
11.000 ID No.6 99999
1.000 Area in hectares
82.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
82.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.009 .264 .000 .000 c.m/s
.098 .791 .168 C perv/imperv/total
15 ADD RUNOFF
.009 .273 .000 .000 c.m/s
10 POND
6 Depth - Discharge - Volume sets
184.800 .000 .0
185.750 .0210 1.0
186.000 .0230 503.0
186.250 .0260 1091.0
186.500 .0280 1765.0
186.700 1.244 2370.0
Peak Outflow = .023 c.m/s
Maximum Depth = 185.944 metres
Maximum Storage = 390. c.m
.009 .273 .023 .000 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment

PROP DEVELOPMENT SOUTH OF SEGMENT 1 - POND P11

4 CATCHMENT
12.000 ID No.6 99999
2.680 Area in hectares
134.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
134.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.088 .000 .023 .000 c.m/s
.098 .801 .344 C perv/imperv/total
15 ADD RUNOFF
.088 .088 .023 .000 c.m/s
4 CATCHMENT
13.000 ID No.6 99999
6.980 Area in hectares
216.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
216.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient

8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.461 .088 .023 .000 c.m/s
.098 .804 .592 C perv/imperv/total
15 ADD RUNOFF
.461 .549 .023 .000 c.m/s
4 CATCHMENT
14.000 ID No.6 99999
.670 Area in hectares
67.000 Length (PERV) metres
1.000 Gradient (%)
60.000 Per cent Impervious
67.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.036 .549 .023 .000 c.m/s
.098 .798 .518 C perv/imperv/total
15 ADD RUNOFF
.036 .584 .023 .000 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .1350286E+04 c.m
10 POND
5 Depth - Discharge - Volume sets
184.800 .000 .0
185.300 .0140 1142.0
186.100 .0240 3519.0
186.500 .287 4978.0
186.800 1.922 6222.0
Peak Outflow = .014 c.m/s
Maximum Depth = 185.307 metres
Maximum Storage = 1163. c.m
.036 .584 .014 .000 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment

PROP DEVELOPMENT SOUTH OF QUAKER RD & WEST OF RICE RD. - PON

4 CATCHMENT
40.000 ID No.6 99999
8.210 Area in hectares
234.000 Length (PERV) metres
1.000 Gradient (%)
25.000 Per cent Impervious
234.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.193 .000 .014 .000 c.m/s
.098 .800 .274 C perv/imperv/total
15 ADD RUNOFF
.193 .193 .014 .000 c.m/s
4 CATCHMENT
41.200 ID No.6 99999
.390 Area in hectares
51.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
51.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.013 .193 .014 .000 c.m/s
.098 .799 .344 C perv/imperv/total
15 ADD RUNOFF
.013 .204 .014 .000 c.m/s
4 CATCHMENT
41.000 ID No.6 99999
8.040 Area in hectares
226.000 Length (PERV) metres
1.000 Gradient (%)
100 Per cent Impervious
226.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.011 .204 .014 .000 c.m/s
.098 .802 .099 C perv/imperv/total
15 ADD RUNOFF
.011 .206 .014 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.011 .206 .206 .000 c.m/s
17 COMBINE
3 Junction Node No.
.011 .206 .206 .206 c.m/s
14 START
1 1=Zero; 2=Define
4 CATCHMENT
42.100 ID No.6 99999
.320 Area in hectares
46.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
46.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"

74.000	SCS Curve No or C	1.000	Gradient (%)
.100	Ia/S Coefficient	70.000	Per cent Impervious
8.924	Initial Abstraction	207.000	Length (IMPERV)
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv	.000	%Imp. with Zero Dpth
.011	.000	.206	.206 c.m/s
.098	.797	.343	C perv/imperv/total
15	ADD RUNOFF	.250	Manning "n"
.011	.011	.206	.206 c.m/s
4	CATCHMENT	74.000	SCS Curve No or C
43.000	ID No.6 99999	.100	Ia/S Coefficient
4.470	Area in hectares	8.924	Initial Abstraction
173.000	Length (PERV) metres	1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.000	Gradient (%)	.290	.011
70.000	Per cent Impervious	.206	.206 c.m/s
173.000	Length (IMPERV)	.098	.807
.000	%Imp. with Zero Dpth	.594	C perv/imperv/total
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat	.290	.299
.250	Manning "n"	.206	.206 c.m/s
74.000	SCS Curve No or C	15	ADD RUNOFF
.100	Ia/S Coefficient	.290	.299
8.924	Initial Abstraction	.206	.206 c.m/s
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv	4	CATCHMENT
.290	.011	44.000	ID No.6 99999
.098	.807	.330	Area in hectares
.594	C perv/imperv/total	47.000	Length (PERV) metres
15	ADD RUNOFF	1.000	Gradient (%)
.290	.299	35.000	Per cent Impervious
.206	.206 c.m/s	47.000	Length (IMPERV)
4	CATCHMENT	.000	%Imp. with Zero Dpth
44.000	ID No.6 99999	1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.330	Area in hectares	.250	Manning "n"
47.000	Length (PERV) metres	74.000	SCS Curve No or C
1.000	Gradient (%)	.100	Ia/S Coefficient
35.000	Per cent Impervious	8.924	Initial Abstraction
47.000	Length (IMPERV)	1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.000	%Imp. with Zero Dpth	.011	.299
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat	.098	.798
.250	Manning "n"	.343	C perv/imperv/total
74.000	SCS Curve No or C	15	ADD RUNOFF
.100	Ia/S Coefficient	.011	.308
8.924	Initial Abstraction	.206	.206 c.m/s
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv	4	CATCHMENT
.011	.299	45.000	ID No.6 99999
.098	.798	.6.400	Area in hectares
.343	C perv/imperv/total	207.000	Length (PERV) metres
15	ADD RUNOFF	1.000	Gradient (%)
.011	.308	70.000	Per cent Impervious
.206	.206 c.m/s	207.000	Length (IMPERV)
4	CATCHMENT	.000	%Imp. with Zero Dpth
45.000	ID No.6 99999	1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.6.400	Area in hectares	.250	Manning "n"
207.000	Length (PERV) metres	74.000	SCS Curve No or C
1.000	Gradient (%)	.100	Ia/S Coefficient
70.000	Per cent Impervious	8.924	Initial Abstraction
207.000	Length (IMPERV)	1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.000	%Imp. with Zero Dpth	.011	.299
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat	.098	.798
.250	Manning "n"	.343	C perv/imperv/total
74.000	SCS Curve No or C	15	ADD RUNOFF
.100	Ia/S Coefficient	.011	.308
8.924	Initial Abstraction	.206	.206 c.m/s
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv	4	CATCHMENT
.011	.299	46.000	ID No.6 99999
.098	.798	.600	Area in hectares
.343	C perv/imperv/total	63.000	Length (PERV) metres
15	ADD RUNOFF	1.000	Gradient (%)
.011	.308	60.000	Per cent Impervious
.206	.206 c.m/s	63.000	Length (IMPERV)
4	CATCHMENT	.000	%Imp. with Zero Dpth
46.000	ID No.6 99999	1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.600	Area in hectares	.250	Manning "n"
63.000	Length (PERV) metres	74.000	SCS Curve No or C
1.000	Gradient (%)	.100	Ia/S Coefficient
60.000	Per cent Impervious	8.924	Initial Abstraction
63.000	Length (IMPERV)	1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.000	%Imp. with Zero Dpth	.033	.938
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat	.098	.799
.250	Manning "n"	.519	C perv/imperv/total
74.000	SCS Curve No or C	15	ADD RUNOFF
.100	Ia/S Coefficient	.033	.969
8.924	Initial Abstraction	.732	.000 c.m/s
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv	27	HYDROGRAPH DISPLAY
.033	.938	5	is # of Hyeto/Hydrograph chosen
.098	.799	Volume =	.2541514E+04 c.m
.519	C perv/imperv/total	10	POND
15	ADD RUNOFF	6	Depth - Discharge - Volume sets
.033	.969	187.000	.000
.732	.000 c.m/s	187.800	.0410
27	HYDROGRAPH DISPLAY	188.300	.0540
5	is # of Hyeto/Hydrograph chosen	188.500	.150
Volume =	.2541514E+04 c.m	188.800	.257
10	POND	189.000	.880
6	Depth - Discharge - Volume sets	Peak Outflow =	.027 c.m/s
187.000	.000	Maximum Depth =	187.532 metres
187.800	.0410	Maximum Storage =	2023. c.m
188.300	.0540	.033	.969
188.500	.150	.027	.000 c.m/s
188.800	.257	14	START
189.000	.880	1	1=Zero; 2=Define
Peak Outflow =	.027 c.m/s	35	COMMENT
Maximum Depth =	187.532 metres	3	line(s) of comment
Maximum Storage =	2023. c.m	*****	
.033	.969	PROP DEVELOPMENT SOUTH OF QUAKER, EAST OF RICE - POND P50	
.027	.000 c.m/s	*****	
14	START	4	CATCHMENT
1	1=Zero; 2=Define	30.000	ID No.6 99999
35	COMMENT	8.470	Area in hectares
3	line(s) of comment	238.000	Length (PERV) metres
*****		1.000	Gradient (%)
PROP DEVELOPMENT SOUTH OF QUAKER, EAST OF RICE - POND P50		.100	Per cent Impervious
*****		238.000	Length (IMPERV)
4	CATCHMENT	.000	%Imp. with Zero Dpth
52.000	ID No.6 99999	1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
6.430	Area in hectares	.250	Manning "n"
207.000	Length (PERV) metres	74.000	SCS Curve No or C
		.100	Ia/S Coefficient
		8.924	Initial Abstraction
		1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
		.007	.000
		.098	.803
		.099	C perv/imperv/total
		15	ADD RUNOFF
		.007	.007
		.009	.000 c.m/s
		4	CATCHMENT
		31.000	ID No.6 99999
		10.420	Area in hectares
		264.000	Length (PERV) metres
		1.000	Gradient (%)

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75.000    Per cent Impervious
264.000    Length (IMPERV)
.000    %Imp. with Zero Dpth
1    Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250    Manning "n"
74.000    SCS Curve No or C
.100    Ia/S Coefficient
8.924    Initial Abstraction
1    Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.723    .007    .009    .000 c.m/s
.098    .798    .623    C perv/imperv/total
15    ADD RUNOFF
.723    .724    .009    .000 c.m/s
27    HYDROGRAPH DISPLAY
5    is # of Hyeto/Hydrograph chosen
Volume = .1834827E+04 c.m
4    CATCHMENT
32.000    ID No.ó 99999
.690    Area in hectares
68.000    Length (PERV) metres
1.000    Gradient (%)
60.000    Per cent Impervious
68.000    Length (IMPERV)
.000    %Imp. with Zero Dpth
1    Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250    Manning "n"
74.000    SCS Curve No or C
.100    Ia/S Coefficient
8.924    Initial Abstraction
1    Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.037    .724    .009    .000 c.m/s
.098    .798    .518    C perv/imperv/total
15    ADD RUNOFF
.037    .760    .009    .000 c.m/s
27    HYDROGRAPH DISPLAY
5    is # of Hyeto/Hydrograph chosen
Volume = .1924289E+04 c.m
10    POND
5 Depth - Discharge - Volume sets
178.800    .000    .0
179.300    .0260    1520.0
180.100    .0440    4649.0
180.600    .414    7069.0
180.800    1.204    8137.0
Peak Outflow = .025 c.m/s
Maximum Depth = 179.280 metres
Maximum Storage = 1460. c.m
.037    .760    .025    .000 c.m/s
14    START
1    1=Zero; 2=Define
35    COMMENT
3    line(s) of comment
*****
PROP DEVELOPMENT SOUTH OF SEGMENT 3 - POND P31
*****
4    CATCHMENT
33.000    ID No.ó 99999
12.960    Area in hectares
294.000    Length (PERV) metres
1.000    Gradient (%)
75.000    Per cent Impervious
294.000    Length (IMPERV)
.000    %Imp. with Zero Dpth
1    Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250    Manning "n"
74.000    SCS Curve No or C
.100    Ia/S Coefficient
8.924    Initial Abstraction
1    Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.887    .000    .025    .000 c.m/s
.098    .801    .625    C perv/imperv/total
15    ADD RUNOFF
.887    .887    .025    .000 c.m/s
27    HYDROGRAPH DISPLAY
5    is # of Hyeto/Hydrograph chosen
Volume = .2028780E+04 c.m
4    CATCHMENT
34.000    ID No.ó 99999
.660    Area in hectares
66.000    Length (PERV) metres
1.000    Gradient (%)
60.000    Per cent Impervious
66.000    Length (IMPERV)
.000    %Imp. with Zero Dpth
1    Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250    Manning "n"
74.000    SCS Curve No or C
.100    Ia/S Coefficient
8.924    Initial Abstraction
1    Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.036    .887    .025    .000 c.m/s
.098    .798    .518    C perv/imperv/total
15    ADD RUNOFF
.036    .922    .025    .000 c.m/s
27    HYDROGRAPH DISPLAY
5    is # of Hyeto/Hydrograph chosen
Volume = .2114417E+04 c.m
10    POND
6 Depth - Discharge - Volume sets
178.300    .000    .0
178.900    .0350    1927.0
179.600    .0540    4692.0
179.800    .150    5590.0
180.000    .321    6538.0
180.300    1.922    8059.0
Peak Outflow = .032 c.m/s
Maximum Depth = 178.844 metres
Maximum Storage = 1746. c.m
.036    .922    .032    .000 c.m/s
14    START
1    1=Zero; 2=Define

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35 COMMENT
3 line(s) of comment
*****
2-YEAR STORM EVENT
*****
2 STORM
1 1=Chicago;2=Huff;3=User;4=Cdn1hr;5=Historic
755.000 Coefficient a
8.000 Constant b (min)
.789 Exponent c
.450 Fraction to peak r
240.000 Duration o 240 min
38.971 mm Total depth
3 IMPERVIOUS
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.015 Manning "n"
98.000 SCS Curve No or C
.100 Ia/S Coefficient
.518 Initial Abstraction
35 COMMENT
3 line(s) of comment
*****
EXISTING RES. WEST OF SEGMENT 1
*****
4 CATCHMENT
1.000 ID No.6 99999
17.520 Area in hectares
343.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
343.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.896 .000 .000 .000 c.m/s
.194 .857 .426 C perv/imperv/total
15 ADD RUNOFF
.896 .896 .000 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 1
*****
4 CATCHMENT
100.000 ID No.6 99999
2.020 Area in hectares
116.000 Length (PERV) metres
.400 Gradient (%)
15.000 Per cent Impervious
116.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.046 .896 .000 .000 c.m/s
.194 .862 .294 C perv/imperv/total
35 COMMENT
3 line(s) of comment
*****
FLOW AT FUT ROADWAY CULVERT - SEGMENT 1
*****
15 ADD RUNOFF
.046 .941 .000 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.046 .941 .941 .000 c.m/s
17 COMBINE
1 Junction Node No.
.046 .941 .941 .941 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT NORTH OF SEGMENT 1 - POND P10
*****
4 CATCHMENT
10.000 ID No.6 99999
4.050 Area in hectares
164.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
164.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.406 .000 .941 .941 c.m/s
.194 .857 .658 C perv/imperv/total
15 ADD RUNOFF
.406 .406 .941 .941 c.m/s
4 CATCHMENT
11.000 ID No.6 99999
1.000 Area in hectares
82.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
82.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.015 .406 .941 .941 c.m/s
.194 .858 .261 C perv/imperv/total

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15 ADD RUNOFF
.015 .422 .941 .941 c.m/s
10 POND
6 Depth - Discharge - Volume sets
184.800 .000 .0
185.750 .0210 1.0
186.000 .0230 503.0
186.250 .0260 1091.0
186.500 .0280 1765.0
186.700 1.244 2370.0
Peak Outflow = .025 c.m/s
Maximum Depth = 186.128 metres
Maximum Storage = 803. c.m
.015 .422 .025 .941 c.m/s
17 COMBINE
1 Junction Node No.
.015 .422 .025 .963 c.m/s
14 START
1 1=Zero; 2=Define
18 CONFLUENCE
1 Junction Node No.
.015 .963 .025 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 1
*****
4 CATCHMENT
101.000 ID No.6 99999
.610 Area in hectares
64.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
64.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.010 .963 .025 .000 c.m/s
.194 .855 .260 C perv/imperv/total
15 ADD RUNOFF
.010 .972 .025 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.010 .972 .972 .000 c.m/s
17 COMBINE
1 Junction Node No.
.010 .972 .972 .972 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT SOUTH OF SEGMENT 1 - POND P11
*****
4 CATCHMENT
12.000 ID No.6 99999
2.680 Area in hectares
134.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
134.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.134 .000 .972 .972 c.m/s
.194 .850 .424 C perv/imperv/total
15 ADD RUNOFF
.134 .134 .972 .972 c.m/s
4 CATCHMENT
13.000 ID No.6 99999
6.980 Area in hectares
216.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
216.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.704 .134 .972 .972 c.m/s
.194 .867 .665 C perv/imperv/total
15 ADD RUNOFF
.704 .838 .972 .972 c.m/s
4 CATCHMENT
14.000 ID No.6 99999
.670 Area in hectares
67.000 Length (PERV) metres
1.000 Gradient (%)
60.000 Per cent Impervious
67.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.060 .838 .972 .972 c.m/s
.194 .856 .592 C perv/imperv/total
15 ADD RUNOFF
.060 .889 .972 .972 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .2406793E+04 c.m
10 POND
5 Depth - Discharge - Volume sets

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184.800	.000	.0			1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
185.300	.0140	1142.0			.450	.018 .325 .325 c.m/s
186.100	.0240	3519.0			.194	.859 .660 C perv/imperv/total
186.500	.287	4978.0		15	ADD RUNOFF	.450 .463 .325 .325 c.m/s
186.800	1.922	6222.0		4	CATCHMENT	
Peak Outflow =		.018 c.m/s		44.000	ID No.6 99999	
Maximum Depth =		185.633 metres		.330	Area in hectares	
Maximum Storage =		2132. c.m		47.000	Length (PERV) metres	
.060 .889 .018 .972 c.m/s				1.000	Gradient (%)	
35 COMMENT				35.000	Per cent Impervious	
3 line(s) of comment				47.000	Length (IMPERV)	
*****				.000	%Imp. with Zero Dpth	
FLOW U/S OF RICE RD CULVERT - OUTLET A1				1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat	
*****				.250	Manning "n"	
17 COMBINE				74.000	SCS Curve No or C	
1 Junction Node No.				.100	Ia/S Coefficient	
.060 .889 .018 .983 c.m/s				8.924	Initial Abstraction	
14 START				1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv	
1 1=Zero; 2=Define				.018	.463 .325 .325 c.m/s	
35 COMMENT				.194	.858 .426 C perv/imperv/total	
3 line(s) of comment				15	ADD RUNOFF	.018 .478 .325 .325 c.m/s
*****				4	CATCHMENT	
PROP DEVELOPMENT SOUTH OF QUAKER RD & WEST OF RICE RD. - PON				45.000	ID No.6 99999	
*****				6.400	Area in hectares	
4 CATCHMENT				207.000	Length (PERV) metres	
40.000 ID No.6 99999				1.000	Gradient (%)	
8.210 Area in hectares				70.000	Per cent Impervious	
234.000 Length (PERV) metres				207.000	Length (IMPERV)	
1.000 Gradient (%)				.000	%Imp. with Zero Dpth	
25.000 Per cent Impervious				1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat	
234.000 Length (IMPERV)				.250	Manning "n"	
.000 %Imp. with Zero Dpth				74.000	SCS Curve No or C	
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat				.100	Ia/S Coefficient	
.250 Manning "n"				8.924	Initial Abstraction	
74.000 SCS Curve No or C				1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv	
.100 Ia/S Coefficient				.300	.000 .018 .983 c.m/s	
8.924 Initial Abstraction				.194	.868 .363 C perv/imperv/total	
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv				15	ADD RUNOFF	.300 .300 .018 .983 c.m/s
.300 .000 .018 .983 c.m/s				4	CATCHMENT	
.194 .868 .363 C perv/imperv/total				41.200 ID No.6 99999		
15 ADD RUNOFF				.390	Area in hectares	
.300 .300 .018 .983 c.m/s				51.000	Length (PERV) metres	
4 CATCHMENT				1.000	Gradient (%)	
41.000 ID No.6 99999				35.000	Per cent Impervious	
.390 Area in hectares				51.000	Length (IMPERV)	
51.000 Length (PERV) metres				.000	%Imp. with Zero Dpth	
1.000 Gradient (%)				1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat	
35.000 Per cent Impervious				.250	Manning "n"	
51.000 Length (IMPERV)				74.000	SCS Curve No or C	
.000 %Imp. with Zero Dpth				.100	Ia/S Coefficient	
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat				8.924	Initial Abstraction	
.250 Manning "n"				1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv	
74.000 SCS Curve No or C				.021	.300 .018 .983 c.m/s	
.100 Ia/S Coefficient				.194	.857 .426 C perv/imperv/total	
8.924 Initial Abstraction				15	ADD RUNOFF	.021 .317 .018 .983 c.m/s
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv				4	CATCHMENT	
.051 .317 .018 .983 c.m/s				41.000 ID No.6 99999		
.194 .868 .195 C perv/imperv/total				8.040 Area in hectares		
15 ADD RUNOFF				226.000 Length (PERV) metres		
.051 .325 .018 .983 c.m/s				1.000 Gradient (%)		
9 ROUTE				226.000 Per cent Impervious		
.000 Conduit Length				1.000 Length (IMPERV)		
.000 No Conduit defined				.000 %Imp. with Zero Dpth		
.000 Zero lag				1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat		
.000 Beta weighting factor				.250 Manning "n"		
.000 Routing timestep				74.000 SCS Curve No or C		
0 No. of sub-reaches				.100 Ia/S Coefficient		
.051 .325 .325 .983 c.m/s				8.924 Initial Abstraction		
17 COMBINE				1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv	
3 Junction Node No.				.054	1.449 1.124 .000 c.m/s	
.051 .325 .325 .325 c.m/s				.194	.855 .590 C perv/imperv/total	
14 START				15	ADD RUNOFF	.054 1.494 1.124 .000 c.m/s
1 1=Zero; 2=Define				27	HYDROGRAPH DISPLAY	
4 CATCHMENT				5	is # of Hyeto/Hydrograph chosen	
42.100 ID No.6 99999				10	POND	
.320 Area in hectares				6	Depth - Discharge - Volume sets	
46.000 Length (PERV) metres				187.000	.000 .0 .0	
1.000 Gradient (%)				187.000	.0410 3045.0	
35.000 Per cent Impervious				188.300	.0540 5273.0	
46.000 Length (IMPERV)				188.500	.150 6237.0	
.000 %Imp. with Zero Dpth				188.800	.257 7764.0	
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat				189.000	.880 8856.0	
.250 Manning "n"				Peak Outflow =	.047 c.m/s	
74.000 SCS Curve No or C				Maximum Depth =	188.014 metres	
.100 Ia/S Coefficient				Maximum Storage =	3998. c.m	
8.924 Initial Abstraction				.054	1.494 .047 .000 c.m/s	
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv				17	COMBINE	
.018 .000 .325 .325 c.m/s				2	Junction Node No.	
.194 .858 .426 C perv/imperv/total				.054	1.494 .047 .047 c.m/s	
15 ADD RUNOFF				14	START	
.018 .018 .325 .325 c.m/s				1	1=Zero; 2=Define	
4 CATCHMENT				35	COMMENT	
43.000 ID No.6 99999				3	line(s) of comment	
4.470 Area in hectares				*****		
173.000 Length (PERV) metres				EXISTING AREA ON QUAKER RD, WEST OF RICE RD		
1.000 Gradient (%)				*****		
70.000 Per cent Impervious				4	CATCHMENT	
173.000 Length (IMPERV)				2.000	ID No.6 99999	
.000 %Imp. with Zero Dpth				9.580	Area in hectares	
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat				245.000	Length (PERV) metres	
.250 Manning "n"				1.000	Gradient (%)	
74.000 SCS Curve No or C				35.000	Per cent Impervious	
.100 Ia/S Coefficient				245.000	Length (IMPERV)	
8.924 Initial Abstraction				.000	%Imp. with Zero Dpth	
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv				1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat	
.485 .000 .047 .047 c.m/s				.250	Manning "n"	
.194 .868 .430 C perv/imperv/total				74.000	SCS Curve No or C	
15 ADD RUNOFF				.100	Ia/S Coefficient	
.485 .485 .047 .047 c.m/s				8.924	Initial Abstraction	
9 ROUTE				1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv	
.000 Conduit Length				.485	.000 .047 .047 c.m/s	
.000 No Conduit defined				.194	.868 .430 C perv/imperv/total	
.000 Zero lag				15	ADD RUNOFF	.485 .485 .047 .047 c.m/s

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.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.485 .485 .485 .047 c.m/s
17 COMBINE
2 Junction Node No.
.485 .485 .485 .505 c.m/s
14 START
1 1=Zero; 2=Define
18 CONFLUENCE
2 Junction Node No.
.485 .505 .485 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
EXISTING AREA ON QUAKER RD, WEST OF RICE RD
*****
4 CATCHMENT
3.000 ID No.6 99999
5.680 Area in hectares
195.000 Length (PERV) metres
1.000 Gradient (%)
40.000 Per cent Impervious
195.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.330 .505 .485 .000 c.m/s
.194 .865 .462 C perv/imperv/total
15 ADD RUNOFF
.330 .835 .485 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.330 .835 .835 .000 c.m/s
17 COMBINE
2 Junction Node No.
.330 .835 .835 .835 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT SOUTH OF QUAKER RD, EAST OF RICE RD
*****
4 CATCHMENT
50.000 ID No.6 99999
3.420 Area in hectares
151.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
151.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.053 .000 .835 .835 c.m/s
.194 .854 .260 C perv/imperv/total
15 ADD RUNOFF
.053 .835 .835 .835 c.m/s
4 CATCHMENT
51.000 ID No.6 99999
1.980 Area in hectares
115.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
115.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.031 .053 .835 .835 c.m/s
.194 .850 .260 C perv/imperv/total
15 ADD RUNOFF
.031 .884 .835 .835 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.031 .084 .084 .835 c.m/s
17 COMBINE
2 Junction Node No.
.031 .084 .084 .919 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
EXISTING AREA WEST OF RICE RD AND SOUTH OF QUAKER ROAD
*****
4 CATCHMENT
4.000 ID No.6 99999
13.940 Area in hectares
305.000 Length (PERV) metres
1.000 Gradient (%)
40.000 Per cent Impervious
305.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.822 .000 .084 .919 c.m/s

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.194 .862 .461 C perv/imperv/total
15 ADD RUNOFF
.822 .822 .084 .919 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.822 .822 .822 .919 c.m/s
17 COMBINE
2 Junction Node No.
.822 .822 .822 1.741 c.m/s
14 START
1 1=Zero; 2=Define
18 CONFLUENCE
2 Junction Node No.
.822 1.741 .822 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
RICE ROAD FROM QUAKER RD TO CITY OF WELLAND MUNICIPAL BOUNDARY
*****
4 CATCHMENT
501.000 ID No.6 99999
1.570 Area in hectares
102.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
102.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.149 1.741 .822 .000 c.m/s
.194 .854 .656 C perv/imperv/total
15 ADD RUNOFF
.149 1.890 .822 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.149 1.890 1.890 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
FLOW D/S OF RICE RD CULVERT - OUTLET A2
*****
17 COMBINE
1 Junction Node No.
.149 1.890 1.890 2.873 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT SOUTH OF QUAKER RD - QUALITY CONTROL ONLY
*****
4 CATCHMENT
20.100 ID No.6 99999
.780 Area in hectares
72.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
72.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.040 .000 1.890 2.873 c.m/s
.194 .857 .426 C perv/imperv/total
15 ADD RUNOFF
.040 .040 1.890 2.873 c.m/s
4 CATCHMENT
20.000 ID No.6 99999
3.210 Area in hectares
146.000 Length (PERV) metres
1.000 Gradient (%)
85.000 Per cent Impervious
146.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.386 .040 1.890 2.873 c.m/s
.194 .854 .755 C perv/imperv/total
15 ADD RUNOFF
.386 .422 1.890 2.873 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.386 .422 .422 2.873 c.m/s
17 COMBINE
1 Junction Node No.
.386 .422 .422 3.295 c.m/s
14 START
1 1=Zero; 2=Define
18 CONFLUENCE
1 Junction Node No.
.386 3.295 .422 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 2
*****

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4 CATCHMENT
 200.000 ID No.6 99999
 .970 Area in hectares
 80.416 Length (PERV) metres
 1.000 Gradient (%)
 10.000 Per cent Impervious
 80.416 Length (IMPERV)
 .000 %Imp. with Zero Dpth
 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
 .250 Manning "n"
 74.000 SCS Curve No or C
 .100 Ia/S Coefficient
 8.924 Initial Abstraction
 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
 .015 3.295 .422 .000 c.m/s
 .194 .858 .261 C perv/imperv/total
 35 COMMENT
 3 line(s) of comment

 FLOW D/S OF AREA A20 - OUTLET B

 15 ADD RUNOFF
 .015 3.310 .422 .000 c.m/s
 35 COMMENT
 3 line(s) of comment

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 4 CATCHMENT
 21.000 ID No.6 99999
 35.460 Area in hectares
 538.000 Length (PERV) metres
 .200 Gradient (%)
 5.000 Per cent Impervious
 538.000 Length (IMPERV)
 .000 %Imp. with Zero Dpth
 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
 .250 Manning "n"
 74.000 SCS Curve No or C
 .100 Ia/S Coefficient
 8.924 Initial Abstraction
 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
 .176 3.310 .422 .000 c.m/s
 .194 .869 .228 C perv/imperv/total
 15 ADD RUNOFF
 .176 3.432 .422 .000 c.m/s
 9 ROUTE
 .000 Conduit Length
 .000 No Conduit defined
 .000 Zero lag
 .000 Beta weighting factor
 .000 Routing timestep
 0 No. of sub-reaches
 .176 3.432 3.432 .000 c.m/s
 35 COMMENT
 3 line(s) of comment

 FLOW U/S OF FIRST AVE CULVERT

 17 COMBINE
 1 Junction Node No.
 .176 3.432 3.432 3.432 c.m/s
 14 START
 1 1=Zero; 2=Define
 35 COMMENT
 3 line(s) of comment

 PROP DEVELOPMENT SOUTH OF QUAKER, EAST OF RICE - POND P50

 4 CATCHMENT
 52.000 ID No.6 99999
 6.430 Area in hectares
 207.000 Length (PERV) metres
 1.000 Gradient (%)
 70.000 Per cent Impervious
 207.000 Length (IMPERV)
 .000 %Imp. with Zero Dpth
 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
 .250 Manning "n"
 74.000 SCS Curve No or C
 .100 Ia/S Coefficient
 8.924 Initial Abstraction
 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
 .649 .000 3.432 3.432 c.m/s
 .194 .866 .665 C perv/imperv/total
 15 ADD RUNOFF
 .649 .649 3.432 3.432 c.m/s
 9 ROUTE
 .000 Conduit Length
 .000 No Conduit defined
 .000 Zero lag
 .000 Beta weighting factor
 .000 Routing timestep
 0 No. of sub-reaches
 .649 .649 .649 3.432 c.m/s
 17 COMBINE
 2 Junction Node No.
 .649 .649 .649 .649 c.m/s
 14 START
 1 1=Zero; 2=Define
 4 CATCHMENT
 53.000 ID No.6 99999
 11.340 Area in hectares
 275.000 Length (PERV) metres
 1.000 Gradient (%)
 70.000 Per cent Impervious
 275.000 Length (IMPERV)
 .000 %Imp. with Zero Dpth
 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
 .250 Manning "n"
 74.000 SCS Curve No or C
 .100 Ia/S Coefficient
 8.924 Initial Abstraction
 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
 1.171 .000 .649 .649 c.m/s
 .194 .865 .664 C perv/imperv/total
 15 ADD RUNOFF
 1.171 1.171 .649 .649 c.m/s
 9 ROUTE
 .000 Conduit Length
 .000 No Conduit defined
 .000 Zero lag

.000 Beta weighting factor
 .000 Routing timestep
 0 No. of sub-reaches
 1.171 1.171 1.171 .649 c.m/s
 17 COMBINE
 2 Junction Node No.
 1.171 1.171 1.171 1.820 c.m/s
 18 CONFLUENCE
 2 Junction Node No.
 1.171 1.820 1.171 .000 c.m/s
 4 CATCHMENT
 54.000 ID No.6 99999
 1.200 Area in hectares
 92.000 Length (PERV) metres
 1.000 Gradient (%)
 60.000 Per cent Impervious
 92.000 Length (IMPERV)
 .000 %Imp. with Zero Dpth
 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
 .250 Manning "n"
 74.000 SCS Curve No or C
 .100 Ia/S Coefficient
 8.924 Initial Abstraction
 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
 .107 1.820 1.171 .000 c.m/s
 .194 .857 .592 C perv/imperv/total
 15 ADD RUNOFF
 .107 1.923 1.171 .000 c.m/s
 27 HYDROGRAPH DISPLAY
 5 is # of Hyeto/Hydrograph chosen
 Volume = .4892284E+04 c.m
 10 POND
 6 Depth - Discharge - Volume sets
 182.000 .000 .0
 182.800 .0190 5251.0
 183.150 .0230 7895.0
 183.500 .238 10751.0
 183.800 .396 13425.0
 184.000 1.028 15337.0
 Peak Outflow = .017 c.m/s
 Maximum Depth = 182.699 metres
 Maximum Storage = 4589. c.m
 .107 1.923 .017 .000 c.m/s
 17 COMBINE
 2 Junction Node No.
 .107 1.923 .017 .017 c.m/s
 14 START
 1 1=Zero; 2=Define
 35 COMMENT
 3 line(s) of comment

 EXISTING AREA ON QUAKER RD, EAST OF RICE RD

 4 CATCHMENT
 5.000 ID No.6 99999
 1.870 Area in hectares
 112.000 Length (PERV) metres
 1.000 Gradient (%)
 50.000 Per cent Impervious
 112.000 Length (IMPERV)
 .000 %Imp. with Zero Dpth
 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
 .250 Manning "n"
 74.000 SCS Curve No or C
 .100 Ia/S Coefficient
 8.924 Initial Abstraction
 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
 .130 .000 .017 .017 c.m/s
 .194 .851 .522 C perv/imperv/total
 15 ADD RUNOFF
 .130 .130 .017 .017 c.m/s
 9 ROUTE
 .000 Conduit Length
 .000 No Conduit defined
 .000 Zero lag
 .000 Beta weighting factor
 .000 Routing timestep
 0 No. of sub-reaches
 .130 .130 .130 .017 c.m/s
 17 COMBINE
 2 Junction Node No.
 .130 .130 .130 .136 c.m/s
 18 CONFLUENCE
 2 Junction Node No.
 .130 .136 .130 .000 c.m/s
 35 COMMENT
 3 line(s) of comment

 EXISTING AREA ON QUAKER RD, EAST OF RICE RD

 4 CATCHMENT
 6.000 ID No.6 99999
 1.920 Area in hectares
 113.000 Length (PERV) metres
 .200 Gradient (%)
 65.000 Per cent Impervious
 113.000 Length (IMPERV)
 .000 %Imp. with Zero Dpth
 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
 .250 Manning "n"
 74.000 SCS Curve No or C
 .100 Ia/S Coefficient
 8.924 Initial Abstraction
 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
 .185 .136 .130 .000 c.m/s
 .194 .867 .631 C perv/imperv/total
 15 ADD RUNOFF
 .185 .321 .130 .000 c.m/s
 35 COMMENT
 3 line(s) of comment

 FIRST AVE FROM QUAKER RD TO CITY OF WELLAND MUNICIPAL BOUND

 4 CATCHMENT
 201.000 ID No.6 99999
 2.430 Area in hectares
 127.000 Length (PERV) metres
 1.000 Gradient (%)
 65.000 Per cent Impervious
 127.000 Length (IMPERV)
 .000 %Imp. with Zero Dpth
 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat

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.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.221 .321 .130 .000 c.m/s
.194 .848 .619 C perv/imperv/total
15 ADD RUNOFF .221 .542 .130 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.221 .542 .542 .000 c.m/s
17 COMBINE
1 Junction Node No.
.221 .542 .542 3.974 c.m/s
35 COMMENT
3 line(s) of comment
*****
FLOW D/S OF FIRST AVE CULVERT - OUTLET C
*****
18 CONFLUENCE
1 Junction Node No.
.221 3.974 .542 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 3
*****
4 CATCHMENT
300.000 ID No.ó 99999
3.180 Area in hectares
146.000 Length (PERV) metres
.200 Gradient (%)
15.000 Per cent Impervious
146.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.071 3.974 .542 .000 c.m/s
.194 .859 .294 C perv/imperv/total
15 ADD RUNOFF .071 4.045 .542 .000 c.m/s
4 CATCHMENT
301.000 ID No.ó 99999
.720 Area in hectares
69.000 Length (PERV) metres
.200 Gradient (%)
10.000 Per cent Impervious
69.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.011 4.045 .542 .000 c.m/s
.194 .855 .260 C perv/imperv/total
15 ADD RUNOFF .011 4.056 .542 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.011 4.056 4.056 .000 c.m/s
17 COMBINE
1 Junction Node No.
.011 4.056 4.056 4.056 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT NORTH OF SEGMENT 3 - POND P30
*****
4 CATCHMENT
30.000 ID No.ó 99999
8.470 Area in hectares
238.000 Length (PERV) metres
.200 Gradient (%)
.100 Per cent Impervious
238.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.035 .000 4.056 4.056 c.m/s
.194 .867 .195 C perv/imperv/total
15 ADD RUNOFF .035 .035 4.056 4.056 c.m/s
4 CATCHMENT
31.000 ID No.ó 99999
10.420 Area in hectares
264.000 Length (PERV) metres
1.000 Gradient (%)
75.000 Per cent Impervious
264.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.154 .035 4.056 4.056 c.m/s
.194 .866 .698 C perv/imperv/total
15 ADD RUNOFF

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1.154 1.158 4.056 4.056 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .3477034E+04 c.m
4 CATCHMENT
32.000 ID No.ó 99999
.690 Area in hectares
68.000 Length (PERV) metres
1.000 Gradient (%)
60.000 Per cent Impervious
68.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.061 1.158 4.056 4.056 c.m/s
.194 .857 .592 C perv/imperv/total
15 ADD RUNOFF .061 1.210 4.056 4.056 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .3636135E+04 c.m
10 POND
5 Depth - Discharge - Volume sets
178.800 .000 .0
179.300 .0260 1520.0
180.100 .0440 4649.0
180.600 .414 7069.0
180.800 1.204 8137.0
Peak Outflow = .034 c.m/s
Maximum Depth = 179.642 metres
Maximum Storage = 2856. c.m
.061 1.210 .034 4.056 c.m/s
17 COMBINE
1 Junction Node No.
.061 1.210 .034 4.074 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT SOUTH OF SEGMENT 3 - POND P31
*****
4 CATCHMENT
33.000 ID No.ó 99999
12.960 Area in hectares
294.000 Length (PERV) metres
1.000 Gradient (%)
75.000 Per cent Impervious
294.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.428 .000 .034 4.074 c.m/s
.194 .863 .696 C perv/imperv/total
15 ADD RUNOFF 1.428 1.428 .034 4.074 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .3513004E+04 c.m
4 CATCHMENT
34.000 ID No.ó 99999
.660 Area in hectares
66.000 Length (PERV) metres
1.000 Gradient (%)
60.000 Per cent Impervious
66.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.059 1.428 .034 4.074 c.m/s
.194 .856 .591 C perv/imperv/total
15 ADD RUNOFF .059 1.478 .034 4.074 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .3665095E+04 c.m
10 POND
6 Depth - Discharge - Volume sets
178.300 .000 .0
178.900 .0350 1927.0
179.600 .0540 4692.0
179.800 .150 5590.0
180.000 .321 6538.0
180.300 1.922 8059.0
Peak Outflow = .043 c.m/s
Maximum Depth = 179.201 metres
Maximum Storage = 3116. c.m
.059 1.478 .043 4.074 c.m/s
17 COMBINE
1 Junction Node No.
.059 1.478 .043 4.096 c.m/s
14 START
1 1=Zero; 2=Define
18 CONFLUENCE
1 Junction Node No.
.059 4.096 .043 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 3
*****
4 CATCHMENT
302.000 ID No.ó 99999
1.610 Area in hectares
104.000 Length (PERV) metres
.200 Gradient (%)
10.000 Per cent Impervious
104.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat

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        .250      Manning "n"
74.000      SCS Curve No or C
        .100      Ia/S Coefficient
        8.924      Initial Abstraction
        1      Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
            .024      4.096      .043      .000 c.m/s
            .194      .868      .262      C perv/imperv/total
35  COMMENT
3      line(s) of comment
      *****
      FLOW U/S OF NIAGARA ST CULVERT - OUTLET D
      *****
15  ADD RUNOFF      .024      4.120      .043      .000 c.m/s
14  START
1      1=Zero; 2=Define

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35 COMMENT
3 line(s) of comment
*****
5-YEAR STORM EVENT
*****
2 STORM
1 1=Chicago;2=Huff;3=User;4=Cdn1hr;5=Historic
830.000 Coefficient a
7.300 Constant b (min)
.777 Exponent c
.450 Fraction to peak r
240.000 Duration o 240 min
45.874 mm Total depth
3 IMPERVIOUS
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.015 Manning "n"
98.000 SCS Curve No or C
.100 Ia/S Coefficient
.518 Initial Abstraction
35 COMMENT
3 line(s) of comment
*****
EXISTING RES. WEST OF SEGMENT 1
*****
4 CATCHMENT
1.000 ID No.6 99999
17.520 Area in hectares
343.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
343.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.082 .000 .000 .000 c.m/s
.236 .879 .461 C perv/imperv/total
15 ADD RUNOFF
1.082 1.082 .000 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 1
*****
4 CATCHMENT
100.000 ID No.6 99999
2.020 Area in hectares
116.000 Length (PERV) metres
.400 Gradient (%)
15.000 Per cent Impervious
116.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.055 1.082 .000 .000 c.m/s
.236 .874 .332 C perv/imperv/total
35 COMMENT
3 line(s) of comment
*****
FLOW AT FUT ROADWAY CULVERT - SEGMENT 1
*****
15 ADD RUNOFF
.055 1.137 .000 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.055 1.137 1.137 .000 c.m/s
17 COMBINE
1 Junction Node No.
.055 1.137 1.137 1.137 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT NORTH OF SEGMENT 1 - POND P10
*****
4 CATCHMENT
10.000 ID No.6 99999
4.050 Area in hectares
164.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
164.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.477 .000 1.137 1.137 c.m/s
.236 .871 .681 C perv/imperv/total
15 ADD RUNOFF
.477 .477 1.137 1.137 c.m/s
4 CATCHMENT
11.000 ID No.6 99999
1.000 Area in hectares
82.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
82.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.020 .477 1.137 1.137 c.m/s
.235 .875 .299 C perv/imperv/total

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15 ADD RUNOFF
.020 .497 1.137 1.137 c.m/s
10 POND
6 Depth - Discharge - Volume sets
184.800 .000 .0
185.750 .0210 1.0
186.000 .0230 503.0
186.250 .0260 1091.0
186.500 .0280 1765.0
186.700 1.244 2370.0
Peak Outflow = .026 c.m/s
Maximum Depth = 186.226 metres
Maximum Storage = 1035. c.m
.020 .497 .026 1.137 c.m/s
17 COMBINE
1 Junction Node No.
.020 .497 .026 1.160 c.m/s
14 START
1 1=Zero; 2=Define
18 CONFLUENCE
1 Junction Node No.
.020 1.160 .026 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 1
*****
4 CATCHMENT
101.000 ID No.6 99999
.610 Area in hectares
64.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
64.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.012 1.160 .026 .000 c.m/s
.235 .873 .299 C perv/imperv/total
15 ADD RUNOFF
.012 1.172 .026 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.012 1.172 1.172 .000 c.m/s
17 COMBINE
1 Junction Node No.
.012 1.172 1.172 1.172 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT SOUTH OF SEGMENT 1 - POND P11
*****
4 CATCHMENT
12.000 ID No.6 99999
2.680 Area in hectares
134.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
134.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.159 .000 1.172 1.172 c.m/s
.236 .866 .456 C perv/imperv/total
15 ADD RUNOFF
.159 .159 1.172 1.172 c.m/s
4 CATCHMENT
13.000 ID No.6 99999
6.980 Area in hectares
216.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
216.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.835 .159 1.172 1.172 c.m/s
.236 .882 .688 C perv/imperv/total
15 ADD RUNOFF
.835 .994 1.172 1.172 c.m/s
4 CATCHMENT
14.000 ID No.6 99999
.670 Area in hectares
67.000 Length (PERV) metres
1.000 Gradient (%)
60.000 Per cent Impervious
67.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.072 .994 1.172 1.172 c.m/s
.235 .873 .618 C perv/imperv/total
15 ADD RUNOFF
.072 1.052 1.172 1.172 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .2954374E+04 c.m
10 POND
5 Depth - Discharge - Volume sets

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184.800      .000      .0
185.300      .0140     1142.0
186.100      .0240     3519.0
186.500      .287      4978.0
186.800      1.922     6222.0
Peak Outflow =      .020 c.m/s
Maximum Depth = 185.805 metres
Maximum Storage = 2641. c.m
              .072      1.052      .020      1.172 c.m/s
35  COMMENT
3  Line(s) of comment
*****
FLOW U/S OF RICE RD CULVERT - OUTLET A1
*****
17  COMBINE
1  Junction Node No.
   .072      1.052      .020      1.185 c.m/s
14  START
1  1=Zero; 2=Define
35  COMMENT
3  Line(s) of comment
*****
PROP DEVELOPMENT SOUTH OF QUAKER RD & WEST OF RICE RD. - PON
*****
4  CATCHMENT
40.000 ID No.6 99999
8.210 Area in hectares
234.000 Length (PERV) metres
1.000 Gradient (%)
25.000 Per cent Impervious
234.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.361 .000 .020 1.185 c.m/s
.236 .884 .398 C perv/imperv/total
15 ADD RUNOFF
.361 .361 .020 1.185 c.m/s
4 CATCHMENT
41.200 ID No.6 99999
.390 Area in hectares
51.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
51.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.026 .361 .020 1.185 c.m/s
.235 .875 .459 C perv/imperv/total
15 ADD RUNOFF
.026 .381 .020 1.185 c.m/s
4 CATCHMENT
41.000 ID No.6 99999
8.040 Area in hectares
226.000 Length (PERV) metres
1.000 Gradient (%)
226.000 Per cent Impervious
226.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.081 .381 .020 1.185 c.m/s
.236 .884 .236 C perv/imperv/total
15 ADD RUNOFF
.081 .398 .020 1.185 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.081 .398 .398 1.185 c.m/s
17 COMBINE
3 Junction Node No.
.081 .398 .398 .398 c.m/s
14 START
1 1=Zero; 2=Define
4 CATCHMENT
42.100 ID No.6 99999
.320 Area in hectares
46.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
46.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.022 .000 .398 .398 c.m/s
.236 .875 .459 C perv/imperv/total
15 ADD RUNOFF
.022 .022 .398 .398 c.m/s
4 CATCHMENT
43.000 ID No.6 99999
4.470 Area in hectares
173.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
173.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.582 .000 .053 .053 c.m/s
.236 .885 .463 C perv/imperv/total
15 ADD RUNOFF
.582 .582 .053 .053 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.529 .022 .398 .398 c.m/s
.236 .872 .681 C perv/imperv/total
15 ADD RUNOFF
.529 .545 .398 .398 c.m/s
4 CATCHMENT
44.000 ID No.6 99999
.330 Area in hectares
47.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
47.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.022 .545 .398 .398 c.m/s
.236 .875 .460 C perv/imperv/total
15 ADD RUNOFF
.022 .563 .398 .398 c.m/s
4 CATCHMENT
45.000 ID No.6 99999
6.400 Area in hectares
207.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
207.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.765 .563 .398 .398 c.m/s
.236 .880 .687 C perv/imperv/total
15 ADD RUNOFF
.765 1.327 .398 .398 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.765 1.327 1.327 .398 c.m/s
17 COMBINE
3 Junction Node No.
.765 1.327 1.327 1.725 c.m/s
14 START
1 1=Zero; 2=Define
18 CONFLUENCE
3 Junction Node No.
.765 1.725 1.327 .000 c.m/s
4 CATCHMENT
46.000 ID No.6 99999
.600 Area in hectares
63.000 Length (PERV) metres
1.000 Gradient (%)
60.000 Per cent Impervious
63.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.066 1.725 1.327 .000 c.m/s
.236 .873 .618 C perv/imperv/total
15 ADD RUNOFF
.066 1.777 1.327 .000 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .6174260E+04 c.m
10 POND
6 Depth - Discharge - Volume sets
187.000 .000 .0
187.000 .0410 3045.0
188.300 .0540 5273.0
188.500 .150 6237.0
188.800 .257 7764.0
189.000 .800 8956.0
Peak Outflow = .053 c.m/s
Maximum Depth = 188.273 metres
Maximum Storage = 5153. c.m
.066 1.777 .053 .000 c.m/s
17 COMBINE
2 Junction Node No.
.066 1.777 .053 .053 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 Line(s) of comment
*****
EXISTING AREA ON QUAKER RD, WEST OF RICE RD
*****
4 CATCHMENT
2.000 ID No.6 99999
9.580 Area in hectares
245.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
245.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.582 .000 .053 .053 c.m/s
.236 .885 .463 C perv/imperv/total
15 ADD RUNOFF
.582 .582 .053 .053 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag

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4 CATCHMENT
200.000 ID No.6 99999 .000 Beta weighting factor
.970 Area in hectares .000 Routing timestep
80.416 Length (PERV) metres 0 No. of sub-reaches
1.000 Gradient (%) 17 COMBINE 1.397 1.397 1.397 .768 c.m/s
10.000 Per cent Impervious 2 Junction Node No. 1.397 1.397 1.397 2.165 c.m/s
80.416 Length (IMPERV) 18 CONFLUENCE 2 Junction Node No. 1.397 2.165 1.397 .000 c.m/s
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.019 3.943 .494 .000 c.m/s
.236 .875 .299 C perv/imperv/total
35 COMMENT
3 line(s) of comment
*****
FLOW D/S OF AREA A20 - OUTLET B
*****
15 ADD RUNOFF .019 3.962 .494 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
EX RES. AND FUT DEVELOPMENT LANDS BY OTHERS WEST OF FIRST AV
*****
4 CATCHMENT
21.000 ID No.6 99999
35.460 Area in hectares
538.000 Length (PERV) metres
.200 Gradient (%)
5.000 Per cent Impervious
538.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.223 3.962 .494 .000 c.m/s
.236 .884 .268 C perv/imperv/total
15 ADD RUNOFF .223 4.132 .494 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.223 4.132 4.132 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
FLOW U/S OF FIRST AVE CULVERT
*****
17 COMBINE
1 Junction Node No. .223 4.132 4.132 4.132 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT SOUTH OF QUAKER, EAST OF RICE - POND P50
*****
4 CATCHMENT
52.000 ID No.6 99999
6.430 Area in hectares
207.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
207.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.768 .000 4.132 4.132 c.m/s
.236 .880 .687 C perv/imperv/total
15 ADD RUNOFF .768 .768 4.132 4.132 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.768 .768 .768 4.132 c.m/s
17 COMBINE
2 Junction Node No. .768 .768 .768 .768 c.m/s
14 START
1 1=Zero; 2=Define
4 CATCHMENT
53.000 ID No.6 99999
11.340 Area in hectares
275.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
275.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.397 .000 .768 .768 c.m/s
.236 .886 .691 C perv/imperv/total
15 ADD RUNOFF 1.397 1.397 .768 .768 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag

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.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
1.397 1.397 1.397 .768 c.m/s
2 Junction Node No. 1.397 1.397 1.397 2.165 c.m/s
2 Junction Node No. 1.397 2.165 1.397 .000 c.m/s
4 CATCHMENT
54.000 ID No.6 99999
1.200 Area in hectares
92.000 Length (PERV) metres
1.000 Gradient (%)
60.000 Per cent Impervious
92.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.131 2.165 1.397 .000 c.m/s
.236 .876 .620 C perv/imperv/total
15 ADD RUNOFF .131 2.285 1.397 .000 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .5982220E+04 c.m
10 POND
6 Depth - Discharge - Volume sets
182.000 .000 .0
182.800 .0190 5251.0
183.150 .0230 7895.0
183.500 .238 10751.0
183.800 .396 13425.0
184.000 1.028 15337.0
Peak Outflow = .020 c.m/s
Maximum Depth = 182.848 metres
Maximum Storage = 5617. c.m
.131 2.285 .020 .000 c.m/s
17 COMBINE
2 Junction Node No. .131 2.285 .020 .020 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
EXISTING AREA ON QUAKER RD, EAST OF RICE RD
*****
4 CATCHMENT
5.000 ID No.6 99999
1.870 Area in hectares
112.000 Length (PERV) metres
1.000 Gradient (%)
50.000 Per cent Impervious
112.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.153 .000 .020 .020 c.m/s
.236 .873 .554 C perv/imperv/total
15 ADD RUNOFF .153 .153 .020 .020 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.153 .153 .153 .020 c.m/s
17 COMBINE
2 Junction Node No. .153 .153 .153 .160 c.m/s
18 CONFLUENCE
2 Junction Node No. .153 .160 .153 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
EXISTING AREA ON QUAKER RD, EAST OF RICE RD
*****
4 CATCHMENT
6.000 ID No.6 99999
1.920 Area in hectares
113.000 Length (PERV) metres
.200 Gradient (%)
65.000 Per cent Impervious
113.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.214 .160 .153 .000 c.m/s
.236 .886 .658 C perv/imperv/total
15 ADD RUNOFF .214 .374 .153 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
FIRST AVE FROM QUAKER RD TO CITY OF WELLAND MUNICIPAL BOUND
*****
4 CATCHMENT
201.000 ID No.6 99999
2.430 Area in hectares
127.000 Length (PERV) metres
1.000 Gradient (%)
65.000 Per cent Impervious
127.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat

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.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.259 .374 .153 .000 c.m/s
.236 .868 .647 C perv/imperv/total
15 ADD RUNOFF .259 .632 .153 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.259 .632 .632 .000 c.m/s
17 COMBINE
1 Junction Node No.
.259 .632 .632 4.764 c.m/s
35 COMMENT
3 line(s) of comment
*****
FLOW D/S OF FIRST AVE CULVERT - OUTLET C
*****
18 CONFLUENCE
1 Junction Node No.
.259 4.764 .632 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 3
*****
4 CATCHMENT
300.000 ID No.ó 99999
3.180 Area in hectares
146.000 Length (PERV) metres
.200 Gradient (%)
15.000 Per cent Impervious
146.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.087 4.764 .632 .000 c.m/s
.236 .880 .332 C perv/imperv/total
15 ADD RUNOFF .087 4.851 .632 .000 c.m/s
4 CATCHMENT
301.000 ID No.ó 99999
.720 Area in hectares
69.000 Length (PERV) metres
.200 Gradient (%)
10.000 Per cent Impervious
69.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.014 4.851 .632 .000 c.m/s
.236 .869 .299 C perv/imperv/total
15 ADD RUNOFF .014 4.865 .632 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.014 4.865 4.865 .000 c.m/s
17 COMBINE
1 Junction Node No.
.014 4.865 4.865 4.865 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT NORTH OF SEGMENT 3 - POND P30
*****
4 CATCHMENT
30.000 ID No.ó 99999
8.470 Area in hectares
238.000 Length (PERV) metres
.200 Gradient (%)
.100 Per cent Impervious
238.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.057 .000 4.865 4.865 c.m/s
.236 .885 .236 C perv/imperv/total
15 ADD RUNOFF .057 .057 4.865 4.865 c.m/s
4 CATCHMENT
31.000 ID No.ó 99999
10.420 Area in hectares
264.000 Length (PERV) metres
1.000 Gradient (%)
75.000 Per cent Impervious
264.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.333 .057 4.865 4.865 c.m/s
.236 .886 .723 C perv/imperv/total
15 ADD RUNOFF

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1.333 1.341 4.865 4.865 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .4376407E+04 c.m
4 CATCHMENT
32.000 ID No.ó 99999
.690 Area in hectares
68.000 Length (PERV) metres
1.000 Gradient (%)
60.000 Per cent Impervious
68.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.074 1.341 4.865 4.865 c.m/s
.236 .873 .618 C perv/imperv/total
15 ADD RUNOFF .074 1.401 4.865 4.865 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .4571937E+04 c.m
10 POND
5 Depth - Discharge - Volume sets
178.800 .000 .0
179.300 .0260 1520.0
180.100 .0440 4649.0
180.600 .414 7069.0
180.800 1.204 8137.0
Peak Outflow = .038 c.m/s
Maximum Depth = 179.851 metres
Maximum Storage = 3675. c.m
.074 1.401 .038 4.865 c.m/s
17 COMBINE
1 Junction Node No.
.074 1.401 .038 4.888 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT SOUTH OF SEGMENT 3 - POND P31
*****
4 CATCHMENT
33.000 ID No.ó 99999
12.960 Area in hectares
294.000 Length (PERV) metres
1.000 Gradient (%)
75.000 Per cent Impervious
294.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.708 .000 .038 4.888 c.m/s
.236 .884 .722 C perv/imperv/total
15 ADD RUNOFF 1.708 1.708 .038 4.888 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .4291300E+04 c.m
4 CATCHMENT
34.000 ID No.ó 99999
.660 Area in hectares
66.000 Length (PERV) metres
1.000 Gradient (%)
60.000 Per cent Impervious
66.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.072 1.708 .038 4.888 c.m/s
.235 .873 .618 C perv/imperv/total
15 ADD RUNOFF .072 1.765 .038 4.888 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .4478340E+04 c.m
10 POND
6 Depth - Discharge - Volume sets
178.300 .000 .0
178.900 .0350 1927.0
179.600 .0540 4692.0
179.800 .150 5590.0
180.000 .321 6538.0
180.300 1.922 8059.0
Peak Outflow = .048 c.m/s
Maximum Depth = 179.388 metres
Maximum Storage = 3856. c.m
.072 1.765 .048 4.888 c.m/s
17 COMBINE
1 Junction Node No.
.072 1.765 .048 4.916 c.m/s
14 START
1 1=Zero; 2=Define
18 CONFLUENCE
1 Junction Node No.
.072 4.916 .048 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 3
*****
4 CATCHMENT
302.000 ID No.ó 99999
1.610 Area in hectares
104.000 Length (PERV) metres
.200 Gradient (%)
10.000 Per cent Impervious
104.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat

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        .250      Manning "n"
74.000      SCS Curve No or C
        .100      Ia/S Coefficient
        8.924      Initial Abstraction
        1         Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
            .030      4.916      .048      .000 c.m/s
            .236      .884      .301      C perv/imperv/total
35  COMMENT
3    line(s) of comment
*****
FLOW U/S OF NIAGARA ST CULVERT - OUTLET D
*****
15  ADD RUNOFF      .030      4.946      .048      .000 c.m/s
14  START
1    1=Zero; 2=Define

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35 COMMENT
3 line(s) of comment
*****
10-YEAR STORM EVENT
*****
2 STORM
1 1=Chicago;2=Huff;3=User;4=Cdn1hr;5=Historic
860.000 Coefficient a
6.500 Constant b (min)
.763 Exponent c
.450 Fraction to peak r
240.000 Duration o 240 min
51.471 mm Total depth
3 IMPERVIOUS
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.015 Manning "n"
98.000 SCS Curve No or C
.100 Ia/S Coefficient
.518 Initial Abstraction
35 COMMENT
3 line(s) of comment
*****
EXISTING RES. WEST OF SEGMENT 1
*****
4 CATCHMENT
1.000 ID No.6 99999
17.520 Area in hectares
343.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
343.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.227 .000 .000 .000 c.m/s
.267 .892 .486 C perv/imperv/total
15 ADD RUNOFF
1.227 1.227 .000 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 1
*****
4 CATCHMENT
100.000 ID No.6 99999
2.020 Area in hectares
116.000 Length (PERV) metres
.400 Gradient (%)
15.000 Per cent Impervious
116.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.063 1.227 .000 .000 c.m/s
.267 .883 .359 C perv/imperv/total
35 COMMENT
3 line(s) of comment
*****
FLOW AT FUT ROADWAY CULVERT - SEGMENT 1
*****
15 ADD RUNOFF
.063 1.290 .000 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.063 1.290 1.290 .000 c.m/s
17 COMBINE
1 Junction Node No.
.063 1.290 1.290 1.290 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT NORTH OF SEGMENT 1 - POND P10
*****
4 CATCHMENT
10.000 ID No.6 99999
4.050 Area in hectares
164.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
164.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.531 .000 1.290 1.290 c.m/s
.267 .879 .695 C perv/imperv/total
15 ADD RUNOFF
.531 .531 1.290 1.290 c.m/s
4 CATCHMENT
11.000 ID No.6 99999
1.000 Area in hectares
82.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
82.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.024 .531 1.290 1.290 c.m/s
.267 .886 .329 C perv/imperv/total

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15 ADD RUNOFF
.024 .555 1.290 1.290 c.m/s
10 POND
6 Depth - Discharge - Volume sets
184.800 .000 .0
185.750 .0210 1.0
186.000 .0230 503.0
186.250 .0260 1091.0
186.500 .0280 1765.0
186.700 1.244 2370.0
Peak Outflow = .026 c.m/s
Maximum Depth = 186.301 metres
Maximum Storage = 1229. c.m
.024 .555 .026 1.290 c.m/s
17 COMBINE
1 Junction Node No.
.024 .555 .026 1.313 c.m/s
14 START
1 1=Zero; 2=Define
18 CONFLUENCE
1 Junction Node No.
.024 1.313 .026 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 1
*****
4 CATCHMENT
101.000 ID No.6 99999
.610 Area in hectares
64.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
64.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.016 1.313 .026 .000 c.m/s
.266 .884 .328 C perv/imperv/total
15 ADD RUNOFF
.016 1.329 .026 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.016 1.329 1.329 .000 c.m/s
17 COMBINE
1 Junction Node No.
.016 1.329 1.329 1.329 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT SOUTH OF SEGMENT 1 - POND P11
*****
4 CATCHMENT
12.000 ID No.6 99999
2.680 Area in hectares
134.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
134.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.178 .000 1.329 1.329 c.m/s
.267 .880 .481 C perv/imperv/total
15 ADD RUNOFF
.178 .178 1.329 1.329 c.m/s
4 CATCHMENT
13.000 ID No.6 99999
6.980 Area in hectares
216.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
216.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.933 .178 1.329 1.329 c.m/s
.267 .890 .703 C perv/imperv/total
15 ADD RUNOFF
.933 1.112 1.329 1.329 c.m/s
4 CATCHMENT
14.000 ID No.6 99999
.670 Area in hectares
67.000 Length (PERV) metres
1.000 Gradient (%)
60.000 Per cent Impervious
67.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.083 1.112 1.329 1.329 c.m/s
.267 .884 .637 C perv/imperv/total
15 ADD RUNOFF
.083 1.177 1.329 1.329 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .3408792E+04 c.m
10 POND
5 Depth - Discharge - Volume sets

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184.800      .000      .0
185.300      .0140     1142.0
186.100      .0240     3519.0
186.500      .287      4978.0
186.800      1.922     6222.0
Peak Outflow =      .022 c.m/s
Maximum Depth = 185.947 metres
Maximum Storage = 3066. c.m
      .083      1.177      .022      1.329 c.m/s
35  COMMENT
3  Line(s) of comment
*****
FLOW U/S OF RICE RD CULVERT - OUTLET A1
*****
17  COMBINE
1  Junction Node No.
      .083      1.177      .022      1.344 c.m/s
14  START
1  1=Zero; 2=Define
35  COMMENT
3  Line(s) of comment
*****
PROP DEVELOPMENT SOUTH OF QUAKER RD & WEST OF RICE RD. - PON
*****
4  CATCHMENT
40.000 ID No.6 99999
8.210 Area in hectares
234.000 Length (PERV) metres
1.000 Gradient (%)
25.000 Per cent Impervious
234.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.408 .000 .022 1.344 c.m/s
.267 .894 .423 C perv/imperv/total
15 ADD RUNOFF
.408 .408 .022 1.344 c.m/s
4 CATCHMENT
41.200 ID No.6 99999
.390 Area in hectares
51.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
51.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.030 .408 .022 1.344 c.m/s
.267 .886 .483 C perv/imperv/total
15 ADD RUNOFF
.030 .432 .022 1.344 c.m/s
4 CATCHMENT
41.000 ID No.6 99999
8.040 Area in hectares
226.000 Length (PERV) metres
1.000 Gradient (%)
226.000 Per cent Impervious
226.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.110 .432 .022 1.344 c.m/s
.267 .892 .267 C perv/imperv/total
15 ADD RUNOFF
.110 .458 .022 1.344 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.110 .458 .458 1.344 c.m/s
17 COMBINE
3 Junction Node No.
.110 .458 .458 .458 c.m/s
14 START
1 1=Zero; 2=Define
4 CATCHMENT
42.100 ID No.6 99999
.320 Area in hectares
46.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
46.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.025 .000 .458 .458 c.m/s
.266 .886 .483 C perv/imperv/total
15 ADD RUNOFF
.025 .025 .458 .458 c.m/s
4 CATCHMENT
43.000 ID No.6 99999
4.470 Area in hectares
173.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
173.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.656 .000 .114 .114 c.m/s
.267 .895 .487 C perv/imperv/total
15 ADD RUNOFF
.656 .656 .114 .114 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.589 .025 .458 .458 c.m/s
.267 .881 .697 C perv/imperv/total
15 ADD RUNOFF
.589 .608 .458 .458 c.m/s
4 CATCHMENT
44.000 ID No.6 99999
.330 Area in hectares
47.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
47.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.026 .608 .458 .458 c.m/s
.266 .885 .483 C perv/imperv/total
15 ADD RUNOFF
.026 .628 .458 .458 c.m/s
4 CATCHMENT
45.000 ID No.6 99999
6.400 Area in hectares
207.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
207.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.854 .628 .458 .458 c.m/s
.267 .887 .701 C perv/imperv/total
15 ADD RUNOFF
.854 1.482 .458 .458 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.854 1.482 1.482 .458 c.m/s
17 COMBINE
3 Junction Node No.
.854 1.482 1.482 1.940 c.m/s
14 START
1 1=Zero; 2=Define
18 CONFLUENCE
3 Junction Node No.
.854 1.940 1.482 .000 c.m/s
4 CATCHMENT
46.000 ID No.6 99999
.600 Area in hectares
63.000 Length (PERV) metres
1.000 Gradient (%)
60.000 Per cent Impervious
63.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.075 1.940 1.482 .000 c.m/s
.266 .885 .637 C perv/imperv/total
15 ADD RUNOFF
.075 1.998 1.482 .000 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .7263024E+04 c.m
10 POND
6 Depth - Discharge - Volume sets
187.000 .000 .0
187.000 .0410 3045.0
188.300 .0540 5273.0
188.500 .150 6237.0
188.800 .257 7764.0
189.000 .800 8956.0
Peak Outflow = .114 c.m/s
Maximum Depth = 188.425 metres
Maximum Storage = 5874. c.m
.075 1.998 .114 .000 c.m/s
17 COMBINE
2 Junction Node No.
.075 1.998 .114 .114 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 Line(s) of comment
*****
EXISTING AREA ON QUAKER RD, WEST OF RICE RD
*****
4 CATCHMENT
2.000 ID No.6 99999
9.500 Area in hectares
245.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
245.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.656 .000 .114 .114 c.m/s
.267 .895 .487 C perv/imperv/total
15 ADD RUNOFF
.656 .656 .114 .114 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag

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.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.656 .656 .656 .114 c.m/s
17 COMBINE
2 Junction Node No.
.656 .656 .656 .685 c.m/s
14 START
1 1=Zero; 2=Define
18 CONFLUENCE
2 Junction Node No.
.656 .685 .656 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
EXISTING AREA ON QUAKER RD, WEST OF RICE RD
*****
4 CATCHMENT
3.000 ID No.6 99999
5.680 Area in hectares
195.000 Length (PERV) metres
1.000 Gradient (%)
40.000 Per cent Impervious
195.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.440 .685 .656 .000 c.m/s
.267 .885 .514 C perv/imperv/total
15 ADD RUNOFF
.440 1.125 .656 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.440 1.125 1.125 .000 c.m/s
17 COMBINE
2 Junction Node No.
.440 1.125 1.125 1.125 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT SOUTH OF QUAKER RD, EAST OF RICE RD
*****
4 CATCHMENT
50.000 ID No.6 99999
3.420 Area in hectares
151.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
151.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.077 .000 1.125 1.125 c.m/s
.267 .875 .328 C perv/imperv/total
15 ADD RUNOFF
.077 .077 1.125 1.125 c.m/s
4 CATCHMENT
51.000 ID No.6 99999
1.980 Area in hectares
115.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
115.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.046 .077 1.125 1.125 c.m/s
.267 .885 .328 C perv/imperv/total
15 ADD RUNOFF
.046 .123 1.125 1.125 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.046 .123 .123 1.125 c.m/s
17 COMBINE
2 Junction Node No.
.046 .123 .123 1.248 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
EXISTING AREA WEST OF RICE RD AND SOUTH OF QUAKER ROAD
*****
4 CATCHMENT
4.000 ID No.6 99999
13.940 Area in hectares
305.000 Length (PERV) metres
1.000 Gradient (%)
40.000 Per cent Impervious
305.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.115 .000 .123 1.248 c.m/s

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.267 .896 .518 C perv/imperv/total
15 ADD RUNOFF
1.115 1.115 .123 1.248 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
1.115 1.115 1.115 1.248 c.m/s
17 COMBINE
2 Junction Node No.
1.115 1.115 1.115 2.363 c.m/s
14 START
1 1=Zero; 2=Define
18 CONFLUENCE
2 Junction Node No.
1.115 2.363 1.115 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
RICE ROAD FROM QUAKER RD TO CITY OF WELLAND MUNICIPAL BOUNDARY
*****
4 CATCHMENT
501.000 ID No.6 99999
1.570 Area in hectares
102.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
102.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.209 2.363 1.115 .000 c.m/s
.267 .886 .700 C perv/imperv/total
15 ADD RUNOFF
.209 2.555 1.115 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.209 2.555 2.555 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
FLOW D/S OF RICE RD CULVERT - OUTLET A2
*****
17 COMBINE
1 Junction Node No.
.209 2.555 2.555 3.899 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT SOUTH OF QUAKER RD - QUALITY CONTROL ONLY
*****
4 CATCHMENT
20.100 ID No.6 99999
.780 Area in hectares
72.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
72.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.057 .000 2.555 3.899 c.m/s
.267 .884 .483 C perv/imperv/total
15 ADD RUNOFF
.057 .057 2.555 3.899 c.m/s
4 CATCHMENT
20.000 ID No.6 99999
3.210 Area in hectares
146.000 Length (PERV) metres
1.000 Gradient (%)
85.000 Per cent Impervious
146.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.500 .057 2.555 3.899 c.m/s
.267 .877 .785 C perv/imperv/total
15 ADD RUNOFF
.500 .549 2.555 3.899 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.500 .549 .549 3.899 c.m/s
17 COMBINE
1 Junction Node No.
.500 .549 .549 4.448 c.m/s
14 START
1 1=Zero; 2=Define
18 CONFLUENCE
1 Junction Node No.
.500 4.448 .549 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 2
*****

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4 CATCHMENT
200.000 ID No.6 99999 .000 Beta weighting factor
.970 Area in hectares .000 Routing timestep
80.416 Length (PERV) metres 0 No. of sub-reaches
1.000 Gradient (%) 1.523 1.523 1.523 .858 c.m/s
10.000 Per cent Impervious 17 COMBINE
80.416 Length (IMPERV) 2 Junction Node No.
.000 %Imp. with Zero Dpth 1.523 1.523 1.523 2.381 c.m/s
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 18 CONFLUENCE
.250 Manning "n" 2 Junction Node No.
74.000 SCS Curve No or C 1.523 2.381 1.523 .000 c.m/s
.100 Ia/S Coefficient 4 CATCHMENT
8.924 Initial Abstraction 54.000 ID No.6 99999
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1.200 Area in hectares
.024 4.448 .549 .000 c.m/s 92.000 Length (PERV) metres
.267 .886 .328 C perv/imperv/total 1.000 Gradient (%)
60.000 Per cent Impervious 92.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.149 2.381 1.523 .000 c.m/s
.267 .887 .639 C perv/imperv/total
15 ADD RUNOFF .149 2.514 1.523 .000 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
10 Volume = .6870401E+04 c.m
POND
6 Depth - Discharge - Volume sets
182.000 .000 .0
182.800 .0190 5251.0
183.150 .0230 7895.0
183.500 .238 10751.0
183.800 .396 13425.0
184.000 1.028 15337.0
Peak Outflow = .021 c.m/s
Maximum Depth = 182.962 metres
Maximum Storage = 6474. c.m
.149 2.514 .021 .000 c.m/s
17 COMBINE
2 Junction Node No.
.149 2.514 .021 .021 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
EXISTING AREA ON QUAKER RD, EAST OF RICE RD
*****
4 CATCHMENT
5.000 ID No.6 99999
1.870 Area in hectares
112.000 Length (PERV) metres
1.000 Gradient (%)
50.000 Per cent Impervious
112.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.175 .000 .021 .021 c.m/s
.267 .885 .576 C perv/imperv/total
15 ADD RUNOFF .175 .175 .021 .021 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.175 .175 .175 .021 c.m/s
17 COMBINE
2 Junction Node No.
.175 .175 .175 .180 c.m/s
18 CONFLUENCE
2 Junction Node No.
.175 .180 .175 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
EXISTING AREA ON QUAKER RD, EAST OF RICE RD
*****
4 CATCHMENT
6.000 ID No.6 99999
1.920 Area in hectares
113.000 Length (PERV) metres
.200 Gradient (%)
65.000 Per cent Impervious
113.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.240 .180 .175 .000 c.m/s
.267 .896 .676 C perv/imperv/total
15 ADD RUNOFF .240 .418 .175 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
FIRST AVE FROM QUAKER RD TO CITY OF WELLAND MUNICIPAL BOUND
*****
4 CATCHMENT
201.000 ID No.6 99999
2.430 Area in hectares
127.000 Length (PERV) metres
1.000 Gradient (%)
65.000 Per cent Impervious
127.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat

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.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.287 .418 .175 .000 c.m/s
.267 .882 .667 C perv/imperv/total
15 ADD RUNOFF .287 .705 .175 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
17 COMBINE .287 .705 .705 .000 c.m/s
1 Junction Node No.
.287 .705 .705 5.388 c.m/s
35 COMMENT
3 line(s) of comment
*****
FLOW D/S OF FIRST AVE CULVERT - OUTLET C
*****
18 CONFLUENCE
1 Junction Node No.
.287 5.388 .705 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 3
*****
4 CATCHMENT
300.000 ID No.ó 99999
3.180 Area in hectares
146.000 Length (PERV) metres
.200 Gradient (%)
15.000 Per cent Impervious
146.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.099 5.388 .705 .000 c.m/s
.267 .894 .361 C perv/imperv/total
15 ADD RUNOFF .099 5.487 .705 .000 c.m/s
4 CATCHMENT
301.000 ID No.ó 99999
.720 Area in hectares
69.000 Length (PERV) metres
.200 Gradient (%)
10.000 Per cent Impervious
69.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.016 5.487 .705 .000 c.m/s
.267 .876 .328 C perv/imperv/total
15 ADD RUNOFF .016 5.503 .705 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
17 COMBINE .016 5.503 5.503 .000 c.m/s
1 Junction Node No.
.016 5.503 5.503 5.503 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT NORTH OF SEGMENT 3 - POND P30
*****
4 CATCHMENT
30.000 ID No.ó 99999
8.470 Area in hectares
238.000 Length (PERV) metres
.200 Gradient (%)
.100 Per cent Impervious
238.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.077 .000 5.503 5.503 c.m/s
.267 .896 .267 C perv/imperv/total
15 ADD RUNOFF .077 .077 5.503 5.503 c.m/s
4 CATCHMENT
31.000 ID No.ó 99999
10.420 Area in hectares
264.000 Length (PERV) metres
1.000 Gradient (%)
75.000 Per cent Impervious
264.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.498 .077 5.503 5.503 c.m/s
.267 .897 .739 C perv/imperv/total
15 ADD RUNOFF

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1.498 1.509 5.503 5.503 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .5129979E+04 c.m
4 CATCHMENT
32.000 ID No.ó 99999
.690 Area in hectares
68.000 Length (PERV) metres
1.000 Gradient (%)
60.000 Per cent Impervious
68.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.085 1.509 5.503 5.503 c.m/s
.267 .884 .637 C perv/imperv/total
15 ADD RUNOFF .085 1.576 5.503 5.503 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .5356216E+04 c.m
10 POND
5 Depth - Discharge - Volume sets
178.800 .000 .0
179.300 .0260 1520.0
180.100 .0440 4649.0
180.600 .414 7069.0
180.800 1.204 8137.0
Peak Outflow = .042 c.m/s
Maximum Depth = 180.027 metres
Maximum Storage = 4365. c.m
.085 1.576 .042 5.503 c.m/s
17 COMBINE
1 Junction Node No.
.085 1.576 .042 5.529 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT SOUTH OF SEGMENT 3 - POND P31
*****
4 CATCHMENT
33.000 ID No.ó 99999
12.960 Area in hectares
294.000 Length (PERV) metres
1.000 Gradient (%)
75.000 Per cent Impervious
294.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.919 .000 .042 5.529 c.m/s
.267 .897 .739 C perv/imperv/total
15 ADD RUNOFF 1.919 1.919 .042 5.529 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .4931703E+04 c.m
4 CATCHMENT
34.000 ID No.ó 99999
.660 Area in hectares
66.000 Length (PERV) metres
1.000 Gradient (%)
60.000 Per cent Impervious
66.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.082 1.919 .042 5.529 c.m/s
.267 .884 .637 C perv/imperv/total
15 ADD RUNOFF .082 1.983 .042 5.529 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .5148076E+04 c.m
10 POND
6 Depth - Discharge - Volume sets
178.300 .000 .0
178.900 .0350 1927.0
179.600 .0540 4692.0
179.800 .150 5590.0
180.000 .321 6538.0
180.300 1.922 8059.0
Peak Outflow = .052 c.m/s
Maximum Depth = 179.543 metres
Maximum Storage = 4465. c.m
.082 1.983 .052 5.529 c.m/s
17 COMBINE
1 Junction Node No.
.082 1.983 .052 5.563 c.m/s
14 START
1 1=Zero; 2=Define
18 CONFLUENCE
1 Junction Node No.
.082 5.563 .052 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 3
*****
4 CATCHMENT
302.000 ID No.ó 99999
1.610 Area in hectares
104.000 Length (PERV) metres
.200 Gradient (%)
10.000 Per cent Impervious
104.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat

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        .250      Manning "n"
74.000      SCS Curve No or C
        .100      Ia/S Coefficient
        8.924      Initial Abstraction
        1         Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
            .035      5.563      .052      .000 c.m/s
            .267      .893      .329      C perv/imperv/total
35  COMMENT
3    line(s) of comment
*****
FLOW U/S OF NIAGARA ST CULVERT - OUTLET D
*****
15  ADD RUNOFF
            .035      5.598      .052      .000 c.m/s
14  START
1    1=Zero; 2=Define

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35 COMMENT
3 line(s) of comment
*****
25-YEAR STORM EVENT
*****
2 STORM
1 1=Chicago;2=Huff;3=User;4=Cdn1hr;5=Historic
900.000 Coefficient a
5.200 Constant b (min)
.745 Exponent c
.450 Fraction to peak r
240.000 Duration o 240 min
59.713 mm Total depth
3 IMPERVIOUS
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.015 Manning "n"
98.000 SCS Curve No or C
.100 Ia/S Coefficient
.518 Initial Abstraction
35 COMMENT
3 line(s) of comment
*****
EXISTING RES. WEST OF SEGMENT 1
*****
4 CATCHMENT
1.000 ID No.ó 99999
17.520 Area in hectares
343.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
343.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.445 .000 .000 .000 c.m/s
.308 .909 .518 C perv/imperv/total
15 ADD RUNOFF
1.445 1.445 .000 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 1
*****
4 CATCHMENT
100.000 ID No.ó 99999
2.020 Area in hectares
116.000 Length (PERV) metres
.400 Gradient (%)
15.000 Per cent Impervious
116.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.077 1.445 .000 .000 c.m/s
.308 .891 .396 C perv/imperv/total
35 COMMENT
3 line(s) of comment
*****
FLOW AT FUT ROADWAY CULVERT - SEGMENT 1
*****
15 ADD RUNOFF
.077 1.522 .000 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.077 1.522 1.522 .000 c.m/s
17 COMBINE
1 Junction Node No.
.077 1.522 1.522 1.522 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT NORTH OF SEGMENT 1 - POND P10
*****
4 CATCHMENT
10.000 ID No.ó 99999
4.050 Area in hectares
164.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
164.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.612 .000 1.522 1.522 c.m/s
.308 .889 .715 C perv/imperv/total
15 ADD RUNOFF
.612 .612 1.522 1.522 c.m/s
4 CATCHMENT
11.000 ID No.ó 99999
1.000 Area in hectares
82.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
82.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.033 .612 1.522 1.522 c.m/s
.308 .898 .367 C perv/imperv/total

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15 ADD RUNOFF
.033 .644 1.522 1.522 c.m/s
10 POND
6 Depth - Discharge - Volume sets
184.800 .000 .0
185.750 .0210 1.0
186.000 .0230 503.0
186.250 .0260 1091.0
186.500 .0280 1765.0
186.700 1.244 2370.0
Peak Outflow = .027 c.m/s
Maximum Depth = 186.413 metres
Maximum Storage = 1531. c.m
.033 .644 .027 1.522 c.m/s
17 COMBINE
1 Junction Node No.
.033 .644 .027 1.546 c.m/s
14 START
1 1=Zero; 2=Define
18 CONFLUENCE
1 Junction Node No.
.033 1.546 .027 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 1
*****
4 CATCHMENT
101.000 ID No.ó 99999
.610 Area in hectares
64.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
64.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.023 1.546 .027 .000 c.m/s
.308 .899 .367 C perv/imperv/total
15 ADD RUNOFF
.023 1.567 .027 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.023 1.567 1.567 .000 c.m/s
17 COMBINE
1 Junction Node No.
.023 1.567 1.567 1.567 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT SOUTH OF SEGMENT 1 - POND P11
*****
4 CATCHMENT
12.000 ID No.ó 99999
2.680 Area in hectares
134.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
134.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.209 .000 1.567 1.567 c.m/s
.308 .897 .514 C perv/imperv/total
15 ADD RUNOFF
.209 .209 1.567 1.567 c.m/s
4 CATCHMENT
13.000 ID No.ó 99999
6.980 Area in hectares
216.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
216.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.083 .209 1.567 1.567 c.m/s
.308 .897 .721 C perv/imperv/total
15 ADD RUNOFF
1.083 1.292 1.567 1.567 c.m/s
4 CATCHMENT
14.000 ID No.ó 99999
.670 Area in hectares
67.000 Length (PERV) metres
1.000 Gradient (%)
60.000 Per cent Impervious
67.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.099 1.292 1.567 1.567 c.m/s
.308 .898 .662 C perv/imperv/total
15 ADD RUNOFF
.099 1.367 1.567 1.567 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .4091430E+04 c.m
10 POND
5 Depth - Discharge - Volume sets

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184.800	.000	.0			1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
185.300	.0140	1142.0			.679	.030 .557 .557 c.m/s
186.100	.0240	3519.0			.308	.888 .714 C perv/imperv/total
186.500	.287	4978.0		15	ADD RUNOFF	.679 .703 .557 .557 c.m/s
186.800	1.922	6222.0		4	CATCHMENT	
Peak Outflow =	.048 c.m/s			44.000	ID No.6 99999	
Maximum Depth =	186.136 metres			.330	Area in hectares	
Maximum Storage =	3650. c.m			47.000	Length (PERV) metres	
.099 1.367 .048 1.567 c.m/s				1.000	Gradient (%)	
35 COMMENT				35.000	Per cent Impervious	
3 line(s) of comment				47.000	Length (IMPERV)	
*****				.000	%Imp. with Zero Dpth	
FLOW U/S OF RICE RD CULVERT - OUTLET A1				1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat	
*****				.250	Manning "n"	
17 COMBINE				74.000	SCS Curve No or C	
1 Junction Node No.				.100	Ia/S Coefficient	
.099 1.367 .048 1.583 c.m/s				8.924	Initial Abstraction	
14 START				1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv	
1 1=Zero; 2=Define				.031	.703 .557 .557 c.m/s	
35 COMMENT				.308	.898 .515 C perv/imperv/total	
3 line(s) of comment				15	ADD RUNOFF	.031 .727 .557 .557 c.m/s
*****				4	CATCHMENT	
PROP DEVELOPMENT SOUTH OF QUAKER RD & WEST OF RICE RD. - PON				45.000	ID No.6 99999	
*****				6.400	Area in hectares	
4 CATCHMENT				207.000	Length (PERV) metres	
40.000 ID No.6 99999				1.000	Gradient (%)	
8.210 Area in hectares				70.000	Per cent Impervious	
234.000 Length (PERV) metres				207.000	Length (IMPERV)	
1.000 Gradient (%)				.000	%Imp. with Zero Dpth	
25.000 Per cent Impervious				1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat	
234.000 Length (IMPERV)				.250	Manning "n"	
.000 %Imp. with Zero Dpth				74.000	SCS Curve No or C	
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat				.100	Ia/S Coefficient	
.250 Manning "n"				8.924	Initial Abstraction	
74.000 SCS Curve No or C				1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv	
.100 Ia/S Coefficient				.484	.000 .048 1.583 c.m/s	
8.924 Initial Abstraction				.308	.902 .457 C perv/imperv/total	
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv				15	ADD RUNOFF	.484 .484 .048 1.583 c.m/s
.484 .000 .048 1.583 c.m/s				4	CATCHMENT	
.308 .902 .457 C perv/imperv/total				41.200 ID No.6 99999		
15 ADD RUNOFF				.390	Area in hectares	
.484 .484 .048 1.583 c.m/s				51.000	Length (PERV) metres	
4 CATCHMENT				1.000	Gradient (%)	
41.000 ID No.6 99999				35.000	Per cent Impervious	
.390 Area in hectares				51.000	Length (IMPERV)	
51.000 Length (PERV) metres				.000	%Imp. with Zero Dpth	
1.000 Gradient (%)				1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat	
25.000 Per cent Impervious				.250	Manning "n"	
234.000 Length (IMPERV)				74.000	SCS Curve No or C	
.000 %Imp. with Zero Dpth				.100	Ia/S Coefficient	
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat				8.924	Initial Abstraction	
.250 Manning "n"				1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv	
74.000 SCS Curve No or C				.036	.484 .048 1.583 c.m/s	
.100 Ia/S Coefficient				.308	.898 .515 C perv/imperv/total	
8.924 Initial Abstraction				15	ADD RUNOFF	.036 .512 .048 1.583 c.m/s
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv				4	CATCHMENT	
.164 .512 .048 1.583 c.m/s				41.000 ID No.6 99999		
.308 .900 .309 C perv/imperv/total				8.040 Area in hectares		
15 ADD RUNOFF				226.000 Length (PERV) metres		
.164 .557 .048 1.583 c.m/s				1.000 Gradient (%)		
9 ROUTE				226.000 Per cent Impervious		
.000 Conduit Length				226.000 Length (IMPERV)		
.000 No Conduit defined				.000	%Imp. with Zero Dpth	
.000 Zero lag				1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat	
.000 Beta weighting factor				.250	Manning "n"	
.000 Routing timestep				74.000	SCS Curve No or C	
0 No. of sub-reaches				.100	Ia/S Coefficient	
.164 .557 .557 1.583 c.m/s				8.924	Initial Abstraction	
17 COMBINE				1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv	
3 Junction Node No.				.089	2.274 1.717 .000 c.m/s	
.164 .557 .557 .557 c.m/s				.308	.899 .663 C perv/imperv/total	
14 START				15	ADD RUNOFF	
1 1=Zero; 2=Define				.089	2.341 1.717 .000 c.m/s	
4 CATCHMENT				27	HYDROGRAPH DISPLAY	
42.100 ID No.6 99999				5	is # of Hyeto/Hydrograph chosen	
.320 Area in hectares				10	POND	
46.000 Length (PERV) metres				6	Depth - Discharge - Volume sets	
1.000 Gradient (%)				187.000	.000 .0 .0	
35.000 Per cent Impervious				187.000	.0410 3045.0	
46.000 Length (IMPERV)				188.300	.0540 5273.0	
.000 %Imp. with Zero Dpth				188.500	.150 6237.0	
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat				188.800	.257 7764.0	
.250 Manning "n"				189.000	.000 8856.0	
74.000 SCS Curve No or C					Peak Outflow = .193 c.m/s	
.100 Ia/S Coefficient					Maximum Depth = 188.620 metres	
8.924 Initial Abstraction					Maximum Storage = 6850. c.m	
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv					.089 2.341 .193 .000 c.m/s	
.030 .000 .557 .557 c.m/s				17	COMBINE	
.308 .898 .515 C perv/imperv/total				2	Junction Node No.	
15 ADD RUNOFF				.089	2.341 .193 .193 c.m/s	
.030 .030 .557 .557 c.m/s				14	START	
4 CATCHMENT				1	1=Zero; 2=Define	
43.000 ID No.6 99999				35	COMMENT	
4.470 Area in hectares				3	line(s) of comment	
173.000 Length (PERV) metres					*****	
1.000 Gradient (%)					EXISTING AREA ON QUAKER RD, WEST OF RICE RD	
70.000 Per cent Impervious					*****	
173.000 Length (IMPERV)				4	CATCHMENT	
.000 %Imp. with Zero Dpth				2.000	ID No.6 99999	
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat				9.500	Area in hectares	
.250 Manning "n"				245.000	Length (PERV) metres	
74.000 SCS Curve No or C				1.000	Gradient (%)	
.100 Ia/S Coefficient				35.000	Per cent Impervious	
8.924 Initial Abstraction				245.000	Length (IMPERV)	
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv				.000	%Imp. with Zero Dpth	
.771 .000 .193 .193 c.m/s				1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat	
.308 .904 .517 C perv/imperv/total				.250	Manning "n"	
15 ADD RUNOFF				74.000	SCS Curve No or C	
.771 .771 .193 .193 c.m/s				.100	Ia/S Coefficient	
9 ROUTE				8.924	Initial Abstraction	
.000 Conduit Length				1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv	
.000 No Conduit defined				.771	.000 .193 .193 c.m/s	
.000 Zero lag				.308	.904 .517 C perv/imperv/total	

		.308	.910	.549	C perv/imperv/total
15	ADD RUNOFF	1.270	1.270	.156	1.478 c.m/s
9	ROUTE				
	.000	Conduit Length			
	.000	No Conduit defined			
	.000	Zero lag			
	.000	Beta weighting factor			
	.000	Routing timestep			
	0	No. of sub-reaches			
	1.270	1.270	1.270	1.478 c.m/s	
17	COMBINE				
2	Junction Node No.	1.270	1.270	1.270	2.748 c.m/s
14	START				
1	1=Zero; 2=Define				
18	CONFLUENCE				
2	Junction Node No.	1.270	2.748	1.270	.000 c.m/s
35	COMMENT				
3	line(s) of comment				

	RICE ROAD FROM QUAKER RD TO CITY OF WELLAND MUNICIPAL BOUNDARY				

4	CATCHMENT				
501.000	ID No.0 99999				
1.570	Area in hectares				
102.000	Length (PERV) metres				
1.000	Gradient (%)				
70.000	Per cent Impervious				
102.000	Length (IMPERV)				
.000	%Imp. with Zero Dpth				
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat				
.250	Manning "n"				
74.000	SCS Curve No or C				
.100	Ia/S Coefficient				
8.924	Initial Abstraction				
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv				
.250	2.748	1.270	.000 c.m/s		
.308	.901	.723	C perv/imperv/total		
15	ADD RUNOFF	.250	2.968	1.270	.000 c.m/s
9	ROUTE				
	.000	Conduit Length			
	.000	No Conduit defined			
	.000	Zero lag			
	.000	Beta weighting factor			
	.000	Routing timestep			
	0	No. of sub-reaches			
	.250	2.968	.000 c.m/s		
35	COMMENT				
3	line(s) of comment				

	FLOW D/S OF RICE RD CULVERT - OUTLET A2				

17	COMBINE				
1	Junction Node No.	.250	2.968	2.968	4.551 c.m/s
14	START				
1	1=Zero; 2=Define				
35	COMMENT				
3	line(s) of comment				

	PROP DEVELOPMENT SOUTH OF QUAKER RD - QUALITY CONTROL ONLY				

4	CATCHMENT				
20.100	ID No.0 99999				
.780	Area in hectares				
72.000	Length (PERV) metres				
1.000	Gradient (%)				
35.000	Per cent Impervious				
72.000	Length (IMPERV)				
.000	%Imp. with Zero Dpth				
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat				
.250	Manning "n"				
74.000	SCS Curve No or C				
.100	Ia/S Coefficient				
8.924	Initial Abstraction				
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv				
.068	.000	2.968	4.551 c.m/s		
.308	.897	.514	C perv/imperv/total		
15	ADD RUNOFF	.068	.068	2.968	4.551 c.m/s
4	CATCHMENT				
20.000	ID No.0 99999				
3.210	Area in hectares				
146.000	Length (PERV) metres				
1.000	Gradient (%)				
85.000	Per cent Impervious				
146.000	Length (IMPERV)				
.000	%Imp. with Zero Dpth				
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat				
.250	Manning "n"				
74.000	SCS Curve No or C				
.100	Ia/S Coefficient				
8.924	Initial Abstraction				
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv				
.575	.068	2.968	4.551 c.m/s		
.308	.893	.806	C perv/imperv/total		
15	ADD RUNOFF	.575	.639	2.968	4.551 c.m/s
9	ROUTE				
	.000	Conduit Length			
	.000	No Conduit defined			
	.000	Zero lag			
	.000	Beta weighting factor			
	.000	Routing timestep			
	0				


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.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.344 .486 .211 .000 c.m/s
.308 .898 .692 C perv/imperv/total
15 ADD RUNOFF .344 .816 .211 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.344 .816 .816 .000 c.m/s
17 COMBINE
1 Junction Node No.
.344 .816 .816 6.310 c.m/s
35 COMMENT
3 line(s) of comment
*****
FLOW D/S OF FIRST AVE CULVERT - OUTLET C
*****
18 CONFLUENCE
1 Junction Node No.
.344 6.310 .816 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 3
*****
4 CATCHMENT
300.000 ID No.0 99999
3.180 Area in hectares
146.000 Length (PERV) metres
.200 Gradient (%)
15.000 Per cent Impervious
146.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.119 6.310 .816 .000 c.m/s
.308 .910 .399 C perv/imperv/total
15 ADD RUNOFF .119 6.429 .816 .000 c.m/s
4 CATCHMENT
301.000 ID No.0 99999
.720 Area in hectares
69.000 Length (PERV) metres
.200 Gradient (%)
10.000 Per cent Impervious
69.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.020 6.429 .816 .000 c.m/s
.308 .892 .367 C perv/imperv/total
15 ADD RUNOFF .020 6.449 .816 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.020 6.449 6.449 .000 c.m/s
17 COMBINE
1 Junction Node No.
.020 6.449 6.449 6.449 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT NORTH OF SEGMENT 3 - POND P30
*****
4 CATCHMENT
30.000 ID No.0 99999
8.470 Area in hectares
238.000 Length (PERV) metres
.200 Gradient (%)
.100 Per cent Impervious
238.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.113 .000 6.449 6.449 c.m/s
.308 .906 .309 C perv/imperv/total
15 ADD RUNOFF .113 .113 6.449 6.449 c.m/s
4 CATCHMENT
31.000 ID No.0 99999
10.420 Area in hectares
264.000 Length (PERV) metres
1.000 Gradient (%)
75.000 Per cent Impervious
264.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.740 .113 6.449 6.449 c.m/s
.308 .907 .758 C perv/imperv/total
15 ADD RUNOFF

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1.743 1.763 6.449 6.449 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .6276292E+04 c.m
4 CATCHMENT
32.000 ID No.0 99999
.690 Area in hectares
68.000 Length (PERV) metres
1.000 Gradient (%)
60.000 Per cent Impervious
68.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.102 1.763 6.449 6.449 c.m/s
.308 .898 .662 C perv/imperv/total
15 ADD RUNOFF .102 1.840 6.449 6.449 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .6549078E+04 c.m
10 POND
5 Depth - Discharge - Volume sets
178.000 .000 .0
179.300 .0260 1520.0
180.100 .0440 4649.0
180.600 .414 7069.0
180.800 1.204 8137.0
Peak Outflow = .114 c.m/s
Maximum Depth = 180.194 metres
Maximum Storage = 5104. c.m
.102 1.840 .114 6.449 c.m/s
17 COMBINE
1 Junction Node No.
.102 1.840 .114 6.477 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT SOUTH OF SEGMENT 3 - POND P31
*****
4 CATCHMENT
33.000 ID No.0 99999
12.960 Area in hectares
294.000 Length (PERV) metres
1.000 Gradient (%)
75.000 Per cent Impervious
294.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
2.171 .000 .114 6.477 c.m/s
.308 .910 .759 C perv/imperv/total
15 ADD RUNOFF 2.171 2.171 .114 6.477 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .5876996E+04 c.m
4 CATCHMENT
34.000 ID No.0 99999
.660 Area in hectares
66.000 Length (PERV) metres
1.000 Gradient (%)
60.000 Per cent Impervious
66.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.098 2.171 .114 6.477 c.m/s
.308 .898 .662 C perv/imperv/total
15 ADD RUNOFF .098 2.245 .114 6.477 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .6138025E+04 c.m
10 POND
6 Depth - Discharge - Volume sets
178.300 .000 .0
178.900 .0350 1927.0
179.600 .0540 4692.0
179.800 .150 5590.0
180.000 .321 6538.0
180.300 1.922 8059.0
Peak Outflow = .107 c.m/s
Maximum Depth = 179.709 metres
Maximum Storage = 5183. c.m
.098 2.245 .107 6.477 c.m/s
17 COMBINE
1 Junction Node No.
.098 2.245 .107 6.514 c.m/s
14 START
1 1=Zero; 2=Define
18 CONFLUENCE
1 Junction Node No.
.098 6.514 .107 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 3
*****
4 CATCHMENT
302.000 ID No.0 99999
1.610 Area in hectares
104.000 Length (PERV) metres
.200 Gradient (%)
10.000 Per cent Impervious
104.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat

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        .250      Manning "n"
74.000      SCS Curve No or C
        .100      Ia/S Coefficient
        8.924      Initial Abstraction
        1         Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
            .043      6.514      .107      .000 c.m/s
            .308      .901      .368      C perv/imperv/total
35  COMMENT
3    line(s) of comment
*****
FLOW U/S OF NIAGARA ST CULVERT - OUTLET D
*****
15  ADD RUNOFF
            .043      6.557      .107      .000 c.m/s
14  START
1    1=Zero; 2=Define

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35 COMMENT
3 line(s) of comment

100-YEAR STORM EVENT

2 STORM
1 1=Chicago;2=Huff;3=User;4=Cdn1hr;5=Historic
1020.000 Coefficient a
4.700 Constant b (min)
.731 Exponent c
.450 Fraction to peak r
240.000 Duration o 240 min
73.203 mm Total depth
3 IMPERVIOUS
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.015 Manning "n"
98.000 SCS Curve No or C
.100 Ia/S Coefficient
.518 Initial Abstraction
35 COMMENT
3 line(s) of comment

EXISTING RES. WEST OF SEGMENT 1

4 CATCHMENT
1.000 ID No.6 99999
17.520 Area in hectares
343.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
343.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.731 .000 .000 .000 c.m/s
.368 .925 .563 C perv/imperv/total
15 ADD RUNOFF
1.731 1.731 .000 .000 c.m/s
35 COMMENT
3 line(s) of comment

REALIGNED CHANNEL - SEGMENT 1

4 CATCHMENT
100.000 ID No.6 99999
2.020 Area in hectares
116.000 Length (PERV) metres
.400 Gradient (%)
15.000 Per cent Impervious
116.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.101 1.731 .000 .000 c.m/s
.368 .905 .448 C perv/imperv/total
35 COMMENT
3 line(s) of comment

FLOW AT FUT ROADWAY CULVERT - SEGMENT 1

15 ADD RUNOFF
.101 1.832 .000 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.101 1.832 1.832 .000 c.m/s
17 COMBINE
1 Junction Node No.
.101 1.832 1.832 1.832 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment

PROP DEVELOPMENT NORTH OF SEGMENT 1 - POND P10

4 CATCHMENT
10.000 ID No.6 99999
4.050 Area in hectares
164.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
164.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.735 .000 1.832 1.832 c.m/s
.367 .909 .747 C perv/imperv/total
15 ADD RUNOFF
.735 .735 1.832 1.832 c.m/s
4 CATCHMENT
11.000 ID No.6 99999
1.000 Area in hectares
82.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
82.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.054 .735 1.832 1.832 c.m/s
.367 .912 .422 C perv/imperv/total

15 ADD RUNOFF
.054 .783 1.832 1.832 c.m/s
10 POND
6 Depth - Discharge - Volume sets
184.800 .000 .0
185.750 .0210 1.0
186.000 .0230 503.0
186.250 .0260 1091.0
186.500 .0280 1765.0
186.700 1.244 2370.0
Peak Outflow = .105 c.m/s
Maximum Depth = 186.513 metres
Maximum Storage = 1804. c.m
.054 .783 .105 1.832 c.m/s
17 COMBINE
1 Junction Node No.
.054 .783 .105 1.857 c.m/s
14 START
1 1=Zero; 2=Define
18 CONFLUENCE
1 Junction Node No.
.054 1.857 .105 .000 c.m/s
35 COMMENT
3 line(s) of comment

REALIGNED CHANNEL - SEGMENT 1

4 CATCHMENT
101.000 ID No.6 99999
.610 Area in hectares
64.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
64.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.038 1.857 .105 .000 c.m/s
.367 .914 .422 C perv/imperv/total
15 ADD RUNOFF
.038 1.890 .105 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.038 1.890 1.890 .000 c.m/s
17 COMBINE
1 Junction Node No.
.038 1.890 1.890 1.890 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment

PROP DEVELOPMENT SOUTH OF SEGMENT 1 - POND P11

4 CATCHMENT
12.000 ID No.6 99999
2.680 Area in hectares
134.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
134.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.262 .000 1.890 1.890 c.m/s
.367 .914 .559 C perv/imperv/total
15 ADD RUNOFF
.262 .262 1.890 1.890 c.m/s
4 CATCHMENT
13.000 ID No.6 99999
6.980 Area in hectares
216.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
216.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.307 .262 1.890 1.890 c.m/s
.368 .908 .746 C perv/imperv/total
15 ADD RUNOFF
1.307 1.567 1.890 1.890 c.m/s
4 CATCHMENT
14.000 ID No.6 99999
.670 Area in hectares
67.000 Length (PERV) metres
1.000 Gradient (%)
60.000 Per cent Impervious
67.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.124 1.567 1.890 1.890 c.m/s
.367 .914 .695 C perv/imperv/total
15 ADD RUNOFF
.124 1.659 1.890 1.890 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .5247869E+04 c.m
10 POND
5 Depth - Discharge - Volume sets

184.800	.000	.0			1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
185.300	.0140	1142.0				.817 .038 .732 .732 c.m/s
186.100	.0240	3519.0				.367 .907 .745 C perv/imperv/total
186.500	.287	4978.0			15	ADD RUNOFF
186.800	1.922	6222.0				.817 .849 .732 .732 c.m/s
Peak Outflow =		.143 c.m/s			4	CATCHMENT
Maximum Depth =		186.281 metres				44.000 ID No.6 99999
Maximum Storage =		4180. c.m				.330 Area in hectares
.124 1.659 .143 1.890 c.m/s						47.000 Length (PERV) metres
35	COMMENT					1.000 Gradient (%)
3	Line(s) of comment					35.000 Per cent Impervious
*****						47.000 Length (IMPERV)
FLOW U/S OF RICE RD CULVERT - OUTLET A1						.000 %Imp. with Zero Dpth
*****						1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
17	COMBINE					.250 Manning "n"
1	Junction Node No.					74.000 SCS Curve No or C
.124 1.659 .143 1.908 c.m/s						.100 Ia/S Coefficient
14	START					8.924 Initial Abstraction
1	1=Zero; 2=Define					1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
35	COMMENT					.039 .849 .732 .732 c.m/s
3	Line(s) of comment					.367 .911 .557 C perv/imperv/total
*****					15	ADD RUNOFF
PROP DEVELOPMENT SOUTH OF QUAKER RD & WEST OF RICE RD. - PON						.039 .882 .732 .732 c.m/s
*****					4	CATCHMENT
4	CATCHMENT					45.000 ID No.6 99999
40.000	ID No.6 99999					6.400 Area in hectares
8.210	Area in hectares					207.000 Length (PERV) metres
234.000	Length (PERV) metres					1.000 Gradient (%)
1.000	Gradient (%)					70.000 Per cent Impervious
25.000	Per cent Impervious					207.000 Length (IMPERV)
234.000	Length (IMPERV)					.000 %Imp. with Zero Dpth
.000	%Imp. with Zero Dpth					1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat					.250 Manning "n"
.250	Manning "n"					74.000 SCS Curve No or C
74.000	SCS Curve No or C					.100 Ia/S Coefficient
.100	Ia/S Coefficient					8.924 Initial Abstraction
8.924	Initial Abstraction					1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv					1.193 .882 .732 .732 c.m/s
.607 .000 .143 1.908 c.m/s						.368 .906 .744 C perv/imperv/total
.367 .911 .503 C perv/imperv/total					15	ADD RUNOFF
15	ADD RUNOFF					1.193 2.075 .732 .732 c.m/s
.607 .607 .143 1.908 c.m/s					9	ROUTE
4	CATCHMENT					.000 Conduit Length
41.200	ID No.6 99999					.000 No Conduit defined
.390	Area in hectares					.000 Zero lag
51.000	Length (PERV) metres					.000 Beta weighting factor
1.000	Gradient (%)					.000 Routing timestep
35.000	Per cent Impervious					.000 No. of sub-reaches
51.000	Length (IMPERV)					1.193 2.075 2.075 .732 c.m/s
.000	%Imp. with Zero Dpth				17	COMBINE
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat					3 Junction Node No.
.250	Manning "n"					1.193 2.075 2.075 2.807 c.m/s
74.000	SCS Curve No or C				14	START
.100	Ia/S Coefficient					1 1=Zero; 2=Define
8.924	Initial Abstraction				18	CONFLUENCE
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv					3 Junction Node No.
.046 .607 .143 1.908 c.m/s						1.193 2.807 2.075 .000 c.m/s
.366 .912 .557 C perv/imperv/total					4	CATCHMENT
15	ADD RUNOFF					46.000 ID No.6 99999
.046 .645 .143 1.908 c.m/s						.600 Area in hectares
4	CATCHMENT					63.000 Length (PERV) metres
41.000	ID No.6 99999					1.000 Gradient (%)
8.040	Area in hectares					60.000 Per cent Impervious
226.000	Length (PERV) metres					63.000 Length (IMPERV)
1.000	Gradient (%)					.000 %Imp. with Zero Dpth
226.000	Per cent Impervious					1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.000	Length (IMPERV)					.250 Manning "n"
.000	%Imp. with Zero Dpth					74.000 SCS Curve No or C
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat					.100 Ia/S Coefficient
.250	Manning "n"					8.924 Initial Abstraction
74.000	SCS Curve No or C					1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.100	Ia/S Coefficient					.112 2.807 2.075 .000 c.m/s
8.924	Initial Abstraction					.367 .914 .695 C perv/imperv/total
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv				15	ADD RUNOFF
.273 .645 .143 1.908 c.m/s						.112 2.889 2.075 .000 c.m/s
.367 .909 .368 C perv/imperv/total					27	HYDROGRAPH DISPLAY
15	ADD RUNOFF					5 is # of Hyeto/Hydrograph chosen
.273 .732 .143 1.908 c.m/s						Volume = .1184395E+05 c.m
9	ROUTE				10	POND
.000	Conduit Length					6 Depth - Discharge - Volume sets
.000	No Conduit defined					187.000 .000 .0
.000	Zero lag					187.000 .0410 3045.0
.000	Beta weighting factor					188.300 .0540 5273.0
.000	Routing timestep					188.500 .150 6237.0
.000	No. of sub-reaches					188.800 .257 7764.0
.273 .732 .732 1.908 c.m/s						189.000 .000 8956.0
17	COMBINE					Peak Outflow = .464 c.m/s
3	Junction Node No.					Maximum Depth = 188.867 metres
.273 .732 .732 .732 c.m/s						Maximum Storage = 8128. c.m
14	START					.112 2.889 .464 .000 c.m/s
1	1=Zero; 2=Define				17	COMBINE
4	CATCHMENT					2 Junction Node No.
42.100	ID No.6 99999					.112 2.889 .464 .464 c.m/s
.320	Area in hectares				14	START
46.000	Length (PERV) metres					1 1=Zero; 2=Define
1.000	Gradient (%)				35	COMMENT
35.000	Per cent Impervious					3 Line(s) of comment
46.000	Length (IMPERV)					*****
.000	%Imp. with Zero Dpth					EXISTING AREA ON QUAKER RD, WEST OF RICE RD
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat					*****
.250	Manning "n"				4	CATCHMENT
74.000	SCS Curve No or C					2.000 ID No.6 99999
.100	Ia/S Coefficient					9.580 Area in hectares
8.924	Initial Abstraction					245.000 Length (PERV) metres
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv					1.000 Gradient (%)
.038 .000 .732 .732 c.m/s						35.000 Per cent Impervious
.367 .911 .558 C perv/imperv/total						245.000 Length (IMPERV)
15	ADD RUNOFF					.000 %Imp. with Zero Dpth
.038 .038 .732 .732 c.m/s						1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
4	CATCHMENT					.250 Manning "n"
43.000	ID No.6 99999					74.000 SCS Curve No or C
4.470	Area in hectares					.100 Ia/S Coefficient
173.000	Length (PERV) metres					8.924 Initial Abstraction
1.000	Gradient (%)					1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
70.000	Per cent Impervious					.953 .000 .464 .464 c.m/s
173.000	Length (IMPERV)					.368 .912 .558 C perv/imperv/total
.000	%Imp. with Zero Dpth				15	ADD RUNOFF
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat					.953 .953 .464 .464 c.m/s
.250	Manning "n"				9	ROUTE
74.000	SCS Curve No or C					.000 Conduit Length
.100	Ia/S Coefficient					.000 No Conduit defined
8.924	Initial Abstraction					.000 Zero lag

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.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.953 .953 .953 .464 c.m/s
17 COMBINE
2 Junction Node No.
.953 .953 .953 .997 c.m/s
14 START
1 1=Zero; 2=Define
18 CONFLUENCE
2 Junction Node No.
.953 .997 .953 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
EXISTING AREA ON QUAKER RD, WEST OF RICE RD
*****
4 CATCHMENT
3.000 ID No.6 99999
5.680 Area in hectares
195.000 Length (PERV) metres
1.000 Gradient (%)
40.000 Per cent Impervious
195.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.632 .997 .953 .000 c.m/s
.367 .903 .582 C perv/imperv/total
15 ADD RUNOFF
.632 1.629 .953 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.632 1.629 1.629 .000 c.m/s
17 COMBINE
2 Junction Node No.
.632 1.629 1.629 1.629 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT SOUTH OF QUAKER RD, EAST OF RICE RD
*****
4 CATCHMENT
50.000 ID No.6 99999
3.420 Area in hectares
151.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
151.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.148 .000 1.629 1.629 c.m/s
.367 .912 .422 C perv/imperv/total
15 ADD RUNOFF
.148 .148 1.629 1.629 c.m/s
4 CATCHMENT
51.000 ID No.6 99999
1.980 Area in hectares
115.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
115.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.092 .148 1.629 1.629 c.m/s
.368 .916 .422 C perv/imperv/total
15 ADD RUNOFF
.092 .240 1.629 1.629 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.092 .240 .240 1.629 c.m/s
17 COMBINE
2 Junction Node No.
.092 .240 .240 1.848 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
EXISTING AREA WEST OF RICE RD AND SOUTH OF QUAKER ROAD
*****
4 CATCHMENT
4.000 ID No.6 99999
13.940 Area in hectares
305.000 Length (PERV) metres
1.000 Gradient (%)
40.000 Per cent Impervious
305.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.566 .000 .240 1.848 c.m/s

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.367 .923 .590 C perv/imperv/total
15 ADD RUNOFF
1.566 1.566 .240 1.848 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
1.566 1.566 1.566 1.848 c.m/s
17 COMBINE
2 Junction Node No.
1.566 1.566 1.566 3.414 c.m/s
14 START
1 1=Zero; 2=Define
18 CONFLUENCE
2 Junction Node No.
1.566 3.414 1.566 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
RICE ROAD FROM QUAKER RD TO CITY OF WELLAND MUNICIPAL BOUNDARY
*****
4 CATCHMENT
501.000 ID No.6 99999
1.570 Area in hectares
102.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
102.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.314 3.414 1.566 .000 c.m/s
.367 .915 .751 C perv/imperv/total
15 ADD RUNOFF
.314 3.677 1.566 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.314 3.677 3.677 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
FLOW D/S OF RICE RD CULVERT - OUTLET A2
*****
17 COMBINE
1 Junction Node No.
.314 3.677 3.677 5.585 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT SOUTH OF QUAKER RD - QUALITY CONTROL ONLY
*****
4 CATCHMENT
20.100 ID No.6 99999
.780 Area in hectares
72.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
72.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.087 .000 3.677 5.585 c.m/s
.366 .914 .558 C perv/imperv/total
15 ADD RUNOFF
.087 .087 3.677 5.585 c.m/s
4 CATCHMENT
20.000 ID No.6 99999
3.210 Area in hectares
146.000 Length (PERV) metres
1.000 Gradient (%)
85.000 Per cent Impervious
146.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.720 .087 3.677 5.585 c.m/s
.368 .913 .831 C perv/imperv/total
15 ADD RUNOFF
.720 .807 3.677 5.585 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.720 .807 .807 5.585 c.m/s
17 COMBINE
1 Junction Node No.
.720 .807 .807 6.340 c.m/s
14 START
1 1=Zero; 2=Define
18 CONFLUENCE
1 Junction Node No.
.720 6.340 .807 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 2
*****

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4  CATCHMENT
200.000 ID No.6 99999 .000 Beta weighting factor
.970 Area in hectares .000 Routing timestep
80.416 Length (PERV) metres 0 No. of sub-reaches
1.000 Gradient (%) 2.157 2.157 2.157 1.198 c.m/s
10.000 Per cent Impervious 17 COMBINE
80.416 Length (IMPERV) 2 2.157 2.157 2.157 3.355 c.m/s
.000 %Imp. with Zero Dpth 18 CONFLUENCE
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 2 Junction Node No.
.250 Manning "n" 2.157 3.355 2.157 .000 c.m/s
74.000 SCS Curve No or C 4 CATCHMENT
.100 Ia/S Coefficient 54.000 ID No.6 99999
8.924 Initial Abstraction 1.200 Area in hectares
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 92.000 Length (PERV) metres
.053 6.340 .807 .000 c.m/s 1.000 Gradient (%)
.367 .912 .422 C perv/imperv/total 60.000 Per cent Impervious
35 COMMENT 92.000 Length (IMPERV)
3 line(s) of comment .000 %Imp. with Zero Dpth
***** 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
FLOW D/S OF AREA A20 - OUTLET B .250 Manning "n"
***** 74.000 SCS Curve No or C
15 ADD RUNOFF .100 Ia/S Coefficient
.053 6.387 .807 .000 c.m/s 8.924 Initial Abstraction
35 COMMENT 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
3 line(s) of comment .225 3.355 2.157 .000 c.m/s
***** C perv/imperv/total
EX RES. AND FUT DEVELOPMENT LANDS BY OTHERS WEST OF FIRST AV .367 .913 .695
***** 15 ADD RUNOFF .225 3.539 2.157 .000 c.m/s
4 CATCHMENT 27 HYDROGRAPH DISPLAY
21.000 ID No.6 99999 5 is # of Hyeto/Hydrograph chosen
35.460 Area in hectares Volume = .1040810E+05 c.m
538.000 Length (PERV) metres 10 POND
.200 Gradient (%) 6 Depth - Discharge - Volume sets
5.000 Per cent Impervious 182.000 .000 .0
538.000 Length (IMPERV) 182.800 .0190 5251.0
.000 %Imp. with Zero Dpth 183.150 .0230 7895.0
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 183.500 .238 10751.0
.250 Manning "n" 183.800 .396 13425.0
74.000 SCS Curve No or C 184.000 1.028 15337.0
.100 Ia/S Coefficient Peak Outflow = .132 c.m/s
8.924 Initial Abstraction Maximum Depth = 183.327 metres
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv Maximum Storage = 9342. c.m
.529 6.387 .807 .000 c.m/s .225 3.539 .132 .000 c.m/s
.368 .925 .395 C perv/imperv/total 17 COMBINE
15 ADD RUNOFF .529 6.785 .807 .000 c.m/s 2 Junction Node No.
9 ROUTE .225 3.539 .132 .132 c.m/s
.000 Conduit Length 14 START
.000 No Conduit defined 1 1=Zero; 2=Define
.000 Zero lag 35 COMMENT
.000 Beta weighting factor 3 line(s) of comment
.000 Routing timestep *****
0 No. of sub-reaches EXISTING AREA ON QUAKER RD, EAST OF RICE RD
.529 6.785 6.785 .000 c.m/s *****
35 COMMENT 4 CATCHMENT
3 line(s) of comment 5.000 ID No.6 99999
***** 1.870 Area in hectares
FLOW U/S OF FIRST AVE CULVERT 112.000 Length (PERV) metres
***** 1.000 Gradient (%)
17 COMBINE 50.000 Per cent Impervious
1 Junction Node No. 112.000 Length (IMPERV)
.529 6.785 6.785 6.785 c.m/s .000 %Imp. with Zero Dpth
14 START 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
1 1=Zero; 2=Define .250 Manning "n"
35 COMMENT 74.000 SCS Curve No or C
3 line(s) of comment .100 Ia/S Coefficient
***** 8.924 Initial Abstraction
PROP DEVELOPMENT SOUTH OF QUAKER, EAST OF RICE - POND P50 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
***** .266 .000 .132 .132 c.m/s
.367 .916 .642 C perv/imperv/total
4 CATCHMENT 15 ADD RUNOFF .266 .266 .132 .132 c.m/s
52.000 ID No.6 99999 9 ROUTE
6.430 Area in hectares .000 Conduit Length
207.000 Length (PERV) metres .000 No Conduit defined
1.000 Gradient (%) .000 Zero lag
70.000 Per cent Impervious .000 Beta weighting factor
207.000 Length (IMPERV) .000 Routing timestep
.000 %Imp. with Zero Dpth 0 No. of sub-reaches
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 1.198 1.198 1.198 6.785 c.m/s
.250 Manning "n" 17 COMBINE
74.000 SCS Curve No or C 2 Junction Node No.
.100 Ia/S Coefficient 1.198 1.198 1.198 1.198 c.m/s
8.924 Initial Abstraction 14 START
1 1=Zero; 2=Define 4 CATCHMENT
53.000 ID No.6 99999
11.340 Area in hectares
275.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
275.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
2.157 .000 1.198 1.198 c.m/s
.368 .919 .753 C perv/imperv/total
15 ADD RUNOFF 2.157 2.157 1.198 1.198 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
17 COMBINE
2 Junction Node No.
1.198 1.198 1.198 1.198 c.m/s
14 START
1 1=Zero; 2=Define
4 CATCHMENT
201.000 ID No.6 99999
2.430 Area in hectares
127.000 Length (PERV) metres
1.000 Gradient (%)
65.000 Per cent Impervious
127.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.339 .274 .266 .000 c.m/s
.368 .914 .723 C perv/imperv/total
15 ADD RUNOFF .339 .594 .266 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
FIRST AVE FROM QUAKER RD TO CITY OF WELLAND MUNICIPAL BOUNDA
*****
4 CATCHMENT
201.000 ID No.6 99999
2.430 Area in hectares
127.000 Length (PERV) metres
1.000 Gradient (%)
65.000 Per cent Impervious
127.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat

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.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.433 .594 .266 .000 c.m/s
.367 .915 .723 C perv/imperv/total
15 ADD RUNOFF .433 .991 .266 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
17 COMBINE
1 Junction Node No.
.433 .991 .991 7.776 c.m/s
35 COMMENT
3 line(s) of comment
*****
FLOW D/S OF FIRST AVE CULVERT - OUTLET C
*****
18 CONFLUENCE
1 Junction Node No.
.433 7.776 .991 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 3
*****
4 CATCHMENT
300.000 ID No.0 99999
3.180 Area in hectares
146.000 Length (PERV) metres
.200 Gradient (%)
15.000 Per cent Impervious
146.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.148 7.776 .991 .000 c.m/s
.368 .924 .451 C perv/imperv/total
15 ADD RUNOFF .148 7.924 .991 .000 c.m/s
4 CATCHMENT
301.000 ID No.0 99999
.720 Area in hectares
69.000 Length (PERV) metres
.200 Gradient (%)
10.000 Per cent Impervious
69.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.030 7.924 .991 .000 c.m/s
.367 .911 .422 C perv/imperv/total
15 ADD RUNOFF .030 7.952 .991 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
17 COMBINE
1 Junction Node No.
.030 7.952 7.952 7.952 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT NORTH OF SEGMENT 3 - POND P30
*****
4 CATCHMENT
30.000 ID No.0 99999
8.470 Area in hectares
238.000 Length (PERV) metres
.200 Gradient (%)
.100 Per cent Impervious
238.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.188 .000 7.952 7.952 c.m/s
.368 .916 .368 C perv/imperv/total
15 ADD RUNOFF .188 .188 7.952 7.952 c.m/s
4 CATCHMENT
31.000 ID No.0 99999
10.420 Area in hectares
264.000 Length (PERV) metres
1.000 Gradient (%)
75.000 Per cent Impervious
264.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
2.113 .188 7.952 7.952 c.m/s
.367 .917 .779 C perv/imperv/total
15 ADD RUNOFF

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27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .8226143E+04 c.m
4 CATCHMENT
32.000 ID No.0 99999
.690 Area in hectares
68.000 Length (PERV) metres
1.000 Gradient (%)
60.000 Per cent Impervious
68.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.127 2.151 7.952 7.952 c.m/s
.367 .914 .695 C perv/imperv/total
15 ADD RUNOFF .127 2.246 7.952 7.952 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .8577319E+04 c.m
10 POND
5 Depth - Discharge - Volume sets
178.000 .000 .0
179.300 .0260 1520.0
180.100 .0440 4649.0
180.600 .414 7069.0
180.800 1.204 8137.0
Peak Outflow = .250 c.m/s
Maximum Depth = 180.379 metres
Maximum Storage = 5999. c.m
.127 2.246 .250 7.952 c.m/s
17 COMBINE
1 Junction Node No.
.127 2.246 .250 7.984 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT SOUTH OF SEGMENT 3 - POND P31
*****
4 CATCHMENT
33.000 ID No.0 99999
12.960 Area in hectares
294.000 Length (PERV) metres
1.000 Gradient (%)
75.000 Per cent Impervious
294.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
2.640 .000 .250 7.984 c.m/s
.368 .922 .783 C perv/imperv/total
15 ADD RUNOFF 2.640 2.640 .250 7.984 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .7430276E+04 c.m
4 CATCHMENT
34.000 ID No.0 99999
.660 Area in hectares
66.000 Length (PERV) metres
1.000 Gradient (%)
60.000 Per cent Impervious
66.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.122 2.640 .250 7.984 c.m/s
.367 .914 .695 C perv/imperv/total
15 ADD RUNOFF .122 2.731 .250 7.984 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .7766209E+04 c.m
10 POND
6 Depth - Discharge - Volume sets
178.300 .000 .0
178.900 .0350 1927.0
179.600 .0540 4692.0
179.800 .150 5590.0
180.000 .321 6538.0
180.300 1.922 8059.0
Peak Outflow = .221 c.m/s
Maximum Depth = 179.883 metres
Maximum Storage = 5982. c.m
.122 2.731 .221 7.984 c.m/s
17 COMBINE
1 Junction Node No.
.122 2.731 .221 8.026 c.m/s
14 START
1 1=Zero; 2=Define
18 CONFLUENCE
1 Junction Node No.
.122 8.026 .221 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 3
*****
4 CATCHMENT
302.000 ID No.0 99999
1.610 Area in hectares
104.000 Length (PERV) metres
.200 Gradient (%)
10.000 Per cent Impervious
104.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat

```

```

        .250      Manning "n"
74.000      SCS Curve No or C
        .100      Ia/S Coefficient
        8.924      Initial Abstraction
        1      Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
            .057      8.026      .221      .000 c.m/s
            .367      .910      .422      C perv/imperv/total
35  COMMENT
3      line(s) of comment
      *****
      FLOW U/S OF NIAGARA ST CULVERT - OUTLET D
      *****
15  ADD RUNOFF
            .057      8.083      .221      .000 c.m/s
14  START
1      1=Zero; 2=Definee

```

APPENDIX D

Stage 2 Conditions MIDUSS Output File

Stage 2 Conditions with SWM

Output File (4.7) 25MM.OUT opened 2024-12-17 13:24

Units used are defined by G = 9.810

24 144 10.000 are MAXDT MAXHYD & DTMIN values

Licensee: UPPER CANADA CONSULTANTS

COMMENT

4 line(s) of comment
STORMWATER MANAGEMENT PLAN
QUAKER ROAD

CITY OF WELLAND
FUTURE CONDITIONS WITH SWM

COMMENT

3 line(s) of comment

25mm STORM EVENT

2 STORM

1 1=Chicago;2=Huff;3=User;4=Cdn1hr;5=Historic

512.000 Coefficient a

6.000 Constant b (min)

.800 Exponent c

.450 Fraction to peak r

240.000 Duration o 240 min

25.035 mm Total depth

3 IMPERVIOUS

1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat

.015 Manning "n"

98.000 SCS Curve No or C

.100 Ia/S Coefficient

.518 Initial Abstraction

35 COMMENT

3 line(s) of comment

PROP DEVELOPMENT NORTH OF SEGMENT 1 - POND P10

4 CATCHMENT

10.000 ID No.6 99999

4.050 Area in hectares

164.000 Length (PERV) metres

1.000 Gradient (%)

70.000 Per cent Impervious

164.000 Length (IMPERV)

.000 %Imp. with Zero Dpth

1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat

.250 Manning "n"

74.000 SCS Curve No or C

.100 Ia/S Coefficient

8.924 Initial Abstraction

1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv

.264 .000 .000 .000 c.m/s

.098 .806 .594 C perv/imperv/total

15 ADD RUNOFF

.264 .264 .000 .000 c.m/s

4 CATCHMENT

11.000 ID No.6 99999

1.000 Area in hectares

82.000 Length (PERV) metres

1.000 Gradient (%)

10.000 Per cent Impervious

82.000 Length (IMPERV)

.000 %Imp. with Zero Dpth

1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat

.250 Manning "n"

74.000 SCS Curve No or C

.100 Ia/S Coefficient

8.924 Initial Abstraction

1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv

.009 .264 .000 .000 c.m/s

.098 .791 .168 C perv/imperv/total

15 ADD RUNOFF

.009 .273 .000 .000 c.m/s

10 POND

6 Depth - Discharge - Volume sets

184.800 .000 .0

185.750 .0210 1.0

186.000 .0230 503.0

186.250 .0260 1091.0

186.500 .0280 1765.0

186.700 1.244 2370.0

Peak Outflow = .023 c.m/s

Maximum Depth = 185.944 metres

Maximum Storage = 390. c.m

.009 .273 .023 .000 c.m/s

14 START

1 1=Zero; 2=Define

35 COMMENT

3 line(s) of comment

PROP DEVELOPMENT SOUTH OF SEGMENT 1 - POND P11

4 CATCHMENT

12.000 ID No.6 99999

2.680 Area in hectares

134.000 Length (PERV) metres

1.000 Gradient (%)

35.000 Per cent Impervious

134.000 Length (IMPERV)

.000 %Imp. with Zero Dpth

1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat

.250 Manning "n"

74.000 SCS Curve No or C

.100 Ia/S Coefficient

8.924 Initial Abstraction

1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv

.088 .000 .023 .000 c.m/s

.098 .801 .344 C perv/imperv/total

15 ADD RUNOFF

.088 .088 .023 .000 c.m/s

4 CATCHMENT

13.000 ID No.6 99999

6.980 Area in hectares

216.000 Length (PERV) metres

1.000 Gradient (%)

70.000 Per cent Impervious

216.000 Length (IMPERV)

.000 %Imp. with Zero Dpth

1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat

.250 Manning "n"

74.000 SCS Curve No or C

.100 Ia/S Coefficient

8.924 Initial Abstraction

1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv

.461 .088 .023 .000 c.m/s

.098 .804 .592 C perv/imperv/total

15 ADD RUNOFF

.461 .549 .023 .000 c.m/s

4 CATCHMENT

14.000 ID No.6 99999

.670 Area in hectares

67.000 Length (PERV) metres

1.000 Gradient (%)

60.000 Per cent Impervious

67.000 Length (IMPERV)

.000 %Imp. with Zero Dpth

1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat

.250 Manning "n"

74.000 SCS Curve No or C

.100 Ia/S Coefficient

8.924 Initial Abstraction

1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv

.036 .549 .023 .000 c.m/s

.098 .798 .518 C perv/imperv/total

15 ADD RUNOFF

.036 .584 .023 .000 c.m/s

27 HYDROGRAPH DISPLAY

5 is # of Hyeto/Hydrograph chosen

Volume = .1350286E+04 c.m

10 POND

5 Depth - Discharge - Volume sets

184.800 .000 .0

185.300 .0140 1142.0

186.100 .0240 3519.0

186.500 .287 4978.0

186.800 1.922 6222.0

Peak Outflow = .014 c.m/s

Maximum Depth = 185.307 metres

Maximum Storage = 1163. c.m

.036 .584 .014 .000 c.m/s

14 START

1 1=Zero; 2=Define

35 COMMENT

3 line(s) of comment

PROP DEVELOPMENT SOUTH OF QUAKER RD & WEST OF RICE RD. - PON

4 CATCHMENT

40.000 ID No.6 99999

8.210 Area in hectares

234.000 Length (PERV) metres

1.000 Gradient (%)

25.000 Per cent Impervious

234.000 Length (IMPERV)

.000 %Imp. with Zero Dpth

1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat

.250 Manning "n"

74.000 SCS Curve No or C

.100 Ia/S Coefficient

8.924 Initial Abstraction

1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv

.193 .000 .014 .000 c.m/s

.098 .800 .274 C perv/imperv/total

15 ADD RUNOFF

.193 .193 .014 .000 c.m/s

4 CATCHMENT

41.000 ID No.6 99999

5.480 Area in hectares

191.000 Length (PERV) metres

1.000 Gradient (%)

70.000 Per cent Impervious

191.000 Length (IMPERV)

.000 %Imp. with Zero Dpth

1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat

.250 Manning "n"

74.000 SCS Curve No or C

.100 Ia/S Coefficient

8.924 Initial Abstraction

1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv

.365 .193 .014 .000 c.m/s

.098 .806 .594 C perv/imperv/total

15 ADD RUNOFF

.365 .558 .014 .000 c.m/s

9 ROUTE

.000 Conduit Length

.000 No Conduit defined

.000 Zero lag

.000 Beta weighting factor

.000 Routing timestep

0 No. of sub-reaches

.365 .558 .558 .000 c.m/s

17 COMBINE

2 Junction Node No.

.365 .558 .558 .558 c.m/s

14 START

1 1=Zero; 2=Define

4 CATCHMENT

42.000 ID No.6 99999

.690 Area in hectares

68.000 Length (PERV) metres

1.000 Gradient (%)

35.000 Per cent Impervious

68.000 Length (IMPERV)

.000 %Imp. with Zero Dpth

1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat

.250 Manning "n"

74.000 SCS Curve No or C

.100 Ia/S Coefficient

8.924 Initial Abstraction

1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv

.022 .000 .558 .558 c.m/s

.098 .798 .343 C perv/imperv/total

15 ADD RUNOFF

.022 .022 .558 .558 c.m/s

4 CATCHMENT

43.000 ID No.6 99999

7.160 Area in hectares

218.000 Length (PERV) metres

1.000 Gradient (%)

70.000 Per cent Impervious

```

218.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.473 .022 .558 .558 c.m/s
.098 .803 .592 C perv/imperv/total
15 ADD RUNOFF
.473 .494 .558 .558 c.m/s
4 CATCHMENT
44.000 ID No.ó 99999
.330 Area in hectares
47.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
47.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.011 .494 .558 .558 c.m/s
.098 .798 .343 C perv/imperv/total
15 ADD RUNOFF
.011 .503 .558 .558 c.m/s
4 CATCHMENT
45.000 ID No.ó 99999
6.400 Area in hectares
207.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
207.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.424 .503 .558 .558 c.m/s
.098 .805 .593 C perv/imperv/total
15 ADD RUNOFF
.424 .927 .558 .558 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.424 .927 .927 .558 c.m/s
17 COMBINE
2 Junction Node No.
.424 .927 .927 1.485 c.m/s
14 START
1 1=Zero; 2=Define
18 CONFLUENCE
2 Junction Node No.
.424 1.485 .927 .000 c.m/s
4 CATCHMENT
46.000 ID No.ó 99999
1.030 Area in hectares
83.000 Length (PERV) metres
1.000 Gradient (%)
60.000 Per cent Impervious
83.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.056 1.485 .927 .000 c.m/s
.098 .791 .514 C perv/imperv/total
15 ADD RUNOFF
.056 1.541 .927 .000 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .3604699E+04 c.m
10 POND
6 Depth - Discharge - Volume sets
187.000 .000 .0
187.800 .0410 4766.0
188.300 .0540 8282.0
188.500 .150 9812.0
188.800 .257 12242.0
189.000 .880 13993.0
Peak Outflow = .027 c.m/s
Maximum Depth = 187.531 metres
Maximum Storage = 3161. c.m
.056 1.541 .027 .000 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT SOUTH OF QUAKER, EAST OF RICE - POND P50
*****
4 CATCHMENT
52.000 ID No.ó 99999
6.430 Area in hectares
207.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
207.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.426 .000 .027 .000 c.m/s
.098 .805 .593 C perv/imperv/total

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```

15 ADD RUNOFF
.426 .426 .027 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.426 .426 .426 .000 c.m/s
17 COMBINE
2 Junction Node No.
.426 .426 .426 .426 c.m/s
14 START
1 1=Zero; 2=Define
4 CATCHMENT
53.000 ID No.ó 99999
11.340 Area in hectares
275.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
275.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.731 .000 .426 .426 c.m/s
.098 .798 .588 C perv/imperv/total
15 ADD RUNOFF
.731 .731 .426 .426 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.731 .731 .731 .426 c.m/s
17 COMBINE
2 Junction Node No.
.731 .731 .731 1.157 c.m/s
18 CONFLUENCE
2 Junction Node No.
.731 1.157 .731 .000 c.m/s
4 CATCHMENT
54.000 ID No.ó 99999
1.280 Area in hectares
92.000 Length (PERV) metres
1.000 Gradient (%)
60.000 Per cent Impervious
92.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.070 1.157 .731 .000 c.m/s
.098 .786 .511 C perv/imperv/total
15 ADD RUNOFF
.070 1.227 .731 .000 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .2781534E+04 c.m
10 POND
6 Depth - Discharge - Volume sets
182.000 .000 .0
182.800 .0190 5251.0
183.150 .0230 7895.0
183.500 .238 10751.0
183.800 .396 13425.0
184.000 1.028 15337.0
Peak Outflow = .009 c.m/s
Maximum Depth = 182.397 metres
Maximum Storage = 2607. c.m
.070 1.227 .009 .000 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT NORTH OF SEGMENT 3 - POND P30
*****
4 CATCHMENT
30.000 ID No.ó 99999
8.470 Area in hectares
238.000 Length (PERV) metres
.200 Gradient (%)
.100 Per cent Impervious
238.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.007 .000 .009 .000 c.m/s
.098 .803 .099 C perv/imperv/total
15 ADD RUNOFF
.007 .007 .009 .000 c.m/s
4 CATCHMENT
31.000 ID No.ó 99999
10.420 Area in hectares
264.000 Length (PERV) metres
1.000 Gradient (%)
75.000 Per cent Impervious
264.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.723 .007 .009 .000 c.m/s

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15      .098      .798      .623      C perv/imperv/total
      ADD RUNOFF      .723      .724      .009      .000 c.m/s
27      HYDROGRAPH DISPLAY
5      is # of Hyeto/Hydrograph chosen
      Volume = .1834827E+04 c.m
4      CATCHMENT
32.000      ID No.6 99999
.690      Area in hectares
68.000      Length (PERV) metres
1.000      Gradient (%)
60.000      Per cent Impervious
68.000      Length (IMPERV)
.000      %Imp. with Zero Dpth
1      Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250      Manning "n"
74.000      SCS Curve No or C
.100      Ia/S Coefficient
8.924      Initial Abstraction
1      Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.037      .724      .009      .000 c.m/s
.098      .798      .518      C perv/imperv/total
15      ADD RUNOFF      .037      .760      .009      .000 c.m/s
27      HYDROGRAPH DISPLAY
5      is # of Hyeto/Hydrograph chosen
      Volume = .1924289E+04 c.m
10      POND
5      Depth - Discharge - Volume sets
178.800      .000      .0
179.300      .0260      1520.0
180.100      .0440      4649.0
180.600      .414      7069.0
180.800      1.204      8137.0
Peak Outflow = .025 c.m/s
Maximum Depth = 179.280 metres
Maximum Storage = 1460. c.m
.037      .760      .025      .000 c.m/s
14      START
1      1=Zero; 2=Define
35      COMMENT
3      line(s) of comment
      *****
      PROP DEVELOPMENT SOUTH OF SEGMENT 3 - POND P31
      *****
4      CATCHMENT
33.000      ID No.6 99999
12.960      Area in hectares
294.000      Length (PERV) metres
1.000      Gradient (%)
75.000      Per cent Impervious
294.000      Length (IMPERV)
.000      %Imp. with Zero Dpth
1      Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250      Manning "n"
74.000      SCS Curve No or C
.100      Ia/S Coefficient
8.924      Initial Abstraction
1      Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.887      .000      .025      .000 c.m/s
.098      .801      .625      C perv/imperv/total
15      ADD RUNOFF      .887      .887      .025      .000 c.m/s
27      HYDROGRAPH DISPLAY
5      is # of Hyeto/Hydrograph chosen
      Volume = .2028780E+04 c.m
4      CATCHMENT
34.000      ID No.6 99999
.660      Area in hectares
66.000      Length (PERV) metres
1.000      Gradient (%)
60.000      Per cent Impervious
66.000      Length (IMPERV)
.000      %Imp. with Zero Dpth
1      Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250      Manning "n"
74.000      SCS Curve No or C
.100      Ia/S Coefficient
8.924      Initial Abstraction
1      Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.036      .887      .025      .000 c.m/s
.098      .798      .518      C perv/imperv/total
15      ADD RUNOFF      .036      .922      .025      .000 c.m/s
27      HYDROGRAPH DISPLAY
5      is # of Hyeto/Hydrograph chosen
      Volume = .2114417E+04 c.m
10      POND
6      Depth - Discharge - Volume sets
178.300      .000      .0
178.900      .0350      1927.0
179.600      .0540      4692.0
179.800      .150      5590.0
180.000      .321      6538.0
180.300      1.922      8059.0
Peak Outflow = .032 c.m/s
Maximum Depth = 178.844 metres
Maximum Storage = 1746. c.m
.036      .922      .032      .000 c.m/s
14      START
1      1=Zero; 2=Define

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35 COMMENT
3 line(s) of comment
*****
2-YEAR STORM EVENT
*****
2 STORM
1 1=Chicago;2=Huff;3=User;4=Cdn1hr;5=Historic
755.000 Coefficient a
8.000 Constant b (min)
.789 Exponent c
.450 Fraction to peak r
240.000 Duration d 240 min
38.971 mm Total depth
3 IMPERVIOUS
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.015 Manning "n"
98.000 SCS Curve No or C
.100 Ia/S Coefficient
.518 Initial Abstraction
35 COMMENT
3 line(s) of comment
*****
EXISTING RES. WEST OF SEGMENT 1
*****
4 CATCHMENT
1.000 ID No.6 99999
17.520 Area in hectares
343.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
343.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.896 .000 .000 .000 c.m/s
.194 .857 .426 C perv/imperv/total
15 ADD RUNOFF
.896 .896 .000 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 1
*****
4 CATCHMENT
100.000 ID No.6 99999
2.020 Area in hectares
116.000 Length (PERV) metres
.400 Gradient (%)
15.000 Per cent Impervious
116.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.046 .896 .000 .000 c.m/s
.194 .862 .294 C perv/imperv/total
35 COMMENT
3 line(s) of comment
*****
FLOW AT FUT ROADWAY CULVERT - SEGMENT 1
*****
15 ADD RUNOFF
.046 .941 .000 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.046 .941 .941 .000 c.m/s
17 COMBINE
1 Junction Node No.
.046 .941 .941 .941 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT NORTH OF SEGMENT 1 - POND P10
*****
4 CATCHMENT
10.000 ID No.6 99999
4.050 Area in hectares
164.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
164.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.406 .000 .941 .941 c.m/s
.194 .857 .658 C perv/imperv/total
15 ADD RUNOFF
.406 .406 .941 .941 c.m/s
4 CATCHMENT
11.000 ID No.6 99999
1.000 Area in hectares
82.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
82.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.015 .406 .941 .941 c.m/s
.194 .858 .261 C perv/imperv/total
15 ADD RUNOFF
.015 .422 .941 .941 c.m/s
10 POND
6 Depth - Discharge - Volume sets
184.800 .000 .0
185.750 .0210 1.0
186.000 .0230 503.0
186.250 .0260 1091.0
186.500 .0280 1765.0
186.700 1.244 2370.0
Peak Outflow = .025 c.m/s
Maximum Depth = 186.128 metres
Maximum Storage = 803. c.m
.015 .422 .025 .941 c.m/s
17 COMBINE
1 Junction Node No.
.015 .422 .025 .963 c.m/s
14 START
1 1=Zero; 2=Define
18 CONFLUENCE
1 Junction Node No.
.015 .963 .025 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 1
*****
4 CATCHMENT
101.000 ID No.6 99999
610 Area in hectares
64.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
64.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.010 .963 .025 .000 c.m/s
.194 .855 .260 C perv/imperv/total
15 ADD RUNOFF
.010 .972 .025 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.010 .972 .972 .000 c.m/s
17 COMBINE
1 Junction Node No.
.010 .972 .972 .972 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT SOUTH OF SEGMENT 1 - POND P11
*****
4 CATCHMENT
12.000 ID No.6 99999
2.680 Area in hectares
134.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
134.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.134 .000 .972 .972 c.m/s
.194 .850 .424 C perv/imperv/total
15 ADD RUNOFF
.134 .134 .972 .972 c.m/s
4 CATCHMENT
13.000 ID No.6 99999
6.980 Area in hectares
216.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
216.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.704 .134 .972 .972 c.m/s
.194 .867 .665 C perv/imperv/total
15 ADD RUNOFF
.704 .838 .972 .972 c.m/s
4 CATCHMENT
14.000 ID No.6 99999
.670 Area in hectares
67.000 Length (PERV) metres
1.000 Gradient (%)
60.000 Per cent Impervious
67.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.060 .838 .972 .972 c.m/s
.194 .856 .592 C perv/imperv/total
15 ADD RUNOFF
.060 .889 .972 .972 c.m/s
27 HYDROGRAPH DISPLAY

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5      is # of Hyeto/Hydrograph chosen
Volume = .2406793E+04 c.m
10 POND
5 Depth - Discharge - Volume sets
184.800 .000 .0
185.300 .0140 1142.0
186.100 .0240 3519.0
186.500 .287 4978.0
186.800 1.922 6222.0
Peak Outflow = .018 c.m/s
Maximum Depth = 185.633 metres
Maximum Storage = 2132. c.m
35 COMMENT
3 line(s) of comment
*****
FLOW U/S OF RICE RD CULVERT - OUTLET A1
*****
17 COMBINE
1 Junction Node No.
.060 .889 .018 .972 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT SOUTH OF QUAKER RD & WEST OF RICE RD. - PON
*****
4 CATCHMENT
40.000 ID No.0 99999
8.210 Area in hectares
234.000 Length (PERV) metres
1.000 Gradient (%)
25.000 Per cent Impervious
234.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.300 .000 .018 .983 c.m/s
.194 .868 .363 C perv/imperv/total
15 ADD RUNOFF
.300 .300 .018 .983 c.m/s
4 CATCHMENT
41.000 ID No.0 99999
5.480 Area in hectares
191.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
191.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.553 .300 .018 .983 c.m/s
.194 .864 .663 C perv/imperv/total
15 ADD RUNOFF
.553 .853 .018 .983 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.553 .853 .853 .983 c.m/s
17 COMBINE
2 Junction Node No.
.553 .853 .853 .853 c.m/s
14 START
1 1=Zero; 2=Define
4 CATCHMENT
42.000 ID No.0 99999
.690 Area in hectares
68.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
68.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.036 .000 .853 .853 c.m/s
.194 .857 .426 C perv/imperv/total
15 ADD RUNOFF
.036 .036 .853 .853 c.m/s
4 CATCHMENT
43.000 ID No.0 99999
7.160 Area in hectares
218.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
218.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.722 .036 .853 .853 c.m/s
.194 .867 .665 C perv/imperv/total
15 ADD RUNOFF
.722 .754 .853 .853 c.m/s
4 CATCHMENT
44.000 ID No.0 99999
.330 Area in hectares
47.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
47.000 Length (IMPERV)

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.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.018 .754 .853 .853 c.m/s
.194 .858 .426 C perv/imperv/total
15 ADD RUNOFF
.018 .768 .853 .853 c.m/s
4 CATCHMENT
45.000 ID No.0 99999
6.400 Area in hectares
207.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
207.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.646 .768 .853 .853 c.m/s
.194 .866 .665 C perv/imperv/total
15 ADD RUNOFF
.646 1.414 .853 .853 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.646 1.414 1.414 .853 c.m/s
17 COMBINE
2 Junction Node No.
.646 1.414 1.414 2.267 c.m/s
14 START
1 1=Zero; 2=Define
18 CONFLUENCE
2 Junction Node No.
.646 2.267 1.414 .000 c.m/s
4 CATCHMENT
46.000 ID No.0 99999
1.030 Area in hectares
83.000 Length (PERV) metres
1.000 Gradient (%)
60.000 Per cent Impervious
83.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.088 2.267 1.414 .000 c.m/s
.194 .857 .592 C perv/imperv/total
15 ADD RUNOFF
.088 2.348 1.414 .000 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .6495084E+04 c.m
10 POND
6 Depth - Discharge - Volume sets
187.000 .000 .0
187.800 .0410 4766.0
188.300 .0540 8282.0
188.500 .150 9812.0
188.800 .257 12242.0
189.000 .880 13993.0
Peak Outflow = .045 c.m/s
Maximum Depth = 187.939 metres
Maximum Storage = 5740. c.m
.088 2.348 .045 .000 c.m/s
17 COMBINE
2 Junction Node No.
.088 2.348 .045 .045 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
EXISTING AREA ON QUAKER RD, WEST OF RICE RD
*****
4 CATCHMENT
2.000 ID No.0 99999
9.020 Area in hectares
245.000 Length (PERV) metres
1.000 Gradient (%)
40.000 Per cent Impervious
245.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.520 .000 .045 .045 c.m/s
.194 .868 .464 C perv/imperv/total
15 ADD RUNOFF
.520 .520 .045 .045 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.520 .520 .520 .045 c.m/s
17 COMBINE
2 Junction Node No.
.520 .520 .520 .539 c.m/s
14 START
1 1=Zero; 2=Define
18 CONFLUENCE

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2	Junction Node No.	.520	.539	.520	.000 c.m/s	.000	Routing timestep	0	No. of sub-reaches		
35	COMMENT					.822	.822	.822		.953 c.m/s	
3	line(s) of comment										

	EXISTING AREA ON QUAKER RD, WEST OF RICE RD										

4	CATCHMENT										
3.000	ID No.6 99999										
5.680	Area in hectares										
195.000	Length (PERV) metres										
1.000	Gradient (%)										
40.000	Per cent Impervious										
195.000	Length (IMPERV)										
.000	%Imp. with Zero Dpth										
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat										
.250	Manning "n"										
74.000	SCS Curve No or C										
.100	Ia/S Coefficient										
8.924	Initial Abstraction										
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv										
.330	.539	.520	.000 c.m/s								
.194	.865	.462	C perv/imperv/total								
15	ADD RUNOFF	.330	.869	.520	.000 c.m/s						
9	ROUTE										
.000	Conduit Length										
.000	No Conduit defined										
.000	Zero lag										
.000	Beta weighting factor										
.000	Routing timestep										
0	No. of sub-reaches										
.330	.869	.869	.000 c.m/s								
17	COMBINE										
2	Junction Node No.	.330	.869	.869	.869 c.m/s						
14	START										
1	1=Zero; 2=Define										
35	COMMENT										
3	line(s) of comment										

	PROP DEVELOPMENT SOUTH OF QUAKER RD, EAST OF RICE RD										

4	CATCHMENT										
50.000	ID No.6 99999										
3.420	Area in hectares										
151.000	Length (PERV) metres										
1.000	Gradient (%)										
10.000	Per cent Impervious										
151.000	Length (IMPERV)										
.000	%Imp. with Zero Dpth										
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat										
.250	Manning "n"										
74.000	SCS Curve No or C										
.100	Ia/S Coefficient										
8.924	Initial Abstraction										
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv										
.053	.000	.869	.869 c.m/s								
.194	.854	.260	C perv/imperv/total								
15	ADD RUNOFF	.053	.053	.869	.869 c.m/s						
4	CATCHMENT										
51.000	ID No.6 99999										
1.980	Area in hectares										
115.000	Length (PERV) metres										
1.000	Gradient (%)										
10.000	Per cent Impervious										
115.000	Length (IMPERV)										
.000	%Imp. with Zero Dpth										
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat										
.250	Manning "n"										
74.000	SCS Curve No or C										
.100	Ia/S Coefficient										
8.924	Initial Abstraction										
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv										
.031	.053	.869	.869 c.m/s								
.194	.850	.260	C perv/imperv/total								
15	ADD RUNOFF	.031	.084	.869	.869 c.m/s						
9	ROUTE										
.000	Conduit Length										
.000	No Conduit defined										
.000	Zero lag										
.000	Beta weighting factor										
.000	Routing timestep										
0	No. of sub-reaches										
.031	.084	.084	.869 c.m/s								
17	COMBINE										
2	Junction Node No.	.031	.084	.084	.953 c.m/s						
14	START										
1	1=Zero; 2=Define										
35	COMMENT										
3	line(s) of comment										

	EXISTING AREA WEST OF RICE RD AND SOUTH OF QUAKER ROAD										

4	CATCHMENT										
4.000	ID No.6 99999										
13.940	Area in hectares										
305.000	Length (PERV) metres										
1.000	Gradient (%)										
40.000	Per cent Impervious										
305.000	Length (IMPERV)										
.000	%Imp. with Zero Dpth										
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat										
.250	Manning "n"										
74.000	SCS Curve No or C										
.100	Ia/S Coefficient										
8.924	Initial Abstraction										
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv										
.822	.000	.084	.953 c.m/s								
.194	.862	.461	C perv/imperv/total								
15	ADD RUNOFF	.822	.822	.084	.953 c.m/s						
9	ROUTE										
.000	Conduit Length										
.000	No Conduit defined										
.000	Zero lag										
.000	Beta weighting factor										
.000	Routing timestep										
0	No. of sub-reaches										
.822	.822	.084	.953 c.m/s								
17	COMBINE										
2	Junction Node No.	.822	.822	.822	1.775 c.m/s						
14	START										
1	1=Zero; 2=Define										
18	CONFLUENCE										
2	Junction Node No.	.822	1.775	.822	.000 c.m/s						
35	COMMENT										
3	line(s) of comment										

	RICE ROAD FROM QUAKER RD TO CITY OF WELLAND MUNICIPAL BOUNDARY										

4	CATCHMENT										
501.000	ID No.6 99999										
1.570	Area in hectares										
102.000	Length (PERV) metres										
1.000	Gradient (%)										
70.000	Per cent Impervious										
102.000	Length (IMPERV)										
.000	%Imp. with Zero Dpth										
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat										
.250	Manning "n"										
74.000	SCS Curve No or C										
.100	Ia/S Coefficient										
8.924	Initial Abstraction										
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv										
.149	1.775	.822	.000 c.m/s								
.194	.854	.656	C perv/imperv/total								
15	ADD RUNOFF	.149	1.924	.822	.000 c.m/s						
9	ROUTE										
.000	Conduit Length										
.000	No Conduit defined										
.000	Zero lag										
.000	Beta weighting factor										
.000	Routing timestep										
0	No. of sub-reaches										
.149	1.924	1.924	.000 c.m/s								
35	COMMENT										
3	line(s) of comment										

	FLOW D/S OF RICE RD CULVERT - OUTLET A2										

17	COMBINE										
1	Junction Node No.	.149	1.924	1.924	2.907 c.m/s						
14	START										
1	1=Zero; 2=Define										
35	COMMENT										
3	line(s) of comment										

	PROP DEVELOPMENT SOUTH OF QUAKER RD - QUALITY CONTROL ONLY										

4	CATCHMENT										
20.100	ID No.6 99999										
.780	Area in hectares										
72.000	Length (PERV) metres										
1.000	Gradient (%)										
35.000	Per cent Impervious										
72.000	Length (IMPERV)										
.000	%Imp. with Zero Dpth										
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat										
.250	Manning "n"										
74.000	SCS Curve No or C										
.100	Ia/S Coefficient										
8.924	Initial Abstraction										
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv										
.040	.000	1.924	2.907 c.m/s								
.194	.857	.426	C perv/imperv/total								
15	ADD RUNOFF	.040	.040	1.924	2.907 c.m/s						
4	CATCHMENT										
20.000	ID No.6 99999										
3.210	Area in hectares										
146.000	Length (PERV) metres										
1.000	Gradient (%)										
85.000	Per cent Impervious										
146.000	Length (IMPERV)										
.000	%Imp. with Zero Dpth										
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat										
.250	Manning "n"										
74.000	SCS Curve No or C										
.100	Ia/S Coefficient										
8.924	Initial Abstraction										
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv										
.386	.040	1.924	2.907 c.m/s								
.194	.854	.755	C perv/imperv/total								
15	ADD RUNOFF	.386	.422	1.924	2.907 c.m/s						
9	ROUTE										
.000	Conduit Length										
.000	No Conduit defined										
.000	Zero lag										
.000	Beta weighting factor										
.000	Routing timestep										
0	No. of sub-reaches										
.386	.422	.422	2.907 c.m/s								
17	COMBINE										
1	Junction Node No.	.386	.422	.422	3.329 c.m/s						
14	START										
1	1=Zero; 2=Define										
18	CONFLUENCE										
1	Junction Node No.	.386	3.329	.422	.000 c.m/s						
35	COMMENT										
3	line(s) of comment										

	REALIGNED CHANNEL - SEGMENT 2										

4	CATCHMENT										
200.000	ID No.6 99999										
.970	Area in hectares										
80.416	Length (PERV) metres										
1.000	Gradient (%)										
10.000	Per cent Impervious										

80.416 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.015 3.329 .422 .000 c.m/s
.194 .858 .261 C perv/imperv/total
35 COMMENT
3 line(s) of comment

FLOW D/S OF AREA A20 - OUTLET B

15 ADD RUNOFF
.015 3.344 .422 .000 c.m/s
35 COMMENT
3 line(s) of comment

EX RES. AND FUT DEVELOPMENT LANDS BY OTHERS WEST OF FIRST AV

4 CATCHMENT
21.000 ID No.ó 99999
35.460 Area in hectares
487.000 Length (PERV) metres
.200 Gradient (%)
5.000 Per cent Impervious
487.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.181 3.344 .422 .000 c.m/s
.194 .867 .228 C perv/imperv/total
15 ADD RUNOFF
.181 3.480 .422 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.181 3.480 .000 c.m/s
35 COMMENT
3 line(s) of comment

FLOW U/S OF FIRST AVE CULVERT

17 COMBINE
1 Junction Node No.
.181 3.480 3.480 3.480 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment

PROP DEVELOPMENT SOUTH OF QUAKER, EAST OF RICE - POND P50

4 CATCHMENT
52.000 ID No.ó 99999
6.430 Area in hectares
207.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
207.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.649 .000 3.480 3.480 c.m/s
.194 .866 .665 C perv/imperv/total
15 ADD RUNOFF
.649 .649 3.480 3.480 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.649 .649 .649 3.480 c.m/s
17 COMBINE
2 Junction Node No.
.649 .649 .649 .649 c.m/s
14 START
1 1=Zero; 2=Define
4 CATCHMENT
53.000 ID No.ó 99999
11.340 Area in hectares
275.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
275.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.171 .000 .649 .649 c.m/s
.194 .865 .664 C perv/imperv/total
15 ADD RUNOFF
1.171 1.171 .649 .649 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
1.171 1.171 1.171 .649 c.m/s

17 COMBINE
2 Junction Node No.
1.171 1.171 1.171 1.820 c.m/s
18 CONFLUENCE
2 Junction Node No.
1.171 1.820 1.171 .000 c.m/s
4 CATCHMENT
54.000 ID No.ó 99999
1.280 Area in hectares
92.000 Length (PERV) metres
1.000 Gradient (%)
60.000 Per cent Impervious
92.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.107 1.820 1.171 .000 c.m/s
.194 .857 .592 C perv/imperv/total
15 ADD RUNOFF
.107 1.923 1.171 .000 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .4892284E+04 c.m
10 POND
6 Depth - Discharge - Volume sets
182.000 .000 .0
182.000 .0190 5251.0
183.150 .0230 7895.0
183.500 .238 10751.0
183.800 .396 13425.0
184.000 1.028 15337.0
Peak Outflow = .017 c.m/s
Maximum Depth = 182.699 metres
Maximum Storage = 4589. c.m
.107 1.923 .017 .000 c.m/s
17 COMBINE
2 Junction Node No.
.107 1.923 .017 .017 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment

EXISTING AREA ON QUAKER RD, EAST OF RICE RD

4 CATCHMENT
5.000 ID No.ó 99999
1.870 Area in hectares
112.000 Length (PERV) metres
1.000 Gradient (%)
50.000 Per cent Impervious
112.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.130 .000 .017 .017 c.m/s
.194 .851 .522 C perv/imperv/total
15 ADD RUNOFF
.130 .130 .017 .017 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.130 .130 .130 .017 c.m/s
17 COMBINE
2 Junction Node No.
.130 .130 .130 .136 c.m/s
18 CONFLUENCE
2 Junction Node No.
.130 .136 .130 .000 c.m/s
35 COMMENT
3 line(s) of comment

EXISTING AREA ON QUAKER RD, EAST OF RICE RD

4 CATCHMENT
6.000 ID No.ó 99999
1.920 Area in hectares
113.000 Length (PERV) metres
.200 Gradient (%)
65.000 Per cent Impervious
113.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.185 .136 .130 .000 c.m/s
.194 .867 .631 C perv/imperv/total
15 ADD RUNOFF
.185 .321 .130 .000 c.m/s
35 COMMENT
3 line(s) of comment

FIRST AVE FROM QUAKER RD TO CITY OF WELLAND MUNICIPAL BOUND

4 CATCHMENT
201.000 ID No.ó 99999
2.430 Area in hectares
127.000 Length (PERV) metres
1.000 Gradient (%)
65.000 Per cent Impervious
127.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C

.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.221 .321 .130 .000 c.m/s
.194 .848 .619 C perv/imperv/total
15 ADD RUNOFF .221 .542 .130 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.221 .542 .542 .000 c.m/s
17 COMBINE
1 Junction Node No.
.221 .542 .542 4.022 c.m/s
35 COMMENT
3 line(s) of comment

FLOW D/S OF FIRST AVE CULVERT - OUTLET C

18 CONFLUENCE
1 Junction Node No.
.221 4.022 .542 .000 c.m/s
35 COMMENT
3 line(s) of comment

REALIGNED CHANNEL - SEGMENT 3

4 CATCHMENT
300.000 ID No.0 99999
3.180 Area in hectares
146.000 Length (PERV) metres
.200 Gradient (%)
15.000 Per cent Impervious
146.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.071 4.022 .542 .000 c.m/s
.194 .859 .294 C perv/imperv/total
15 ADD RUNOFF .071 4.093 .542 .000 c.m/s
4 CATCHMENT
301.000 ID No.0 99999
.720 Area in hectares
69.000 Length (PERV) metres
.200 Gradient (%)
10.000 Per cent Impervious
69.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.011 4.093 .542 .000 c.m/s
.194 .855 .260 C perv/imperv/total
15 ADD RUNOFF .011 4.104 .542 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.011 4.104 4.104 .000 c.m/s
17 COMBINE
1 Junction Node No.
.011 4.104 4.104 4.104 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment

PROP DEVELOPMENT NORTH OF SEGMENT 3 - POND P30

4 CATCHMENT
30.000 ID No.0 99999
8.470 Area in hectares
238.000 Length (PERV) metres
.200 Gradient (%)
.100 Per cent Impervious
238.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.035 .000 4.104 4.104 c.m/s
.194 .867 .195 C perv/imperv/total
15 ADD RUNOFF .035 .035 4.104 4.104 c.m/s
4 CATCHMENT
31.000 ID No.0 99999
10.420 Area in hectares
264.000 Length (PERV) metres
1.000 Gradient (%)
75.000 Per cent Impervious
264.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.154 .035 4.104 4.104 c.m/s
.194 .866 .698 C perv/imperv/total
15 ADD RUNOFF

1.154 1.158 4.104 4.104 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .3477034E+04 c.m
4 CATCHMENT
32.000 ID No.0 99999
.690 Area in hectares
68.000 Length (PERV) metres
1.000 Gradient (%)
60.000 Per cent Impervious
68.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.061 1.158 4.104 4.104 c.m/s
.194 .857 .592 C perv/imperv/total
15 ADD RUNOFF .061 1.210 4.104 4.104 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .3636135E+04 c.m
10 POND
5 Depth - Discharge - Volume sets
178.000 .000 .0
179.300 .0260 1520.0
180.100 .0440 4649.0
180.600 .414 7069.0
180.800 1.204 8137.0
Peak Outflow = .034 c.m/s
Maximum Depth = 179.642 metres
Maximum Storage = 2856. c.m
.061 1.210 .034 4.104 c.m/s
17 COMBINE
1 Junction Node No.
.061 1.210 .034 4.122 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment

PROP DEVELOPMENT SOUTH OF SEGMENT 3 - POND P31

4 CATCHMENT
33.000 ID No.0 99999
12.960 Area in hectares
294.000 Length (PERV) metres
1.000 Gradient (%)
75.000 Per cent Impervious
294.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.428 .000 .034 4.122 c.m/s
.194 .863 .696 C perv/imperv/total
15 ADD RUNOFF 1.428 1.428 .034 4.122 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .3513004E+04 c.m
4 CATCHMENT
34.000 ID No.0 99999
.660 Area in hectares
66.000 Length (PERV) metres
1.000 Gradient (%)
60.000 Per cent Impervious
66.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.059 1.428 .034 4.122 c.m/s
.194 .856 .591 C perv/imperv/total
15 ADD RUNOFF .059 1.478 .034 4.122 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .3665095E+04 c.m
10 POND
6 Depth - Discharge - Volume sets
178.300 .000 .0
178.900 .0350 1927.0
179.600 .0540 4692.0
179.800 .150 5590.0
180.000 .321 6538.0
180.300 1.922 8059.0
Peak Outflow = .043 c.m/s
Maximum Depth = 179.201 metres
Maximum Storage = 3116. c.m
.059 1.478 .043 4.122 c.m/s
17 COMBINE
1 Junction Node No.
.059 1.478 .043 4.144 c.m/s
14 START
1 1=Zero; 2=Define
18 CONFLUENCE
1 Junction Node No.
.059 4.144 .043 .000 c.m/s
35 COMMENT
3 line(s) of comment

REALIGNED CHANNEL - SEGMENT 3

4 CATCHMENT
302.000 ID No.0 99999
1.610 Area in hectares
104.000 Length (PERV) metres
.200 Gradient (%)
10.000 Per cent Impervious
104.000 Length (IMPERV)

```

.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.024 4.144 .043 .000 c.m/s
.194 .868 .262 C perv/imperv/total
35 COMMENT
3 Line(s) of comment
*****
FLOW U/S OF NIAGARA ST CULVERT - OUTLET D
*****
15 ADD RUNOFF
.024 4.168 .043 .000 c.m/s
14 START
1 1=Zero; 2=Define

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35 COMMENT
3 line(s) of comment
*****
5-YEAR STORM EVENT
*****

2 STORM
1 1=Chicago;2=Huff;3=User;4=Cdn1hr;5=Historic
830.000 Coefficient a
7.300 Constant b (min)
.777 Exponent c
.450 Fraction to peak r
240.000 Duration ó 240 min
45.874 mm Total depth

3 IMPERVIOUS
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.015 Manning "n"
98.000 SCS Curve No or C
.100 Ia/S Coefficient
.518 Initial Abstraction

35 COMMENT
3 line(s) of comment
*****
EXISTING RES. WEST OF SEGMENT 1
*****

4 CATCHMENT
1.000 ID No.ó 99999
17.520 Area in hectares
343.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
343.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.082 .000 .000 .000 c.m/s
.236 .879 .461 C perv/imperv/total

15 ADD RUNOFF
1.082 1.082 .000 .000 c.m/s

35 COMMENT
3 line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 1
*****

4 CATCHMENT
100.000 ID No.ó 99999
2.020 Area in hectares
116.000 Length (PERV) metres
.400 Gradient (%)
15.000 Per cent Impervious
116.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.055 1.082 .000 .000 c.m/s
.236 .874 .332 C perv/imperv/total

35 COMMENT
3 line(s) of comment
*****
FLOW AT FUT ROADWAY CULVERT - SEGMENT 1
*****

15 ADD RUNOFF
.055 1.137 .000 .000 c.m/s

9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.055 1.137 1.137 .000 c.m/s

17 COMBINE
1 Junction Node No.
.055 1.137 1.137 1.137 c.m/s

14 START
1 1=Zero; 2=Define

35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT NORTH OF SEGMENT 1 - POND P10
*****

4 CATCHMENT
10.000 ID No.ó 99999
4.050 Area in hectares
164.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
164.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.477 .000 1.137 1.137 c.m/s
.236 .871 .681 C perv/imperv/total

15 ADD RUNOFF
.477 .477 1.137 1.137 c.m/s

4 CATCHMENT
11.000 ID No.ó 99999
1.000 Area in hectares
82.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
82.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv

.020 .477 1.137 1.137 c.m/s
.235 .875 .299 C perv/imperv/total

15 ADD RUNOFF
.020 .497 1.137 1.137 c.m/s

10 POND
6 Depth - Discharge - Volume sets
184.800 .000 .0
185.750 .0210 1.0
186.000 .0230 503.0
186.250 .0260 1091.0
186.500 .0280 1765.0
186.700 1.244 2370.0
Peak Outflow = .026 c.m/s
Maximum Depth = 186.226 metres
Maximum Storage = 1035. c.m
.020 .497 .026 1.137 c.m/s

17 COMBINE
1 Junction Node No.
.020 .497 .026 1.160 c.m/s

14 START
1 1=Zero; 2=Define

18 CONFLUENCE
1 Junction Node No.
.020 1.160 .026 .000 c.m/s

35 COMMENT
3 line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 1
*****

4 CATCHMENT
101.000 ID No.ó 99999
610 Area in hectares
64.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
64.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.012 1.160 .026 .000 c.m/s
.235 .873 .299 C perv/imperv/total

15 ADD RUNOFF
.012 1.172 .026 .000 c.m/s

9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.012 1.172 1.172 .000 c.m/s

17 COMBINE
1 Junction Node No.
.012 1.172 1.172 1.172 c.m/s

14 START
1 1=Zero; 2=Define

35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT SOUTH OF SEGMENT 1 - POND P11
*****

4 CATCHMENT
12.000 ID No.ó 99999
2.680 Area in hectares
134.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
134.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.159 .000 1.172 1.172 c.m/s
.236 .866 .456 C perv/imperv/total

15 ADD RUNOFF
.159 .159 1.172 1.172 c.m/s

4 CATCHMENT
13.000 ID No.ó 99999
6.980 Area in hectares
216.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
216.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.835 .159 1.172 1.172 c.m/s
.236 .882 .688 C perv/imperv/total

15 ADD RUNOFF
.835 .994 1.172 1.172 c.m/s

4 CATCHMENT
14.000 ID No.ó 99999
.670 Area in hectares
67.000 Length (PERV) metres
1.000 Gradient (%)
60.000 Per cent Impervious
67.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.072 .994 1.172 1.172 c.m/s
.235 .873 .618 C perv/imperv/total

15 ADD RUNOFF
.072 1.052 1.172 1.172 c.m/s

27 HYDROGRAPH DISPLAY

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5 is # of Hyeto/Hydrograph chosen
Volume = .2954374E+04 c.m
10 POND
5 Depth - Discharge - Volume sets
184.800 .000 .0
185.300 .0140 1142.0
186.100 .0240 3519.0
186.500 .287 4978.0
186.800 1.922 6222.0
Peak Outflow = .020 c.m/s
Maximum Depth = 185.805 metres
Maximum Storage = 2641. c.m
.072 1.052 .020 1.172 c.m/s
35 COMMENT
3 line(s) of comment
*****
FLOW U/S OF RICE RD CULVERT - OUTLET A1
*****
17 COMBINE
1 Junction Node No.
.072 1.052 .020 1.185 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT SOUTH OF QUAKER RD & WEST OF RICE RD. - PON
*****
4 CATCHMENT
40.000 ID No.0 99999
8.210 Area in hectares
234.000 Length (PERV) metres
1.000 Gradient (%)
25.000 Per cent Impervious
234.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.361 .000 .020 1.185 c.m/s
.236 .884 .398 C perv/imperv/total
15 ADD RUNOFF
.361 .361 .020 1.185 c.m/s
4 CATCHMENT
41.000 ID No.0 99999
5.480 Area in hectares
191.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
191.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.652 .361 .020 1.185 c.m/s
.236 .876 .684 C perv/imperv/total
15 ADD RUNOFF
.652 1.013 .020 1.185 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.652 1.013 1.013 1.185 c.m/s
17 COMBINE
2 Junction Node No.
.652 1.013 1.013 1.013 c.m/s
14 START
1 1=Zero; 2=Define
4 CATCHMENT
42.000 ID No.0 99999
.690 Area in hectares
68.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
68.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.044 .000 1.013 1.013 c.m/s
.236 .873 .459 C perv/imperv/total
15 ADD RUNOFF
.044 .044 1.013 1.013 c.m/s
4 CATCHMENT
43.000 ID No.0 99999
7.160 Area in hectares
218.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
218.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.857 .044 1.013 1.013 c.m/s
.236 .882 .688 C perv/imperv/total
15 ADD RUNOFF
.857 .894 1.013 1.013 c.m/s
4 CATCHMENT
44.000 ID No.0 99999
.330 Area in hectares
47.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
47.000 Length (IMPERV)

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2	Junction Node No.	.624	.649	.624	.000 c.m/s	.000	Routing timestep	0	No. of sub-reaches	.988	.988	.988	1.145 c.m/s
35	COMMENT												
3	line(s) of comment												

	EXISTING AREA ON QUAKER RD, WEST OF RICE RD												

4	CATCHMENT												
3.000	ID No.6 99999												
5.680	Area in hectares												
195.000	Length (PERV) metres												
1.000	Gradient (%)												
40.000	Per cent Impervious												
195.000	Length (IMPERV)												
.000	%Imp. with Zero Dpth												
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat												
.250	Manning "n"												
74.000	SCS Curve No or C												
.100	Ia/S Coefficient												
8.924	Initial Abstraction												
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv												
.392	.649	.624	.000 c.m/s										
.236	.877	.492	C perv/imperv/total										
15	ADD RUNOFF	.392	1.041	.624	.000 c.m/s								
9	ROUTE												
.000	Conduit Length												
.000	No Conduit defined												
.000	Zero lag												
.000	Beta weighting factor												
.000	Routing timestep												
0	No. of sub-reaches												
.392	1.041	1.041	.000 c.m/s										
17	COMBINE												
2	Junction Node No.	.392	1.041	1.041	1.041 c.m/s								
14	START												
1	1=Zero; 2=Define												
35	COMMENT												
3	line(s) of comment												

	PROP DEVELOPMENT SOUTH OF QUAKER RD, EAST OF RICE RD												

4	CATCHMENT												
50.000	ID No.6 99999												
3.420	Area in hectares												
151.000	Length (PERV) metres												
1.000	Gradient (%)												
10.000	Per cent Impervious												
151.000	Length (IMPERV)												
.000	%Imp. with Zero Dpth												
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat												
.250	Manning "n"												
74.000	SCS Curve No or C												
.100	Ia/S Coefficient												
8.924	Initial Abstraction												
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv												
.066	.000	1.041	1.041 c.m/s										
.236	.868	.299	C perv/imperv/total										
15	ADD RUNOFF	.066	.066	1.041	1.041 c.m/s								
4	CATCHMENT												
51.000	ID No.6 99999												
1.980	Area in hectares												
115.000	Length (PERV) metres												
1.000	Gradient (%)												
10.000	Per cent Impervious												
115.000	Length (IMPERV)												
.000	%Imp. with Zero Dpth												
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat												
.250	Manning "n"												
74.000	SCS Curve No or C												
.100	Ia/S Coefficient												
8.924	Initial Abstraction												
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv												
.039	.066	1.041	1.041 c.m/s										
.236	.872	.299	C perv/imperv/total										
15	ADD RUNOFF	.039	.104	1.041	1.041 c.m/s								
9	ROUTE												
.000	Conduit Length												
.000	No Conduit defined												
.000	Zero lag												
.000	Beta weighting factor												
.000	Routing timestep												
0	No. of sub-reaches												
.039	.104	.104	1.041 c.m/s										
17	COMBINE												
2	Junction Node No.	.039	.104	.104	1.145 c.m/s								
14	START												
1	1=Zero; 2=Define												
35	COMMENT												
3	line(s) of comment												

	EXISTING AREA WEST OF RICE RD AND SOUTH OF QUAKER ROAD												

4	CATCHMENT												
4.000	ID No.6 99999												
13.940	Area in hectares												
305.000	Length (PERV) metres												
1.000	Gradient (%)												
40.000	Per cent Impervious												
305.000	Length (IMPERV)												
.000	%Imp. with Zero Dpth												
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat												
.250	Manning "n"												
74.000	SCS Curve No or C												
.100	Ia/S Coefficient												
8.924	Initial Abstraction												
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv												
.988	.000	.104	1.145 c.m/s										
.236	.883	.495	C perv/imperv/total										
15	ADD RUNOFF	.988	.988	.104	1.145 c.m/s								
9	ROUTE												
.000	Conduit Length												
.000	No Conduit defined												
.000	Zero lag												
.000	Beta weighting factor												
.000	Routing timestep												
0	No. of sub-reaches												
.452	.494	.494	3.491 c.m/s										
17	COMBINE												
1	Junction Node No.	.452	.494	.494	3.985 c.m/s								
14	START												
1	1=Zero; 2=Define												
18	CONFLUENCE												
1	Junction Node No.	.452	3.985	.494	.000 c.m/s								
35	COMMENT												
3	line(s) of comment												

	REALIGNED CHANNEL - SEGMENT 2												

4	CATCHMENT												
200.000	ID No.6 99999												
.970	Area in hectares												
80.416	Length (PERV) metres												
1.000	Gradient (%)												
10.000	Per cent Impervious												

80.416 Length (IMPERV)
 .000 %Imp. with Zero Dpth
 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
 .250 Manning "n"
 74.000 SCS Curve No or C
 .100 Ia/S Coefficient
 8.924 Initial Abstraction
 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
 .019 3.985 .494 .000 c.m/s
 .236 .875 .299 C perv/imperv/total
 35 COMMENT
 3 line(s) of comment

 FLOW D/S OF AREA A20 - OUTLET B

 15 ADD RUNOFF
 .019 4.004 .494 .000 c.m/s
 35 COMMENT
 3 line(s) of comment

 EX RES. AND FUT DEVELOPMENT LANDS BY OTHERS WEST OF FIRST AV

 4 CATCHMENT
 21.000 ID No.ó 99999
 35.460 Area in hectares
 487.000 Length (PERV) metres
 .200 Gradient (%)
 5.000 Per cent Impervious
 487.000 Length (IMPERV)
 .000 %Imp. with Zero Dpth
 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
 .250 Manning "n"
 74.000 SCS Curve No or C
 .100 Ia/S Coefficient
 8.924 Initial Abstraction
 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
 .229 4.004 .494 .000 c.m/s
 .236 .884 .268 C perv/imperv/total
 15 ADD RUNOFF
 .229 4.191 .494 .000 c.m/s
 9 ROUTE
 .000 Conduit Length
 .000 No Conduit defined
 .000 Zero lag
 .000 Beta weighting factor
 .000 Routing timestep
 0 No. of sub-reaches
 .229 4.191 4.191 .000 c.m/s
 35 COMMENT
 3 line(s) of comment

 FLOW U/S OF FIRST AVE CULVERT

 17 COMBINE
 1 Junction Node No.
 .229 4.191 4.191 4.191 c.m/s
 14 START
 1 1=Zero; 2=Define
 35 COMMENT
 3 line(s) of comment

 PROP DEVELOPMENT SOUTH OF QUAKER, EAST OF RICE - POND P50

 4 CATCHMENT
 52.000 ID No.ó 99999
 6.430 Area in hectares
 207.000 Length (PERV) metres
 1.000 Gradient (%)
 70.000 Per cent Impervious
 207.000 Length (IMPERV)
 .000 %Imp. with Zero Dpth
 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
 .250 Manning "n"
 74.000 SCS Curve No or C
 .100 Ia/S Coefficient
 8.924 Initial Abstraction
 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
 .768 .000 4.191 4.191 c.m/s
 .236 .880 .687 C perv/imperv/total
 15 ADD RUNOFF
 .768 .768 4.191 4.191 c.m/s
 9 ROUTE
 .000 Conduit Length
 .000 No Conduit defined
 .000 Zero lag
 .000 Beta weighting factor
 .000 Routing timestep
 0 No. of sub-reaches
 .768 .768 .768 4.191 c.m/s
 17 COMBINE
 2 Junction Node No.
 .768 .768 .768 .768 c.m/s
 14 START
 1 1=Zero; 2=Define
 4 CATCHMENT
 53.000 ID No.ó 99999
 11.340 Area in hectares
 275.000 Length (PERV) metres
 1.000 Gradient (%)
 70.000 Per cent Impervious
 275.000 Length (IMPERV)
 .000 %Imp. with Zero Dpth
 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
 .250 Manning "n"
 74.000 SCS Curve No or C
 .100 Ia/S Coefficient
 8.924 Initial Abstraction
 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
 1.397 .000 .768 .768 c.m/s
 .236 .886 .691 C perv/imperv/total
 15 ADD RUNOFF
 1.397 1.397 .768 .768 c.m/s
 9 ROUTE
 .000 Conduit Length
 .000 No Conduit defined
 .000 Zero lag
 .000 Beta weighting factor
 .000 Routing timestep
 0 No. of sub-reaches
 1.397 1.397 1.397 .768 c.m/s

17 COMBINE
 2 Junction Node No.
 1.397 1.397 1.397 2.165 c.m/s
 18 CONFLUENCE
 2 Junction Node No.
 1.397 2.165 1.397 .000 c.m/s
 4 CATCHMENT
 54.000 ID No.ó 99999
 1.280 Area in hectares
 92.000 Length (PERV) metres
 1.000 Gradient (%)
 60.000 Per cent Impervious
 92.000 Length (IMPERV)
 .000 %Imp. with Zero Dpth
 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
 .250 Manning "n"
 74.000 SCS Curve No or C
 .100 Ia/S Coefficient
 8.924 Initial Abstraction
 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
 .131 2.165 1.397 .000 c.m/s
 .236 .876 .620 C perv/imperv/total
 15 ADD RUNOFF
 .131 2.285 1.397 .000 c.m/s
 27 HYDROGRAPH DISPLAY
 5 is # of Hyeto/Hydrograph chosen
 Volume = .5982220E+04 c.m
 10 POND
 6 Depth - Discharge - Volume sets
 182.000 .000 .0
 182.000 .0190 5251.0
 183.150 .0230 7895.0
 183.500 .238 10751.0
 183.800 .396 13425.0
 184.000 1.028 15337.0
 Peak Outflow = .020 c.m/s
 Maximum Depth = 182.848 metres
 Maximum Storage = 5617. c.m
 .131 2.285 .020 .000 c.m/s
 17 COMBINE
 2 Junction Node No.
 .131 2.285 .020 .020 c.m/s
 14 START
 1 1=Zero; 2=Define
 35 COMMENT
 3 line(s) of comment

 EXISTING AREA ON QUAKER RD, EAST OF RICE RD

 4 CATCHMENT
 5.000 ID No.ó 99999
 1.870 Area in hectares
 112.000 Length (PERV) metres
 1.000 Gradient (%)
 50.000 Per cent Impervious
 112.000 Length (IMPERV)
 .000 %Imp. with Zero Dpth
 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
 .250 Manning "n"
 74.000 SCS Curve No or C
 .100 Ia/S Coefficient
 8.924 Initial Abstraction
 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
 .153 .000 .020 .020 c.m/s
 .236 .873 .554 C perv/imperv/total
 15 ADD RUNOFF
 .153 .153 .020 .020 c.m/s
 9 ROUTE
 .000 Conduit Length
 .000 No Conduit defined
 .000 Zero lag
 .000 Beta weighting factor
 .000 Routing timestep
 0 No. of sub-reaches
 .153 .153 .153 .020 c.m/s
 17 COMBINE
 2 Junction Node No.
 .153 .153 .153 .160 c.m/s
 18 CONFLUENCE
 2 Junction Node No.
 .153 .160 .153 .000 c.m/s
 35 COMMENT
 3 line(s) of comment

 EXISTING AREA ON QUAKER RD, EAST OF RICE RD

 4 CATCHMENT
 6.000 ID No.ó 99999
 1.920 Area in hectares
 113.000 Length (PERV) metres
 .200 Gradient (%)
 65.000 Per cent Impervious
 113.000 Length (IMPERV)
 .000 %Imp. with Zero Dpth
 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
 .250 Manning "n"
 74.000 SCS Curve No or C
 .100 Ia/S Coefficient
 8.924 Initial Abstraction
 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
 .214 .160 .153 .000 c.m/s
 .236 .886 .658 C perv/imperv/total
 15 ADD RUNOFF
 .214 .374 .153 .000 c.m/s
 35 COMMENT
 3 line(s) of comment

 FIRST AVE FROM QUAKER RD TO CITY OF WELLAND MUNICIPAL BOUND

 4 CATCHMENT
 201.000 ID No.ó 99999
 2.430 Area in hectares
 127.000 Length (PERV) metres
 1.000 Gradient (%)
 65.000 Per cent Impervious
 127.000 Length (IMPERV)
 .000 %Imp. with Zero Dpth
 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
 .250 Manning "n"
 74.000 SCS Curve No or C

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.100      Ia/S Coefficient
8.924     Initial Abstraction
1         Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.259      .374      .153      .000 c.m/s
.236      .868      .647      C perv/imperv/total
15  ADD RUNOFF      .259      .632      .153      .000 c.m/s
9   ROUTE
.000      Conduit Length
.000      No Conduit defined
.000      Zero lag
.000      Beta weighting factor
.000      Routing timestep
0         No. of sub-reaches
.259      .632      .632      .000 c.m/s
17  COMBINE
1         Junction Node No.
.259      .632      .632      4.823 c.m/s
35  COMMENT
3         line(s) of comment
*****
FLOW D/S OF FIRST AVE CULVERT - OUTLET C
*****
18  CONFLUENCE
1         Junction Node No.
.259      4.823      .632      .000 c.m/s
35  COMMENT
3         line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 3
*****
4   CATCHMENT
300.000   ID No.0 99999
3.180     Area in hectares
146.000   Length (PERV) metres
.200      Gradient (%)
15.000    Per cent Impervious
146.000   Length (IMPERV)
.000      %Imp. with Zero Dpth
1         Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250      Manning "n"
74.000    SCS Curve No or C
.100      Ia/S Coefficient
8.924     Initial Abstraction
1         Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.087      4.823      .632      .000 c.m/s
.236      .880      .332      C perv/imperv/total
15  ADD RUNOFF      .087      4.910      .632      .000 c.m/s
4   CATCHMENT
301.000   ID No.0 99999
.720      Area in hectares
69.000    Length (PERV) metres
.200      Gradient (%)
10.000    Per cent Impervious
69.000    Length (IMPERV)
.000      %Imp. with Zero Dpth
1         Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250      Manning "n"
74.000    SCS Curve No or C
.100      Ia/S Coefficient
8.924     Initial Abstraction
1         Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.014      4.910      .632      .000 c.m/s
.236      .869      .299      C perv/imperv/total
15  ADD RUNOFF      .014      4.924      .632      .000 c.m/s
9   ROUTE
.000      Conduit Length
.000      No Conduit defined
.000      Zero lag
.000      Beta weighting factor
.000      Routing timestep
0         No. of sub-reaches
.014      4.924      4.924      .000 c.m/s
17  COMBINE
1         Junction Node No.
.014      4.924      4.924      4.924 c.m/s
14  START
1         1=Zero; 2=Define
35  COMMENT
3         line(s) of comment
*****
PROP DEVELOPMENT NORTH OF SEGMENT 3 - POND P30
*****
4   CATCHMENT
30.000    ID No.0 99999
8.470     Area in hectares
238.000   Length (PERV) metres
.200      Gradient (%)
.100      Per cent Impervious
238.000   Length (IMPERV)
.000      %Imp. with Zero Dpth
1         Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250      Manning "n"
74.000    SCS Curve No or C
.100      Ia/S Coefficient
8.924     Initial Abstraction
1         Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.057      .000      4.924      4.924 c.m/s
.236      .885      .236      C perv/imperv/total
15  ADD RUNOFF      .057      .057      4.924      4.924 c.m/s
4   CATCHMENT
31.000    ID No.0 99999
10.420    Area in hectares
264.000   Length (PERV) metres
.1000     Gradient (%)
75.000    Per cent Impervious
264.000   Length (IMPERV)
.000      %Imp. with Zero Dpth
1         Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250      Manning "n"
74.000    SCS Curve No or C
.100      Ia/S Coefficient
8.924     Initial Abstraction
1         Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.333     .057      4.924      4.924 c.m/s
.236      .886      .723      C perv/imperv/total
15  ADD RUNOFF

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1.333     1.341     4.924     4.924 c.m/s
27  HYDROGRAPH DISPLAY
5         is # of Hyeto/Hydrograph chosen
Volume = .4376407E+04 c.m
4   CATCHMENT
32.000    ID No.0 99999
.690      Area in hectares
68.000    Length (PERV) metres
1.000     Gradient (%)
60.000    Per cent Impervious
68.000    Length (IMPERV)
.000      %Imp. with Zero Dpth
1         Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250      Manning "n"
74.000    SCS Curve No or C
.100      Ia/S Coefficient
8.924     Initial Abstraction
1         Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.074      1.341     4.924     4.924 c.m/s
.236      .873      .618      C perv/imperv/total
15  ADD RUNOFF      .074      1.401     4.924     4.924 c.m/s
27  HYDROGRAPH DISPLAY
5         is # of Hyeto/Hydrograph chosen
Volume = .4571937E+04 c.m
10  POND
5 Depth - Discharge - Volume sets
178.800   .000      .0
179.300   .0260    1520.0
180.100   .0440    4649.0
180.600   .414     7069.0
180.800   1.204    8137.0
Peak Outflow = .038 c.m/s
Maximum Depth = 179.851 metres
Maximum Storage = 3675. c.m
.074      1.401     .038      4.924 c.m/s
17  COMBINE
1         Junction Node No.
.074      1.401     .038      4.947 c.m/s
14  START
1         1=Zero; 2=Define
35  COMMENT
3         line(s) of comment
*****
PROP DEVELOPMENT SOUTH OF SEGMENT 3 - POND P31
*****
4   CATCHMENT
33.000    ID No.0 99999
12.960    Area in hectares
294.000   Length (PERV) metres
1.000     Gradient (%)
75.000    Per cent Impervious
294.000   Length (IMPERV)
.000      %Imp. with Zero Dpth
1         Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250      Manning "n"
74.000    SCS Curve No or C
.100      Ia/S Coefficient
8.924     Initial Abstraction
1         Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.708     .000      .038      4.947 c.m/s
.236      .884      .722      C perv/imperv/total
15  ADD RUNOFF      1.708     1.708     .038      4.947 c.m/s
27  HYDROGRAPH DISPLAY
5         is # of Hyeto/Hydrograph chosen
Volume = .4291300E+04 c.m
4   CATCHMENT
34.000    ID No.0 99999
.660      Area in hectares
66.000    Length (PERV) metres
1.000     Gradient (%)
60.000    Per cent Impervious
66.000    Length (IMPERV)
.000      %Imp. with Zero Dpth
1         Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250      Manning "n"
74.000    SCS Curve No or C
.100      Ia/S Coefficient
8.924     Initial Abstraction
1         Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.072      1.708     .038      4.947 c.m/s
.235      .873      .618      C perv/imperv/total
15  ADD RUNOFF      .072      1.765     .038      4.947 c.m/s
27  HYDROGRAPH DISPLAY
5         is # of Hyeto/Hydrograph chosen
Volume = .4478340E+04 c.m
10  POND
6 Depth - Discharge - Volume sets
178.300   .000      .0
178.900   .0350    1927.0
179.600   .0540    4692.0
179.800   .150     5590.0
180.000   .321     6538.0
180.300   1.922    8059.0
Peak Outflow = .048 c.m/s
Maximum Depth = 179.388 metres
Maximum Storage = 3856. c.m
.072      1.765     .048      4.947 c.m/s
17  COMBINE
1         Junction Node No.
.072      1.765     .048      4.975 c.m/s
14  START
1         1=Zero; 2=Define
18  CONFLUENCE
1         Junction Node No.
.072      4.975     .048      .000 c.m/s
35  COMMENT
3         line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 3
*****
4   CATCHMENT
302.000   ID No.0 99999
1.610     Area in hectares
104.000   Length (PERV) metres
.200      Gradient (%)
10.000    Per cent Impervious
104.000   Length (IMPERV)

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.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.030 4.975 .048 .000 c.m/s
.236 .884 .301 C perv/imperv/total
35 COMMENT
3 Line(s) of comment
*****
FLOW U/S OF NIAGARA ST CULVERT - OUTLET D
*****
15 ADD RUNOFF
.030 5.005 .048 .000 c.m/s
14 START
1 1=Zero; 2=Define

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35 COMMENT
3 line(s) of comment
*****
10-YEAR STORM EVENT
*****
2 STORM
1 1=Chicago;2=Huff;3=User;4=Cdn1hr;5=Historic
860.000 Coefficient a
6.500 Constant b (min)
.763 Exponent c
.450 Fraction to peak r
240.000 Duration ó 240 min
51.471 mm Total depth
3 IMPERVIOUS
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.015 Manning "n"
98.000 SCS Curve No or C
.100 Ia/S Coefficient
.518 Initial Abstraction
35 COMMENT
3 line(s) of comment
*****
EXISTING RES. WEST OF SEGMENT 1
*****
4 CATCHMENT
1.000 ID No.ó 99999
17.520 Area in hectares
343.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
343.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.227 .000 .000 .000 c.m/s
.267 .892 .486 C perv/imperv/total
15 ADD RUNOFF
1.227 1.227 .000 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 1
*****
4 CATCHMENT
100.000 ID No.ó 99999
2.020 Area in hectares
116.000 Length (PERV) metres
.400 Gradient (%)
15.000 Per cent Impervious
116.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.063 1.227 .000 .000 c.m/s
.267 .883 .359 C perv/imperv/total
35 COMMENT
3 line(s) of comment
*****
FLOW AT FUT ROADWAY CULVERT - SEGMENT 1
*****
15 ADD RUNOFF
.063 1.290 .000 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.063 1.290 .000 c.m/s
17 COMBINE
1 Junction Node No.
.063 1.290 1.290 1.290 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT NORTH OF SEGMENT 1 - POND P10
*****
4 CATCHMENT
10.000 ID No.ó 99999
4.050 Area in hectares
164.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
164.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.531 .000 1.290 1.290 c.m/s
.267 .879 .695 C perv/imperv/total
15 ADD RUNOFF
.531 .531 1.290 1.290 c.m/s
4 CATCHMENT
11.000 ID No.ó 99999
1.000 Area in hectares
82.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
82.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.024 .531 1.290 1.290 c.m/s
.267 .886 .329 C perv/imperv/total
15 ADD RUNOFF
.024 .555 1.290 1.290 c.m/s
10 POND
6 Depth - Discharge - Volume sets
184.800 .000 .0
185.750 .0210 1.0
186.000 .0230 503.0
186.250 .0260 1091.0
186.500 .0280 1765.0
186.700 1.244 2370.0
Peak Outflow = .026 c.m/s
Maximum Depth = 186.301 metres
Maximum Storage = 1229. c.m
.024 .555 .026 1.290 c.m/s
17 COMBINE
1 Junction Node No.
.024 .555 .026 1.313 c.m/s
14 START
1 1=Zero; 2=Define
18 CONFLUENCE
1 Junction Node No.
.024 1.313 .026 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 1
*****
4 CATCHMENT
101.000 ID No.ó 99999
610 Area in hectares
64.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
64.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.016 1.313 .026 .000 c.m/s
.266 .884 .328 C perv/imperv/total
15 ADD RUNOFF
.016 1.329 .026 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.016 1.329 1.329 .000 c.m/s
17 COMBINE
1 Junction Node No.
.016 1.329 1.329 1.329 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT SOUTH OF SEGMENT 1 - POND P11
*****
4 CATCHMENT
12.000 ID No.ó 99999
2.680 Area in hectares
134.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
134.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.178 .000 1.329 1.329 c.m/s
.267 .880 .481 C perv/imperv/total
15 ADD RUNOFF
.178 .178 1.329 1.329 c.m/s
4 CATCHMENT
13.000 ID No.ó 99999
6.980 Area in hectares
216.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
216.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.933 .178 1.329 1.329 c.m/s
.267 .890 .703 C perv/imperv/total
15 ADD RUNOFF
.933 1.112 1.329 1.329 c.m/s
4 CATCHMENT
14.000 ID No.ó 99999
.670 Area in hectares
67.000 Length (PERV) metres
1.000 Gradient (%)
60.000 Per cent Impervious
67.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.083 1.112 1.329 1.329 c.m/s
.267 .884 .637 C perv/imperv/total
15 ADD RUNOFF
.083 1.177 1.329 1.329 c.m/s
27 HYDROGRAPH DISPLAY

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5 is # of Hyeto/Hydrograph chosen
Volume = .348792E+04 c.m
10 POND
5 Depth - Discharge - Volume sets
184.800 .000 .0
185.300 .0140 1142.0
186.100 .0240 3519.0
186.500 .287 4978.0
186.800 1.922 6222.0
Peak Outflow = .022 c.m/s
Maximum Depth = 185.947 metres
Maximum Storage = 3066. c.m
.083 1.177 .022 1.329 c.m/s
35 COMMENT
3 line(s) of comment
*****
FLOW U/S OF RICE RD CULVERT - OUTLET A1
*****
17 COMBINE
1 Junction Node No.
.083 1.177 .022 1.344 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT SOUTH OF QUAKER RD & WEST OF RICE RD. - PON
*****
4 CATCHMENT
40.000 ID No.0 99999
8.210 Area in hectares
234.000 Length (PERV) metres
1.000 Gradient (%)
25.000 Per cent Impervious
234.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.408 .000 .022 1.344 c.m/s
.267 .894 .423 C perv/imperv/total
15 ADD RUNOFF
.408 .408 .022 1.344 c.m/s
4 CATCHMENT
41.000 ID No.0 99999
5.480 Area in hectares
191.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
191.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.728 .408 .022 1.344 c.m/s
.267 .884 .699 C perv/imperv/total
15 ADD RUNOFF
.728 1.136 .022 1.344 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.728 1.136 1.136 1.344 c.m/s
17 COMBINE
2 Junction Node No.
.728 1.136 1.136 1.136 c.m/s
14 START
1 1=Zero; 2=Define
4 CATCHMENT
42.000 ID No.0 99999
.690 Area in hectares
68.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
68.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.051 .000 1.136 1.136 c.m/s
.267 .884 .483 C perv/imperv/total
15 ADD RUNOFF
.051 .051 1.136 1.136 c.m/s
4 CATCHMENT
43.000 ID No.0 99999
7.160 Area in hectares
218.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
218.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.958 .051 1.136 1.136 c.m/s
.267 .890 .703 C perv/imperv/total
15 ADD RUNOFF
.958 1.000 1.136 1.136 c.m/s
4 CATCHMENT
44.000 ID No.0 99999
.330 Area in hectares
47.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
47.000 Length (IMPERV)

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.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.026 1.000 1.136 1.136 c.m/s
.266 .885 .483 C perv/imperv/total
15 ADD RUNOFF
.026 1.020 1.136 1.136 c.m/s
4 CATCHMENT
45.000 ID No.0 99999
6.400 Area in hectares
207.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
207.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.854 1.020 1.136 1.136 c.m/s
.267 .887 .701 C perv/imperv/total
15 ADD RUNOFF
.854 1.874 1.136 1.136 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.854 1.874 1.874 1.136 c.m/s
17 COMBINE
2 Junction Node No.
.854 1.874 1.874 3.010 c.m/s
14 START
1 1=Zero; 2=Define
18 CONFLUENCE
2 Junction Node No.
.854 3.010 1.874 .000 c.m/s
4 CATCHMENT
46.000 ID No.0 99999
1.030 Area in hectares
83.000 Length (PERV) metres
1.000 Gradient (%)
60.000 Per cent Impervious
83.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.122 3.010 1.874 .000 c.m/s
.267 .886 .638 C perv/imperv/total
15 ADD RUNOFF
.122 3.115 1.874 .000 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .9253276E+04 c.m
10 POND
6 Depth - Discharge - Volume sets
187.000 .000 .0
187.800 .0410 4766.0
188.300 .0540 8282.0
188.500 .150 9812.0
188.800 .257 12242.0
189.000 .880 13993.0
Peak Outflow = .055 c.m/s
Maximum Depth = 188.302 metres
Maximum Storage = 8297. c.m
.122 3.115 .055 .000 c.m/s
17 COMBINE
2 Junction Node No.
.122 3.115 .055 .055 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
EXISTING AREA ON QUAKER RD, WEST OF RICE RD
*****
4 CATCHMENT
2.000 ID No.0 99999
9.020 Area in hectares
245.000 Length (PERV) metres
1.000 Gradient (%)
40.000 Per cent Impervious
245.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.702 .000 .055 .055 c.m/s
.267 .895 .518 C perv/imperv/total
15 ADD RUNOFF
.702 .702 .055 .055 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.702 .702 .702 .055 c.m/s
17 COMBINE
2 Junction Node No.
.702 .702 .702 .731 c.m/s
14 START
1 1=Zero; 2=Define
18 CONFLUENCE

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2	Junction Node No.	.702	.731	.702	.000 c.m/s	.000	Routing timestep	0	No. of sub-reaches	1.115	1.115	1.115	1.294 c.m/s
35	COMMENT												
3	line(s) of comment												

	EXISTING AREA ON QUAKER RD, WEST OF RICE RD												

4	CATCHMENT												
	3.000 ID No.6 99999												
	5.680 Area in hectares												
195.000	Length (PERV) metres												
1.000	Gradient (%)												
40.000	Per cent Impervious												
195.000	Length (IMPERV)												
.000	%Imp. with Zero Dpth												
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat												
.250	Manning "n"												
74.000	SCS Curve No or C												
.100	Ia/S Coefficient												
8.924	Initial Abstraction												
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv												
.440	.731	.702	.000 c.m/s										
.267	.885	.514	C perv/imperv/total										
15	ADD RUNOFF	.440	1.171	.702	.000 c.m/s								
9	ROUTE												
	.000 Conduit Length												
	.000 No Conduit defined												
	.000 Zero lag												
	.000 Beta weighting factor												
	.000 Routing timestep												
	0 No. of sub-reaches												
	.440 1.171 1.171 .000 c.m/s												
17	COMBINE												
2	Junction Node No.	.440	1.171	1.171	1.171 c.m/s								
14	START												
1	1=Zero; 2=Define												
35	COMMENT												
3	line(s) of comment												

	PROP DEVELOPMENT SOUTH OF QUAKER RD, EAST OF RICE RD												

4	CATCHMENT												
	50.000 ID No.6 99999												
	3.420 Area in hectares												
151.000	Length (PERV) metres												
1.000	Gradient (%)												
10.000	Per cent Impervious												
151.000	Length (IMPERV)												
.000	%Imp. with Zero Dpth												
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat												
.250	Manning "n"												
74.000	SCS Curve No or C												
.100	Ia/S Coefficient												
8.924	Initial Abstraction												
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv												
.077	.000	1.171	1.171 c.m/s										
.267	.875	.328	C perv/imperv/total										
15	ADD RUNOFF	.077	.077	1.171	1.171 c.m/s								
4	CATCHMENT												
	51.000 ID No.6 99999												
	1.980 Area in hectares												
115.000	Length (PERV) metres												
1.000	Gradient (%)												
10.000	Per cent Impervious												
115.000	Length (IMPERV)												
.000	%Imp. with Zero Dpth												
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat												
.250	Manning "n"												
74.000	SCS Curve No or C												
.100	Ia/S Coefficient												
8.924	Initial Abstraction												
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv												
.046	.077	1.171	1.171 c.m/s										
.267	.885	.328	C perv/imperv/total										
15	ADD RUNOFF	.046	.123	1.171	1.171 c.m/s								
9	ROUTE												
	.000 Conduit Length												
	.000 No Conduit defined												
	.000 Zero lag												
	.000 Beta weighting factor												
	.000 Routing timestep												
	0 No. of sub-reaches												
	.046 .123 .123 1.171 c.m/s												
17	COMBINE												
2	Junction Node No.	.046	.123	.123	1.294 c.m/s								
14	START												
1	1=Zero; 2=Define												
35	COMMENT												
3	line(s) of comment												

	EXISTING AREA WEST OF RICE RD AND SOUTH OF QUAKER ROAD												

4	CATCHMENT												
	4.000 ID No.6 99999												
	13.940 Area in hectares												
305.000	Length (PERV) metres												
1.000	Gradient (%)												
40.000	Per cent Impervious												
305.000	Length (IMPERV)												
.000	%Imp. with Zero Dpth												
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat												
.250	Manning "n"												
74.000	SCS Curve No or C												
.100	Ia/S Coefficient												
8.924	Initial Abstraction												
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv												
1.115	.000	.123	1.294 c.m/s										
.267	.896	.518	C perv/imperv/total										
15	ADD RUNOFF	1.115	1.115	.123	1.294 c.m/s								
9	ROUTE												
	.000 Conduit Length												
	.000 No Conduit defined												
	.000 Zero lag												
	.000 Beta weighting factor												
	.000 Routing timestep												
	0 No. of sub-reaches												
	.500 .549 .549 3.945 c.m/s												
17	COMBINE												
1	Junction Node No.	.500	.549	.549	4.494 c.m/s								
14	START												
1	1=Zero; 2=Define												
18	CONFLUENCE												
1	Junction Node No.	.500	4.494	.549	.000 c.m/s								
35	COMMENT												
3	line(s) of comment												

	REALIGNED CHANNEL - SEGMENT 2												

4	CATCHMENT												
	200.000 ID No.6 99999												
	.970 Area in hectares												
80.416	Length (PERV) metres												
1.000	Gradient (%)												
10.000	Per cent Impervious												

80.416 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.024 4.494 .549 .000 c.m/s
.267 .886 .328 C perv/imperv/total
35 COMMENT
3 line(s) of comment

FLOW D/S OF AREA A20 - OUTLET B

15 ADD RUNOFF
.024 4.518 .549 .000 c.m/s
35 COMMENT
3 line(s) of comment

EX RES. AND FUT DEVELOPMENT LANDS BY OTHERS WEST OF FIRST AV

4 CATCHMENT
21.000 ID No.ó 99999
35.460 Area in hectares
487.000 Length (PERV) metres
.200 Gradient (%)
5.000 Per cent Impervious
487.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.269 4.518 .549 .000 c.m/s
.267 .897 .298 C perv/imperv/total
15 ADD RUNOFF
.269 4.748 .549 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.269 4.748 4.748 .000 c.m/s
35 COMMENT
3 line(s) of comment

FLOW U/S OF FIRST AVE CULVERT

17 COMBINE
1 Junction Node No.
.269 4.748 4.748 4.748 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment

PROP DEVELOPMENT SOUTH OF QUAKER, EAST OF RICE - POND P50

4 CATCHMENT
52.000 ID No.ó 99999
6.430 Area in hectares
207.000 Length (PERV) metres
.1.000 Gradient (%)
70.000 Per cent Impervious
207.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.858 .000 4.748 4.748 c.m/s
.267 .887 .701 C perv/imperv/total
15 ADD RUNOFF
.858 .858 4.748 4.748 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.858 .858 .858 4.748 c.m/s
17 COMBINE
2 Junction Node No.
.858 .858 .858 .858 c.m/s
14 START
1 1=Zero; 2=Define
4 CATCHMENT
53.000 ID No.ó 99999
11.340 Area in hectares
275.000 Length (PERV) metres
.1.000 Gradient (%)
70.000 Per cent Impervious
275.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.523 .000 .858 .858 c.m/s
.267 .897 .708 C perv/imperv/total
15 ADD RUNOFF
1.523 1.523 .858 .858 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
1.523 1.523 1.523 .858 c.m/s

17 COMBINE
2 Junction Node No.
1.523 1.523 1.523 2.381 c.m/s
18 CONFLUENCE
2 Junction Node No.
1.523 2.381 1.523 .000 c.m/s
4 CATCHMENT
54.000 ID No.ó 99999
1.280 Area in hectares
92.000 Length (PERV) metres
.1.000 Gradient (%)
60.000 Per cent Impervious
92.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.149 2.381 1.523 .000 c.m/s
.267 .887 .639 C perv/imperv/total
15 ADD RUNOFF
.149 2.514 1.523 .000 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .6870401E+04 c.m
10 POND
6 Depth - Discharge - Volume sets
182.000 .000 .0
182.000 .0190 5251.0
183.150 .0230 7895.0
183.500 .238 10751.0
183.800 .396 13425.0
184.000 1.028 15337.0
Peak Outflow = .021 c.m/s
Maximum Depth = 182.962 metres
Maximum Storage = 6474. c.m
.149 2.514 .021 .000 c.m/s
17 COMBINE
2 Junction Node No.
.149 2.514 .021 .021 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment

EXISTING AREA ON QUAKER RD, EAST OF RICE RD

4 CATCHMENT
5.000 ID No.ó 99999
1.870 Area in hectares
112.000 Length (PERV) metres
.1.000 Gradient (%)
50.000 Per cent Impervious
112.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.175 .000 .021 .021 c.m/s
.267 .885 .576 C perv/imperv/total
15 ADD RUNOFF
.175 .175 .021 .021 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.175 .175 .175 .021 c.m/s
17 COMBINE
2 Junction Node No.
.175 .175 .175 .180 c.m/s
18 CONFLUENCE
2 Junction Node No.
.175 .180 .175 .000 c.m/s
35 COMMENT
3 line(s) of comment

EXISTING AREA ON QUAKER RD, EAST OF RICE RD

4 CATCHMENT
6.000 ID No.ó 99999
1.920 Area in hectares
113.000 Length (PERV) metres
.200 Gradient (%)
65.000 Per cent Impervious
113.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.240 .180 .175 .000 c.m/s
.267 .896 .676 C perv/imperv/total
15 ADD RUNOFF
.240 .418 .175 .000 c.m/s
35 COMMENT
3 line(s) of comment

FIRST AVE FROM QUAKER RD TO CITY OF WELLAND MUNICIPAL BOUNDARY

4 CATCHMENT
201.000 ID No.ó 99999
2.430 Area in hectares
127.000 Length (PERV) metres
.1.000 Gradient (%)
65.000 Per cent Impervious
127.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C

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.100      Ia/S Coefficient
8.924    Initial Abstraction
1        Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
      .287      .418      .175      .000 c.m/s
      .267      .882      .667      C perv/imperv/total
15 ADD RUNOFF      .287      .705      .175      .000 c.m/s
9  ROUTE
      .000      Conduit Length
      .000      No Conduit defined
      .000      Zero lag
      .000      Beta weighting factor
      .000      Routing timestep
      0        No. of sub-reaches
      .287      .705      .705      .000 c.m/s
17 COMBINE
1  Junction Node No.
      .287      .705      .705      5.453 c.m/s
35 COMMENT
3  line(s) of comment
*****
FLOW D/S OF FIRST AVE CULVERT - OUTLET C
*****
18 CONFLUENCE
1  Junction Node No.
      .287      5.453      .705      .000 c.m/s
35 COMMENT
3  line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 3
*****
4  CATCHMENT
300.000 ID No.ó 99999
3.180   Area in hectares
146.000 Length (PERV) metres
      .200   Gradient (%)
15.000   Per cent Impervious
146.000 Length (IMPERV)
      .000   %Imp. with Zero Dpth
      1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
      .250   Manning "n"
74.000   SCS Curve No or C
      .100   Ia/S Coefficient
8.924    Initial Abstraction
      1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
      .099      5.453      .705      .000 c.m/s
      .267      .894      .361      C perv/imperv/total
15 ADD RUNOFF      .099      5.552      .705      .000 c.m/s
4  CATCHMENT
301.000 ID No.ó 99999
.720    Area in hectares
69.000 Length (PERV) metres
      .200   Gradient (%)
10.000 Per cent Impervious
69.000 Length (IMPERV)
      .000   %Imp. with Zero Dpth
      1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
      .250   Manning "n"
74.000 SCS Curve No or C
      .100   Ia/S Coefficient
8.924   Initial Abstraction
      1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
      .016      5.552      .705      .000 c.m/s
      .267      .876      .328      C perv/imperv/total
15 ADD RUNOFF      .016      5.568      .705      .000 c.m/s
9  ROUTE
      .000      Conduit Length
      .000      No Conduit defined
      .000      Zero lag
      .000      Beta weighting factor
      .000      Routing timestep
      0        No. of sub-reaches
      .016      5.568      5.568      .000 c.m/s
17 COMBINE
1  Junction Node No.
      .016      5.568      5.568      5.568 c.m/s
14 START
1  1=Zero; 2=Define
35 COMMENT
3  line(s) of comment
*****
PROP DEVELOPMENT NORTH OF SEGMENT 3 - POND P30
*****
4  CATCHMENT
30.000 ID No.ó 99999
8.470   Area in hectares
238.000 Length (PERV) metres
      .200   Gradient (%)
      .100   Per cent Impervious
238.000 Length (IMPERV)
      .000   %Imp. with Zero Dpth
      1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
      .250   Manning "n"
74.000 SCS Curve No or C
      .100   Ia/S Coefficient
8.924   Initial Abstraction
      1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
      .077      .000      5.568      5.568 c.m/s
      .267      .896      .267      C perv/imperv/total
15 ADD RUNOFF      .077      .077      5.568      5.568 c.m/s
4  CATCHMENT
31.000 ID No.ó 99999
10.420 Area in hectares
264.000 Length (PERV) metres
      .1000  Gradient (%)
75.000   Per cent Impervious
264.000 Length (IMPERV)
      .000   %Imp. with Zero Dpth
      1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
      .250   Manning "n"
74.000 SCS Curve No or C
      .100   Ia/S Coefficient
8.924   Initial Abstraction
      1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
      1.498      .077      5.568      5.568 c.m/s
      .267      .897      .739      C perv/imperv/total
15 ADD RUNOFF

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      1.498      1.509      5.568      5.568 c.m/s
27 HYDROGRAPH DISPLAY
5  is # of Hyeto/Hydrograph chosen
Volume = .5129908E+04 c.m
4  CATCHMENT
32.000 ID No.ó 99999
.690   Area in hectares
68.000 Length (PERV) metres
      1.000  Gradient (%)
60.000 Per cent Impervious
68.000 Length (IMPERV)
      .000   %Imp. with Zero Dpth
      1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
      .250   Manning "n"
74.000 SCS Curve No or C
      .100   Ia/S Coefficient
8.924   Initial Abstraction
      1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
      .085      1.509      5.568      5.568 c.m/s
      .267      .884      .637      C perv/imperv/total
15 ADD RUNOFF      .085      1.576      5.568      5.568 c.m/s
27 HYDROGRAPH DISPLAY
5  is # of Hyeto/Hydrograph chosen
Volume = .5356146E+04 c.m
10 POND
5 Depth - Discharge - Volume sets
178.000 .000 .0
179.300 .0260 1520.0
180.100 .0440 4649.0
180.600 .414 7069.0
180.800 1.204 8137.0
Peak Outflow = .042 c.m/s
Maximum Depth = 180.027 metres
Maximum Storage = 4365. c.m
      .085      1.576      .042      5.568 c.m/s
17 COMBINE
1  Junction Node No.
      .085      1.576      .042      5.594 c.m/s
14 START
1  1=Zero; 2=Define
35 COMMENT
3  line(s) of comment
*****
PROP DEVELOPMENT SOUTH OF SEGMENT 3 - POND P31
*****
4  CATCHMENT
33.000 ID No.ó 99999
12.960 Area in hectares
294.000 Length (PERV) metres
      1.000  Gradient (%)
75.000 Per cent Impervious
294.000 Length (IMPERV)
      .000   %Imp. with Zero Dpth
      1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
      .250   Manning "n"
74.000 SCS Curve No or C
      .100   Ia/S Coefficient
8.924   Initial Abstraction
      1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
      1.919      .000      .042      5.594 c.m/s
      .267      .897      .739      C perv/imperv/total
15 ADD RUNOFF      1.919      1.919      .042      5.594 c.m/s
27 HYDROGRAPH DISPLAY
5  is # of Hyeto/Hydrograph chosen
Volume = .4931688E+04 c.m
4  CATCHMENT
34.000 ID No.ó 99999
.660   Area in hectares
66.000 Length (PERV) metres
      1.000  Gradient (%)
60.000 Per cent Impervious
66.000 Length (IMPERV)
      .000   %Imp. with Zero Dpth
      1     Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
      .250   Manning "n"
74.000 SCS Curve No or C
      .100   Ia/S Coefficient
8.924   Initial Abstraction
      1     Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
      .082      1.919      .042      5.594 c.m/s
      .267      .884      .637      C perv/imperv/total
15 ADD RUNOFF      .082      1.983      .042      5.594 c.m/s
27 HYDROGRAPH DISPLAY
5  is # of Hyeto/Hydrograph chosen
Volume = .5148061E+04 c.m
10 POND
6 Depth - Discharge - Volume sets
178.300 .000 .0
178.900 .0350 1927.0
179.600 .0540 4692.0
179.800 .150 5590.0
180.000 .321 6538.0
180.300 1.922 8059.0
Peak Outflow = .052 c.m/s
Maximum Depth = 179.543 metres
Maximum Storage = 4465. c.m
      .082      1.983      .052      5.594 c.m/s
17 COMBINE
1  Junction Node No.
      .082      1.983      .052      5.628 c.m/s
14 START
1  1=Zero; 2=Define
18 CONFLUENCE
1  Junction Node No.
      .082      5.628      .052      .000 c.m/s
35 COMMENT
3  line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 3
*****
4  CATCHMENT
302.000 ID No.ó 99999
1.610   Area in hectares
104.000 Length (PERV) metres
      .200   Gradient (%)
10.000 Per cent Impervious
104.000 Length (IMPERV)

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.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.035 5.628 .052 .000 c.m/s
.267 .893 .329 C perv/imperv/total
35 COMMENT
3 Line(s) of comment
*****
FLOW U/S OF NIAGARA ST CULVERT - OUTLET D
*****
15 ADD RUNOFF
.035 5.663 .052 .000 c.m/s
14 START
1 1=Zero; 2=Define

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35 COMMENT
3 line(s) of comment
*****
25-YEAR STORM EVENT
*****
2 STORM
1 1=Chicago;2=Huff;3=User;4=Cdn1hr;5=Historic
900.000 Coefficient a
5.200 Constant b (min)
.745 Exponent c
.450 Fraction to peak r
240.000 Duration ó 240 min
59.713 mm Total depth
3 IMPERVIOUS
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.015 Manning "n"
98.000 SCS Curve No or C
.100 Ia/S Coefficient
.518 Initial Abstraction
35 COMMENT
3 line(s) of comment
*****
EXISTING RES. WEST OF SEGMENT 1
*****
4 CATCHMENT
1.000 ID No.ó 99999
17.520 Area in hectares
343.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
343.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.445 .000 .000 .000 c.m/s
.308 .909 .518 C perv/imperv/total
15 ADD RUNOFF
1.445 1.445 .000 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 1
*****
4 CATCHMENT
100.000 ID No.ó 99999
2.020 Area in hectares
116.000 Length (PERV) metres
.400 Gradient (%)
15.000 Per cent Impervious
116.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.077 1.445 .000 .000 c.m/s
.308 .891 .396 C perv/imperv/total
35 COMMENT
3 line(s) of comment
*****
FLOW AT FUT ROADWAY CULVERT - SEGMENT 1
*****
15 ADD RUNOFF
.077 1.522 .000 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.077 1.522 1.522 .000 c.m/s
17 COMBINE
1 Junction Node No.
.077 1.522 1.522 1.522 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT NORTH OF SEGMENT 1 - POND P10
*****
4 CATCHMENT
10.000 ID No.ó 99999
4.050 Area in hectares
164.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
164.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.612 .000 1.522 1.522 c.m/s
.308 .889 .715 C perv/imperv/total
15 ADD RUNOFF
.612 .612 1.522 1.522 c.m/s
4 CATCHMENT
11.000 ID No.ó 99999
1.000 Area in hectares
82.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
82.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.033 .612 1.522 1.522 c.m/s
.308 .898 .367 C perv/imperv/total
15 ADD RUNOFF
.033 .644 1.522 1.522 c.m/s
10 POND
6 Depth - Discharge - Volume sets
184.800 .000 .0
185.750 .0210 1.0
186.000 .0230 503.0
186.250 .0260 1091.0
186.500 .0280 1765.0
186.700 1.244 2370.0
Peak Outflow = .027 c.m/s
Maximum Depth = 186.413 metres
Maximum Storage = 1531. c.m
.033 .644 .027 1.522 c.m/s
17 COMBINE
1 Junction Node No.
.033 .644 .027 1.546 c.m/s
14 START
1 1=Zero; 2=Define
18 CONFLUENCE
1 Junction Node No.
.033 1.546 .027 .000 c.m/s
35 COMMENT
3 line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 1
*****
4 CATCHMENT
101.000 ID No.ó 99999
610 Area in hectares
64.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
64.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.023 1.546 .027 .000 c.m/s
.308 .899 .367 C perv/imperv/total
15 ADD RUNOFF
.023 1.567 .027 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.023 1.567 1.567 .000 c.m/s
17 COMBINE
1 Junction Node No.
.023 1.567 1.567 1.567 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT SOUTH OF SEGMENT 1 - POND P11
*****
4 CATCHMENT
12.000 ID No.ó 99999
2.680 Area in hectares
134.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
134.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.209 .000 1.567 1.567 c.m/s
.308 .897 .514 C perv/imperv/total
15 ADD RUNOFF
.209 .209 1.567 1.567 c.m/s
4 CATCHMENT
13.000 ID No.ó 99999
6.980 Area in hectares
216.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
216.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.083 .209 1.567 1.567 c.m/s
.308 .897 .721 C perv/imperv/total
15 ADD RUNOFF
1.083 1.292 1.567 1.567 c.m/s
4 CATCHMENT
14.000 ID No.ó 99999
.670 Area in hectares
67.000 Length (PERV) metres
1.000 Gradient (%)
60.000 Per cent Impervious
67.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.099 1.292 1.567 1.567 c.m/s
.308 .898 .662 C perv/imperv/total
15 ADD RUNOFF
.099 1.367 1.567 1.567 c.m/s
27 HYDROGRAPH DISPLAY

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5 is # of Hyeto/Hydrograph chosen
Volume = .4091430E+04 c.m
10 POND
5 Depth - Discharge - Volume sets
184.800 .000 .0
185.300 .0140 1142.0
186.100 .0240 3519.0
186.500 .287 4978.0
186.800 1.922 6222.0
Peak Outflow = .048 c.m/s
Maximum Depth = 186.136 metres
Maximum Storage = 3650. c.m
35 COMMENT
3 line(s) of comment
*****
FLOW U/S OF RICE RD CULVERT - OUTLET A1
*****
17 COMBINE
1 Junction Node No.
.099 1.367 .048 1.583 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT SOUTH OF QUAKER RD & WEST OF RICE RD. - PON
*****
4 CATCHMENT
40.000 ID No.0 99999
8.210 Area in hectares
234.000 Length (PERV) metres
1.000 Gradient (%)
25.000 Per cent Impervious
234.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.484 .000 .048 1.583 c.m/s
.308 .902 .457 C perv/imperv/total
15 ADD RUNOFF
.484 .484 .048 1.583 c.m/s
4 CATCHMENT
41.000 ID No.0 99999
5.480 Area in hectares
191.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
191.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.842 .484 .048 1.583 c.m/s
.308 .893 .718 C perv/imperv/total
15 ADD RUNOFF
.842 1.326 .048 1.583 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.842 1.326 1.326 1.583 c.m/s
17 COMBINE
2 Junction Node No.
.842 1.326 1.326 1.326 c.m/s
14 START
1 1=Zero; 2=Define
4 CATCHMENT
42.000 ID No.0 99999
.690 Area in hectares
68.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
68.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.061 .000 1.326 1.326 c.m/s
.308 .898 .515 C perv/imperv/total
15 ADD RUNOFF
.061 .061 1.326 1.326 c.m/s
4 CATCHMENT
43.000 ID No.0 99999
7.160 Area in hectares
218.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
218.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.111 .061 1.326 1.326 c.m/s
.308 .898 .721 C perv/imperv/total
15 ADD RUNOFF
1.111 1.162 1.326 1.326 c.m/s
4 CATCHMENT
44.000 ID No.0 99999
.330 Area in hectares
47.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
47.000 Length (IMPERV)

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.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.031 1.162 1.326 1.326 c.m/s
.308 .898 .515 C perv/imperv/total
15 ADD RUNOFF
.031 1.186 1.326 1.326 c.m/s
4 CATCHMENT
45.000 ID No.0 99999
6.400 Area in hectares
207.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
207.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.990 1.186 1.326 1.326 c.m/s
.308 .896 .719 C perv/imperv/total
15 ADD RUNOFF
.990 2.176 1.326 1.326 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.990 2.176 2.176 1.326 c.m/s
17 COMBINE
2 Junction Node No.
.990 2.176 2.176 3.502 c.m/s
14 START
1 1=Zero; 2=Define
18 CONFLUENCE
2 Junction Node No.
.990 3.502 2.176 .000 c.m/s
4 CATCHMENT
46.000 ID No.0 99999
1.030 Area in hectares
83.000 Length (PERV) metres
1.000 Gradient (%)
60.000 Per cent Impervious
83.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.147 3.502 2.176 .000 c.m/s
.308 .899 .662 C perv/imperv/total
15 ADD RUNOFF
.147 3.622 2.176 .000 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .1113844E+05 c.m
10 POND
6 Depth - Discharge - Volume sets
187.000 .000 .0
187.800 .0410 4766.0
188.300 .0540 8282.0
188.500 .150 9812.0
188.800 .257 12242.0
189.000 .880 13993.0
Peak Outflow = .141 c.m/s
Maximum Depth = 188.482 metres
Maximum Storage = 9674. c.m
.147 3.622 .141 .000 c.m/s
17 COMBINE
2 Junction Node No.
.147 3.622 .141 .141 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
EXISTING AREA ON QUAKER RD, WEST OF RICE RD
*****
4 CATCHMENT
2.000 ID No.0 99999
9.020 Area in hectares
245.000 Length (PERV) metres
1.000 Gradient (%)
40.000 Per cent Impervious
245.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.824 .000 .141 .141 c.m/s
.308 .904 .547 C perv/imperv/total
15 ADD RUNOFF
.824 .824 .141 .141 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.824 .824 .824 .141 c.m/s
17 COMBINE
2 Junction Node No.
.824 .824 .824 .860 c.m/s
14 START
1 1=Zero; 2=Define
18 CONFLUENCE

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2	Junction Node No.	.824	.860	.824	.000 c.m/s	.000	Routing timestep	0	No. of sub-reaches				
35	COMMENT					1.270	1.270	1.270	1.531 c.m/s				
3	line(s) of comment												

	EXISTING AREA ON QUAKER RD, WEST OF RICE RD												

4	CATCHMENT												
	3.000 ID No.6 99999												
	5.680 Area in hectares												
195.000	Length (PERV) metres												
1.000	Gradient (%)												
40.000	Per cent Impervious												
195.000	Length (IMPERV)												
.000	%Imp. with Zero Dpth												
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat												
.250	Manning "n"												
74.000	SCS Curve No or C												
.100	Ia/S Coefficient												
8.924	Initial Abstraction												
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv												
.515	.860	.824	.000 c.m/s										
.308	.894	.543	C perv/imperv/total										
15	ADD RUNOFF	.515	1.375	.824	.000 c.m/s								
9	ROUTE												
	.000 Conduit Length												
	.000 No Conduit defined												
	.000 Zero lag												
	.000 Beta weighting factor												
	.000 Routing timestep												
	0 No. of sub-reaches												
	.515 1.375 1.375 .000 c.m/s												
17	COMBINE												
2	Junction Node No.	.515	1.375	1.375	1.375 c.m/s								
14	START												
1	1=Zero; 2=Define												
35	COMMENT												
3	line(s) of comment												

	PROP DEVELOPMENT SOUTH OF QUAKER RD, EAST OF RICE RD												

4	CATCHMENT												
	50.000 ID No.6 99999												
	3.420 Area in hectares												
151.000	Length (PERV) metres												
1.000	Gradient (%)												
10.000	Per cent Impervious												
151.000	Length (IMPERV)												
.000	%Imp. with Zero Dpth												
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat												
.250	Manning "n"												
74.000	SCS Curve No or C												
.100	Ia/S Coefficient												
8.924	Initial Abstraction												
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv												
.097	.000	1.375	1.375 c.m/s										
.308	.892	.367	C perv/imperv/total										
15	ADD RUNOFF	.097	.097	1.375	1.375 c.m/s								
4	CATCHMENT												
	51.000 ID No.6 99999												
	1.980 Area in hectares												
115.000	Length (PERV) metres												
1.000	Gradient (%)												
10.000	Per cent Impervious												
115.000	Length (IMPERV)												
.000	%Imp. with Zero Dpth												
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat												
.250	Manning "n"												
74.000	SCS Curve No or C												
.100	Ia/S Coefficient												
8.924	Initial Abstraction												
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv												
.059	.097	1.375	1.375 c.m/s										
.308	.899	.367	C perv/imperv/total										
15	ADD RUNOFF	.059	.156	1.375	1.375 c.m/s								
9	ROUTE												
	.000 Conduit Length												
	.000 No Conduit defined												
	.000 Zero lag												
	.000 Beta weighting factor												
	.000 Routing timestep												
	0 No. of sub-reaches												
	.059 .156 .156 1.375 c.m/s												
17	COMBINE												
2	Junction Node No.	.059	.156	.156	1.531 c.m/s								
14	START												
1	1=Zero; 2=Define												
35	COMMENT												
3	line(s) of comment												

	EXISTING AREA WEST OF RICE RD AND SOUTH OF QUAKER ROAD												

4	CATCHMENT												
	4.000 ID No.6 99999												
	13.940 Area in hectares												
305.000	Length (PERV) metres												
1.000	Gradient (%)												
40.000	Per cent Impervious												
305.000	Length (IMPERV)												
.000	%Imp. with Zero Dpth												
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat												
.250	Manning "n"												
74.000	SCS Curve No or C												
.100	Ia/S Coefficient												
8.924	Initial Abstraction												
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv												
1.270	.000	.156	1.531 c.m/s										
.308	.910	.549	C perv/imperv/total										
15	ADD RUNOFF	1.270	1.270	.156	1.531 c.m/s								
9	ROUTE												
	.000 Conduit Length												
	.000 No Conduit defined												
	.000 Zero lag												
	.000 Beta weighting factor												
	.000 Routing timestep												
	0 No. of sub-reaches												
	.575 .639 .639 4.604 c.m/s												
17	COMBINE												
1	Junction Node No.	.575	.639	.639	5.236 c.m/s								
14	START												
1	1=Zero; 2=Define												
18	CONFLUENCE												
1	Junction Node No.	.575	5.236	.639	.000 c.m/s								
35	COMMENT												
3	line(s) of comment												

	REALIGNED CHANNEL - SEGMENT 2												

4	CATCHMENT												
	200.000 ID No.6 99999												
	.970 Area in hectares												
80.416	Length (PERV) metres												
1.000	Gradient (%)												
10.000	Per cent Impervious												

80.416 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.032 5.236 .639 .000 c.m/s
.308 .898 .367 C perv/imperv/total
35 COMMENT
3 line(s) of comment

FLOW D/S OF AREA A20 - OUTLET B

15 ADD RUNOFF
.032 5.267 .639 .000 c.m/s
35 COMMENT
3 line(s) of comment

EX RES. AND FUT DEVELOPMENT LANDS BY OTHERS WEST OF FIRST AV

4 CATCHMENT
21.000 ID No.ó 99999
35.460 Area in hectares
487.000 Length (PERV) metres
.200 Gradient (%)
5.000 Per cent Impervious
487.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.338 5.267 .639 .000 c.m/s
.308 .911 .339 C perv/imperv/total
15 ADD RUNOFF
.338 5.569 .639 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.338 5.569 5.569 .000 c.m/s
35 COMMENT
3 line(s) of comment

FLOW U/S OF FIRST AVE CULVERT

17 COMBINE
1 Junction Node No.
.338 5.569 5.569 5.569 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment

PROP DEVELOPMENT SOUTH OF QUAKER, EAST OF RICE - POND P50

4 CATCHMENT
52.000 ID No.ó 99999
6.430 Area in hectares
207.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
207.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.995 .000 5.569 5.569 c.m/s
.308 .896 .719 C perv/imperv/total
15 ADD RUNOFF
.995 .995 5.569 5.569 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.995 .995 .995 5.569 c.m/s
17 COMBINE
2 Junction Node No.
.995 .995 .995 .995 c.m/s
14 START
1 1=Zero; 2=Define
4 CATCHMENT
53.000 ID No.ó 99999
11.340 Area in hectares
275.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
275.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.776 .000 .995 .995 c.m/s
.308 .908 .728 C perv/imperv/total
15 ADD RUNOFF
1.776 1.776 .995 .995 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
1.776 1.776 1.776 .995 c.m/s

17 COMBINE
2 Junction Node No.
1.776 1.776 1.776 2.771 c.m/s
18 CONFLUENCE
2 Junction Node No.
1.776 2.771 1.776 .000 c.m/s
4 CATCHMENT
54.000 ID No.ó 99999
1.280 Area in hectares
92.000 Length (PERV) metres
1.000 Gradient (%)
60.000 Per cent Impervious
92.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.179 2.771 1.776 .000 c.m/s
.308 .900 .663 C perv/imperv/total
15 ADD RUNOFF
.179 2.924 1.776 .000 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .8196629E+04 c.m
10 POND
6 Depth - Discharge - Volume sets
182.000 .000 .0
182.000 .0190 5251.0
183.150 .0230 7895.0
183.500 .238 10751.0
183.800 .396 13425.0
184.000 1.028 15337.0
Peak Outflow = .023 c.m/s
Maximum Depth = 183.132 metres
Maximum Storage = 7762. c.m
.179 2.924 .023 .000 c.m/s
17 COMBINE
2 Junction Node No.
.179 2.924 .023 .023 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment

EXISTING AREA ON QUAKER RD, EAST OF RICE RD

4 CATCHMENT
5.000 ID No.ó 99999
1.870 Area in hectares
112.000 Length (PERV) metres
1.000 Gradient (%)
50.000 Per cent Impervious
112.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.211 .000 .023 .023 c.m/s
.308 .900 .604 C perv/imperv/total
15 ADD RUNOFF
.211 .211 .023 .023 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.211 .211 .211 .023 c.m/s
17 COMBINE
2 Junction Node No.
.211 .211 .211 .217 c.m/s
18 CONFLUENCE
2 Junction Node No.
.211 .217 .211 .000 c.m/s
35 COMMENT
3 line(s) of comment

EXISTING AREA ON QUAKER RD, EAST OF RICE RD

4 CATCHMENT
6.000 ID No.ó 99999
1.920 Area in hectares
113.000 Length (PERV) metres
.200 Gradient (%)
65.000 Per cent Impervious
113.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.279 .217 .211 .000 c.m/s
.308 .906 .697 C perv/imperv/total
15 ADD RUNOFF
.279 .486 .211 .000 c.m/s
35 COMMENT
3 line(s) of comment

FIRST AVE FROM QUAKER RD TO CITY OF WELLAND MUNICIPAL BOUND

4 CATCHMENT
201.000 ID No.ó 99999
2.430 Area in hectares
127.000 Length (PERV) metres
1.000 Gradient (%)
65.000 Per cent Impervious
127.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C

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.100      Ia/S Coefficient
8.924    Initial Abstraction
1        Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
      .344      .486      .211      .000 c.m/s
      .308      .898      .692      C perv/imperv/total
15  ADD RUNOFF      .344      .816      .211      .000 c.m/s
9    ROUTE
      .000      Conduit Length
      .000      No Conduit defined
      .000      Zero lag
      .000      Beta weighting factor
      .000      Routing timestep
      0        No. of sub-reaches
      .344      .816      .816      .000 c.m/s
17  COMBINE
1    Junction Node No.
      .344      .816      .816      6.385 c.m/s
35  COMMENT
3    line(s) of comment
*****
FLOW D/S OF FIRST AVE CULVERT - OUTLET C
*****
18  CONFLUENCE
1    Junction Node No.
      .344      6.385      .816      .000 c.m/s
35  COMMENT
3    line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 3
*****
4    CATCHMENT
300.000  ID No.0 99999
3.180    Area in hectares
146.000  Length (PERV) metres
.200     Gradient (%)
15.000   Per cent Impervious
146.000  Length (IMPERV)
.000     %Imp. with Zero Dpth
1        Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250     Manning "n"
74.000   SCS Curve No or C
.100     Ia/S Coefficient
8.924    Initial Abstraction
1        Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
      .119      6.385      .816      .000 c.m/s
      .308      .910      .399      C perv/imperv/total
15  ADD RUNOFF      .119      6.504      .816      .000 c.m/s
4    CATCHMENT
301.000  ID No.0 99999
.720     Area in hectares
69.000   Length (PERV) metres
.200     Gradient (%)
10.000   Per cent Impervious
69.000   Length (IMPERV)
.000     %Imp. with Zero Dpth
1        Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250     Manning "n"
74.000   SCS Curve No or C
.100     Ia/S Coefficient
8.924    Initial Abstraction
1        Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
      .020      6.504      .816      .000 c.m/s
      .308      .892      .367      C perv/imperv/total
15  ADD RUNOFF      .020      6.524      .816      .000 c.m/s
9    ROUTE
      .000      Conduit Length
      .000      No Conduit defined
      .000      Zero lag
      .000      Beta weighting factor
      .000      Routing timestep
      0        No. of sub-reaches
      .020      6.524      6.524      .000 c.m/s
17  COMBINE
1    Junction Node No.
      .020      6.524      6.524      6.524 c.m/s
14  START
1    1=Zero; 2=Define
35  COMMENT
3    line(s) of comment
*****
PROP DEVELOPMENT NORTH OF SEGMENT 3 - POND P30
*****
4    CATCHMENT
30.000   ID No.0 99999
8.470    Area in hectares
238.000  Length (PERV) metres
.200     Gradient (%)
.100     Per cent Impervious
238.000  Length (IMPERV)
.000     %Imp. with Zero Dpth
1        Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250     Manning "n"
74.000   SCS Curve No or C
.100     Ia/S Coefficient
8.924    Initial Abstraction
1        Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
      .113      .000      6.524      6.524 c.m/s
      .308      .906      .309      C perv/imperv/total
15  ADD RUNOFF      .113      .113      6.524      6.524 c.m/s
4    CATCHMENT
31.000   ID No.0 99999
10.420   Area in hectares
264.000  Length (PERV) metres
.200     Gradient (%)
.100     Per cent Impervious
264.000  Length (IMPERV)
.000     %Imp. with Zero Dpth
1        Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250     Manning "n"
74.000   SCS Curve No or C
.100     Ia/S Coefficient
8.924    Initial Abstraction
1        Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
      1.743      .113      6.524      6.524 c.m/s
      .308      .907      .758      C perv/imperv/total
15  ADD RUNOFF

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      1.743      1.763      6.524      6.524 c.m/s
27  HYDROGRAPH DISPLAY
5    is # of Hyeto/Hydrograph chosen
      Volume = .6276292E+04 c.m
4    CATCHMENT
32.000   ID No.0 99999
.690     Area in hectares
68.000   Length (PERV) metres
1.000    Gradient (%)
60.000   Per cent Impervious
68.000   Length (IMPERV)
.000     %Imp. with Zero Dpth
1        Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250     Manning "n"
74.000   SCS Curve No or C
.100     Ia/S Coefficient
8.924    Initial Abstraction
1        Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
      .102      1.763      6.524      6.524 c.m/s
      .308      .898      .662      C perv/imperv/total
15  ADD RUNOFF      .102      1.840      6.524      6.524 c.m/s
27  HYDROGRAPH DISPLAY
5    is # of Hyeto/Hydrograph chosen
      Volume = .6549078E+04 c.m
10   POND
5    Depth - Discharge - Volume sets
178.000  .000      .0
179.300  .0260    1520.0
180.100  .0440    4649.0
180.600  .414     7069.0
180.800  1.204    8137.0
Peak Outflow = .114 c.m/s
Maximum Depth = 180.194 metres
Maximum Storage = 5104. c.m
.102     1.840      .114      6.524 c.m/s
17  COMBINE
1    Junction Node No.
      .102      1.840      .114      6.552 c.m/s
14  START
1    1=Zero; 2=Define
35  COMMENT
3    line(s) of comment
*****
PROP DEVELOPMENT SOUTH OF SEGMENT 3 - POND P31
*****
4    CATCHMENT
33.000   ID No.0 99999
12.960   Area in hectares
294.000  Length (PERV) metres
.200     Gradient (%)
75.000   Per cent Impervious
294.000  Length (IMPERV)
.000     %Imp. with Zero Dpth
1        Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250     Manning "n"
74.000   SCS Curve No or C
.100     Ia/S Coefficient
8.924    Initial Abstraction
1        Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
      2.171      .000      .114      6.552 c.m/s
      .308      .910      .759      C perv/imperv/total
15  ADD RUNOFF      2.171      2.171      .114      6.552 c.m/s
27  HYDROGRAPH DISPLAY
5    is # of Hyeto/Hydrograph chosen
      Volume = .5876996E+04 c.m
4    CATCHMENT
34.000   ID No.0 99999
.660     Area in hectares
66.000   Length (PERV) metres
.200     Gradient (%)
60.000   Per cent Impervious
66.000   Length (IMPERV)
.000     %Imp. with Zero Dpth
1        Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250     Manning "n"
74.000   SCS Curve No or C
.100     Ia/S Coefficient
8.924    Initial Abstraction
1        Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
      .098      2.171      .114      6.552 c.m/s
      .308      .898      .662      C perv/imperv/total
15  ADD RUNOFF      .098      2.245      .114      6.552 c.m/s
27  HYDROGRAPH DISPLAY
5    is # of Hyeto/Hydrograph chosen
      Volume = .6138025E+04 c.m
10   POND
6    Depth - Discharge - Volume sets
178.300  .000      .0
178.900  .0350    1927.0
179.600  .0540    4692.0
179.800  .150     5590.0
180.000  .321     6538.0
180.300  1.922    8059.0
Peak Outflow = .107 c.m/s
Maximum Depth = 179.709 metres
Maximum Storage = 5183. c.m
.098     2.245      .107      6.552 c.m/s
17  COMBINE
1    Junction Node No.
      .098      2.245      .107      6.589 c.m/s
14  START
1    1=Zero; 2=Define
18  CONFLUENCE
1    Junction Node No.
      .098      6.589      .107      .000 c.m/s
35  COMMENT
3    line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 3
*****
4    CATCHMENT
302.000  ID No.0 99999
1.610    Area in hectares
104.000  Length (PERV) metres
.200     Gradient (%)
10.000   Per cent Impervious
104.000  Length (IMPERV)

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.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.043 6.589 .107 .000 c.m/s
.308 .901 .368 C perv/imperv/total
35 COMMENT
3 Line(s) of comment
*****
FLOW U/S OF NIAGARA ST CULVERT - OUTLET D
*****
15 ADD RUNOFF
.043 6.632 .107 .000 c.m/s
14 START
1 1=Zero; 2=Define

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35 COMMENT
3 line(s) of comment
*****
100-YEAR STORM EVENT
*****

2 STORM
1 1=Chicago;2=Huff;3=User;4=Cdn1hr;5=Historic
1020.000 Coefficient a
4.700 Constant b (min)
.731 Exponent c
.450 Fraction to peak r
240.000 Duration ó 240 min
73.203 mm Total depth

3 IMPERVIOUS
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.015 Manning "n"
98.000 SCS Curve No or C
.100 Ia/S Coefficient
.518 Initial Abstraction

35 COMMENT
3 line(s) of comment
*****
EXISTING RES. WEST OF SEGMENT 1
*****

4 CATCHMENT
1.000 ID No.ó 99999
17.520 Area in hectares
343.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
343.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.731 .000 .000 .000 c.m/s
.368 .925 .563 C perv/imperv/total

15 ADD RUNOFF
1.731 1.731 .000 .000 c.m/s

35 COMMENT
3 line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 1
*****

4 CATCHMENT
100.000 ID No.ó 99999
2.020 Area in hectares
116.000 Length (PERV) metres
.400 Gradient (%)
15.000 Per cent Impervious
116.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.101 1.731 .000 .000 c.m/s
.368 .905 .448 C perv/imperv/total

35 COMMENT
3 line(s) of comment
*****
FLOW AT FUT ROADWAY CULVERT - SEGMENT 1
*****

15 ADD RUNOFF
.101 1.832 .000 .000 c.m/s

9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.101 1.832 1.832 .000 c.m/s

17 COMBINE
1 Junction Node No.
.101 1.832 1.832 1.832 c.m/s

14 START
1 1=Zero; 2=Define

35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT NORTH OF SEGMENT 1 - POND P10
*****

4 CATCHMENT
10.000 ID No.ó 99999
4.050 Area in hectares
164.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
164.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.735 .000 1.832 1.832 c.m/s
.367 .909 .747 C perv/imperv/total

15 ADD RUNOFF
.735 .735 1.832 1.832 c.m/s

4 CATCHMENT
11.000 ID No.ó 99999
1.000 Area in hectares
82.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
82.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv

.054 .735 1.832 1.832 c.m/s
.367 .912 .422 C perv/imperv/total

15 ADD RUNOFF
.054 .783 1.832 1.832 c.m/s

10 POND
6 Depth - Discharge - Volume sets
184.800 .000 .0
185.750 .0210 1.0
186.000 .0230 503.0
186.250 .0260 1091.0
186.500 .0280 1765.0
186.700 1.244 2370.0
Peak Outflow = .105 c.m/s
Maximum Depth = 186.513 metres
Maximum Storage = 1804. c.m

17 COMBINE
1 Junction Node No.
.054 .783 .105 1.832 c.m/s

14 START
1 1=Zero; 2=Define

18 CONFLUENCE
1 Junction Node No.
.054 1.857 .105 .000 c.m/s

35 COMMENT
3 line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 1
*****

4 CATCHMENT
101.000 ID No.ó 99999
610 Area in hectares
64.000 Length (PERV) metres
1.000 Gradient (%)
10.000 Per cent Impervious
64.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.038 1.857 .105 .000 c.m/s
.367 .914 .422 C perv/imperv/total

15 ADD RUNOFF
.038 1.890 .105 .000 c.m/s

9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.038 1.890 1.890 .000 c.m/s

17 COMBINE
1 Junction Node No.
.038 1.890 1.890 1.890 c.m/s

14 START
1 1=Zero; 2=Define

35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT SOUTH OF SEGMENT 1 - POND P11
*****

4 CATCHMENT
12.000 ID No.ó 99999
2.680 Area in hectares
134.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
134.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.262 .000 1.890 1.890 c.m/s
.367 .914 .559 C perv/imperv/total

15 ADD RUNOFF
.262 .262 1.890 1.890 c.m/s

4 CATCHMENT
13.000 ID No.ó 99999
6.980 Area in hectares
216.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
216.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.307 .262 1.890 1.890 c.m/s
.368 .908 .746 C perv/imperv/total

15 ADD RUNOFF
1.307 1.567 1.890 1.890 c.m/s

4 CATCHMENT
14.000 ID No.ó 99999
.670 Area in hectares
67.000 Length (PERV) metres
1.000 Gradient (%)
60.000 Per cent Impervious
67.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.124 1.567 1.890 1.890 c.m/s
.367 .914 .695 C perv/imperv/total

15 ADD RUNOFF
.124 1.659 1.890 1.890 c.m/s

27 HYDROGRAPH DISPLAY

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5 is # of Hyeto/Hydrograph chosen
Volume = .5247869E+04 c.m
10 POND
5 Depth - Discharge - Volume sets
184.800 .000 .0
185.300 .0140 1142.0
186.100 .0240 3519.0
186.500 .287 4978.0
186.800 1.922 6222.0
Peak Outflow = .143 c.m/s
Maximum Depth = 186.281 metres
Maximum Storage = 4180. c.m
124 1.659 .143 1.890 c.m/s
35 COMMENT
3 line(s) of comment
*****
FLOW U/S OF RICE RD CULVERT - OUTLET A1
*****
17 COMBINE
1 Junction Node No.
.124 1.659 .143 1.908 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP. DEVELOPMENT SOUTH OF QUAKER RD & WEST OF RICE RD. - PON
*****
4 CATCHMENT
40.000 ID No.0 99999
8.210 Area in hectares
234.000 Length (PERV) metres
1.000 Gradient (%)
25.000 Per cent Impervious
234.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.607 .000 .143 1.908 c.m/s
.367 .911 .503 C perv/imperv/total
15 ADD RUNOFF
.607 .607 .143 1.908 c.m/s
4 CATCHMENT
41.000 ID No.0 99999
5.480 Area in hectares
191.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
191.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.014 .607 .143 1.908 c.m/s
.367 .903 .742 C perv/imperv/total
15 ADD RUNOFF
1.014 1.621 .143 1.908 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
1.014 1.621 1.621 1.908 c.m/s
17 COMBINE
2 Junction Node No.
1.014 1.621 1.621 1.621 c.m/s
14 START
1 1=Zero; 2=Define
4 CATCHMENT
42.000 ID No.0 99999
.690 Area in hectares
68.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
68.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.078 .000 1.621 1.621 c.m/s
.367 .914 .559 C perv/imperv/total
15 ADD RUNOFF
.078 .078 1.621 1.621 c.m/s
4 CATCHMENT
43.000 ID No.0 99999
7.160 Area in hectares
218.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
218.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.342 .078 1.621 1.621 c.m/s
.368 .908 .746 C perv/imperv/total
15 ADD RUNOFF
1.342 1.407 1.621 1.621 c.m/s
4 CATCHMENT
44.000 ID No.0 99999
.330 Area in hectares
47.000 Length (PERV) metres
1.000 Gradient (%)
35.000 Per cent Impervious
47.000 Length (IMPERV)

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2	Junction Node No.	.000	Routing timestep	
1.013	1.056	1.013	No. of sub-reaches	
35	COMMENT		1.566	1.566 1.566 1.907 c.m/s
3	line(s) of comment		17	COMBINE
*****			2	Junction Node No.
EXISTING AREA ON QUAKER RD, WEST OF RICE RD			1.566	1.566 1.566 3.473 c.m/s
*****			14	START
4	CATCHMENT		1	1=Zero; 2=Define
3.000	ID No.6 99999		18	CONFLUENCE
5.680	Area in hectares		2	Junction Node No.
195.000	Length (PERV) metres		1.566	3.473 1.566 .000 c.m/s
1.000	Gradient (%)		35	COMMENT
40.000	Per cent Impervious		3	line(s) of comment
195.000	Length (IMPERV)		*****	
.000	%Imp. with Zero Dpth			RICE ROAD FROM QUAKER RD TO CITY OF WELLAND MUNICIPAL BOUNDARY
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat		4	CATCHMENT
.250	Manning "n"		501.000	ID No.6 99999
74.000	SCS Curve No or C		1.570	Area in hectares
.100	Ia/S Coefficient		102.000	Length (PERV) metres
8.924	Initial Abstraction		1.000	Gradient (%)
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv		70.000	Per cent Impervious
.632	1.056 1.013 .000 c.m/s		102.000	Length (IMPERV)
.367	.903 .582 C perv/imperv/total		.000	%Imp. with Zero Dpth
15	ADD RUNOFF		1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.632	1.688 1.013 .000 c.m/s		.250	Manning "n"
9	ROUTE		74.000	SCS Curve No or C
.000	Conduit Length		.100	Ia/S Coefficient
.000	No Conduit defined		8.924	Initial Abstraction
.000	Zero lag		1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.000	Beta weighting factor		.314	3.473 1.566 .000 c.m/s
.000	Routing timestep		.367	.915 .751 C perv/imperv/total
0	No. of sub-reaches		15	ADD RUNOFF
.632	1.688 1.688 .000 c.m/s		.314	3.736 1.566 .000 c.m/s
17	COMBINE		9	ROUTE
2	Junction Node No.		.000	Conduit Length
.632	1.688 1.688 1.688 c.m/s		.000	No Conduit defined
14	START		.000	Zero lag
1	1=Zero; 2=Define		.000	Beta weighting factor
35	COMMENT		.000	Routing timestep
3	line(s) of comment		0	No. of sub-reaches
*****			.314	3.736 3.736 .000 c.m/s
PROP DEVELOPMENT SOUTH OF QUAKER RD, EAST OF RICE RD			35	COMMENT
*****			3	line(s) of comment
4	CATCHMENT		*****	
50.000	ID No.6 99999			FLOW D/S OF RICE RD CULVERT - OUTLET A2
3.420	Area in hectares		17	COMBINE
151.000	Length (PERV) metres		1	Junction Node No.
1.000	Gradient (%)		.314	3.736 3.736 5.644 c.m/s
10.000	Per cent Impervious		14	START
151.000	Length (IMPERV)		1	1=Zero; 2=Define
.000	%Imp. with Zero Dpth		35	COMMENT
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat		3	line(s) of comment
.250	Manning "n"		*****	
74.000	SCS Curve No or C			PROP DEVELOPMENT SOUTH OF QUAKER RD - QUALITY CONTROL ONLY
.100	Ia/S Coefficient		4	CATCHMENT
8.924	Initial Abstraction		20.100	ID No.6 99999
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv		.780	Area in hectares
.148	.000 1.688 1.688 c.m/s		72.000	Length (PERV) metres
.367	.912 .422 C perv/imperv/total		1.000	Gradient (%)
15	ADD RUNOFF		35.000	Per cent Impervious
.148	.148 1.688 1.688 c.m/s		72.000	Length (IMPERV)
4	CATCHMENT		.000	%Imp. with Zero Dpth
51.000	ID No.6 99999		1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
1.980	Area in hectares		.250	Manning "n"
115.000	Length (PERV) metres		74.000	SCS Curve No or C
1.000	Gradient (%)		.100	Ia/S Coefficient
10.000	Per cent Impervious		8.924	Initial Abstraction
115.000	Length (IMPERV)		1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.000	%Imp. with Zero Dpth		.087	.000 3.736 5.644 c.m/s
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat		.366	.914 .558 C perv/imperv/total
.250	Manning "n"		15	ADD RUNOFF
74.000	SCS Curve No or C		.087	.087 3.736 5.644 c.m/s
.100	Ia/S Coefficient		4	CATCHMENT
8.924	Initial Abstraction		20.000	ID No.6 99999
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv		3.210	Area in hectares
.092	.148 1.688 1.688 c.m/s		146.000	Length (PERV) metres
.368	.916 .422 C perv/imperv/total		1.000	Gradient (%)
15	ADD RUNOFF		85.000	Per cent Impervious
.092	.240 1.688 1.688 c.m/s		146.000	Length (IMPERV)
9	ROUTE		.000	%Imp. with Zero Dpth
.000	Conduit Length		1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.000	No Conduit defined		.250	Manning "n"
.000	Zero lag		74.000	SCS Curve No or C
.000	Beta weighting factor		.100	Ia/S Coefficient
.000	Routing timestep		8.924	Initial Abstraction
0	No. of sub-reaches		1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.092	.240 .240 1.688 c.m/s		.720	.087 3.736 5.644 c.m/s
17	COMBINE		.368	.913 .831 C perv/imperv/total
2	Junction Node No.		15	ADD RUNOFF
.092	.240 .240 1.907 c.m/s		.720	.807 3.736 5.644 c.m/s
14	START		9	ROUTE
1	1=Zero; 2=Define		.000	Conduit Length
35	COMMENT		.000	No Conduit defined
3	line(s) of comment		.000	Zero lag
*****			.000	Beta weighting factor
EXISTING AREA WEST OF RICE RD AND SOUTH OF QUAKER ROAD			.000	Routing timestep
*****			0	No. of sub-reaches
4	CATCHMENT		.720	.807 .807 5.644 c.m/s
4.000	ID No.6 99999		17	COMBINE
13.940	Area in hectares		1	Junction Node No.
305.000	Length (PERV) metres		.720	.807 .807 6.399 c.m/s
1.000	Gradient (%)		14	START
40.000	Per cent Impervious		1	1=Zero; 2=Define
305.000	Length (IMPERV)		18	CONFLUENCE
.000	%Imp. with Zero Dpth		1	Junction Node No.
1	Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat		.720	6.399 .807 .000 c.m/s
.250	Manning "n"		35	COMMENT
74.000	SCS Curve No or C		3	line(s) of comment
.100	Ia/S Coefficient		*****	
8.924	Initial Abstraction			REALIGNED CHANNEL - SEGMENT 2
1	Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv		4	CATCHMENT
1.566	.000 .240 1.907 c.m/s		200.000	ID No.6 99999
.367	.923 .590 C perv/imperv/total		.970	Area in hectares
15	ADD RUNOFF		80.416	Length (PERV) metres
1.566	1.566 .240 1.907 c.m/s		1.000	Gradient (%)
9	ROUTE		10.000	Per cent Impervious
.000	Conduit Length			
.000	No Conduit defined			
.000	Zero lag			
.000	Beta weighting factor			

80.416 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.053 6.399 .807 .000 c.m/s
.367 .912 .422 C perv/imperv/total
35 COMMENT
3 line(s) of comment

FLOW D/S OF AREA A20 - OUTLET B

15 ADD RUNOFF
.053 6.446 .807 .000 c.m/s
35 COMMENT
3 line(s) of comment

EX RES. AND FUT DEVELOPMENT LANDS BY OTHERS WEST OF FIRST AV

4 CATCHMENT
21.000 ID No.ó 99999
35.460 Area in hectares
487.000 Length (PERV) metres
.200 Gradient (%)
5.000 Per cent Impervious
487.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.559 6.446 .807 .000 c.m/s
.368 .922 .395 C perv/imperv/total
15 ADD RUNOFF
.559 6.872 .807 .000 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.559 6.872 .000 c.m/s
35 COMMENT
3 line(s) of comment

FLOW U/S OF FIRST AVE CULVERT

17 COMBINE
1 Junction Node No.
.559 6.872 6.872 6.872 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment

PROP DEVELOPMENT SOUTH OF QUAKER, EAST OF RICE - POND P50

4 CATCHMENT
52.000 ID No.ó 99999
6.430 Area in hectares
207.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
207.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.198 .000 6.872 6.872 c.m/s
.368 .906 .744 C perv/imperv/total
15 ADD RUNOFF
1.198 1.198 6.872 6.872 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
1.198 1.198 1.198 6.872 c.m/s
17 COMBINE
2 Junction Node No.
1.198 1.198 1.198 1.198 c.m/s
14 START
1 1=Zero; 2=Define
4 CATCHMENT
53.000 ID No.ó 99999
11.340 Area in hectares
275.000 Length (PERV) metres
1.000 Gradient (%)
70.000 Per cent Impervious
275.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
2.157 .000 1.198 1.198 c.m/s
.368 .919 .753 C perv/imperv/total
15 ADD RUNOFF
2.157 2.157 1.198 1.198 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
2.157 2.157 2.157 1.198 c.m/s

17 COMBINE
2 Junction Node No.
2.157 2.157 2.157 3.355 c.m/s
18 CONFLUENCE
2 Junction Node No.
2.157 3.355 2.157 .000 c.m/s
4 CATCHMENT
54.000 ID No.ó 99999
1.200 Area in hectares
92.000 Length (PERV) metres
1.000 Gradient (%)
60.000 Per cent Impervious
92.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.225 3.355 2.157 .000 c.m/s
.367 .913 .695 C perv/imperv/total
15 ADD RUNOFF
.225 3.539 2.157 .000 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .1040810E+05 c.m
10 POND
6 Depth - Discharge - Volume sets
182.000 .000 .0
182.000 .0190 5251.0
183.150 .0230 7895.0
183.500 .238 10751.0
183.800 .396 13425.0
184.000 1.028 15337.0
Peak Outflow = .132 c.m/s
Maximum Depth = 183.327 metres
Maximum Storage = 9342. c.m
.225 3.539 .132 .000 c.m/s
17 COMBINE
2 Junction Node No.
.225 3.539 .132 .132 c.m/s
14 START
1 1=Zero; 2=Define
35 COMMENT
3 line(s) of comment

EXISTING AREA ON QUAKER RD, EAST OF RICE RD

4 CATCHMENT
5.000 ID No.ó 99999
1.870 Area in hectares
112.000 Length (PERV) metres
1.000 Gradient (%)
50.000 Per cent Impervious
112.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.266 .000 .132 .132 c.m/s
.367 .916 .642 C perv/imperv/total
15 ADD RUNOFF
.266 .266 .132 .132 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.266 .266 .266 .132 c.m/s
17 COMBINE
2 Junction Node No.
.266 .266 .266 .274 c.m/s
18 CONFLUENCE
2 Junction Node No.
.266 .274 .266 .000 c.m/s
35 COMMENT
3 line(s) of comment

EXISTING AREA ON QUAKER RD, EAST OF RICE RD

4 CATCHMENT
6.000 ID No.ó 99999
1.920 Area in hectares
113.000 Length (PERV) metres
.200 Gradient (%)
65.000 Per cent Impervious
113.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.339 .274 .266 .000 c.m/s
.368 .914 .723 C perv/imperv/total
15 ADD RUNOFF
.339 .594 .266 .000 c.m/s
35 COMMENT
3 line(s) of comment

FIRST AVE FROM QUAKER RD TO CITY OF WELLAND MUNICIPAL BOUNDARY

4 CATCHMENT
201.000 ID No.ó 99999
2.430 Area in hectares
127.000 Length (PERV) metres
1.000 Gradient (%)
65.000 Per cent Impervious
127.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C

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.100      Ia/S Coefficient
8.924      Initial Abstraction
1          Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.433      .594      .266      .000 c.m/s
.367      .915      .723      C perv/imperv/total
15      ADD RUNOFF      .433      .991      .266      .000 c.m/s
9      ROUTE
.000      Conduit Length
.000      No Conduit defined
.000      Zero lag
.000      Beta weighting factor
.000      Routing timestep
0          No. of sub-reaches
.433      .991      .991      .000 c.m/s
17      COMBINE
1          Junction Node No.
.433      .991      .991      7.863 c.m/s
35      COMMENT
3          line(s) of comment
*****
FLOW D/S OF FIRST AVE CULVERT - OUTLET C
*****
18      CONFLUENCE
1          Junction Node No.
.433      7.863      .991      .000 c.m/s
35      COMMENT
3          line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 3
*****
4          CATCHMENT
300.000      ID No.ó 99999
3.180      Area in hectares
146.000      Length (PERV) metres
.200      Gradient (%)
15.000      Per cent Impervious
146.000      Length (IMPERV)
.000      %Imp. with Zero Dpth
1          Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250      Manning "n"
74.000      SCS Curve No or C
.100      Ia/S Coefficient
8.924      Initial Abstraction
1          Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.148      7.863      .991      .000 c.m/s
.368      .924      .451      C perv/imperv/total
15      ADD RUNOFF      .148      8.011      .991      .000 c.m/s
4          CATCHMENT
301.000      ID No.ó 99999
.720      Area in hectares
69.000      Length (PERV) metres
.200      Gradient (%)
10.000      Per cent Impervious
69.000      Length (IMPERV)
.000      %Imp. with Zero Dpth
1          Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250      Manning "n"
74.000      SCS Curve No or C
.100      Ia/S Coefficient
8.924      Initial Abstraction
1          Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.030      8.011      .991      .000 c.m/s
.367      .911      .422      C perv/imperv/total
15      ADD RUNOFF      .030      8.039      .991      .000 c.m/s
9      ROUTE
.000      Conduit Length
.000      No Conduit defined
.000      Zero lag
.000      Beta weighting factor
.000      Routing timestep
0          No. of sub-reaches
.030      8.039      8.039      .000 c.m/s
17      COMBINE
1          Junction Node No.
.030      8.039      8.039      8.039 c.m/s
14      START
1          1=Zero; 2=Define
35      COMMENT
3          line(s) of comment
*****
PROP DEVELOPMENT NORTH OF SEGMENT 3 - POND P30
*****
4          CATCHMENT
30.000      ID No.ó 99999
8.470      Area in hectares
238.000      Length (PERV) metres
.200      Gradient (%)
.100      Per cent Impervious
238.000      Length (IMPERV)
.000      %Imp. with Zero Dpth
1          Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250      Manning "n"
74.000      SCS Curve No or C
.100      Ia/S Coefficient
8.924      Initial Abstraction
1          Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.188      .000      8.039      8.039 c.m/s
.368      .916      .368      C perv/imperv/total
15      ADD RUNOFF      .188      .188      8.039      8.039 c.m/s
4          CATCHMENT
31.000      ID No.ó 99999
10.420      Area in hectares
264.000      Length (PERV) metres
.1000      Gradient (%)
75.000      Per cent Impervious
264.000      Length (IMPERV)
.000      %Imp. with Zero Dpth
1          Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250      Manning "n"
74.000      SCS Curve No or C
.100      Ia/S Coefficient
8.924      Initial Abstraction
1          Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
2.113      .188      8.039      8.039 c.m/s
.367      .917      .779      C perv/imperv/total
15      ADD RUNOFF

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27      HYDROGRAPH DISPLAY
5          is # of Hyeto/Hydrograph chosen
Volume = .8226000E+04 c.m
4          CATCHMENT
32.000      ID No.ó 99999
.690      Area in hectares
68.000      Length (PERV) metres
1.000      Gradient (%)
60.000      Per cent Impervious
68.000      Length (IMPERV)
.000      %Imp. with Zero Dpth
1          Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250      Manning "n"
74.000      SCS Curve No or C
.100      Ia/S Coefficient
8.924      Initial Abstraction
1          Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.127      2.151      8.039      8.039 c.m/s
.367      .914      .695      C perv/imperv/total
15      ADD RUNOFF      .127      2.246      8.039      8.039 c.m/s
27      HYDROGRAPH DISPLAY
5          is # of Hyeto/Hydrograph chosen
Volume = .8577177E+04 c.m
10      POND
5          Depth - Discharge - Volume sets
178.000      .000      .0
179.300      .0260      1520.0
180.100      .0440      4649.0
180.600      .414      7069.0
180.800      1.204      8137.0
Peak Outflow = .250 c.m/s
Maximum Depth = 180.379 metres
Maximum Storage = 5999. c.m
.127      2.246      .250      8.039 c.m/s
17      COMBINE
1          Junction Node No.
.127      2.246      .250      8.071 c.m/s
14      START
1          1=Zero; 2=Define
35      COMMENT
3          line(s) of comment
*****
PROP DEVELOPMENT SOUTH OF SEGMENT 3 - POND P31
*****
4          CATCHMENT
33.000      ID No.ó 99999
12.960      Area in hectares
294.000      Length (PERV) metres
1.000      Gradient (%)
75.000      Per cent Impervious
294.000      Length (IMPERV)
.000      %Imp. with Zero Dpth
1          Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250      Manning "n"
74.000      SCS Curve No or C
.100      Ia/S Coefficient
8.924      Initial Abstraction
1          Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
2.640      .000      .250      8.071 c.m/s
.368      .922      .783      C perv/imperv/total
15      ADD RUNOFF      2.640      2.640      .250      8.071 c.m/s
27      HYDROGRAPH DISPLAY
5          is # of Hyeto/Hydrograph chosen
Volume = .7430276E+04 c.m
4          CATCHMENT
34.000      ID No.ó 99999
.660      Area in hectares
66.000      Length (PERV) metres
1.000      Gradient (%)
60.000      Per cent Impervious
66.000      Length (IMPERV)
.000      %Imp. with Zero Dpth
1          Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250      Manning "n"
74.000      SCS Curve No or C
.100      Ia/S Coefficient
8.924      Initial Abstraction
1          Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.122      2.640      .250      8.071 c.m/s
.367      .914      .695      C perv/imperv/total
15      ADD RUNOFF      .122      2.731      .250      8.071 c.m/s
27      HYDROGRAPH DISPLAY
5          is # of Hyeto/Hydrograph chosen
Volume = .7766209E+04 c.m
10      POND
6          Depth - Discharge - Volume sets
178.300      .000      .0
178.900      .0350      1927.0
179.600      .0540      4692.0
179.800      .150      5590.0
180.000      .321      6538.0
180.300      1.922      8059.0
Peak Outflow = .221 c.m/s
Maximum Depth = 179.883 metres
Maximum Storage = 5982. c.m
.122      2.731      .221      8.071 c.m/s
17      COMBINE
1          Junction Node No.
.122      2.731      .221      8.113 c.m/s
14      START
1          1=Zero; 2=Define
18      CONFLUENCE
1          Junction Node No.
.122      8.113      .221      .000 c.m/s
35      COMMENT
3          line(s) of comment
*****
REALIGNED CHANNEL - SEGMENT 3
*****
4          CATCHMENT
302.000      ID No.ó 99999
1.610      Area in hectares
104.000      Length (PERV) metres
.200      Gradient (%)
10.000      Per cent Impervious
104.000      Length (IMPERV)

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.000 %Imp. with Zero Dpth
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.057 8.113 .221 .000 c.m/s
.367 .910 .422 C perv/imperv/total
35 COMMENT
3 Line(s) of comment
*****
FLOW U/S OF NIAGARA ST CULVERT - OUTLET D
*****
15 ADD RUNOFF
.057 8.170 .221 .000 c.m/s
14 START
1 1=Zero; 2=Define

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