

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

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APPENDICES

- 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.

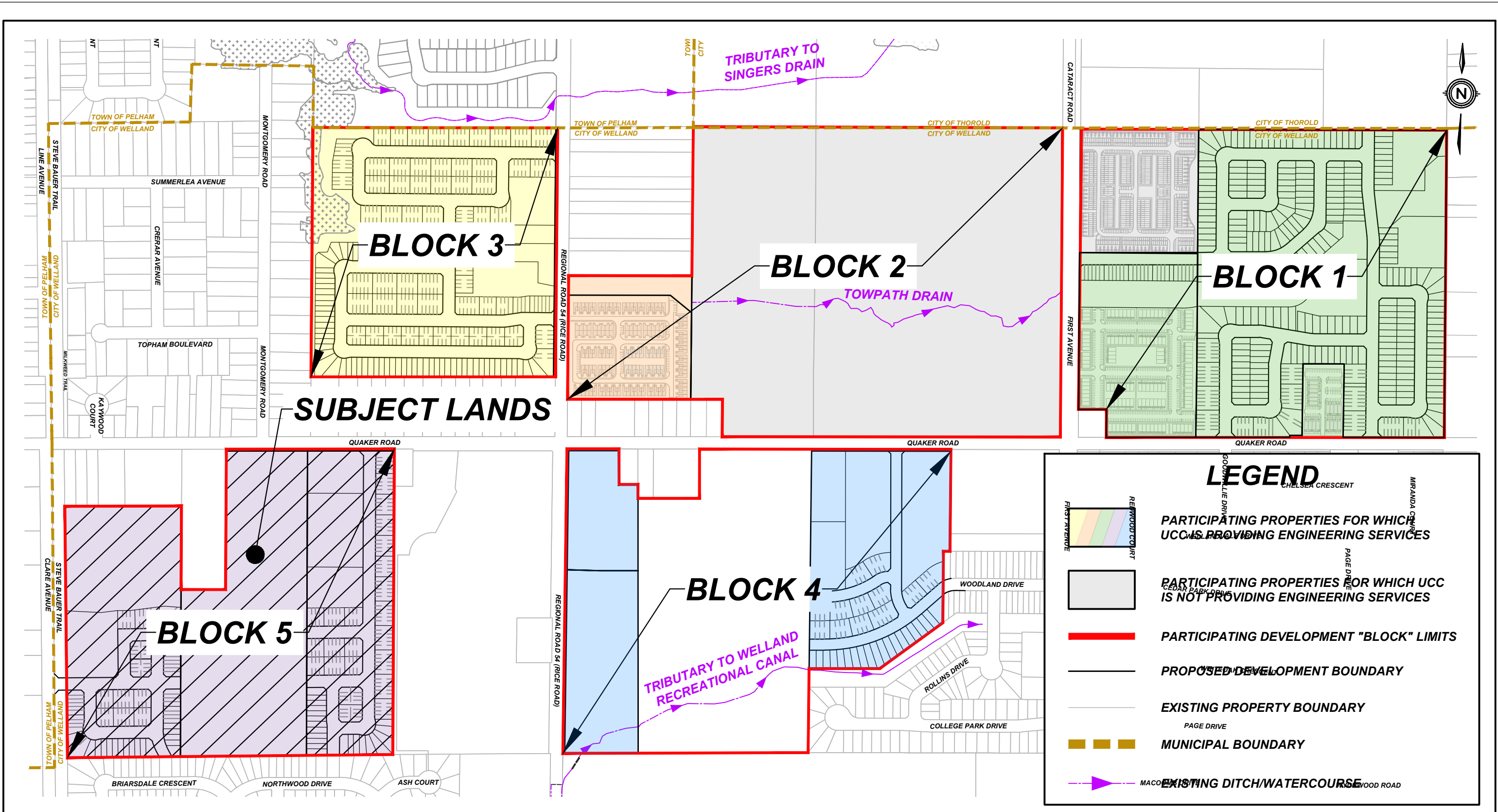
It was identified in the Implementation Plan that a single SWM Facility is to be constructed within the proposed subdivision lands and on the adjacent future development lands at 607 Quaker Road. This proposed facility will provide stormwater management quality and quantity controls for the entire 'Block' 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.



| | |
|---------|-----------------|
| DATE | 2024-12-15 |
| SCALE | 1:6000 m |
| REF No. | - |
| DWG No. | FIGURE 1 |

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.

Stormwater Management Plan
575 Quaker Road & Clare Avenue, City of Welland

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

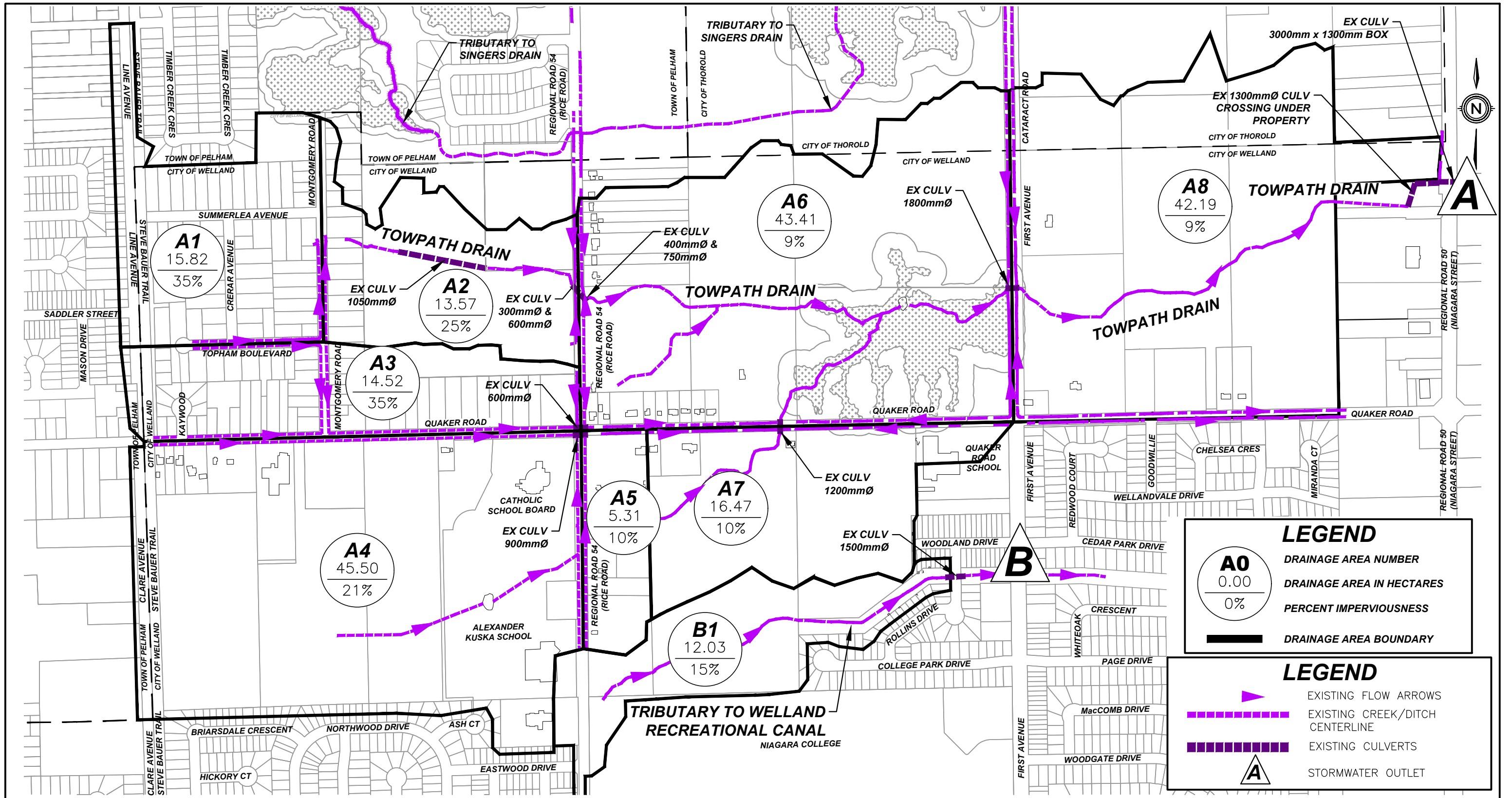
Design storm hyetographs for the storm system design uses a Chicago distribution based on the City of Welland Intensity-Duration-Frequency (IDF) curves. Hyetographs for the 2, 5, 10, 25, and 100 year events were developed using the City of Welland IDF Curve parameters for a 4 hour Chicago distribution. 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 | | | Duration (minutes) |
| | $i = \frac{a}{(t + b)^c}$ | | | |
| | 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.



LEGEND

- A0**
0.00
0%
- DRAINAGE AREA NUMBER**
- DRAINAGE AREA IN HECTARES**
- PERCENT IMPERVIOUSNESS**
- DRAINAGE AREA BOUNDARY**

LEGEND

- EXISTING FLOW ARROWS
- EXISTING CREEK/DITCH CENTERLINE
- EXISTING CULVERTS
- STORMWATER OUTLET



**UPPER CANADA
CONSULTANTS**
ENGINEERS / PLANNERS

**NORTHWEST WELLAND STORMWATER MANAGEMENT
IMPLEMENTATION PLAN
CITY OF WELLAND
EXISTING STORM DRAINAGE AREA PLAN**

| | |
|---------|------------|
| DATE | 2022-10-12 |
| SCALE | 1:7000 |
| REF No. | 21243 |
| DWG No. | FIGURE 2 |

| 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.

Stormwater Management Plan
575 Quaker Road & Clare Avenue, City of Welland

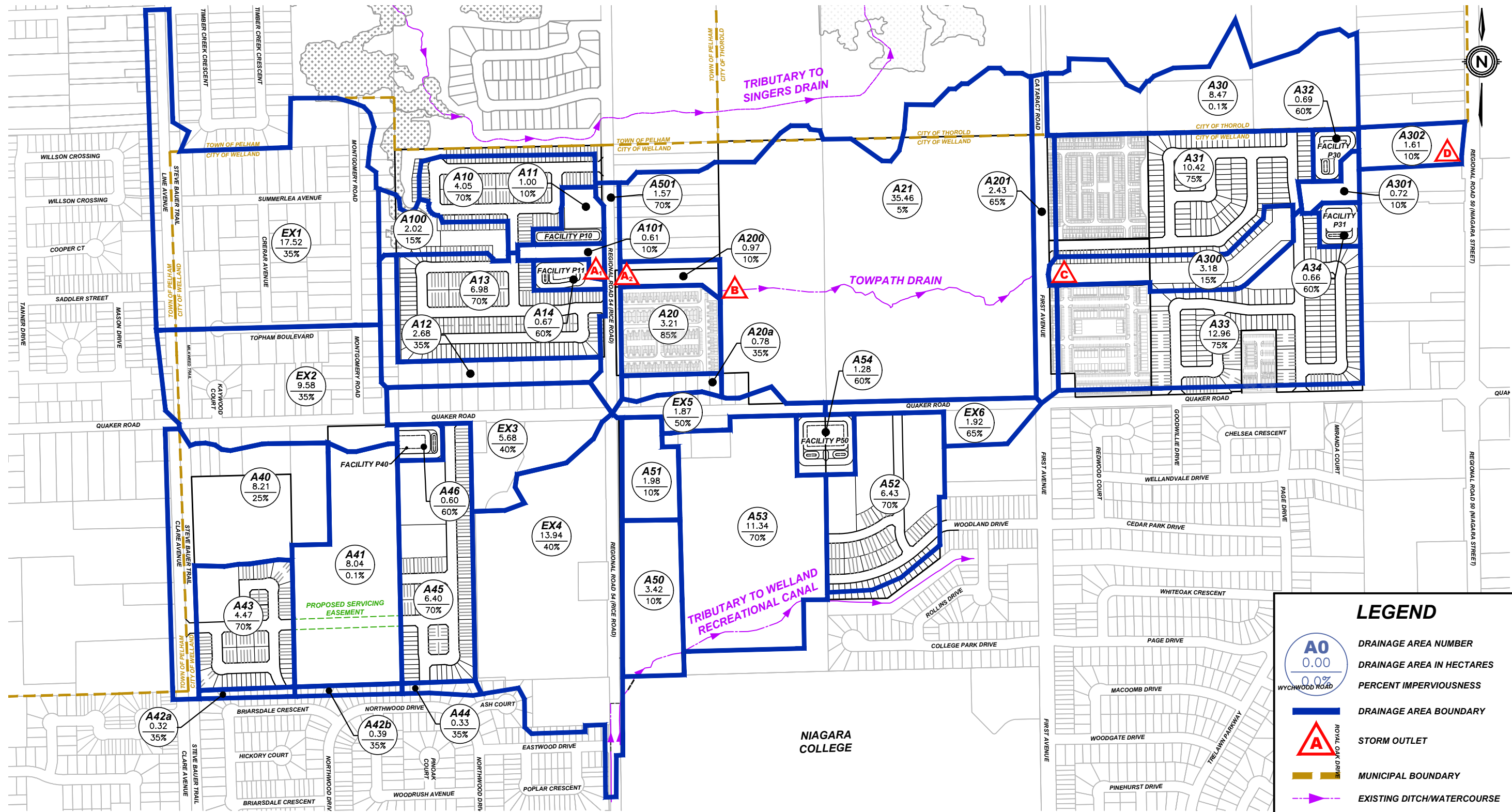
Table 3 below provides a summary of the Stage 1 catchment areas shown in Figure 3 and associated hydrological parameters used for the Stage 1 conditions MIDUSS software model.

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% |

Stormwater Management Plan
575 Quaker Road & Clare Avenue, City of Welland

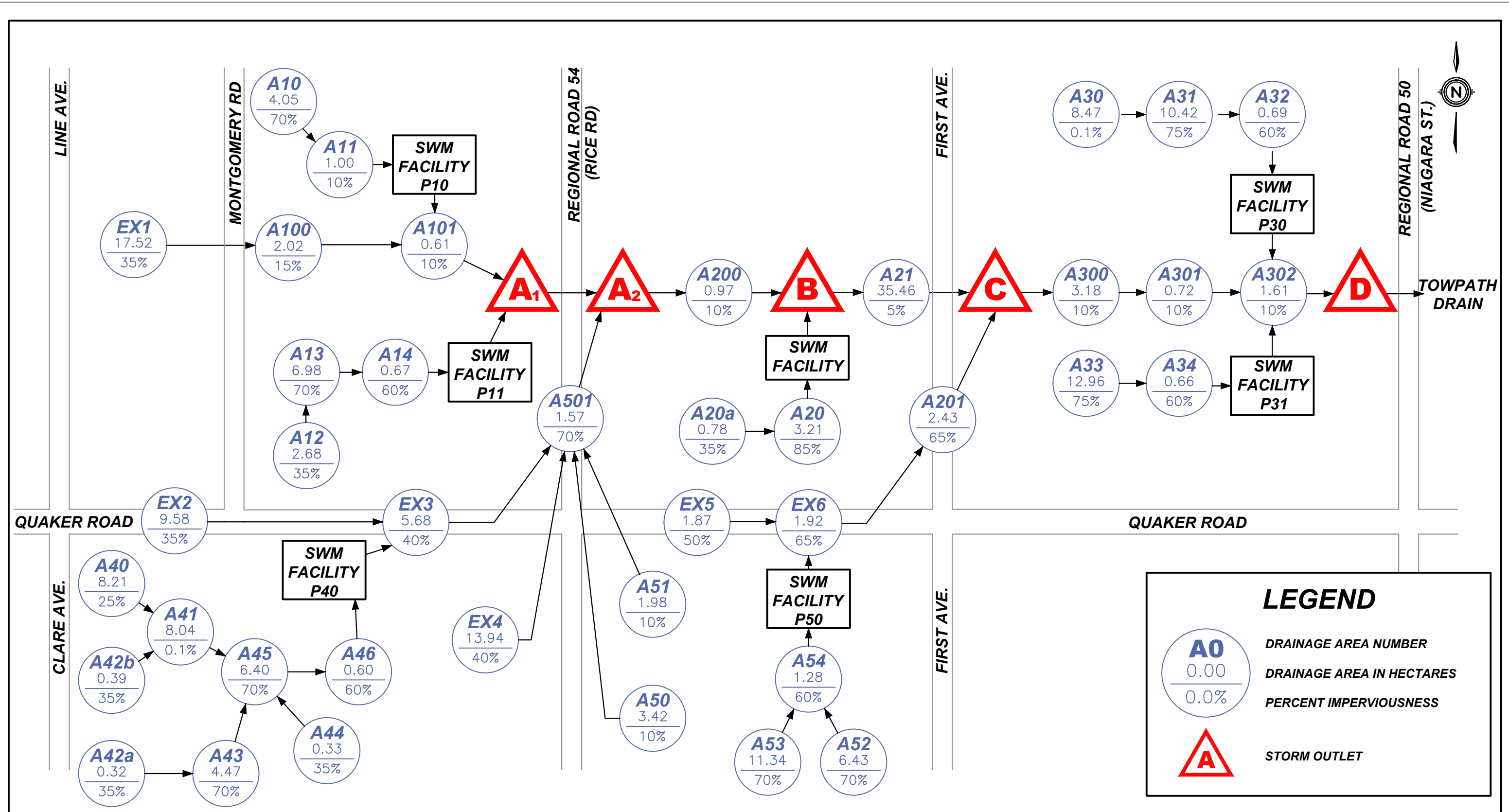
| | | | | | | | | |
|---------------|-------|------------------------|-----|------|-------|----|----|------|
| A200 | 0.97 | 80 | 1.0 | 0.25 | 0.015 | CD | 74 | 10% |
| A21 | 35.46 | 487 | 0.2 | 0.25 | 0.015 | CD | 74 | 5% |
| A52 | 6.43 | 207 | 1.0 | 0.25 | 0.015 | CD | 74 | 70% |
| A53 | 11.34 | 275 | 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% |
| 204.87 | | Total Area (ha) | | | | | | |



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ENGINEERS / PLANNERS

NORTHWEST WELLAND SECONDARY PLAN
CITY OF WELLAND
STAGE 1 CONDITIONS STORM DRAINAGE AREAS - BLOCK 5

| | |
|---------|-----------------|
| DATE | 2024-12-15 |
| SCALE | 1:7500 m |
| REF No. | - |
| DWG No. | FIGURE 3 |



LEGEND

- A0**
0.00
0.0%
DRAINAGE AREA NUMBER
DRAINAGE AREA IN HECTARES
PERCENT IMPERVIOUSNESS
- A**
STORM OUTLET



NORTHWEST WELLAND SECONDARY PLAN
CITY OF WELLAND
STAGE 1 HYDROLOGICAL MODELLING SCHEMATIC - BLOCK 5

| | |
|---------|-----------------|
| DATE | 2024-12-15 |
| SCALE | N.T.S. |
| REF No. | - |
| DWG No. | FIGURE 4 |

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.

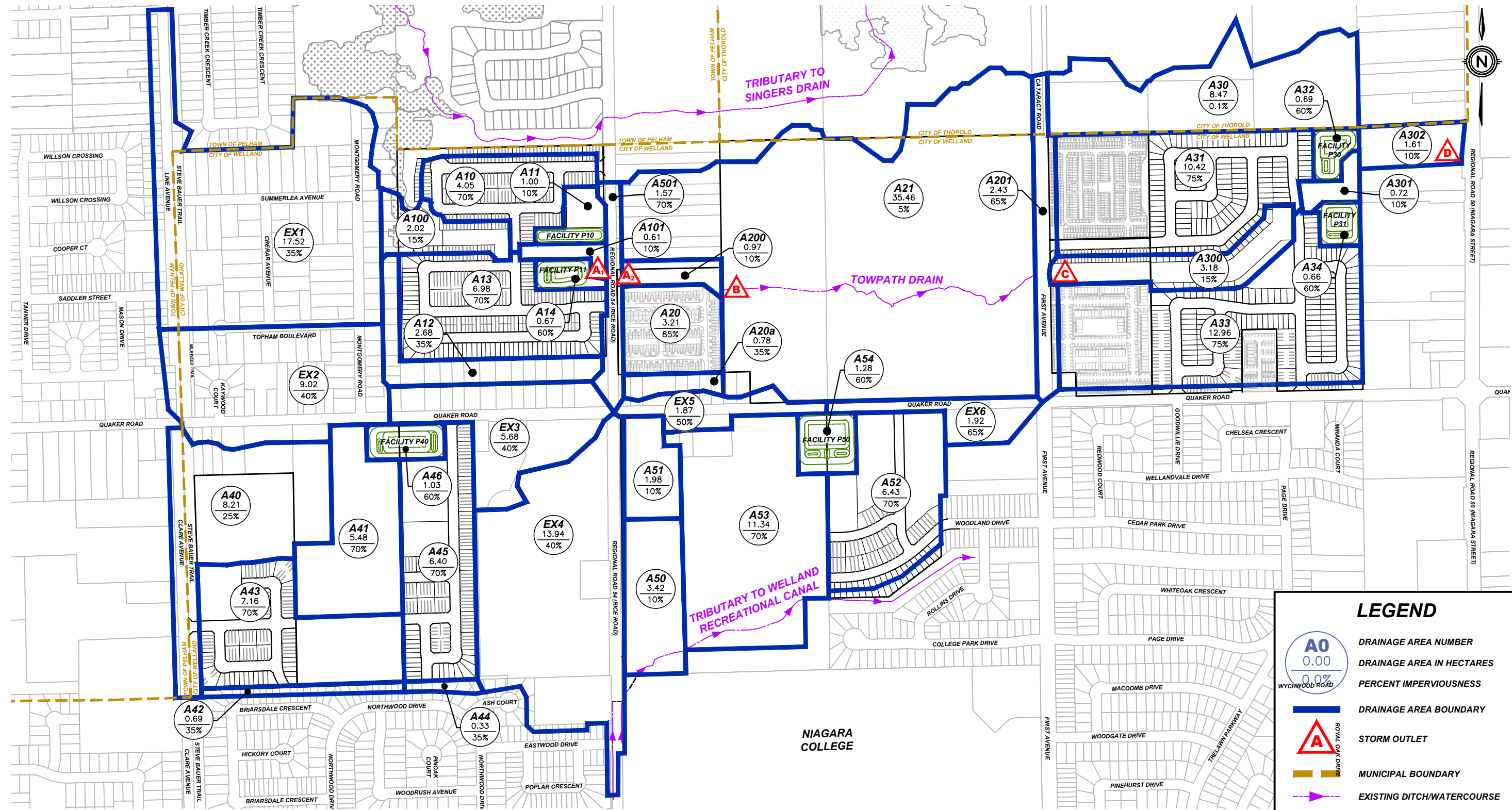
Table 4 below provides a summary of the Stage 2 catchment areas shown in Figure 5 and associated hydrological parameters used for the Stage 2 conditions MIDUSS software model.

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% |

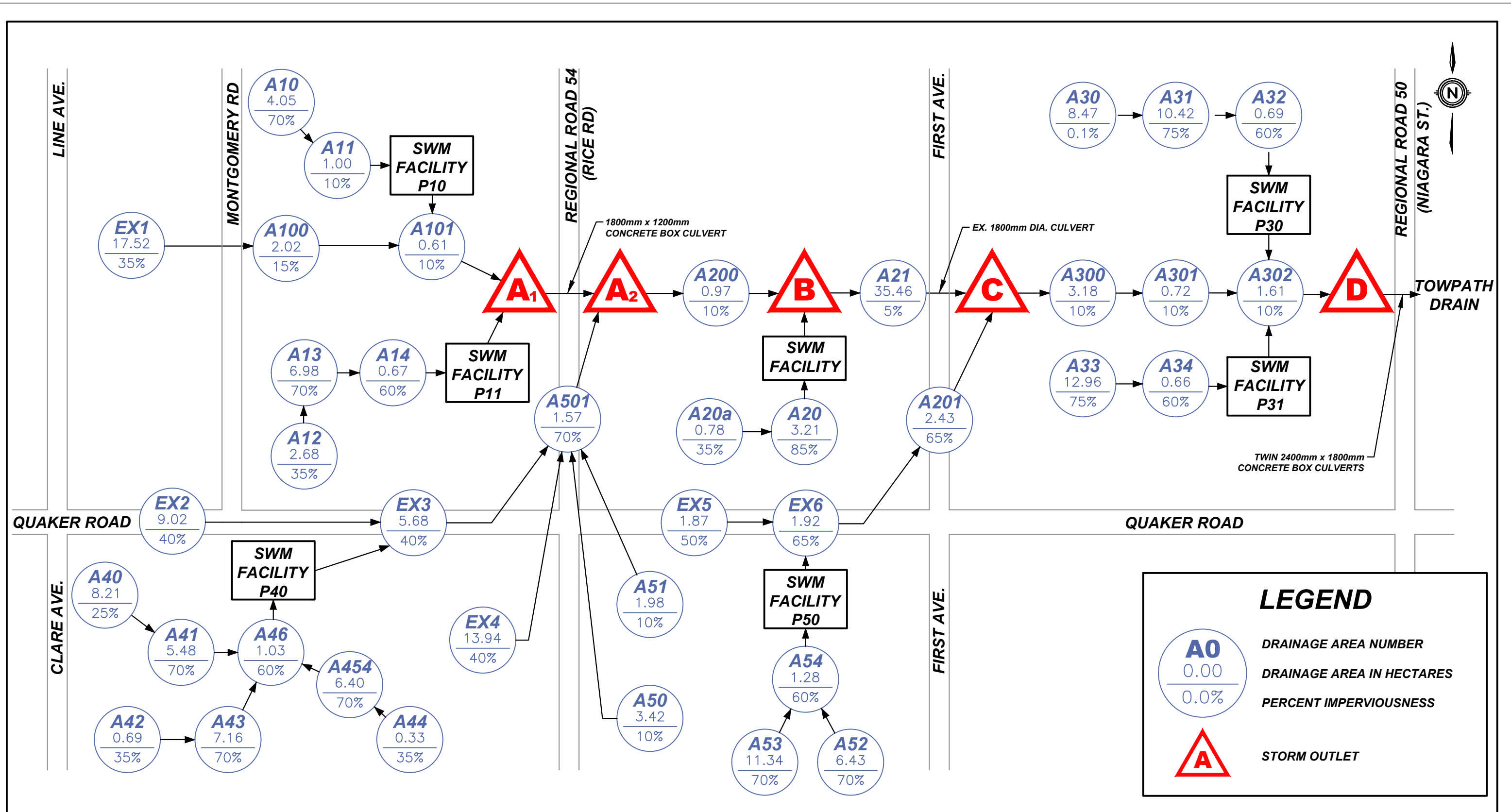
Stormwater Management Plan
575 Quaker Road & Clare Avenue, City of Welland

| | | | | | | | | |
|---------------|------------------------|-----|-----|------|-------|----|----|------|
| 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% |
| 204.87 | Total Area (ha) | | | | | | | |



NORTHWEST WELLAND SECONDARY PLAN
CITY OF WELLAND
STAGE 2 CONDITIONS STORM DRAINAGE AREAS - BLOCK 5

| | |
|---------|-----------------|
| DATE | 2024-12-15 |
| SCALE | 1:7500 m |
| REF No. | - |
| DWG No. | FIGURE 5 |



NORTHWEST WELLAND SECONDARY PLAN
CITY OF WELLAND
STAGE 2 HYDROLOGICAL MODELLING SCHEMATIC - BLOCK 5

| | |
|---------|-----------------|
| DATE | 2024-10-17 |
| SCALE | N.T.S. |
| REF No. | - |
| DWG No. | FIGURE 6 |

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 | | | |
| Site Conditions | Flat ±1% | Variable ±15 mm/hr | Shallow | At Considerable Depth | ± 29.30ha | | | |
| 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) | |

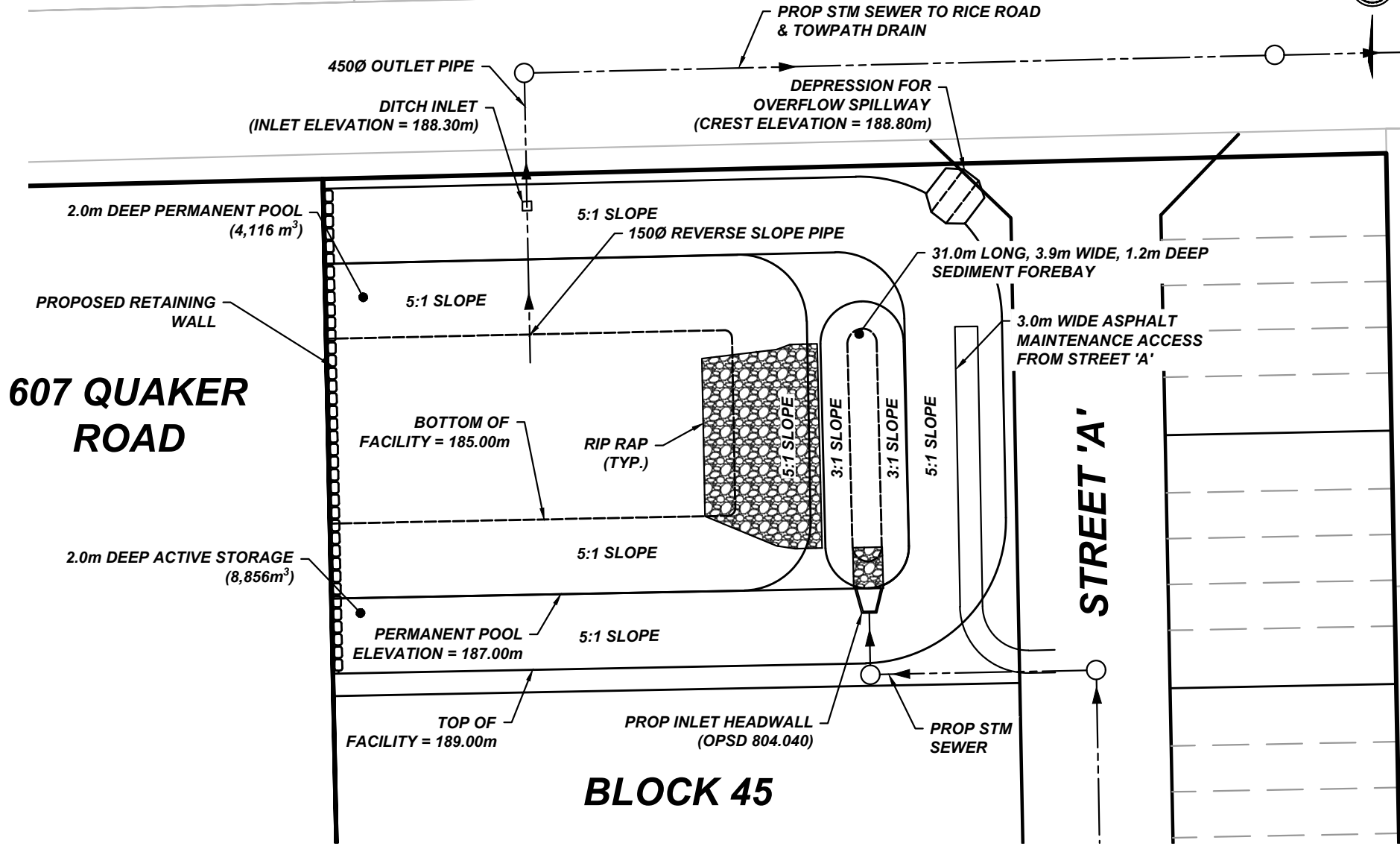
d) Average Velocity of Flow

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



607 QUAKER ROAD

STREET 'A'

BLOCK 45



UPPER CANADA CONSULTANTS
ENGINEERS / PLANNERS

575 QUAKER ROAD
CITY OF WELLAND
STAGE 1 STORMWATER MANAGEMENT POND P40

| | |
|---------|------------|
| DATE | 2024-12-16 |
| 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.

| 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 |

| 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

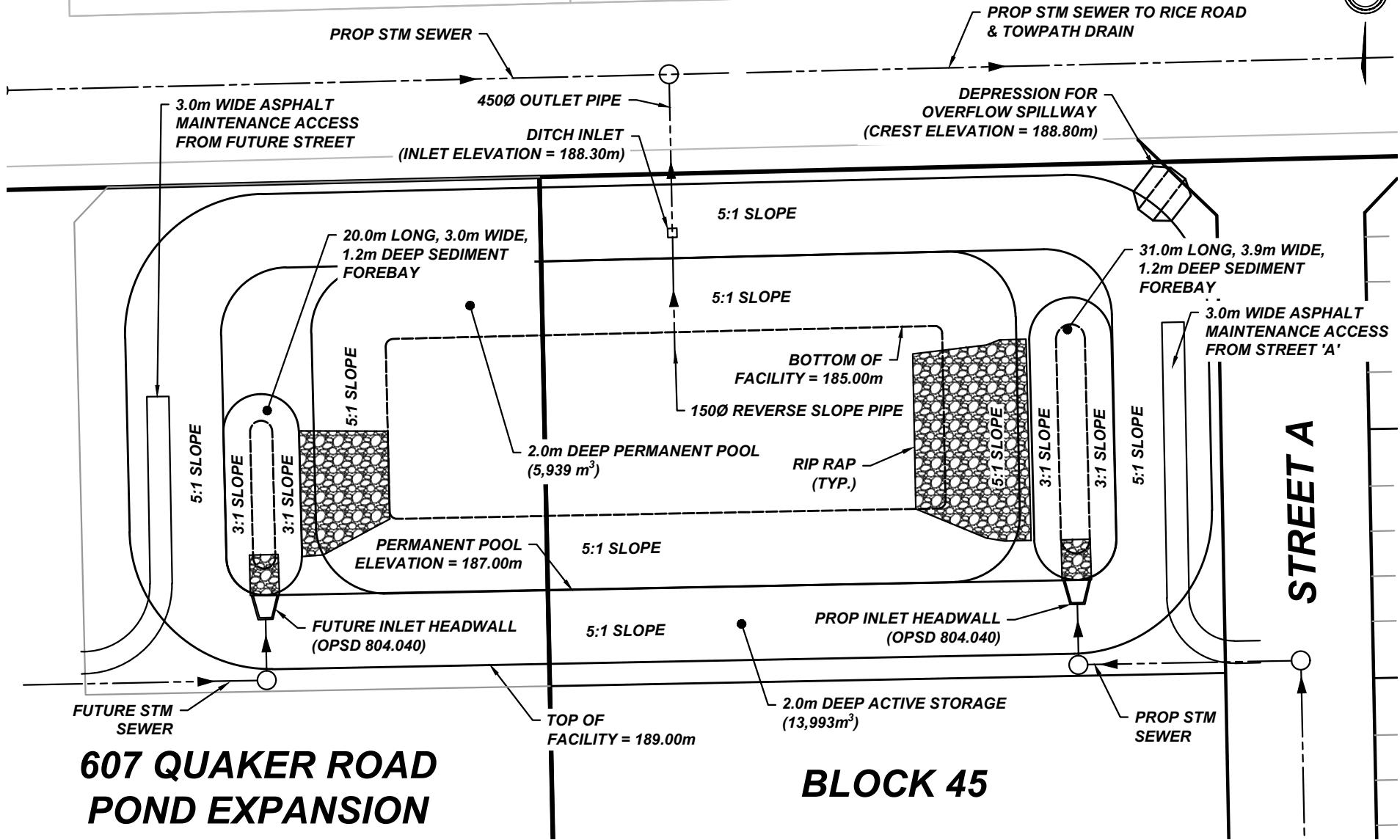
Is this Acceptable? **Yes**

| | | | |
|-------|-------|--------------------|-------------------------------|
| 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 | 2024-12-15 |
| 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.

| 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 |

| 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 |

| 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 |

| 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> | 2,497 (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 |
| 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.

| 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 |

| 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



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 l=Chicago;2=Huff;3=User;4=Cdnlhr;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

17 COMBINE
1 Junction Node No.
.255 2.185 2.185 2.185 c.m/s

14 START
1 l=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

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
START

14 1 l=Zero; 2=Define

35 COMMENT
 3 line(s) of comment

 2-YEAR STORM EVENT

2 STORM
 1 1=Chicago;2=Huff;3=User;4=Cdnlhr;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
 START

14 1=Zero; 2=Define

35 COMMENT
 3 line(s) of comment

 5-YEAR STORM EVENT

2 STORM
 1 1=Chicago;2=Huff;3=User;4=Cdnlnr;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
 .676 4.870 4.870 .000 c.m/s

17 COMBINE
 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
 .306 .306 .306 4.870 c.m/s

17 COMBINE
 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=Cdnlhr;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
*****
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
.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=Cdnlnr;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

14 START
 1 1=Zero; 2=Define

```

35 COMMENT
3 line(s) of comment
*****
100-YEAR STORM EVENT
*****
2 STORM
1 1=Chicago;2=Huff;3=User;4=Cdnlhr;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
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
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
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
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
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
17 COMBINE
1 Junction Node No.
1.548 .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

```

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 | | | | |
| Water Level Elev. = 187.00 m | | | | |
| Pond Drawdown Time Calculation (MOE, 2003) | | | | |
| | 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 | |

| 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 | 1,331 | | | 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.
 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 trapezoidal 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 | | | | |
| Water Level Elev. = 187.00 m | | | | |
| Pond Drawdown Time Calculation (MOE, 2003) | | | | |
| | 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 l=Chicago;2=Huff;3=User;4=Cdnlhr;5=Historic
 512.000 Coefficient a
 6.000 Constant b (min)
 .800 Exponent c
 .450 Fraction to peak r
 240.000 Duration δ 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 l=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 l=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 (%)
 1.000 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
 .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 l=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"

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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
.011 .000 .206 .206 c.m/s 1 %Imp. with Zero Dpth
.098 .797 .343 C perv/imperv/total .250
15 ADD RUNOFF 74.000 SCS Curve No or C
.011 .011 .206 .206 c.m/s .100
4 CATCHMENT 8.924 Initial Abstraction
43.000 ID No.6 99999 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
4.470 Area in hectares .426 .000 .027 .000 c.m/s
173.000 Length (PERV) metres 1.000 .098 .805 .593 C perv/imperv/total
1.000 Gradient (%) 15 ADD RUNOFF
70.000 Per cent Impervious .426 .426 .027 .000 c.m/s
173.000 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 .426 .426 .426 .000 c.m/s
.290 .011 .206 .206 c.m/s 17 COMBINE
.098 .807 .594 C perv/imperv/total 2 Junction Node No.
15 ADD RUNOFF .290 .299 .206 .206 c.m/s 14 START
.290 .299 .206 .206 c.m/s 1 1=Zero; 2=Define
4 CATCHMENT 4 CATCHMENT
44.000 ID No.6 99999 53.000 ID No.6 99999
.330 Area in hectares 11.340 Area in hectares
47.000 Length (PERV) metres 275.000 Length (PERV) metres
1.000 Gradient (%) 1.000 Gradient (%)
35.000 Per cent Impervious 70.000 Per cent Impervious
47.000 Length (IMPERV) 275.000 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
.011 .299 .206 .206 c.m/s .731 .000 .426 .426 c.m/s
.098 .798 .343 C perv/imperv/total .098 .798 .588 C perv/imperv/total
15 ADD RUNOFF .011 .308 .206 .206 c.m/s 15 ADD RUNOFF
.011 .308 .206 .206 c.m/s 9 ROUTE
4 CATCHMENT .731 .731 .426 .426 c.m/s
45.000 ID No.6 99999 .000 Conduit Length
6.400 Area in hectares .000 No Conduit defined
207.000 Length (PERV) metres .000 Zero lag
1.000 Gradient (%) .000 Beta weighting factor
70.000 Per cent Impervious .000 Routing timestep
207.000 Length (IMPERV) 0 No. of sub-reaches
.000 %Imp. with Zero Dpth .731 .731 .731 .426 c.m/s
.1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 17 COMBINE
.250 Manning "n" 2 Junction Node No.
74.000 SCS Curve No or C .731 .731 .731 1.157 c.m/s
.100 Ia/S Coefficient 18 CONFLUENCE
8.924 Initial Abstraction 2 Junction Node No.
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .731 1.157 .731 .000 c.m/s
.424 .308 .206 .206 c.m/s 4 CATCHMENT
.098 .805 .593 C perv/imperv/total 54.000 ID No.6 99999
15 ADD RUNOFF .424 .732 .206 .206 c.m/s 1.280 Area in hectares
9 ROUTE 92.000 Length (PERV) metres
.000 Conduit Length 1.000 Gradient (%)
.000 No Conduit defined 60.000 Per cent Impervious
.000 Zero lag 92.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
.000 Beta weighting factor 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.000 Routing timestep .250 Manning "n"
0 No. of sub-reaches 74.000 SCS Curve No or C
.424 .732 .732 .206 c.m/s .100 Ia/S Coefficient
17 COMBINE 8.924 Initial Abstraction
3 Junction Node No. 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.424 .732 .732 .938 c.m/s .070 1.157 .731 .000 c.m/s
14 START .098 .786 .511 C perv/imperv/total
1 1=Zero; 2=Define 15 ADD RUNOFF
18 CONFLUENCE .070 1.227 .731 .000 c.m/s
3 Junction Node No. 27 HYDROGRAPH DISPLAY
.424 .938 .732 .000 c.m/s 5 is # of Hyeto/Hydrograph chosen
4 CATCHMENT 10 POND
46.000 ID No.6 99999 6 Depth - Discharge - Volume sets
.600 Area in hectares 182.000 .000 .0
63.000 Length (PERV) metres 187.000 .0410 3045.0
1.000 Gradient (%) 188.300 .0540 5273.0
60.000 Per cent Impervious 188.500 .150 6237.0
63.000 Length (IMPERV) 188.800 .257 7764.0
.000 %Imp. with Zero Dpth 189.000 .880 8856.0
.1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Peak Outflow = .027 c.m/s
.250 Manning "n" Maximum Depth = 187.532 metres
74.000 SCS Curve No or C Maximum Storage = 2023. c.m
.100 Ia/S Coefficient .033 .938 .732 .000 c.m/s
8.924 Initial Abstraction 14 START
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .033 .938 .732 .000 c.m/s
.098 .799 .519 C perv/imperv/total 35 COMMENT
15 ADD RUNOFF .033 .969 .732 .000 c.m/s 3 line(s) of comment
27 HYDROGRAPH DISPLAY *****
5 is # of Hyeto/Hydrograph chosen PROP DEVELOPMENT NORTH OF SEGMENT 3 - POND P30
*****
10 POND 4 CATCHMENT
6 Depth - Discharge - Volume sets 30.000 ID No.6 99999
187.000 .000 .0 8.470 Area in hectares
187.800 .0410 3045.0 238.000 Length (PERV) metres
188.300 .0540 5273.0 .200 Gradient (%)
188.500 .150 6237.0 .100 Per cent Impervious
188.800 .257 7764.0 238.000 Length (IMPERV)
189.000 .880 8856.0 .000 %Imp. with Zero Dpth
Peak Outflow = .027 c.m/s 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
Maximum Depth = 187.532 metres .250 Manning "n"
Maximum Storage = 2023. c.m 74.000 SCS Curve No or C
.033 .969 .027 .000 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 .007 .000 .009 .000 c.m/s
3 line(s) of comment .098 .803 .099 C perv/imperv/total
***** 15 ADD RUNOFF
PROP DEVELOPMENT SOUTH OF QUAKER, EAST OF RICE - POND P50 ***** .007 .007 .009 .000 c.m/s
4 CATCHMENT 4 CATCHMENT
52.000 ID No.6 99999 31.000 ID No.6 99999
6.430 Area in hectares 10.420 Area in hectares
207.000 Length (PERV) metres 264.000 Length (PERV) metres
1.000 Gradient (%) 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 .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=Cdnlnr;5=Historic
 755.000 Coefficient a
 8.000 Constant b (min)
 .789 Exponent c
 .450 Fraction to peak r
 240.000 Duration δ 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 PUT 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
 5 is # of Hyeto/Hydrograph chosen
 Volume = .2406793E+04 c.m
 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
Maximum Depth = 185.633 metres
Maximum Storage = 2132. c.m
.060 .889 .018 .972 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.
.060 .889 .018 .983 c.m/s
14 START
1 l=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
.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
41.200 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
.021 .300 .018 .983 c.m/s
.194 .857 .426 C perv/imperv/total
15 ADD RUNOFF .021 .317 .018 .983 c.m/s
4 CATCHMENT
41.000 ID No.6 99999
8.040 Area in hectares
226.000 Length (PERV) metres
1.000 Gradient (%)
100.000 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
.051 .317 .018 .983 c.m/s
.194 .868 .015 C perv/imperv/total
15 ADD RUNOFF .051 .325 .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
.051 .325 .325 .983 c.m/s
17 COMBINE
3 Junction Node No.
.051 .325 .325 .325 c.m/s
14 START
1 l=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
.018 .000 .325 .325 c.m/s
.194 .858 .426 C perv/imperv/total
15 ADD RUNOFF .018 .018 .325 .325 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
.485 .000 .047 .047 c.m/s
.194 .868 .430 C perv/imperv/total
15 ADD RUNOFF .485 .485 .047 .047 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag

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| | | | | | | | | |
|---------|--------|--|---------------------|------------|------|-----------------------|------|---------------------|
| | .000 | Beta weighting factor | | | .194 | .862 | .461 | C perv/imperv/total |
| | .000 | Routing timestep | 15 | ADD RUNOFF | .822 | .822 | .084 | .919 c.m/s |
| | 0 | No. of sub-reaches | | ROUTE | .000 | | | |
| 17 | .485 | .485 | .485 | .047 c.m/s | .000 | Conduit Length | | |
| | | | | | .000 | No Conduit defined | | |
| 14 | .485 | .485 | .485 | .505 c.m/s | .000 | Zero lag | | |
| | | | | | .000 | Beta weighting factor | | |
| 18 | 1 | 1=Zero; 2=Define | | | .000 | Routing timestep | | |
| | 2 | Junction Node No. | | | 0 | No. of sub-reaches | | |
| 35 | .485 | .505 | .485 | .000 c.m/s | .822 | .822 | .822 | .919 c.m/s |
| | | | | | | | | |
| 35 | 3 | line(s) of comment | | | 2 | Junction Node No. | | |
| | | ***** | | | .822 | .822 | .822 | 1.741 c.m/s |
| | | EXISTING AREA ON QUAKER RD, WEST OF RICE RD | | | | | | |
| | | ***** | | | | | | |
| 4 | | CATCHMENT | | | 14 | START | | |
| | 3.000 | ID No.6 99999 | | | 1 | 1=Zero; 2=Define | | |
| | 5.680 | Area in hectares | | | 2 | Junction Node No. | | |
| 195.000 | | Length (PERV) metres | | | .822 | 1.741 | .822 | .000 c.m/s |
| 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 | .330 | .835 | .485 | .000 c.m/s | | | | |
| | | | | | | | | |
| 9 | | | | | | | | |
| | .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 | | | | | | | | |
| | | | | | | | | |
| 17 | 2 | Junction Node No. | | | | | | |
| | .330 | .835 | .835 | .835 c.m/s | | | | |
| 14 | | | | | | | | |
| | 1 | 1=Zero; 2=Define | | | | | | |
| 35 | 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 | .053 | .835 | .835 c.m/s | | | | | |
| | | | | | | | | |
| 4 | | | | | | | | |
| | | | | | | | | |
| 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 | .031 | .835 | .835 c.m/s | | | | | |
| | | | | | | | | |
| 9 | | | | | | | | |
| | .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 | | | | | | | | |
| | | | | | | | | |
| 17 | 2 | Junction Node No. | | | | | | |
| | .031 | .084 | .084 | .919 c.m/s | | | | |
| 14 | | | | | | | | |
| | 1 | 1=Zero; 2=Define | | | | | | |
| 35 | 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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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 1.171 1.171 1.171 .649 c.m/s
10.000 Per cent Impervious 2 COMBINE
80.416 Length (IMPERV) 18 1.171 1.171 1.171 1.820 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 4 CATCHMENT
.100 Ia/S Coefficient 54.000 ID No.6 99999
8.924 Initial Abstraction 1.280 Area in hectares
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 92.000 Length (PERV) metres
.015 3.295 .422 .000 c.m/s 1.000 Gradient (%)
.194 .858 .261 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
.015 3.310 .422 .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 .107 1.820 1.171 .000 c.m/s
***** 194 .857 .592 C perv/imperv/total
EX RES. AND FUT DEVELOPMENT LANDS BY OTHERS WEST OF FIRST AV 15 ADD RUNOFF
***** .107 1.923 1.171 .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 = .4892284E+04 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 = .017 c.m/s
8.924 Initial Abstraction Maximum Depth = 182.699 metres
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv Maximum Storage = 4589. c.m
.176 3.310 .422 .000 c.m/s 17 COMBINE
.194 .869 .228 C perv/imperv/total 2 Junction Node No.
15 ADD RUNOFF .176 3.432 .422 .000 c.m/s 2 .107 1.923 .017 .017 c.m/s
9 ROUTE 14 START
.000 Conduit Length 1 1=Zero; 2=Define
.000 No Conduit defined 35 COMMENT
.000 Zero lag 3 line(s) of comment
.000 Beta weighting factor *****
.000 Routing timestep EXISTING AREA ON QUAKER RD, EAST OF RICE RD
.000 No. of sub-reaches *****
.176 3.432 3.432 .000 c.m/s 4 CATCHMENT
35 COMMENT 5.000 ID No.6 99999
3 line(s) of comment 1.870 Area in hectares
***** 112.000 Length (PERV) metres
FLOW U/S OF FIRST AVE CULVERT 1.000 Gradient (%)
***** 50.000 Per cent Impervious
17 COMBINE 112.000 Length (IMPERV)
1 Junction Node No. .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
***** .130 .000 .017 .017 c.m/s
.194 .851 .522 C perv/imperv/total
4 CATCHMENT 15 ADD RUNOFF
52.000 ID No.6 99999 .130 .130 .017 .017 c.m/s
6.430 Area in hectares 9 ROUTE
207.000 Length (PERV) metres .000 Conduit Length
1.000 Gradient (%) .000 No Conduit defined
70.000 Per cent Impervious .000 Zero lag
207.000 Length (IMPERV) .000 Beta weighting factor
.000 %Imp. with Zero Dpth .000 Routing timestep
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 0 No. of sub-reaches
.250 Manning "n" .130 .130 .130 .017 c.m/s
74.000 SCS Curve No or C 17 COMBINE
.100 Ia/S Coefficient 2 Junction Node No.
8.924 Initial Abstraction .130 .130 .130 .136 c.m/s
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 18 CONFLUENCE
.649 .000 3.432 3.432 c.m/s 2 Junction Node No.
.194 .866 .665 C perv/imperv/total 35 COMMENT
15 ADD RUNOFF .649 .649 3.432 3.432 c.m/s 3 line(s) of comment
9 ROUTE *****
.000 Conduit Length EXISTING AREA ON QUAKER RD, EAST OF RICE RD
.000 No Conduit defined *****
.000 Zero lag 4 CATCHMENT
.000 Beta weighting factor 6.000 ID No.6 99999
.000 Routing timestep 1.920 Area in hectares
.000 No. of sub-reaches 113.000 Length (PERV) metres
.649 .649 .649 3.432 c.m/s .200 Gradient (%)
17 COMBINE 65.000 Per cent Impervious
2 Junction Node No. 113.000 Length (IMPERV)
14 START 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
1 1=Zero; 2=Define .250 Manning "n"
4 CATCHMENT 74.000 SCS Curve No or C
53.000 ID No.6 99999 .100 Ia/S Coefficient
11.340 Area in hectares 8.924 Initial Abstraction
275.000 Length (PERV) metres 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.000 Gradient (%) .185 .136 .130 .000 c.m/s
70.000 Per cent Impervious .194 .867 .631 C perv/imperv/total
275.000 Length (IMPERV) 15 ADD RUNOFF
.000 %Imp. with Zero Dpth .185 .321 .130 .000 c.m/s
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 35 COMMENT
.250 Manning "n" 3 line(s) of comment
74.000 SCS Curve No or C *****
.100 Ia/S Coefficient FIRST AVE FROM QUAKER RD TO CITY OF WELLAND MUNICIPAL BOUNDA
8.924 Initial Abstraction *****
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 4 CATCHMENT
.171 .000 .649 .649 c.m/s 201.000 ID No.6 99999
.194 .865 .664 C perv/imperv/total 2.430 Area in hectares
15 ADD RUNOFF 1.171 1.171 .649 .649 c.m/s 127.000 Length (PERV) metres
9 ROUTE 1.000 Gradient (%)
.000 Conduit Length 65.000 Per cent Impervious
.000 No Conduit defined 127.000 Length (IMPERV)
.000 Zero lag .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
17 COMBINE .221 .542 .542 .000 c.m/s
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.6 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.6 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
17 COMBINE .011 4.056 4.056 .000 c.m/s
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.6 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.6 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

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.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
.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.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
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.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
.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.6 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 4.096 .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
```

35 COMMENT
 3 line(s) of comment

 5-YEAR STORM EVENT

2 STORM
 1 1=Chicago;2=Huff;3=User;4=Cdnlnr;5=Historic
 830.000 Coefficient a
 7.300 Constant b (min)
 .777 Exponent c
 .450 Fraction to peak r
 240.000 Duration δ 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 PUT 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

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
 POND

10 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 l=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 l=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option l=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 l=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option l=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 (%)
.100 Per cent Impervious
226.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option l=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option l=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 l=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 l=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option l=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 l=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option l=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 l=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 l=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option l=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 l=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option l=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 l=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 l=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option l=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
187.800 .0410 3045.0
188.300 .0540 5273.0
188.500 .150 6237.0
188.800 .257 7764.0
189.000 .880 8856.0
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 l=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 l=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option l=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

```

| | | | | | | | | |
|---------|--|-----------------------|---------------------|------------|------|-----------------------|------|---------------------|
| | .000 | Beta weighting factor | | | .236 | .883 | .495 | C perv/imperv/total |
| | .000 | Routing timestep | 15 | ADD RUNOFF | .988 | .988 | .104 | 1.103 c.m/s |
| | 0 | No. of sub-reaches | | ROUTE | .000 | | | |
| 17 | .582 | .582 | .582 | .053 c.m/s | .000 | Conduit Length | | |
| | COMBINE | | | | .000 | No Conduit defined | | |
| 2 | .582 | .582 | .582 | .607 c.m/s | .000 | Zero lag | | |
| 14 | START | | | | .000 | Beta weighting factor | | |
| 1 | 1=Zero; 2=Define | | | | .000 | Routing timestep | | |
| 18 | CONFLUENCE | | | | 0 | No. of sub-reaches | | |
| 2 | Junction Node No. | | | | .988 | .988 | .988 | 1.103 c.m/s |
| | .582 | .607 | .582 | .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 | | | | | | | |
| .392 | .607 | .582 | .000 c.m/s | | | | | |
| .236 | .877 | .492 | C perv/imperv/total | | | | | |
| 15 | ADD RUNOFF | | | | .392 | .999 | .582 | .000 c.m/s |
| 9 | ROUTE | | | | .000 | Conduit Length | | |
| .000 | No Conduit defined | | | | .000 | Zero lag | | |
| .000 | Beta weighting factor | | | | .000 | Routing timestep | | |
| .000 | No. of sub-reaches | | | | 0 | | | |
| | .392 | .999 | .999 | .000 c.m/s | | | | |
| 17 | COMBINE | | | | | | | |
| 2 | Junction Node No. | | | | .392 | .999 | .999 | .999 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 | .999 | .999 c.m/s | | | | | |
| .236 | .868 | .299 | C perv/imperv/total | | | | | |
| 15 | ADD RUNOFF | | | | .066 | .999 | .999 | .999 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 | .999 | .999 c.m/s | | | | | |
| .236 | .872 | .299 | C perv/imperv/total | | | | | |
| 15 | ADD RUNOFF | | | | .039 | .104 | .999 | .999 c.m/s |
| 9 | ROUTE | | | | .000 | Conduit Length | | |
| .000 | No Conduit defined | | | | .000 | Zero lag | | |
| .000 | Beta weighting factor | | | | .000 | Routing timestep | | |
| .000 | No. of sub-reaches | | | | 0 | | | |
| | .039 | .104 | .104 | .999 c.m/s | | | | |
| 17 | COMBINE | | | | | | | |
| 2 | Junction Node No. | | | | .039 | .104 | .104 | 1.103 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 | 1.103 c.m/s | | | | | |


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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 (%) 1.397 1.397 1.397 .768 c.m/s
10.000 Per cent Impervious 17 COMBINE
80.416 Length (IMPERV) 2 Junction Node No.
.000 %Imp. with Zero Dpth 1.397 1.397 1.397 2.165 c.m/s
.000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n" 18 CONFLUENCE
74.000 SCS Curve No or C 2 Junction Node No.
.100 Ia/S Coefficient 1.397 2.165 1.397 .000 c.m/s
8.924 Initial Abstraction 4 CATCHMENT
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 54.000 ID No.6 99999
.019 3.943 .494 .000 c.m/s 1.280 Area in hectares
.236 .875 .299 C perv/imperv/total 92.000 Length (PERV) metres
35 COMMENT 1.000 Gradient (%)
3 line(s) of comment 60.000 Per cent Impervious
***** 92.000 Length (IMPERV)
FLOW D/S OF AREA A20 - OUTLET B .000 %Imp. with Zero Dpth
***** 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
15 ADD RUNOFF .250 Manning "n"
.019 3.962 .494 .000 c.m/s 74.000 SCS Curve No or C
35 COMMENT .100 Ia/S Coefficient
3 line(s) of comment 8.924 Initial Abstraction
***** 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
EX RES. AND FUT DEVELOPMENT LANDS BY OTHERS WEST OF FIRST AV .131 2.165 1.397 .000 c.m/s
***** 15 ADD RUNOFF
4 CATCHMENT .236 .876 .620 C perv/imperv/total
21.000 ID No.6 99999 27 HYDROGRAPH DISPLAY
35.460 Area in hectares 5 is # of Hyeto/Hydrograph chosen
538.000 Length (PERV) metres Volume = .5982220E+04 c.m
.200 Gradient (%) 10 POND
5.000 Per cent Impervious 6 Depth - Discharge - Volume sets
538.000 Length (IMPERV) 182.000 .000 .0
.000 %Imp. with Zero Dpth 182.800 .0190 5251.0
.000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 183.150 .0230 7895.0
.250 Manning "n" 183.500 .238 10751.0
74.000 SCS Curve No or C 183.800 .396 13425.0
.100 Ia/S Coefficient 184.000 1.028 15337.0
8.924 Initial Abstraction Peak Outflow = .020 c.m/s
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv Maximum Depth = 182.848 metres
.223 3.962 .494 .000 c.m/s Maximum Storage = 5617. c.m
.236 .884 .268 C perv/imperv/total 17 COMBINE
15 ADD RUNOFF .131 2.285 1.397 .000 c.m/s
.223 4.132 .494 .000 c.m/s 2 Junction Node No.
9 ROUTE .131 2.285 .020 .020 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 *****
.000 No. of sub-reaches EXISTING AREA ON QUAKER RD, EAST OF RICE RD
.223 4.132 4.132 .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)
.223 4.132 4.132 4.132 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
***** .153 .000 .020 .020 c.m/s
.236 .873 .554 C perv/imperv/total 15 ADD RUNOFF
4 CATCHMENT .153 .153 .020 .020 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 .153 .153 .153 .020 c.m/s
.250 Manning "n" 17 COMBINE
74.000 SCS Curve No or C 2 Junction Node No.
.100 Ia/S Coefficient .153 .153 .153 .160 c.m/s
8.924 Initial Abstraction 18 CONFLUENCE
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 2 Junction Node No.
.768 .000 4.132 4.132 c.m/s .153 .160 .153 .000 c.m/s
.236 .880 .687 C perv/imperv/total 35 COMMENT
15 ADD RUNOFF .768 .768 4.132 4.132 c.m/s 3 line(s) of comment
9 ROUTE *****
.000 Conduit Length EXISTING AREA ON QUAKER RD, EAST OF RICE RD
.000 No Conduit defined *****
.000 Zero lag 4 CATCHMENT
.000 Beta weighting factor 6.000 ID No.6 99999
.000 Routing timestep 1.920 Area in hectares
.000 No. of sub-reaches 113.000 Length (PERV) metres
.768 .768 .768 4.132 c.m/s .200 Gradient (%)
17 COMBINE 65.000 Per cent Impervious
2 Junction Node No. 113.000 Length (IMPERV)
.768 .768 .768 .768 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"
4 CATCHMENT 74.000 SCS Curve No or C
53.000 ID No.6 99999 .100 Ia/S Coefficient
11.340 Area in hectares 8.924 Initial Abstraction
275.000 Length (PERV) metres 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
1.000 Gradient (%) .214 .160 .153 .000 c.m/s
70.000 Per cent Impervious .236 .886 .658 C perv/imperv/total
275.000 Length (IMPERV) 15 ADD RUNOFF
.000 %Imp. with Zero Dpth .214 .374 .153 .000 c.m/s
.000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 35 COMMENT
.250 Manning "n" 3 line(s) of comment
74.000 SCS Curve No or C *****
.100 Ia/S Coefficient FIRST AVE FROM QUAKER RD TO CITY OF WELLAND MUNICIPAL BOUNDA
8.924 Initial Abstraction *****
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 4 CATCHMENT
1.397 .000 .768 .768 c.m/s 201.000 ID No.6 99999
.236 .886 .691 C perv/imperv/total 2.430 Area in hectares
15 ADD RUNOFF 1.397 1.397 .768 .768 c.m/s 127.000 Length (PERV) metres
9 ROUTE 1.000 Gradient (%)
.000 Conduit Length 65.000 Per cent Impervious
.000 No Conduit defined 127.000 Length (IMPERV)
.000 Zero lag .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
17 COMBINE .259 .632 .632 .000 c.m/s
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.6 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.6 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
17 COMBINE .014 4.865 4.865 .000 c.m/s
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.6 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.6 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.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
.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.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
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.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
.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.6 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=Cdnlnr;5=Historic
 860.000 Coefficient a
 6.500 Constant b (min)
 .763 Exponent c
 .450 Fraction to peak r
 240.000 Duration δ 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 PUT 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

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
 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 l=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 l=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option l=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 l=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option l=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 (%)
.100 Per cent Impervious
226.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
1 Option l=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option l=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 l=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 l=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option l=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 l=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option l=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 l=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 l=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option l=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 l=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option l=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 l=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 l=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option l=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
187.800 .0410 3045.0
188.300 .0540 5273.0
188.500 .150 6237.0
188.800 .257 7764.0
189.000 .880 8856.0
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 l=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 l=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option l=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 | | | .267 | .896 | .518 | C perv/imperv/total |
| | .000 | Routing timestep | 15 | ADD RUNOFF | 1.115 | 1.115 | .123 | 1.248 c.m/s |
| | 0 | No. of sub-reaches | | ROUTE | | | | |
| 17 | .656 | .656 | .656 | .114 | c.m/s | | | |
| COMBINE | | | | | | | | |
| 2 | Junction Node No. | | | | | | | |
| 14 | .656 | .656 | .656 | .685 | c.m/s | | | |
| 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. | | | | | | | |
| 14 | .440 | 1.125 | 1.125 | 1.125 | c.m/s | | | |
| 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. | | | | | | | |
| 14 | .046 | .123 | .123 | 1.248 | c.m/s | | | |
| 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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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 1.280 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 (%)
35 COMMENT 60.000 Per cent Impervious
3 line(s) of comment 92.000 Length (IMPERV)
***** %Imp. with Zero Dpth
FLOW D/S OF AREA A20 - OUTLET B 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
***** .250 Manning "n"
15 ADD RUNOFF 74.000 SCS Curve No or C
.024 4.472 .549 .000 c.m/s .100 Ia/S Coefficient
35 COMMENT 8.924 Initial Abstraction
3 line(s) of comment 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
***** .149 2.381 1.523 .000 c.m/s
EX RES. AND FUT DEVELOPMENT LANDS BY OTHERS WEST OF FIRST AV .267 .887 .639 C perv/imperv/total
***** 15 ADD RUNOFF
4 CATCHMENT .149 2.514 1.523 .000 c.m/s
21.000 ID No.6 99999 27 HYDROGRAPH DISPLAY
35.460 Area in hectares 5 is # of Hyeto/Hydrograph chosen
538.000 Length (PERV) metres Volume = .6870401E+04 c.m
.200 Gradient (%) POND
5.000 Per cent Impervious 6 Depth - Discharge - Volume sets
538.000 Length (IMPERV) 182.000 .000 .0
.000 %Imp. with Zero Dpth 182.800 .0190 5251.0
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 183.150 .0230 7895.0
.250 Manning "n" 183.500 .238 10751.0
74.000 SCS Curve No or C 183.800 .396 13425.0
.100 Ia/S Coefficient 184.000 1.028 15337.0
8.924 Initial Abstraction Peak Outflow = .021 c.m/s
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv Maximum Depth = 182.962 metres
.262 4.472 .549 .000 c.m/s Maximum Storage = 6474. c.m
.267 .895 .298 C perv/imperv/total .149 2.514 .021 .000 c.m/s
15 ADD RUNOFF 17 COMBINE
.262 4.683 .549 .000 c.m/s 2 Junction Node No.
9 ROUTE .149 2.514 .021 .021 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
.262 4.683 4.683 .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)
.262 4.683 4.683 4.683 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
***** .175 .000 .021 .021 c.m/s
4 CATCHMENT .267 .885 .576 C perv/imperv/total
52.000 ID No.6 99999 15 ADD RUNOFF
6.430 Area in hectares .175 .175 .021 .021 c.m/s
207.000 Length (PERV) metres 9 ROUTE
1.000 Gradient (%) .000 Conduit Length
70.000 Per cent Impervious .000 No Conduit defined
207.000 Length (IMPERV) .000 Zero lag
.000 %Imp. with Zero Dpth .000 Beta weighting factor
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 Routing timestep
.250 Manning "n" 0 No. of sub-reaches
74.000 SCS Curve No or C .175 .175 .175 .021 c.m/s
.100 Ia/S Coefficient 17 COMBINE
8.924 Initial Abstraction 2 Junction Node No.
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .175 .175 .175 .180 c.m/s
.858 .000 4.683 4.683 c.m/s 18 CONFLUENCE
.267 .887 .701 C perv/imperv/total 2 Junction Node No.
15 ADD RUNOFF .175 .180 .175 .000 c.m/s
.858 .858 4.683 4.683 c.m/s 35 COMMENT
9 ROUTE 3 line(s) of comment
.000 Conduit Length *****
.000 No Conduit defined EXISTING AREA ON QUAKER RD, EAST OF RICE RD
.000 Zero lag *****
.000 Beta weighting factor 4 CATCHMENT
.000 Routing timestep 6.000 ID No.6 99999
0 No. of sub-reaches 1.920 Area in hectares
.858 .858 .858 4.683 c.m/s 113.000 Length (PERV) metres
17 COMBINE .200 Gradient (%)
2 Junction Node No. 65.000 Per cent Impervious
.858 .858 .858 .858 c.m/s 113.000 Length (IMPERV)
14 START .000 %Imp. with Zero Dpth
1 1=Zero; 2=Define 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
4 CATCHMENT .250 Manning "n"
53.000 ID No.6 99999 74.000 SCS Curve No or C
11.340 Area in hectares .100 Ia/S Coefficient
275.000 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 .240 .180 .175 .000 c.m/s
275.000 Length (IMPERV) .267 .896 .676 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 .240 .418 .175 .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 FIRST AVE FROM QUAKER RD TO CITY OF WELLAND MUNICIPAL BOUNDA
*****
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 4 CATCHMENT
1.523 .000 .858 .858 c.m/s 201.000 ID No.6 99999
.267 .897 .708 C perv/imperv/total 2.430 Area in hectares
15 ADD RUNOFF 127.000 Length (PERV) metres
1.523 1.523 .858 .858 c.m/s 1.000 Gradient (%)
9 ROUTE 65.000 Per cent Impervious
.000 Conduit Length 127.000 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

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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.6 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.6 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.6 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.6 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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.250      Manning "n"
74.000    SCS 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=Cdnlnr;5=Historic
 900.000 Coefficient a
 5.200 Constant b (min)
 .745 Exponent c
 .450 Fraction to peak r
 240.000 Duration δ 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.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
 1.445 .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.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
 .077 1.445 .000 .000 c.m/s
 .308 .891 .396 C perv/imperv/total
 35 COMMENT
 3 line(s) of comment

 FLOW AT PUT 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.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
 .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.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
 .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.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
 .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.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
 .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.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
 1.083 .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.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
 .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
 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 =      .048 c.m/s
Maximum Depth = 186.136 metres
Maximum Storage = 3650. c.m
.099      1.367      .048      1.567 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.
.099      1.367      .048      1.583 c.m/s
14 START
1 l=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 l=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option l=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
41.200 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 l=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option l=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.036 .484 .048 1.583 c.m/s
.308 .898 .515 C perv/imperv/total
15 ADD RUNOFF
.036 .512 .048 1.583 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 l=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option l=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.164 .512 .048 1.583 c.m/s
.308 .900 .309 C perv/imperv/total
15 ADD RUNOFF
.164 .557 .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
.164 .557 .557 1.583 c.m/s
17 COMBINE
3 Junction Node No.
.164 .557 .557 .557 c.m/s
14 START
1 l=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 l=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option l=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.030 .000 .557 .557 c.m/s
.308 .898 .515 C perv/imperv/total
15 ADD RUNOFF
.030 .030 .557 .557 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 l=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
.771 .000 .193 .193 c.m/s
.308 .904 .517 C perv/imperv/total
15 ADD RUNOFF
.771 .771 .193 .193 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
1 Option l=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.679 .030 .557 .557 c.m/s
.308 .888 .714 C perv/imperv/total
15 ADD RUNOFF
.679 .703 .557 .557 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 l=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option l=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.031 .703 .557 .557 c.m/s
.308 .898 .515 C perv/imperv/total
15 ADD RUNOFF
.031 .727 .557 .557 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 l=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option l=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.990 .727 .557 .557 c.m/s
.308 .896 .719 C perv/imperv/total
15 ADD RUNOFF
.990 1.717 .557 .557 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 1.717 1.717 .557 c.m/s
17 COMBINE
3 Junction Node No.
.990 1.717 1.717 2.274 c.m/s
14 START
1 l=Zero; 2=Define
18 CONFLUENCE
3 Junction Node No.
.990 2.274 1.717 .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 l=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
1 Option l=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.089 2.274 1.717 .000 c.m/s
.308 .899 .663 C perv/imperv/total
15 ADD RUNOFF
.089 2.341 1.717 .000 c.m/s
27 HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .8935566E+04 c.m
10 POND
6 Depth - Discharge - Volume sets
187.000 .000 .0
187.800 .0410 3045.0
188.300 .0540 5273.0
188.500 .150 6237.0
188.800 .257 7764.0
189.000 .880 8856.0
Peak Outflow = .193 c.m/s
Maximum Depth = 188.620 metres
Maximum Storage = 6850. c.m
.089 2.341 .193 .000 c.m/s
17 COMBINE
2 Junction Node No.
.089 2.341 .193 .193 c.m/s
14 START
1 l=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 l=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.250 Manning "n"
74.000 SCS Curve No or C
.100 Ia/S Coefficient
8.924 Initial Abstraction
.771 .000 .193 .193 c.m/s
.308 .904 .517 C perv/imperv/total
15 ADD RUNOFF
.771 .771 .193 .193 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag

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| | | | | | | | | | |
|----|--|--|-------|-------|---------------------|------|------|------|---------------------|
| | .000 | Beta weighting factor | | | | .308 | .910 | .549 | C perv/imperv/total |
| | .000 | Routing timestep | | | | | | | |
| | 0 | No. of sub-reaches | | | | | | | |
| 17 | .771 | .771 | .771 | .193 | c.m/s | | | | |
| | COMBINE | | | | | | | | |
| | 2 | Junction Node No. | | | | | | | |
| | .771 | .771 | .771 | .807 | c.m/s | | | | |
| 14 | START | | | | | | | | |
| | 1 | 1=Zero; 2=Define | | | | | | | |
| 18 | CONFLUENCE | | | | | | | | |
| | 2 | Junction Node No. | | | | | | | |
| | .771 | .807 | .771 | .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 | | | | | | | |
| | .515 | .807 | .771 | .000 | c.m/s | | | | |
| | .308 | .894 | .543 | | C perv/imperv/total | | | | |
| 15 | ADD RUNOFF | | | | | | | | |
| | .515 | 1.322 | .771 | .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 | 1.322 | 1.322 | .000 | c.m/s | | | | |
| 17 | COMBINE | | | | | | | | |
| | 2 | Junction Node No. | | | | | | | |
| | .515 | 1.322 | 1.322 | 1.322 | 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 | 1.322 | 1.322 | c.m/s | | | | |
| | .308 | .892 | .367 | | C perv/imperv/total | | | | |
| 15 | ADD RUNOFF | | | | | | | | |
| | .097 | .097 | 1.322 | 1.322 | 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 | 1.322 | 1.322 | c.m/s | | | | |
| | .308 | .899 | .367 | | C perv/imperv/total | | | | |
| 15 | ADD RUNOFF | | | | | | | | |
| | .059 | .156 | 1.322 | 1.322 | 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 | 1.322 | c.m/s | | | | |
| 17 | COMBINE | | | | | | | | |
| | 2 | Junction Node No. | | | | | | | |
| | .059 | .156 | .156 | 1.478 | 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 | 1.478 | c.m/s | | | | |

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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 1.776 1.776 1.776 .995 c.m/s
10.000 Per cent Impervious 2 Junction Node No.
80.416 Length (IMPERV) 1.776 1.776 1.776 2.771 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" 1.776 2.771 1.776 .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 1.280 Area in hectares
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 92.000 Length (PERV) metres
.032 5.183 .639 .000 c.m/s 1.000 Gradient (%)
.308 .898 .367 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
.032 5.214 .639 .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 .179 2.771 1.776 .000 c.m/s
***** EX RES. AND FUT DEVELOPMENT LANDS BY OTHERS WEST OF FIRST AV .308 .900 .663 C perv/imperv/total
***** 15 ADD RUNOFF
4 CATCHMENT .179 2.924 1.776 .000 c.m/s
21.000 ID No.6 99999 27 HYDROGRAPH DISPLAY
35.460 Area in hectares 5 is # of Hyeto/Hydrograph chosen
538.000 Length (PERV) metres Volume = .8196629E+04 c.m
.200 Gradient (%) 10 POND
5.000 Per cent Impervious 6 Depth - Discharge - Volume sets
538.000 Length (IMPERV) 182.000 .000 .0
.000 %Imp. with Zero Dpth 182.800 .0190 5251.0
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 183.150 .0230 7895.0
.250 Manning "n" 183.500 .238 10751.0
74.000 SCS Curve No or C 183.800 .396 13425.0
.100 Ia/S Coefficient 184.000 1.028 15337.0
8.924 Initial Abstraction Peak Outflow = .023 c.m/s
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv Maximum Depth = 183.132 metres
.327 5.214 .639 .000 c.m/s Maximum Storage = 7762. c.m
.308 .910 .338 C perv/imperv/total .179 2.924 .023 .000 c.m/s
15 ADD RUNOFF 17 COMBINE
.327 5.494 .639 .000 c.m/s 2 Junction Node No.
9 ROUTE .179 2.924 .023 .023 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 *****
.000 No. of sub-reaches EXISTING AREA ON QUAKER RD, EAST OF RICE RD
.327 5.494 5.494 .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)
.327 5.494 5.494 5.494 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
***** .211 .000 .023 .023 c.m/s
4 CATCHMENT 308 .900 .604 C perv/imperv/total
52.000 ID No.6 99999 15 ADD RUNOFF
6.430 Area in hectares 9 ROUTE
207.000 Length (PERV) metres .211 .211 .023 .023 c.m/s
1.000 Gradient (%) 17 COMBINE
70.000 Per cent Impervious 2 Junction Node No.
207.000 Length (IMPERV) .211 .211 .211 .217 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" .211 .217 .211 .000 c.m/s
74.000 SCS Curve No or C 35 COMMENT
.100 Ia/S Coefficient 3 line(s) of comment
8.924 Initial Abstraction *****
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv EXISTING AREA ON QUAKER RD, EAST OF RICE RD
.995 .000 5.494 5.494 c.m/s *****
.308 .896 .719 C perv/imperv/total 4 CATCHMENT
15 ADD RUNOFF 6.000 ID No.6 99999
.995 .995 5.494 5.494 c.m/s 1.920 Area in hectares
9 ROUTE 113.000 Length (PERV) metres
.000 Conduit Length .200 Gradient (%)
.000 No Conduit defined 65.000 Per cent Impervious
.000 Zero lag 113.000 Length (IMPERV)
.000 Beta weighting factor .000 %Imp. with Zero Dpth
.000 Routing timestep 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
0 No. of sub-reaches .250 Manning "n"
.995 .995 .995 5.494 c.m/s 74.000 SCS Curve No or C
17 COMBINE 1.920 Ia/S Coefficient
2 Junction Node No. 8.924 Initial Abstraction
.995 .995 .995 .995 c.m/s 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
14 START .279 .217 .211 .000 c.m/s
1 1=Zero; 2=Define .308 .906 .697 C perv/imperv/total
4 CATCHMENT 15 ADD RUNOFF
53.000 ID No.6 99999 35 COMMENT
11.340 Area in hectares *****
275.000 Length (PERV) metres 3 line(s) of comment
1.000 Gradient (%) *****
70.000 Per cent Impervious FIRST AVE FROM QUAKER RD TO CITY OF WELLAND MUNICIPAL BOUNDA
275.000 Length (IMPERV) *****
.000 %Imp. with Zero Dpth 4 CATCHMENT
.250 Manning "n" 201.000 ID No.6 99999
74.000 SCS Curve No or C 2.430 Area in hectares
.100 Ia/S Coefficient 127.000 Length (PERV) metres
8.924 Initial Abstraction 1.000 Gradient (%)
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 65.000 Per cent Impervious
.279 .217 .211 .000 c.m/s 127.000 Length (IMPERV)
.308 .906 .697 C perv/imperv/total .000 %Imp. with Zero Dpth
15 ADD RUNOFF .279 .486 .211 .000 c.m/s 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
35 COMMENT 3 line(s) of comment
*****
FIRST AVE FROM QUAKER RD TO CITY OF WELLAND MUNICIPAL BOUNDA
*****

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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
17 COMBINE .344 .816 .816 .000 c.m/s
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.6 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.6 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
.250 Manning "n"
74.000 SCS 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
17 COMBINE .020 6.449 6.449 .000 c.m/s
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.6 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.6 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
1.743 .113 6.449 6.449 c.m/s
.308 .907 .758 C perv/imperv/total
15 ADD RUNOFF

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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
```

35 COMMENT
 3 line(s) of comment

 100-YEAR STORM EVENT

 2 STORM
 1 1=Chicago;2=Huff;3=User;4=Cdnlnr;5=Historic
 1020.000 Coefficient a
 4.700 Constant b (min)
 .731 Exponent c
 .450 Fraction to peak r
 240.000 Duration δ 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 PUT 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
 1.307 .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
 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 | | | | | | |
| 186.800 | 1.922 | 6222.0 | | | .817 | .849 | .732 | .732 c.m/s |
| 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.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 | | | | | | | |
| .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.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 | | | | | | | |
| .046 | .607 | .143 | | | | | | 1.908 c.m/s |
| .366 | .912 | .557 | | | | | | C perv/imperv/total |
| 15 | ADD RUNOFF | | | | | | | |
| .046 | .645 | .143 | | | | | | 1.908 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 | | | | | | | |
| .273 | .645 | .143 | | | | | | 1.908 c.m/s |
| .367 | .909 | .368 | | | | | | C perv/imperv/total |
| 15 | ADD RUNOFF | | | | | | | |
| .273 | .732 | .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 | | | | | | | |
| .273 | .732 | .732 | | | | | | 1.908 c.m/s |
| 17 | COMBINE | | | | | | | |
| 3 | Junction Node No. | | | | | | | |
| .273 | .732 | .732 | | | | | | .732 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 | | | | | | | |
| .038 | .000 | .732 | | | | | | .732 c.m/s |
| .367 | .911 | .558 | | | | | | C perv/imperv/total |
| 15 | ADD RUNOFF | | | | | | | |
| .038 | .038 | .732 | | | | | | .732 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 | | | | | | | |
| .953 | .000 | .464 | | | | | | .464 c.m/s |
| .368 | .912 | .558 | | | | | | C perv/imperv/total |
| 15 | ADD RUNOFF | | | | | | | |
| .953 | .953 | .464 | | | | | | .464 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
.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

.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 BOUNDA
*****
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 Junction Node No.
.000 %Imp. with Zero Dpth 2.157 2.157 2.157 3.355 c.m/s
.000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
1 Manning "n" 18 CONFLUENCE
.250 SCS Curve No or C 2 Junction Node No.
74.000 Ia/S Coefficient 2.157 3.355 2.157 .000 c.m/s
.100 Initial Abstraction 4 CATCHMENT
8.924 Initial Abstraction 54.000 ID No.6 99999
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 1.280 Area in hectares
.053 6.340 .807 .000 c.m/s 92.000 Length (PERV) metres
.367 .912 .422 C perv/imperv/total 1.000 Gradient (%)
35 COMMENT 60.000 Per cent Impervious
3 line(s) of comment 92.000 Length (IMPERV)
***** %Imp. with Zero Dpth
FLOW D/S OF AREA A20 - OUTLET B 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
***** Manning "n"
15 ADD RUNOFF .250 SCS Curve No or C
.053 6.387 .807 .000 c.m/s 74.000 Ia/S Coefficient
35 COMMENT .100 Initial Abstraction
3 line(s) of comment 8.924 Initial Abstraction
***** 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
EX RES. AND FUT DEVELOPMENT LANDS BY OTHERS WEST OF FIRST AV .225 3.355 2.157 .000 c.m/s
***** .367 .913 .695 C perv/imperv/total
4 CATCHMENT 15 ADD RUNOFF
21.000 ID No.6 99999 27 HYDROGRAPH DISPLAY
35.460 Area in hectares 5 is # of Hyeto/Hydrograph chosen
538.000 Length (PERV) metres Volume = .1040810E+05 c.m
.200 Gradient (%) POND
5.000 Per cent Impervious 6 Depth - Discharge - Volume sets
538.000 Length (IMPERV) 182.000 .000 .0
.000 %Imp. with Zero Dpth 182.800 .0190 5251.0
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 183.150 .0230 7895.0
.250 Manning "n" 183.500 .238 10751.0
74.000 SCS Curve No or C 183.800 .396 13425.0
.100 Ia/S Coefficient 184.000 1.028 15337.0
8.924 Initial Abstraction Peak Outflow = .132 c.m/s
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv Maximum Depth = 183.327 metres
.529 6.387 .807 .000 c.m/s Maximum Storage = 9342. c.m
.368 .925 .395 C perv/imperv/total .225 3.539 .132 .000 c.m/s
15 ADD RUNOFF 17 COMBINE
.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
*****
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
4 CATCHMENT 15 ADD RUNOFF
52.000 ID No.6 99999 .367 .916 .642 C perv/imperv/total
6.430 Area in hectares 9 ROUTE
207.000 Length (PERV) metres .000 Conduit Length
1.000 Gradient (%) .000 No Conduit defined
70.000 Per cent Impervious .000 Zero lag
207.000 Length (IMPERV) .000 Beta weighting factor
.000 %Imp. with Zero Dpth .000 Routing timestep
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 0 No. of sub-reaches
.250 Manning "n" .266 .266 .266 .132 c.m/s
74.000 SCS Curve No or C 17 COMBINE
.100 Ia/S Coefficient 2 Junction Node No.
8.924 Initial Abstraction .266 .266 .266 .274 c.m/s
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 18 CONFLUENCE
1.198 .000 6.785 6.785 c.m/s 2 Junction Node No.
.368 .906 .744 C perv/imperv/total .266 .274 .266 .000 c.m/s
15 ADD RUNOFF 35 COMMENT
1.198 1.198 6.785 6.785 c.m/s 3 line(s) of comment
9 ROUTE *****
.000 Conduit Length EXISTING AREA ON QUAKER RD, EAST OF RICE RD
.000 No Conduit defined *****
.000 Zero lag 4 CATCHMENT
.000 Beta weighting factor 6.000 ID No.6 99999
.000 Routing timestep 1.920 Area in hectares
0 No. of sub-reaches 113.000 Length (PERV) metres
17 COMBINE .200 Gradient (%)
2 Junction Node No. 65.000 Per cent Impervious
1.198 1.198 1.198 1.198 c.m/s 113.000 Length (IMPERV)
14 START .000 %Imp. with Zero Dpth
1 1=Zero; 2=Define 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
4 CATCHMENT .250 Manning "n"
53.000 ID No.6 99999 74.000 SCS Curve No or C
11.340 Area in hectares .100 Ia/S Coefficient
275.000 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 .339 .274 .266 .000 c.m/s
275.000 Length (IMPERV) .368 .914 .723 C perv/imperv/total
.000 %Imp. with Zero Dpth 15 ADD RUNOFF
.000 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .339 .594 .266 .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 FIRST AVE FROM QUAKER RD TO CITY OF WELLAND MUNICIPAL BOUNDA
*****
15 ADD RUNOFF 4 CATCHMENT
2.157 .000 1.198 1.198 c.m/s 201.000 ID No.6 99999
.368 .919 .753 C perv/imperv/total 2.430 Area in hectares
127.000 Length (PERV) metres
9 ROUTE 1.000 Gradient (%)
.000 Per cent Impervious
.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 .433 .991 .991 .000 c.m/s
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.6 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.6 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 .030 7.952 7.952 .000 c.m/s
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.6 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.6 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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.250 Manning "n"
74.000 SCS 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

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 l=Chicago;2=Huff;3=User;4=Cdnlhr;5=Historic
512.000 Coefficient a
6.000 Constant b (min)
.800 Exponent c
.450 Fraction to peak r
240.000 Duration δ 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 l=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 l=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 l=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

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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.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
.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.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
.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.6 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.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
.426 .000 .027 .000 c.m/s
.098 .805 .593 C perv/imperv/total
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.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
.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.6 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.6 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.6 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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.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.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=Cdnlnr;5=Historic
755.000 Coefficient a
8.000 Constant b (min)
.789 Exponent c
.450 Fraction to peak r
240.000 Duration 6 240 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
17 COMBINE
1 Junction Node No.
.015 .422 .025 .941 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 .000 %Imp. with Zero Dpth
Volume = .2406793E+04 c.m 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
10 POND .250 Manning "n"
5 Depth - Discharge - Volume sets 74.000 SCS Curve No or C
184.800 .000 .0 100 Ia/S Coefficient
185.300 .0140 1142.0 8.924 Initial Abstraction
186.100 .0240 3519.0 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
186.500 .287 4978.0 .018 .754 .853 .853 c.m/s
186.800 1.922 6222.0 .194 .858 .426 C perv/imperv/total
Peak Outflow = .018 c.m/s 15 ADD RUNOFF .018 .768 .853 .853 c.m/s
Maximum Depth = 185.633 metres 4 CATCHMENT
Maximum Storage = 2132. c.m 45.000 ID No.6 99999
.060 .889 .018 .972 c.m/s 6.400 Area in hectares
35 COMMENT 3 line(s) of comment 207.000 Length (PERV) metres
***** FLOW U/S OF RICE RD CULVERT - OUTLET A1 1.000 Gradient (%)
***** 70.000 Per cent Impervious
COMBINE 207.000 Length (IMPERV)
1 Junction Node No. .000 %Imp. with Zero Dpth
.060 .889 .018 .983 c.m/s 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
14 START 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
***** PROP DEVELOPMENT SOUTH OF QUAKER RD & WEST OF RICE RD. - PON 8.924 Initial Abstraction
***** 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
4 CATCHMENT .646 .768 .853 .853 c.m/s
40.000 ID No.6 99999 .194 .866 .665 C perv/imperv/total
8.210 Area in hectares 15 ADD RUNOFF .646 1.414 .853 .853 c.m/s
234.000 Length (PERV) metres 9 ROUTE
1.000 Gradient (%) .000 Conduit Length
25.000 Per cent Impervious .000 No Conduit defined
234.000 Length (IMPERV) .000 Zero lag
.000 %Imp. with Zero Dpth .000 Beta weighting factor
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 Routing timestep
.250 Manning "n" 0 No. of sub-reaches
74.000 SCS Curve No or C .646 1.414 1.414 .853 c.m/s
100 Ia/S Coefficient 17 COMBINE
8.924 Initial Abstraction 2 Junction Node No.
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .646 1.414 1.414 2.267 c.m/s
.300 .000 .018 .983 c.m/s 14 START
.194 .868 .363 C perv/imperv/total 1 1=Zero; 2=Define
15 ADD RUNOFF .300 .300 .018 .983 c.m/s 18 CONFLUENCE
.300 .300 .018 .983 c.m/s 2 Junction Node No.
4 CATCHMENT .646 2.267 1.414 .000 c.m/s
46.000 ID No.6 99999 4 CATCHMENT
5.480 Area in hectares 46.000 ID No.6 99999
191.000 Length (PERV) metres 1.030 Area in hectares
1.000 Gradient (%) 83.000 Length (PERV) metres
70.000 Per cent Impervious 1.000 Gradient (%)
191.000 Length (IMPERV) 60.000 Per cent Impervious
.000 %Imp. with Zero Dpth 83.000 Length (IMPERV)
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 %Imp. with Zero Dpth
.250 Manning "n" 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
74.000 SCS Curve No or C .250 Manning "n"
100 Ia/S Coefficient 74.000 SCS Curve No or C
8.924 Initial Abstraction 100 Ia/S Coefficient
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 8.924 Initial Abstraction
.553 .300 .018 .983 c.m/s .088 2.267 1.414 .000 c.m/s
.194 .864 .663 C perv/imperv/total .194 .857 .592 C perv/imperv/total
15 ADD RUNOFF .553 .853 .018 .983 c.m/s 15 ADD RUNOFF .088 2.348 1.414 .000 c.m/s
9 ROUTE 27 HYDROGRAPH DISPLAY
.000 Conduit Length 5 is # of Hyeto/Hydrograph chosen
.000 No Conduit defined 10 Volume = .6495084E+04 c.m
.000 Zero lag 10 POND
.000 Beta weighting factor 6 Depth - Discharge - Volume sets
.000 Routing timestep 187.000 .000 .0 .0
0 No. of sub-reaches 187.800 .0410 4766.0
.553 .853 .853 .983 c.m/s 188.300 .0540 8282.0
17 COMBINE 188.500 .150 9812.0
2 Junction Node No. 188.800 .257 12242.0
.553 .853 .853 .853 c.m/s 189.000 .880 13993.0
14 START 1=Zero; 2=Define Peak Outflow = .045 c.m/s
4 CATCHMENT Maximum Depth = 187.939 metres
42.000 ID No.6 99999 Maximum Storage = 5740. c.m
.690 Area in hectares .088 2.348 .045 .000 c.m/s
68.000 Length (PERV) metres 17 COMBINE
1.000 Gradient (%) 2 Junction Node No.
35.000 Per cent Impervious .088 2.348 .045 .045 c.m/s
68.000 Length (IMPERV) 14 START
.000 %Imp. with Zero Dpth 1 1=Zero; 2=Define
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 35 COMMENT
.250 Manning "n" *****
74.000 SCS Curve No or C *****
100 Ia/S Coefficient 4 CATCHMENT
8.924 Initial Abstraction 2.000 ID No.6 99999
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 9.020 Area in hectares
.036 .000 .853 .853 c.m/s 245.000 Length (PERV) metres
.194 .857 .426 C perv/imperv/total 1.000 Gradient (%)
15 ADD RUNOFF .036 .036 .853 .853 c.m/s 40.000 Per cent Impervious
4 CATCHMENT 245.000 Length (IMPERV)
43.000 ID No.6 99999 .000 %Imp. with Zero Dpth
7.160 Area in hectares 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
218.000 Length (PERV) metres .250 Manning "n"
1.000 Gradient (%) 74.000 SCS Curve No or C
70.000 Per cent Impervious 100 Ia/S Coefficient
218.000 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 .520 .000 .045 .045 c.m/s
.250 Manning "n" .194 .868 .464 C perv/imperv/total
74.000 SCS Curve No or C 15 ADD RUNOFF .520 .520 .045 .045 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
.722 .036 .853 .853 c.m/s .000 Zero lag
.194 .867 .665 C perv/imperv/total .000 Beta weighting factor
15 ADD RUNOFF .722 .754 .853 .853 c.m/s .000 Routing timestep
4 CATCHMENT 0 No. of sub-reaches
44.000 ID No.6 99999 .520 .520 .520 .045 c.m/s
.330 Area in hectares 17 COMBINE
47.000 Length (PERV) metres 2 Junction Node No.
1.000 Gradient (%) .520 .520 .520 .539 c.m/s
35.000 Per cent Impervious 14 START
47.000 Length (IMPERV) 1 1=Zero; 2=Define
18 CONFLUENCE

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2 Junction Node No. .000 Routing timestep
.520 .539 .520 .000 c.m/s 0 No. of sub-reaches
35 COMMENT .822 .822 .822 .953 c.m/s
3 line(s) of comment 17 COMBINE
***** 2 Junction Node No.
EXISTING AREA ON QUAKER RD, WEST OF RICE RD .822 .822 .822 1.775 c.m/s
4 CATCHMENT 14 START
3.000 ID No.6 99999 1 1=Zero; 2=Define
5.680 Area in hectares 18 CONFLUENCE
195.000 Length (PERV) metres 2 Junction Node No.
1.000 Gradient (%) .822 1.775 .822 .000 c.m/s
40.000 Per cent Impervious 35 COMMENT
195.000 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 RICE ROAD FROM QUAKER RD TO CITY OF WELLAND MUNICIPAL BOUNDA
.250 Manning "n" *****
74.000 SCS Curve No or C 4 CATCHMENT
.100 Ia/S Coefficient 501.000 ID No.6 99999
8.924 Initial Abstraction 1.570 Area in hectares
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 102.000 Length (PERV) metres
.330 .539 .520 .000 c.m/s 1.000 Gradient (%)
.194 .865 .462 C perv/imperv/total 70.000 Per cent Impervious
15 ADD RUNOFF .000 Length (IMPERV)
.330 .869 .520 .000 c.m/s .000 %Imp. with Zero Dpth
9 ROUTE 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.000 Conduit Length .250 Manning "n"
.000 No Conduit defined 74.000 SCS Curve No or C
.000 Zero lag .100 Ia/S Coefficient
.000 Beta weighting factor 8.924 Initial Abstraction
.000 Routing timestep 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
0 No. of sub-reaches .149 1.775 .822 .000 c.m/s
.330 .869 .869 .000 c.m/s .194 .854 .656 C perv/imperv/total
17 COMBINE 15 ADD RUNOFF .149 1.924 .822 .000 c.m/s
2 Junction Node No. 9 ROUTE
.330 .869 .869 .869 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
PROP DEVELOPMENT SOUTH OF QUAKER RD, EAST OF RICE RD .149 1.924 1.924 .000 c.m/s
4 CATCHMENT 35 COMMENT
50.000 ID No.6 99999 3 line(s) of comment
3.420 Area in hectares *****
151.000 Length (PERV) metres FLOW D/S OF RICE RD CULVERT - OUTLET A2
1.000 Gradient (%) *****
10.000 Per cent Impervious 17 COMBINE
151.000 Length (IMPERV) 1 Junction Node No.
.000 %Imp. with Zero Dpth .149 1.924 1.924 2.907 c.m/s
.1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 14 START
.250 Manning "n" 1 1=Zero; 2=Define
74.000 SCS Curve No or C 35 COMMENT
.100 Ia/S Coefficient *****
8.924 Initial Abstraction PROP DEVELOPMENT SOUTH OF QUAKER RD - QUALITY CONTROL ONLY
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv *****
.053 .000 .869 .869 c.m/s 4 CATCHMENT
.194 .854 .260 C perv/imperv/total 20.100 ID No.6 99999
15 ADD RUNOFF .053 .053 .869 .869 c.m/s .780 Area in hectares
4 CATCHMENT 72.000 Length (PERV) metres
51.000 ID No.6 99999 1.000 Gradient (%)
1.980 Area in hectares 35.000 Per cent Impervious
115.000 Length (PERV) metres 72.000 Length (IMPERV)
1.000 Gradient (%) .000 %Imp. with Zero Dpth
10.000 Per cent Impervious 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
115.000 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 .040 .000 1.924 2.907 c.m/s
8.924 Initial Abstraction .194 .857 .426 C perv/imperv/total
15 ADD RUNOFF .040 .040 1.924 2.907 c.m/s
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 4 CATCHMENT
.031 .053 .869 .869 c.m/s 20.000 ID No.6 99999
.194 .850 .260 C perv/imperv/total 3.210 Area in hectares
15 ADD RUNOFF .031 .084 .869 .869 c.m/s 146.000 Length (PERV) metres
9 ROUTE 1.000 Gradient (%)
.000 Conduit Length 85.000 Per cent Impervious
.000 No Conduit defined 146.000 Length (IMPERV)
.000 Zero lag .000 %Imp. with Zero Dpth
.000 Beta weighting factor 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.000 Routing timestep .250 Manning "n"
0 No. of sub-reaches 74.000 SCS Curve No or C
.031 .084 .084 .869 c.m/s .100 Ia/S Coefficient
17 COMBINE 8.924 Initial Abstraction
2 Junction Node No. 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.031 .084 .084 .953 c.m/s .386 .040 1.924 2.907 c.m/s
14 START .194 .854 .755 C perv/imperv/total
1 1=Zero; 2=Define 15 ADD RUNOFF .386 .422 1.924 2.907 c.m/s
35 COMMENT 9 ROUTE
3 line(s) of comment .000 Conduit Length
***** .000 No Conduit defined
EXISTING AREA WEST OF RICE RD AND SOUTH OF QUAKER ROAD .000 Zero lag
4 CATCHMENT .000 Beta weighting factor
4.000 ID No.6 99999 .000 Routing timestep
13.940 Area in hectares 0 No. of sub-reaches
305.000 Length (PERV) metres .386 .422 .422 2.907 c.m/s
1.000 Gradient (%) 17 COMBINE
40.000 Per cent Impervious 1 Junction Node No.
305.000 Length (IMPERV) .386 .422 .422 3.329 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" 18 CONFLUENCE
74.000 SCS Curve No or C 1 Junction Node No.
.100 Ia/S Coefficient .386 3.329 .422 .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
.822 .000 .084 .953 c.m/s *****
.194 .862 .461 C perv/imperv/total REALIGNED CHANNEL - SEGMENT 2
15 ADD RUNOFF .822 .822 .084 .953 c.m/s *****
9 ROUTE 4 CATCHMENT
.000 Conduit Length 200.000 ID No.6 99999
.000 No Conduit defined .970 Area in hectares
.000 Zero lag 80.416 Length (PERV) metres
.000 Beta weighting factor 1.000 Gradient (%)
.000 Routing timestep 10.000 Per cent Impervious
0 No. of sub-reaches

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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.6 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 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.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 3.480 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.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
1.280 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
182.800 .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 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
.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
.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
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.6 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.6 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
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.6 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.6 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

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1.154 1.158 4.104 4.104 c.m/s
HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .3477034E+04 c.m
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
.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
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 4.104 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.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
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
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
.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
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.6 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
.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=Cdnlnr;5=Historic
830.000 Coefficient a
7.300 Constant b (min)
.777 Exponent c
.450 Fraction to peak r
240.000 Duration  $\delta$  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
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
17 COMBINE
1 Junction Node No.
.020 .497 .026 1.137 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

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5 is # of Hyeto/Hydrograph chosen .000 %Imp. with Zero Dpth
Volume = .2954374E+04 c.m 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
10 POND .250 Manning "n"
5 Depth - Discharge - Volume sets 74.000 SCS Curve No or C
184.800 .000 .0 1.000 Ia/S Coefficient
185.300 .0140 1142.0 8.924 Initial Abstraction
186.100 .0240 3519.0 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
186.500 .287 4978.0 .022 .894 1.013 1.013 c.m/s
186.800 1.922 6222.0 .236 .875 .460 C perv/imperv/total
Peak Outflow = .020 c.m/s 15 ADD RUNOFF .022 .912 1.013 1.013 c.m/s
Maximum Depth = 185.805 metres 4 CATCHMENT
Maximum Storage = 2641. c.m 45.000 ID No.6 99999
.072 1.052 .020 1.172 c.m/s 6.400 Area in hectares
35 COMMENT 3 line(s) of comment 207.000 Length (PERV) metres
***** FLOW U/S OF RICE RD CULVERT - OUTLET A1 1.000 Gradient (%)
***** 70.000 Per cent Impervious
COMBINE 207.000 Length (IMPERV)
1 Junction Node No. .000 %Imp. with Zero Dpth
.072 1.052 .020 1.185 c.m/s 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
14 START 1 l=Zero; 2=Define .250 Manning "n"
35 COMMENT 74.000 SCS Curve No or C
3 line(s) of comment 1.000 Ia/S Coefficient
***** PROP DEVELOPMENT SOUTH OF QUAKER RD & WEST OF RICE RD. - PON 8.924 Initial Abstraction
***** 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
4 CATCHMENT .361 .000 .020 1.185 c.m/s
40.000 ID No.6 99999 .236 .884 .398 C perv/imperv/total
8.210 Area in hectares 15 ADD RUNOFF .361 .361 .020 1.185 c.m/s
234.000 Length (PERV) metres 9 ROUTE .765 .912 1.013 1.013 c.m/s
1.000 Gradient (%) .000 No Conduit defined
25.000 Per cent Impervious .000 Zero lag
234.000 Length (IMPERV) .000 Beta weighting factor
.000 %Imp. with Zero Dpth .000 Routing timestep
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 0 No. of sub-reaches
.250 Manning "n" 17 COMBINE .765 1.676 1.676 1.013 c.m/s
74.000 SCS Curve No or C 2 Junction Node No.
.100 Ia/S Coefficient .765 1.676 1.676 2.689 c.m/s
8.924 Initial Abstraction 14 START 1 l=Zero; 2=Define
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 18 CONFLUENCE
.361 .000 .020 1.185 c.m/s 2 Junction Node No.
.236 .884 .398 C perv/imperv/total .765 2.689 1.676 .000 c.m/s
15 ADD RUNOFF .361 .361 .020 1.185 c.m/s 4 CATCHMENT
4 CATCHMENT 46.000 ID No.6 99999
41.000 Area in hectares 1.030 Area in hectares
5.480 Length (PERV) metres 83.000 Length (PERV) metres
191.000 Length (PERV) metres 1.000 Gradient (%)
1.000 Gradient (%) 60.000 Per cent Impervious
70.000 Per cent Impervious 83.000 Length (IMPERV)
191.000 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
.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
.652 .361 .020 1.185 c.m/s .107 2.689 1.676 .000 c.m/s
.236 .876 .684 C perv/imperv/total .236 .876 .620 C perv/imperv/total
15 ADD RUNOFF .652 1.013 .020 1.185 c.m/s 15 ADD RUNOFF .107 2.784 1.676 .000 c.m/s
9 ROUTE 27 HYDROGRAPH DISPLAY
.000 Conduit Length 5 is # of Hyeto/Hydrograph chosen
.000 No Conduit defined 10 Volume = .800214E+04 c.m
.000 Zero lag POND
.000 Beta weighting factor 6 Depth - Discharge - Volume sets
.000 Routing timestep 187.000 .000 .0
.000 No. of sub-reaches 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 = .050 c.m/s
Maximum Depth = 188.136 metres
Maximum Storage = 7131. c.m
.107 2.784 .050 .000 c.m/s
17 COMBINE 2 Junction Node No.
.652 1.013 1.013 1.013 c.m/s .107 2.784 .050 .050 c.m/s
14 START 1 l=Zero; 2=Define 14 START 1 l=Zero; 2=Define
4 CATCHMENT 35 COMMENT
42.000 ID No.6 99999 *****
.690 Area in hectares *****
68.000 Length (PERV) metres 4 CATCHMENT
1.000 Gradient (%) 2.000 ID No.6 99999
35.000 Per cent Impervious 9.020 Area in hectares
68.000 Length (IMPERV) 245.000 Length (PERV) metres
.000 %Imp. with Zero Dpth 1.000 Gradient (%)
.000 %Imp. with Zero Dpth 40.000 Per cent Impervious
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 245.000 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
.044 .000 1.013 1.013 c.m/s 8.924 Initial Abstraction
.236 .873 .459 C perv/imperv/total 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
15 ADD RUNOFF .044 .044 1.013 1.013 c.m/s .624 .000 .050 .050 c.m/s
4 CATCHMENT .236 .885 .496 C perv/imperv/total
43.000 ID No.6 99999 15 ADD RUNOFF .624 .624 .050 .050 c.m/s
7.160 Area in hectares 9 ROUTE
218.000 Length (PERV) metres .000 Conduit Length
1.000 Gradient (%) .000 No Conduit defined
70.000 Per cent Impervious .000 Zero lag
218.000 Length (IMPERV) .000 Beta weighting factor
.000 %Imp. with Zero Dpth .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 .624 .624 .624 .050 c.m/s
.250 Manning "n" 17 COMBINE
74.000 SCS Curve No or C 2 Junction Node No.
.100 Ia/S Coefficient .624 .624 .624 .649 c.m/s
8.924 Initial Abstraction 14 START 1 l=Zero; 2=Define
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 18 CONFLUENCE
.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.6 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
.624 .649 .624 .000 c.m/s 0 No. of sub-reaches
35 COMMENT .988 .988 .988 1.145 c.m/s
3 line(s) of comment 17 COMBINE
***** 2 Junction Node No.
EXISTING AREA ON QUAKER RD, WEST OF RICE RD .988 .988 .988 2.133 c.m/s
4 CATCHMENT 14 START
3.000 ID No.6 99999 1 1=Zero; 2=Define
5.680 Area in hectares 18 CONFLUENCE
195.000 Length (PERV) metres 2 Junction Node No.
1.000 Gradient (%) .988 2.133 .988 .000 c.m/s
40.000 Per cent Impervious 35 COMMENT
195.000 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 RICE ROAD FROM QUAKER RD TO CITY OF WELLAND MUNICIPAL BOUNDA
.250 Manning "n" *****
74.000 SCS Curve No or C 4 CATCHMENT
.100 Ia/S Coefficient 501.000 ID No.6 99999
8.924 Initial Abstraction 1.570 Area in hectares
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 102.000 Length (PERV) metres
.392 .649 .624 .000 c.m/s 1.000 Gradient (%)
.236 .877 .492 C perv/imperv/total 70.000 Per cent Impervious
15 ADD RUNOFF .000 Length (IMPERV)
.392 1.041 .624 .000 c.m/s .000 %Imp. with Zero Dpth
9 ROUTE 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.000 Conduit Length .250 Manning "n"
.000 No Conduit defined 74.000 SCS Curve No or C
.000 Zero lag .100 Ia/S Coefficient
.000 Beta weighting factor 8.924 Initial Abstraction
.000 Routing timestep 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
0 No. of sub-reaches .182 2.133 .988 .000 c.m/s
.392 1.041 1.041 .000 c.m/s 15 ADD RUNOFF .236 .874 .683 C perv/imperv/total
17 COMBINE .182 2.306 .988 .000 c.m/s
2 Junction Node No. 9 ROUTE
.392 1.041 1.041 1.041 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
PROP DEVELOPMENT SOUTH OF QUAKER RD, EAST OF RICE RD .182 2.306 2.306 .000 c.m/s
4 CATCHMENT 35 COMMENT
50.000 ID No.6 99999 3 line(s) of comment
3.420 Area in hectares *****
151.000 Length (PERV) metres FLOW D/S OF RICE RD CULVERT - OUTLET A2
1.000 Gradient (%) *****
10.000 Per cent Impervious 17 COMBINE
151.000 Length (IMPERV) 1 Junction Node No.
.000 %Imp. with Zero Dpth .182 2.306 2.306 3.491 c.m/s
.1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 14 START
.250 Manning "n" 1 1=Zero; 2=Define
74.000 SCS Curve No or C 35 COMMENT
.100 Ia/S Coefficient *****
8.924 Initial Abstraction PROP DEVELOPMENT SOUTH OF QUAKER RD - QUALITY CONTROL ONLY
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv *****
.066 .000 1.041 1.041 c.m/s 4 CATCHMENT
.236 .868 .299 C perv/imperv/total 20.100 ID No.6 99999
15 ADD RUNOFF .066 .066 1.041 1.041 c.m/s .780 Area in hectares
4 CATCHMENT 72.000 Length (PERV) metres
51.000 ID No.6 99999 1.000 Gradient (%)
1.980 Area in hectares 35.000 Per cent Impervious
115.000 Length (PERV) metres 72.000 Length (IMPERV)
1.000 Gradient (%) .000 %Imp. with Zero Dpth
10.000 Per cent Impervious 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
115.000 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 .049 .000 2.306 3.491 c.m/s
8.924 Initial Abstraction .236 .873 .459 C perv/imperv/total
15 ADD RUNOFF .049 .049 2.306 3.491 c.m/s
4 CATCHMENT 20.000 ID No.6 99999
3.210 Area in hectares 146.000 Length (PERV) metres
146.000 Length (PERV) metres 1.000 Gradient (%)
85.000 Per cent Impervious 146.000 Length (IMPERV)
.000 %Imp. with Zero Dpth
146.000 Length (IMPERV) 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.000 %Imp. with Zero Dpth .250 Manning "n"
.1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 74.000 SCS Curve No or C
.100 Ia/S Coefficient 74.000 SCS Curve No or C
8.924 Initial Abstraction .100 Ia/S Coefficient
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 8.924 Initial Abstraction
.452 .049 2.306 3.491 c.m/s 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.236 .866 .772 C perv/imperv/total 15 ADD RUNOFF .452 .494 2.306 3.491 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 .452 .494 .494 3.491 c.m/s
1 Junction Node No. 14 START
.452 .494 .494 3.985 c.m/s 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

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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.6 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.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 4.191 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.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
.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.6 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
182.800 .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 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
.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
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.6 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.6 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
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.6 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.6 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 4.924 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
HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .4376407E+04 c.m
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
.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
HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .4571937E+04 c.m
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.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
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
HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .4291300E+04 c.m
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
.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
HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .4478340E+04 c.m
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.6 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=Cdnlnr;5=Historic
860.000 Coefficient a
6.500 Constant b (min)
.763 Exponent c
.450 Fraction to peak r
240.000 Duration δ 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.δ 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.δ 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.δ 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.δ 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
17 COMBINE
1 Junction Node No.
.024 .555 .026 1.290 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.δ 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.δ 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.δ 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.δ 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 .000 %Imp. with Zero Dpth
Volume = .3408792E+04 c.m 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
10 POND .250 Manning "n"
5 Depth - Discharge - Volume sets 74.000 SCS Curve No or C
184.800 .000 .0 1.000 Ia/S Coefficient
185.300 .0140 1142.0 8.924 Initial Abstraction
186.100 .0240 3519.0 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
186.500 .287 4978.0 .026 1.000 1.136 1.136 c.m/s
186.800 1.922 6222.0 .266 .885 .483 C perv/imperv/total
Peak Outflow = .022 c.m/s 15 ADD RUNOFF .026 1.020 1.136 1.136 c.m/s
Maximum Depth = 185.947 metres 4 CATCHMENT
Maximum Storage = 3066. c.m 45.000 ID No.6 99999
.083 1.177 .022 1.329 c.m/s 6.400 Area in hectares
35 COMMENT 3 line(s) of comment 207.000 Length (PERV) metres
***** FLOW U/S OF RICE RD CULVERT - OUTLET A1 1.000 Gradient (%)
***** 70.000 Per cent Impervious
COMBINE 207.000 Length (IMPERV)
17 1 Junction Node No. .000 %Imp. with Zero Dpth
.083 1.177 .022 1.344 c.m/s 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
14 START 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
***** PROP DEVELOPMENT SOUTH OF QUAKER RD & WEST OF RICE RD. - PON 8.924 Initial Abstraction
***** 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
4 CATCHMENT .854 1.020 1.136 1.136 c.m/s
40.000 ID No.6 99999 .267 .887 .701 C perv/imperv/total
8.210 Area in hectares 15 ADD RUNOFF .854 1.874 1.136 1.136 c.m/s
234.000 Length (PERV) metres 9 ROUTE
1.000 Gradient (%) .000 Conduit Length
25.000 Per cent Impervious .000 No Conduit defined
234.000 Length (IMPERV) .000 Zero lag
.000 %Imp. with Zero Dpth .000 Beta weighting factor
.000 Routing timestep
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 0 No. of sub-reaches
.250 Manning "n" .854 1.874 1.874 1.136 c.m/s
74.000 SCS Curve No or C 17 COMBINE
.100 Ia/S Coefficient 2 Junction Node No.
8.924 Initial Abstraction .854 1.874 1.874 3.010 c.m/s
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 14 START
.408 .000 .022 1.344 c.m/s 1=Zero; 2=Define
.267 .894 .423 C perv/imperv/total 18 CONFLUENCE
15 ADD RUNOFF .408 .408 .022 1.344 c.m/s 2 Junction Node No.
.408 .408 .022 1.344 c.m/s .854 3.010 1.874 .000 c.m/s
4 CATCHMENT 4 CATCHMENT
41.000 ID No.6 99999 46.000 ID No.6 99999
5.480 Area in hectares 1.030 Area in hectares
191.000 Length (PERV) metres 83.000 Length (PERV) metres
1.000 Gradient (%) 1.000 Gradient (%)
70.000 Per cent Impervious 60.000 Per cent Impervious
191.000 Length (IMPERV) 83.000 Length (IMPERV)
.000 %Imp. with Zero Dpth .000 %Imp. with Zero Dpth
.000 Routing timestep 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 .122 3.010 1.874 .000 c.m/s
.728 .408 .022 1.344 c.m/s .267 .886 .638 C perv/imperv/total
15 ADD RUNOFF .267 .884 .699 C perv/imperv/total 15 ADD RUNOFF .122 3.115 1.874 .000 c.m/s
.728 1.136 .022 1.344 c.m/s 27 HYDROGRAPH DISPLAY
9 ROUTE 5 is # of Hyeto/Hydrograph chosen
.000 Conduit Length Volume = .9253276E+04 c.m
.000 No Conduit defined 10 POND
.000 Zero lag 6 Depth - Discharge - Volume sets
.000 Beta weighting factor 187.000 .000 .0
.000 Routing timestep 187.800 .0410 4766.0
.000 No. of sub-reaches 188.300 .0540 8282.0
.728 1.136 1.136 1.344 c.m/s 188.500 .150 9812.0
17 COMBINE 188.800 .257 12242.0
2 Junction Node No. 189.000 .880 13993.0
.728 1.136 1.136 1.136 c.m/s Peak Outflow = .055 c.m/s
14 START 1=Zero; 2=Define Maximum Depth = 188.302 metres
1 1=Zero; 2=Define Maximum Storage = 8297. c.m
4 CATCHMENT .122 3.115 .055 .000 c.m/s
42.000 ID No.6 99999 17 COMBINE
.690 Area in hectares 2 Junction Node No.
68.000 Length (PERV) metres .122 3.115 .055 .055 c.m/s
1.000 Gradient (%) 14 START
35.000 Per cent Impervious 1=Zero; 2=Define
68.000 Length (IMPERV) 35 COMMENT
.000 %Imp. with Zero Dpth *****
.000 Routing timestep *****
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 4 CATCHMENT
.250 Manning "n" 2.000 ID No.6 99999
74.000 SCS Curve No or C 9.020 Area in hectares
.100 Ia/S Coefficient 245.000 Length (PERV) metres
8.924 Initial Abstraction 1.000 Gradient (%)
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 40.000 Per cent Impervious
.051 .000 1.136 1.136 c.m/s 245.000 Length (IMPERV)
.267 .884 .483 C perv/imperv/total .000 %Imp. with Zero Dpth
15 ADD RUNOFF .051 .051 1.136 1.136 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
7.160 Area in hectares .100 Ia/S Coefficient
218.000 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 .702 .000 .055 .055 c.m/s
218.000 Length (IMPERV) .267 .895 .518 C perv/imperv/total
.000 %Imp. with Zero Dpth 15 ADD RUNOFF .702 .702 .055 .055 c.m/s
.000 Routing timestep 9 ROUTE
.000 No. of sub-reaches .000 Conduit Length
.702 .702 .702 .055 c.m/s .000 No Conduit defined
17 COMBINE .000 Zero lag
2 Junction Node No. .000 Beta weighting factor
.702 .702 .702 .731 c.m/s .000 Routing timestep
14 START 0 No. of sub-reaches
1=Zero; 2=Define .702 .702 .702 .055 c.m/s
18 CONFLUENCE

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2 Junction Node No. .000 Routing timestep
.702 .731 .702 .000 c.m/s 0 No. of sub-reaches
35 COMMENT 1.115 1.115 1.115 1.294 c.m/s
3 line(s) of comment 17 COMBINE
***** 2 Junction Node No.
EXISTING AREA ON QUAKER RD, WEST OF RICE RD 1.115 1.115 2.409 c.m/s
4 CATCHMENT 14 START
3.000 ID No.6 99999 1 1=Zero; 2=Define
5.680 Area in hectares 18 CONFLUENCE
195.000 Length (PERV) metres 2 Junction Node No.
1.000 Gradient (%) 1.115 1.115 2.409 c.m/s
40.000 Per cent Impervious 35 COMMENT
195.000 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 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
.440 .731 .702 .000 c.m/s 102.000 Length (IMPERV)
.267 .885 .514 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
.440 1.171 .702 .000 c.m/s 1 Manning "n"
9 ROUTE .250
.000 Conduit Length 74.000 SCS Curve No or C
.000 No Conduit defined .100 Ia/S Coefficient
.000 Zero lag 8.924 Initial Abstraction
.000 Beta weighting factor 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
.000 Routing timestep .209 2.409 1.115 .000 c.m/s
0 No. of sub-reaches .267 .886 .700 C perv/imperv/total
.440 1.171 1.171 .000 c.m/s 15 ADD RUNOFF
9 ROUTE .209 2.601 1.115 .000 c.m/s
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor
.000 Routing timestep
0 No. of sub-reaches
.209 2.601 2.601 .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 2.601 2.601 3.945 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

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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.6 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.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
.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.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
1.523 .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.6 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
182.800 .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 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
.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
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.6 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.6 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
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.6 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.6 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 5.568 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
HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .5129908E+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
.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
178.800 .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 5.568 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.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
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.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
.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.6 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=Cdnlnr;5=Historic
900.000 Coefficient a
5.200 Constant b (min)
.745 Exponent c
.450 Fraction to peak r
240.000 Duration δ 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.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
1.445 .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.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
.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.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
.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.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
.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

.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
17 COMBINE
1 Junction Node No.
.033 .644 .027 1.522 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.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
.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.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
.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.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
1.083 .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.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
.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

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5 is # of Hyeto/Hydrograph chosen .000 %Imp. with Zero Dpth
Volume = .4091430E+04 c.m 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
10 POND .250 Manning "n"
5 Depth - Discharge - Volume sets 74.000 SCS Curve No or C
184.800 .000 .0 Ia/S Coefficient
185.300 .0140 1142.0 8.924 Initial Abstraction
186.100 .0240 3519.0 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
186.500 .287 4978.0 .031 1.162 1.326 1.326 c.m/s
186.800 1.922 6222.0 .308 .898 .515 C perv/imperv/total
Peak Outflow = .048 c.m/s 15 ADD RUNOFF .031 1.186 1.326 1.326 c.m/s
Maximum Depth = 186.136 metres 4 CATCHMENT
Maximum Storage = 3650. c.m 45.000 ID No.6 99999
.099 1.367 .048 1.567 c.m/s 6.400 Area in hectares
35 COMMENT 3 line(s) of comment 207.000 Length (PERV) metres
***** FLOW U/S OF RICE RD CULVERT - OUTLET A1 1.000 Gradient (%)
***** 70.000 Per cent Impervious
COMBINE 207.000 Length (IMPERV)
1 Junction Node No. .000 %Imp. with Zero Dpth
.099 1.367 .048 1.583 c.m/s 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
14 START 1 l=Zero; 2=Define .250 Manning "n"
35 COMMENT 74.000 SCS Curve No or C
3 line(s) of comment .100 Ia/S Coefficient
***** PROP DEVELOPMENT SOUTH OF QUAKER RD & WEST OF RICE RD. - PON 8.924 Initial Abstraction
***** 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
4 CATCHMENT .990 1.186 1.326 1.326 c.m/s
40.000 ID No.6 99999 .308 .896 .719 C perv/imperv/total
8.210 Area in hectares 15 ADD RUNOFF .990 2.176 1.326 1.326 c.m/s
234.000 Length (PERV) metres 9 ROUTE
1.000 Gradient (%) .000 Conduit Length
25.000 Per cent Impervious .000 No Conduit defined
234.000 Length (IMPERV) .000 Zero lag
.000 %Imp. with Zero Dpth .000 Beta weighting factor
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat .000 Routing timestep
.250 Manning "n" 0 No. of sub-reaches
74.000 SCS Curve No or C .990 2.176 2.176 1.326 c.m/s
.100 Ia/S Coefficient 17 COMBINE
8.924 Initial Abstraction 2 Junction Node No.
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv .990 2.176 2.176 3.502 c.m/s
.484 .000 .048 1.583 c.m/s 14 START
.308 .902 .457 C perv/imperv/total 1 l=Zero; 2=Define
15 ADD RUNOFF .484 .484 .048 1.583 c.m/s 18 CONFLUENCE
4 CATCHMENT 2 Junction Node No.
41.000 ID No.6 99999 .990 3.502 2.176 .000 c.m/s
5.480 Area in hectares 4 CATCHMENT
191.000 Length (PERV) metres 46.000 ID No.6 99999
1.000 Gradient (%) 1.030 Area in hectares
70.000 Per cent Impervious 83.000 Length (PERV) metres
191.000 Length (IMPERV) 1.000 Gradient (%)
.000 %Imp. with Zero Dpth 60.000 Per cent Impervious
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 83.000 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
.842 .484 .048 1.583 c.m/s 8.924 Initial Abstraction
.308 .893 .718 C perv/imperv/total 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
15 ADD RUNOFF .842 1.326 .048 1.583 c.m/s .147 3.502 2.176 .000 c.m/s
9 ROUTE .308 .899 .662 C perv/imperv/total
.842 1.326 .048 1.583 c.m/s 15 ADD RUNOFF .147 3.622 2.176 .000 c.m/s
17 COMBINE 27 HYDROGRAPH DISPLAY
2 Junction Node No. 5 is # of Hyeto/Hydrograph chosen
.842 1.326 1.326 1.326 c.m/s 10 Volume = .1113844E+05 c.m
14 START 1 l=Zero; 2=Define
4 CATCHMENT 10 POND
42.000 ID No.6 99999 6 Depth - Discharge - Volume sets
.690 Area in hectares 187.000 .000 .0
68.000 Length (PERV) metres 187.800 .0410 4766.0
1.000 Gradient (%) 188.300 .0540 8282.0
35.000 Per cent Impervious 188.500 .150 9812.0
68.000 Length (IMPERV) 188.800 .257 12242.0
.000 %Imp. with Zero Dpth 189.000 .880 13993.0
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat Peak Outflow = .141 c.m/s
.250 Manning "n" Maximum Depth = 188.482 metres
74.000 SCS Curve No or C Maximum Storage = 9674. c.m
.100 Ia/S Coefficient .147 3.622 .141 .000 c.m/s
8.924 Initial Abstraction 17 COMBINE
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 2 Junction Node No.
.061 .000 1.326 1.326 c.m/s .147 3.622 .141 .141 c.m/s
.308 .898 .515 C perv/imperv/total 14 START
15 ADD RUNOFF .061 .061 1.326 1.326 c.m/s 1 l=Zero; 2=Define
4 CATCHMENT 35 COMMENT
43.000 ID No.6 99999 *****
7.160 Area in hectares EXISTING AREA ON QUAKER RD, WEST OF RICE RD
*****
218.000 Length (PERV) metres 4 CATCHMENT
1.000 Gradient (%) 2.000 ID No.6 99999
70.000 Per cent Impervious 9.020 Area in hectares
218.000 Length (IMPERV) 245.000 Length (PERV) metres
.000 %Imp. with Zero Dpth 1.000 Gradient (%)
1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 40.000 Per cent Impervious
.250 Manning "n" 245.000 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
.111 .061 1.326 1.326 c.m/s 74.000 Ia/S Coefficient
.308 .898 .721 C perv/imperv/total 8.924 Initial Abstraction
15 ADD RUNOFF .111 1.162 1.326 1.326 c.m/s .824 .000 .141 .141 c.m/s
4 CATCHMENT .308 .904 .547 C perv/imperv/total
44.000 ID No.6 99999 15 ADD RUNOFF .824 .824 .141 .141 c.m/s
.330 Area in hectares 9 ROUTE
47.000 Length (PERV) metres .000 Conduit Length
1.000 Gradient (%) .000 No Conduit defined
35.000 Per cent Impervious .000 Zero lag
47.000 Length (IMPERV) .000 Beta weighting factor
.000 %Imp. with Zero Dpth .000 Routing timestep
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 0 No. of sub-reaches
1.111 1.162 1.326 1.326 c.m/s .824 .824 .824 .141 c.m/s
17 COMBINE
2 Junction Node No.
.824 .824 .824 .860 c.m/s
14 START
1 l=Zero; 2=Define
18 CONFLUENCE

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2 Junction Node No. .000 Routing timestep
.824 .860 .824 .000 c.m/s 0 No. of sub-reaches
35 COMMENT 1.270 1.270 1.270 1.531 c.m/s
3 line(s) of comment 17 COMBINE
***** 2 Junction Node No.
EXISTING AREA ON QUAKER RD, WEST OF RICE RD 1.270 1.270 2.801 c.m/s
4 CATCHMENT 14 START
3.000 ID No.6 99999 1 1=Zero; 2=Define
5.680 Area in hectares 18 CONFLUENCE
195.000 Length (PERV) metres 2 Junction Node No.
1.000 Gradient (%) 1.270 2.801 1.270 .000 c.m/s
40.000 Per cent Impervious 35 COMMENT
195.000 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 RICE ROAD FROM QUAKER RD TO CITY OF WELLAND MUNICIPAL BOUNDA
.250 Manning "n" *****
74.000 SCS Curve No or C 4 CATCHMENT
.100 Ia/S Coefficient 501.000 ID No.6 99999
8.924 Initial Abstraction 1.570 Area in hectares
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv 102.000 Length (PERV) metres
.515 .860 .824 .000 c.m/s 1.000 Gradient (%)
.308 .894 .543 C perv/imperv/total 70.000 Per cent Impervious
15 ADD RUNOFF .000 Length (IMPERV)
.515 1.375 .824 .000 c.m/s .000 %Imp. with Zero Dpth
9 ROUTE 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
.000 Conduit Length .250 Manning "n"
.000 No Conduit defined 74.000 SCS Curve No or C
.000 Zero lag .100 Ia/S Coefficient
.000 Beta weighting factor 8.924 Initial Abstraction
.000 Routing timestep 1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv
0 No. of sub-reaches .250 2.801 1.270 .000 c.m/s
.515 1.375 1.375 .000 c.m/s 15 ADD RUNOFF .308 .901 .723 C perv/imperv/total
17 COMBINE .250 3.021 1.270 .000 c.m/s
2 Junction Node No. 9 ROUTE
.515 1.375 1.375 1.375 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
PROP DEVELOPMENT SOUTH OF QUAKER RD, EAST OF RICE RD .250 3.021 3.021 .000 c.m/s
4 CATCHMENT 35 COMMENT
50.000 ID No.6 99999 3 line(s) of comment
3.420 Area in hectares *****
151.000 Length (PERV) metres FLOW D/S OF RICE RD CULVERT - OUTLET A2
1.000 Gradient (%) *****
10.000 Per cent Impervious 17 COMBINE
151.000 Length (IMPERV) 1 Junction Node No.
.000 %Imp. with Zero Dpth .250 3.021 3.021 4.604 c.m/s
.1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat 14 START
.250 Manning "n" 1 1=Zero; 2=Define
74.000 SCS Curve No or C 35 COMMENT
.100 Ia/S Coefficient *****
8.924 Initial Abstraction PROP DEVELOPMENT SOUTH OF QUAKER RD - QUALITY CONTROL ONLY
1 Option 1=Trianglr; 2=Rectanglr; 3=SWM HYD; 4=Lin. Reserv *****
.097 .000 1.375 1.375 c.m/s 4 CATCHMENT
.308 .892 .367 C perv/imperv/total 20.100 ID No.6 99999
15 ADD RUNOFF .097 .097 1.375 1.375 c.m/s .780 Area in hectares
4 CATCHMENT 72.000 Length (PERV) metres
51.000 ID No.6 99999 1.000 Gradient (%)
1.980 Area in hectares 35.000 Per cent Impervious
115.000 Length (PERV) metres 72.000 Length (IMPERV)
1.000 Gradient (%) .000 %Imp. with Zero Dpth
10.000 Per cent Impervious 1 Option 1=SCS CN/C; 2=Horton; 3=Green-Ampt; 4=Repeat
115.000 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 .068 .000 3.021 4.604 c.m/s
8.924 Initial Abstraction .308 .897 .514 C perv/imperv/total
15 ADD RUNOFF .068 .068 3.021 4.604 c.m/s
4 CATCHMENT 4 CATCHMENT
20.000 ID No.6 99999 20.000 ID No.6 99999
3.210 Area in hectares 3.210 Area in hectares
146.000 Length (PERV) metres 146.000 Length (PERV) metres
1.000 Gradient (%) 1.000 Gradient (%)
85.000 Per cent Impervious 85.000 Per cent Impervious
146.000 Length (IMPERV) 146.000 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
.575 .068 3.021 4.604 c.m/s .575 .068 3.021 4.604 c.m/s
.308 .893 .806 C perv/imperv/total .308 .893 .806 C perv/imperv/total
15 ADD RUNOFF .575 .639 3.021 4.604 c.m/s 15 ADD RUNOFF
9 ROUTE .575 .639 3.021 4.604 c.m/s
.000 Conduit Length 9 ROUTE
.000 No Conduit defined .000 Conduit Length
.000 Zero lag .000 No Conduit defined
.000 Beta weighting factor .000 Zero lag
.000 Routing timestep .000 Beta weighting factor
0 No. of sub-reaches .000 Routing timestep
.575 .639 .639 4.604 c.m/s 0 No. of sub-reaches
17 COMBINE .575 .639 .639 4.604 c.m/s 17 COMBINE
1 Junction Node No. 1 Junction Node No.
.575 .639 .639 5.236 c.m/s .575 .639 .639 5.236 c.m/s
14 START 1 1=Zero; 2=Define 14 START
18 CONFLUENCE 18 CONFLUENCE
1 Junction Node No. 1 Junction Node No.
.575 5.236 .639 .000 c.m/s .575 5.236 .639 .000 c.m/s
35 COMMENT 35 COMMENT
3 line(s) of comment 3 line(s) of comment
***** REALIGNED CHANNEL - SEGMENT 2
EXISTING AREA WEST OF RICE RD AND SOUTH OF QUAKER ROAD *****
4 CATCHMENT 4 CATCHMENT
4.000 ID No.6 99999 200.000 ID No.6 99999
13.940 Area in hectares .970 Area in hectares
305.000 Length (PERV) metres 80.416 Length (PERV) metres
1.000 Gradient (%) 1.000 Gradient (%)
40.000 Per cent Impervious 10.000 Per cent Impervious
305.000 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
1.270 .000 .156 1.531 c.m/s 1.270 .000 .156 1.531 c.m/s
.308 .910 .549 C perv/imperv/total .308 .910 .549 C perv/imperv/total
15 ADD RUNOFF 1.270 1.270 .156 1.531 c.m/s 15 ADD RUNOFF
9 ROUTE 1.270 1.270 .156 1.531 c.m/s 9 ROUTE
.000 Conduit Length .000 Conduit Length
.000 No Conduit defined .000 No Conduit defined
.000 Zero lag .000 Zero lag
.000 Beta weighting factor .000 Beta weighting factor

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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.6 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.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
.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.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
1.776 .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.6 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
182.800 .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 = .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.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
.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.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
.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 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
.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
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.6 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.6 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
17 COMBINE
1 Junction Node No.
.020 6.524 6.524 6.524 c.m/s
14 START
1 l=Zero; 2=Define
35 COMMENT
3 line(s) of comment
*****
PROP DEVELOPMENT NORTH OF SEGMENT 3 - POND P30
*****
4 CATCHMENT
30.000 ID No.6 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.6 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
1.743 .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.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
.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
178.800 .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 = .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 l=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
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.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
.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 l=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.6 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=Cdnlnr;5=Historic
1020.000 Coefficient a
4.700 Constant b (min)
.731 Exponent c
.450 Fraction to peak r
240.000 Duration δ 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.δ 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.δ 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.δ 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.δ 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.δ 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.δ 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.δ 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.δ 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
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 1.890 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
.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.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
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.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
.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.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
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.6 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 .000 c.m/s
0 No. of sub-reaches
35 COMMENT 1.566 1.566 1.566 1.907 c.m/s
3 line(s) of comment 17 COMBINE
*****
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 1.056 1.013 .000 c.m/s
.367 .903 .582 C perv/imperv/total
15 ADD RUNOFF .632 1.688 1.013 .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 1.688 1.688 .000 c.m/s
17 COMBINE
2 Junction Node No.
.632 1.688 1.688 1.688 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 1.688 1.688 c.m/s
.367 .912 .422 C perv/imperv/total
15 ADD RUNOFF .148 .148 1.688 1.688 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 1.688 1.688 c.m/s
.368 .916 .422 C perv/imperv/total
15 ADD RUNOFF .092 .240 1.688 1.688 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 1.688 c.m/s
17 COMBINE
2 Junction Node No.
.092 .240 .240 1.907 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 1.907 c.m/s
.367 .923 .590 C perv/imperv/total
15 ADD RUNOFF 1.566 1.566 .240 1.907 c.m/s
9 ROUTE
.000 Conduit Length
.000 No Conduit defined
.000 Zero lag
.000 Beta weighting factor

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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.6 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 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.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
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.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
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.6 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
.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
182.800 .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 = .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.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
.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.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
.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
.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
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.6 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.6 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
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.6 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.6 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 8.039 8.039 c.m/s
.367 .917 .779 C perv/imperv/total
15 ADD RUNOFF

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2.113 2.151 8.039 8.039 c.m/s
HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .8226000E+04 c.m
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
.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
HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .8577177E+04 c.m
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 = .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.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
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
HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .7430276E+04 c.m
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
.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
HYDROGRAPH DISPLAY
5 is # of Hyeto/Hydrograph chosen
Volume = .7766209E+04 c.m
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.6 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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