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Municipal Class Environmental Assessment Phase 3 and 4 – Glancaster Road

Drainage and Stormwater Management Report

City of Hamilton

60637047

January 2022

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Quality Information

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Revision History

Rev #	Revision Date	Revised By:	Revision Description
1	2021-12-17	Jian Gao	To address comments from City on November 24, 2021

Distribution List

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Appendix B. Culvert Master Output for Hydraulic Analysis

1. Introduction

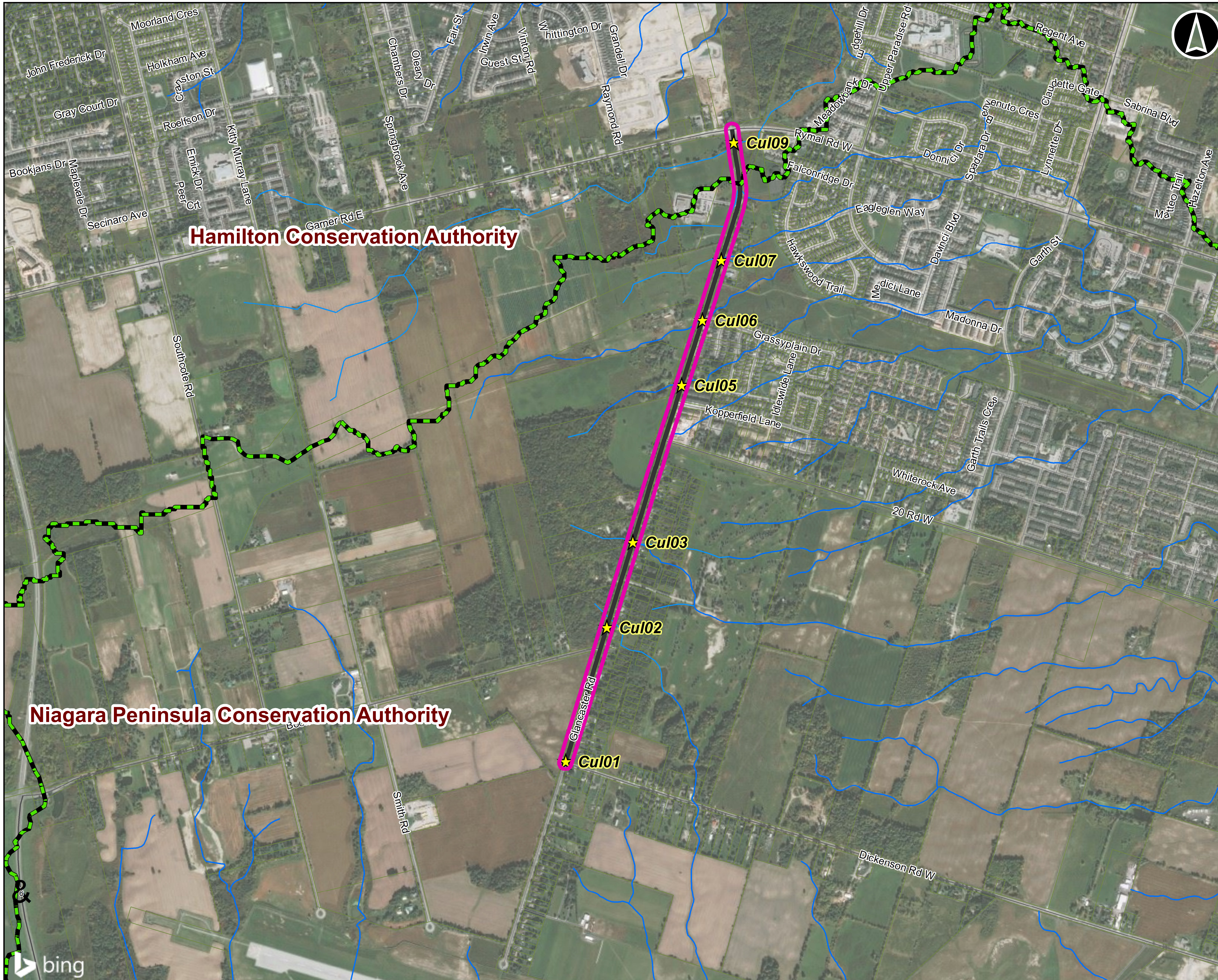
AECOM Canada Ltd. has been retained by the City of Hamilton (City) to complete a Municipal Class Environmental Assessment Phase 3 and 4 for Glancaster Road between Garner Road East to Dickenson Road West (Study Area, shown in **Figure 1**). Glancaster Road is located within the Hamilton Airport Employment Growth District (AEGD) and classified as a North-South Arterial Roadway with a proposed widening from two to four lanes.

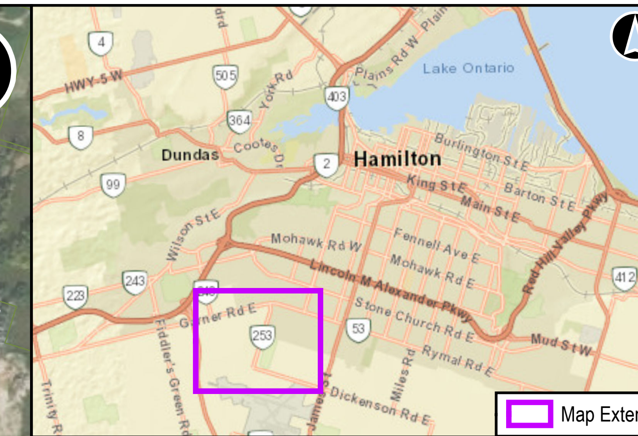
The purpose of the following Drainage and Stormwater Management (SWM) Report is to illustrate the existing drainage conditions and provide a hydrologic and hydraulic assessment of the existing crossings and roadside ditch within the Study Area. The report includes the following:

- Identify the existing creek crossing structures, tributary features within the Right-of-way (ROW)/zone of influence, develop drainage boundary for each tributary, and determine and identify the existing condition flood line upstream and downstream of the road culvert location;
- Assess all existing culverts to confirm the current level of service for multiple storm events and determine the road overtopping flooding depth at all creek crossing structures' locations.
- Identify deficiencies constraints and opportunities for additional stormwater management measures.

The proposed roadway layout and proposed stormwater function design will be discussed in the next submission of the project, once final design has been confirmed. The following will be included in the next submission of the report:

- Capacity assessment for the proposed roadside ditches to determine the maximum length of road that can handle the road drainages.
- Design of all creek crossing structures, including downstream impact assessment for any new /upsized culverts.
- Design to convey both minor and major storm events along the roadway, in accordance with AEGD sub-watershed study recommendations.
- Based on the increase in pavement from the proposed road right-of-way, propose stormwater control measures in accordance with the applicable environmental targets, policies, acts, standards from all applicable agencies including City of Hamilton, Hamilton Conservation (HCA), Niagara Peninsula Conservation Authority: NPCA (NPCA), Ministry of Transportation (MTO), Ministry of Natural Resources and Forestry (MNRF) , Fisheries and Oceans Canada (DFO), and Ministry of the Environment, Conservation and Parks (MECP).
- Evaluation of stormwater management practices for the management of roadway runoff to address water quality and water quantity issues, consistent with AEGD Subwatershed Study's objectives and requirements.
- Evaluation of different Low-Impact Development (LID) techniques and various best management practices (BMPs), utilizing available groundwater information, to develop a functional 'treatment train' design to address water quality, water deficit, and erosion control.
- A design of off-site/on-site outlet to the adjacent creek to meet the flood control targets.





Legend

- Glancaster Culvert Crossings
- Glancaster Road Study Section
- Glancaster Road Study Area
- Conservation Authority Boundary
- Watercourses

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Glancaster Road, Municipal Class Environmental Assessment Phases 3 and 4

Drainage and Stormwater Management Report

0 50 100 200 300 400 500 600 700
Meters
DATUM: NAD 1983 UTM Zone 17N

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Figure 1 Study Area

2. Existing Conditions

2.1 Water Crossing Structures and Existing Drainage

The Study Area is located within the Tiffany Creek watershed in the jurisdiction of Hamilton Conservation Authority (HCA) and Twenty Mile Creek watershed in the jurisdiction of Niagara Peninsula Conservation Authority (NPCA). There are seven (7) active stream crossings (culverts) identified within the Study Area, based on 2021 survey data collected by J. D. Barnes (shown in **Figure 2**). Watercourse 09 (WC09) is a 1500mm CSP culvert outlet to Tiffany Creek located within HCA regulated area, with the remaining six (6) crossings consisting of culverts for tributaries of Twenty Mills Creek located within NPCA regulated area but not located within floodplain extent. There are also existing roadside swales flowing along the west side of Glancaster Road. Characteristics for each existing culvert are presented in **Table 1**. Below is a summary of each culvert:

- **Culvert 09** is a 1500mm CSP culvert, located about 50m south of intersection of Glancaster Road and Garner Road East crossing a tributary of Tiffany Creek crossing.
- **Culvert 07** is a 800mm CSP culvert crossing Glancaster Road and outlet to roadside ditch east of Glancaster Road.
- **Culvert 06** is a 1000mm Steel culvert crossing Glancaster Road and outlet to a 900mm storm sewer east of Glancaster Road that cross Grassyplain Drive to north.
- **Culvert 05** is a 650mm Concrete culvert crossing Glancaster Road and outlet to a 675mm storm sewer east of Glancaster Road within a townhouse block.
- **Culvert 03** is a 900mm CSP culvert crossing Glancaster Road and outlet to roadside ditch east of Glancaster Road then to another 900mm CSP culvert which outlets to the back of the private property.
- **Culvert 02** is a 900mm CSP culvert crossing Glancaster Road and outlet to roadside ditch east of Glancaster Road then to another 900mm CSP culvert which outlets to the back of the private property.
- **Culvert 01** is a 800mm CSP culvert crossing Glancaster Road located at north of intersection of Glancaster Road and Dickenson Road west and outlet to roadside ditch east of Glancaster Road.

Catchment areas to each active culvert were confirmed based on the 2021 survey data, existing hydrological model obtained for the AEGD Stormwater Master Plan, and Hamilton 1m DTM contour for external drainage. Catchment boundaries are shown in **Figure 2** and detail of each crossing are shown in **Figure 2-1** to **Figure 2-4**.

Table 1: Characteristics of Existing Water Crossings [1]

Water Crossing	Size mm	Length m	Material	Invert (m) [2]		Top of Road m	Note
				Upstream	Downstream		
Cul09	1500	20.1	CSP	229.641	229.642	232.373	Water crossing of tributary of Tiffany Creek
Cul07	800	18.5	CSP	235.120	234.734	236.500	Outlets to roadside ditch east of Glancaster Rd,
Cul06	1000	16.3	Steel	234.149	233.986 [3]	236.000	Outlets to 900mm Storm Sewer
Cul05	650	24.8	Concrete	236.363	236.083	238.643	Outlets to 675mm Storm Sewer
Cul03	900	16.9	CSP	240.349	240.296	242.106	Outlets to roadside ditch east of Glancaster Rd, then to another 900mm culvert to east
Cul02	900	12.7	CSP	240.243	240.257	241.657	Outlets to roadside ditch east of Glancaster Rd, then to another 900mm culvert to east
Cul01	800	18.5	CSP	238.795	238.727	240.211	Outlets to roadside ditch, north of Dickenson Rd

Note: 1. Culverts information obtained from 2021 survey data by J. D. Barnes;
2. Inverts were taken from elevations of inlet and outlet feature of culverts minus culvert depth;
3. Culvert WS4 connect to storm sewer, no survey information for culvert outlet. Slope of 1% was assumed to estimate downstream invert.

Water Crossing [1]	Size mm	Length m	Material	Invert (m) [2]		Top of Road m
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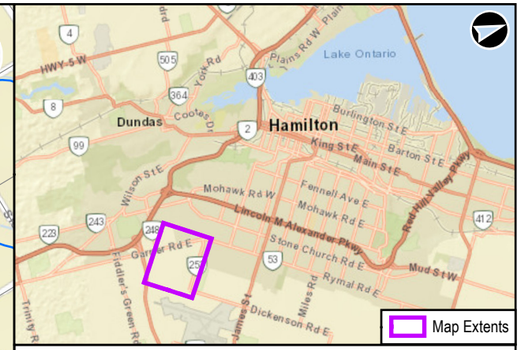

Legend

- Glancaster Culvert Crossings
- Storm MH
- Storm Sewer
- Existing Drainage - External Catchment
- Existing Road Drainage
- Conservation Authority Boundary

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Glancaster Road, Municipal Class Environmental Assessment Phases 3 and 4

Drainage and Stormwater Management Report

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Meters
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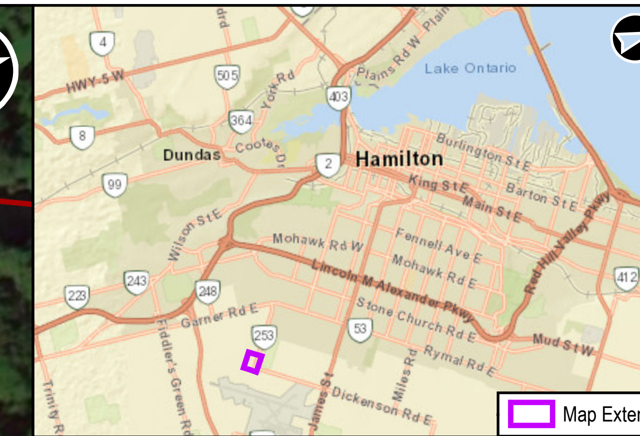
Figure 2 Culvert Crossing and Existing Drainage



Legend

- Glancaster Culvert Crossings
- DTM 1m Contours
- Storm MH
- Storm Sewer
- Existing Drainage - External Catchment
- Existing Road Drainage
- Conservation Authority Boundary

Survey Data

- Roadside Ditch
- Road Culvert
- Ditch Culvert

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Glancaster Road, Municipal Class Environmental Assessment Phases 3 and 4

Drainage and Stormwater Management Report

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Meters
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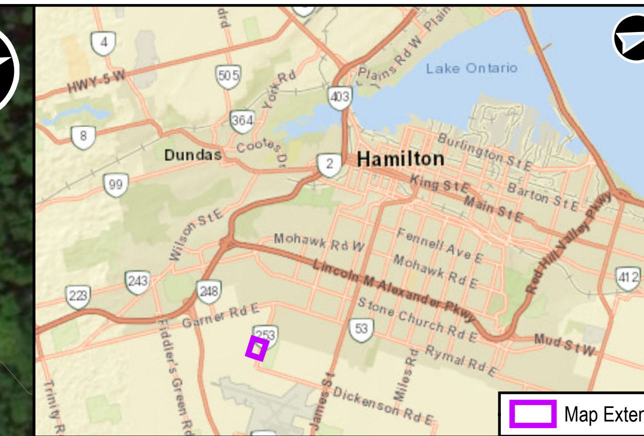
Figure 2-1 Culvert 01



Legend

- Glancaster Culvert Crossings
- Storm MH
- Storm Sewer
- DTM 1m Contour
- Existing Drainage - External Catchment
- Existing Road Drainage
- Conservation Authority Boundary

Survey Data

- Roadside Ditch
- Road Culvert
- Ditch Culvert

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Glancaster Road, Municipal Class Environmental Assessment Phases 3 and 4 Drainage and Stormwater Management Report

Culvert Crossing and Existing Drainage

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Meters
DATUM: NAD 1983 UTM Zone 17N

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Figure 2-2
Culvert 02 and 03

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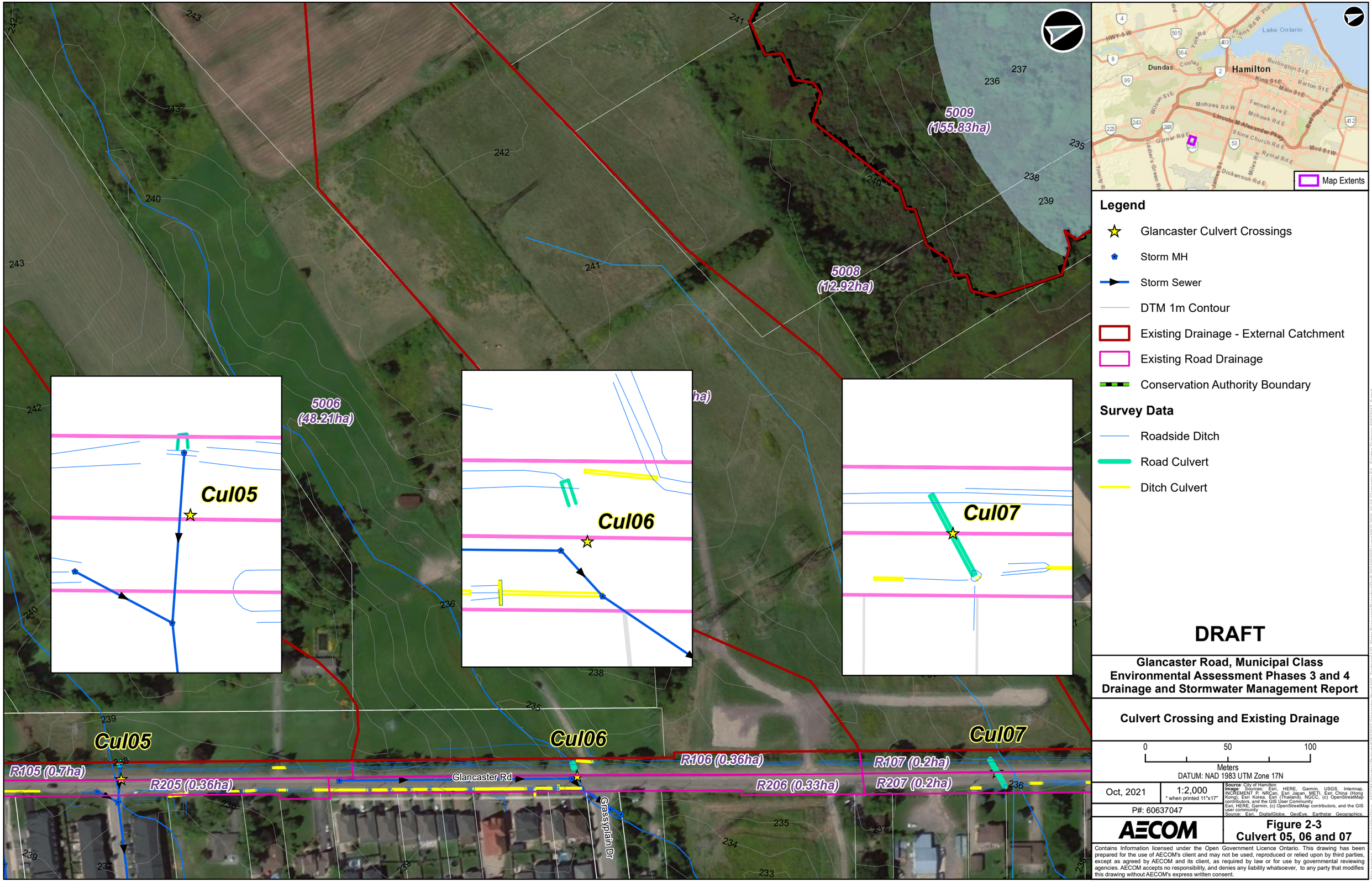

Legend

- Glancaster Culvert Crossings
- Storm MH
- Storm Sewer
- DTM 1m Contour
- Existing Drainage - External Catchment
- Existing Road Drainage
- Conservation Authority Boundary

Survey Data

- Roadside Ditch
- Road Culvert
- Ditch Culvert

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Glancaster Road, Municipal Class Environmental Assessment Phases 3 and 4
Drainage and Stormwater Management Report

Culvert Crossing and Existing Drainage

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Meters
DATUM: NAD 1983 UTM Zone 17N

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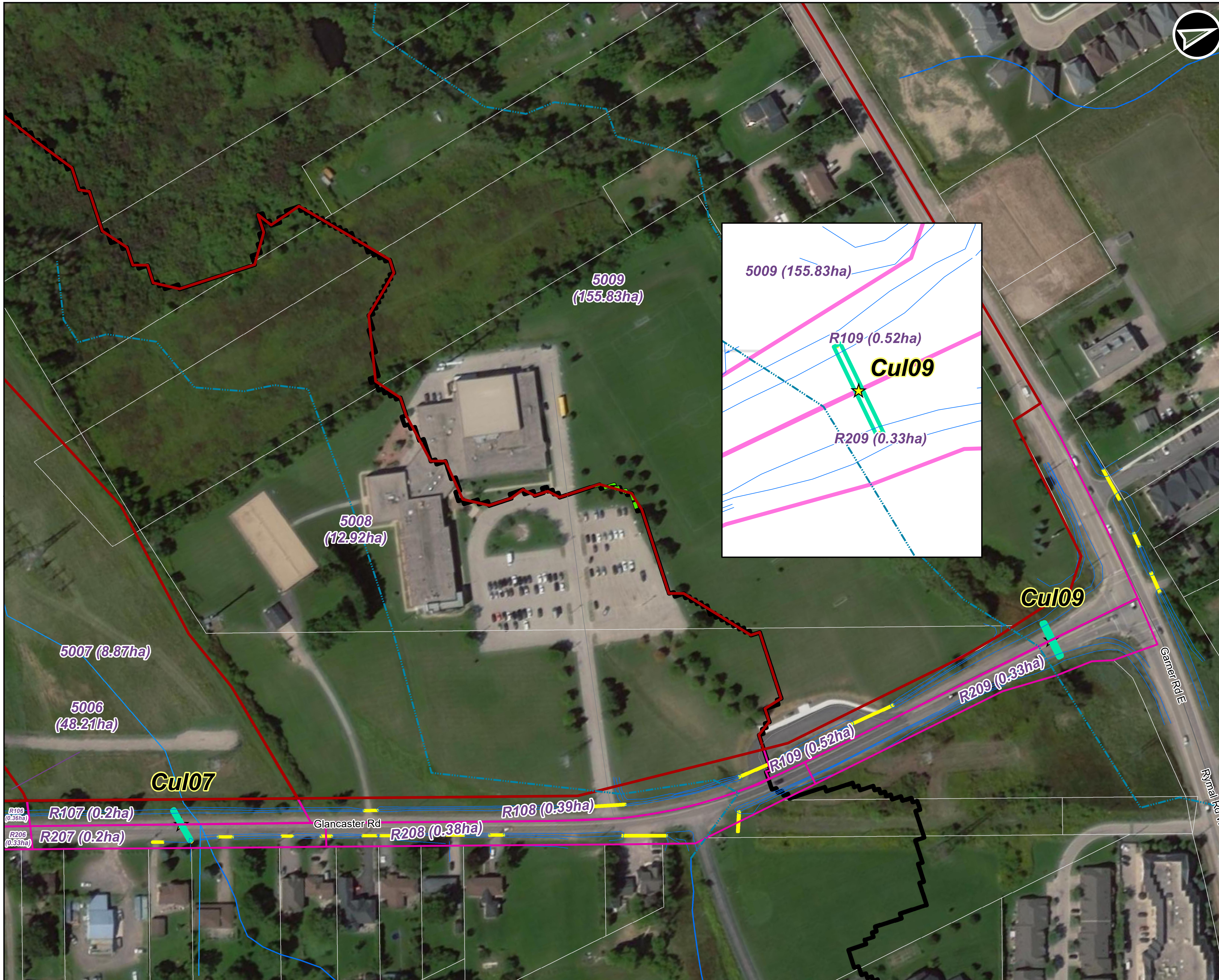
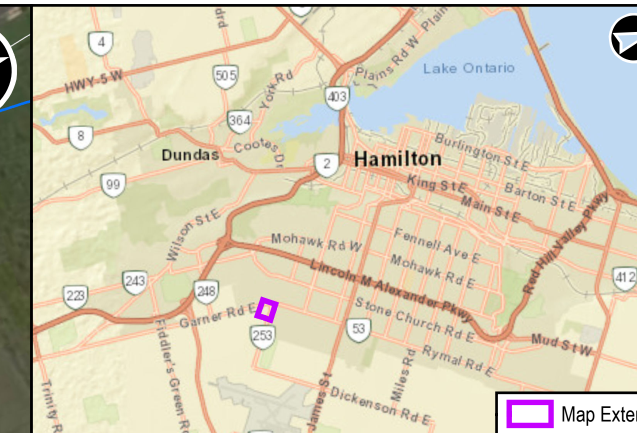
Figure 2-3
Culvert 05, 06 and 07





Legend

- Watercourse (AEGD)
- Glancaster Culvert Crossings
- Storm MH
- Storm Sewer
- Existing Drainage - External Catchment
- Existing Road Drainage
- Conservation Authority Boundary

Survey Data

- Roadside Ditch
- Road Culvert
- Ditch Culvert

Glancaster Road, Municipal Class Environmental Assessment Phases 3 and 4 Drainage and Stormwater Management Report

Culvert Crossing and Existing Drainage

0 50 100
Meters
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Figure 2-4 Culvert 09

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2.2 Hydrologic Assessment

2.2.1 Catchment Delineation

The existing condition hydrologic model (SWMHYMO 4.02) from the AEGD Stormwater Master Plan was obtained from City in October 2020. Catchment information for Catchments S-8, T-25, T-27 and T-32 were exported and used as input into a separate Visual OTTHYMO (VO6, parameters are provided in **Table 2**). These catchments were further delineated for each culvert, based on the 2021 survey data and Hamilton 1m DTM contour. The *NASHYD* routine was used for external drainage of each culvert, with the *STANDHYD* routine used for the road drainage to each culvert, to determine the discharge rate to the inlet of each culvert. Modified SCS Curve Method was used for infiltration for Road Catchments (R101 to R109), CN and IA of each road catchment are provided in **Table 2**. Overland flow length of 10 m for pervious area was used and flow length for impervious area was calculated using VO6 method assuming Area = 1.5 $(LGI)^2$.

Please note, WC08 in Glancaster Headwater Drainage Feature Assessment (AECOM, 2021) was described as a lawn lined swale that flows into a roadside ditch and then crosses Glancaster Road through a corrugated steel pipe. The downstream discharge point of this feature was not investigated (access was unavailable). According to the survey data provided by J. D. Barnes, while there was no road culvert identified, ditch culverts were surveyed. Therefore, it is assumed that WC08 (external catchment 5008) discharges into the roadside ditch west of Glancaster Road then following via roadside ditch to Culvert 09. As such, flows from Catchment 5008 and R108 were included in peak flows to Culvert 09.

Table 2: Catchment Parameters - Existing Condition

Catchment ID	Type	Outlet	Area (ha)	CN	IA	TP (hr)
5009	NasHyd	Inlet of Cul09	155.83	77	7.6	2.5
5008 *	NasHyd		12.92	80	6.4	1.7
5007	NasHyd	Inlet of Cul07	8.87	80	6.4	1.7
5006	NasHyd	Inlet of Cul06	48.21	80	6.4	1.7
5005	NasHyd	Inlet of Cul05	22.48	80	6.4	1.7
5003	NasHyd	Inlet of Cul03	17.51	84	4.8	1.3
5002	NasHyd	Inlet of Cul02	22.38	84	4.8	1.3
5001	NasHyd	Inlet of Cul01	10.35	82	5.6	2.3
Catchment ID	**Type**	**Outlet**	**Area (ha)**	**CN**	**IA**	**% impervious**
R109	StandHyd	Inlet of Cul09	0.517	77	7.6	40
R108 *	StandHyd		0.388	80	6.4	45

Catchment ID	Type	Outlet	Area (ha)	CN	IA	TP (hr)
R107	StandHyd	Inlet of Cul07	0.201	80	6.4	45
R106	StandHyd	Inlet of Cul06	0.355	80	6.4	45
R105	StandHyd	Inlet of Cul05	0.696	80	6.4	45
R103	StandHyd	Inlet of Cul03	0.222	84	4.8	45
R102	StandHyd	Inlet of Cul02	0.346	84	4.8	40
R101	StandHyd	Inlet of Cul01	0.740	82	5.6	40
Note: *. No road culvert was identified based on the survey data. Flow from catchment 5008 and R108 discharge to Culvert 09 via roadside ditch west of Glancaster Road						

2.2.2 Design Storm

The design storms included in the AEGD Stormwater Master Plan are Mount Hope 24-hour SCS distribution for 2-year to 100-year design storm events. For conservative assessment purpose, Mount Hope Chicago 6-hours 100-year storm event was also applied. Peak intensity and rainfall depth for the SCS 24-hour storm events and Chicago 6-hour storm events are provided in **Table 3.** Chicago 6-hour storm has high peak intensity, but less total rainfall volume compared to SCS 24-hour storm.

Table 3: Design Storm – Mount Hope

	2-year	5-year	25-year	50-year	100-year
	Mount Hope SCS 24-hour Storm				
Peak Intensity (mm/hr)	58.6	79.3	110.2	123.0	135.7
24-hour Total Rainfall (mm)	53.1	71.8	99.8	111.4	122.9
	Mount Hope Chicago 6--hour Storm				
Peak Intensity (mm/hr)	74.0	103.0	122.29	146.1	164.5
6-hour Total Rainfall (mm)	38.5	54.8	65.6	79.4	88.7

2.2.3 Modeling Results

The new hydrologic model (VO6) was analyzed for the 2-year to 100-year events with SCS 24-hour distribution and Chicago 6-hour event. Peak flow rates to each culvert are provided in **Table 4**. Compare peak flow rates of SCS 24-hour 100-year and Chicago 6-hour 100-year storm events to each culvert shown in **Table 4**, peak flow rates of SCS 24-hour 100-year are greater than peak flow rates of Chicago 6-hour event except Culvert 3 and 2 which are 0.023 m^3/s

(2.3%) and 0.03 m^3/s (2.4%) smaller. Therefore, for conservative assessment purpose, results of SCS 24-hour storm events will be used for hydraulic analysis.

A copy of SWMHYMO modeling output, a model schematic and rating curve for the culverts are included in **Appendix A**.

Table 4: Simulated Peak Flow Rate – Existing Conditions (m^3/s)

Water Crossing ID	Total Drainage Area (ha)	SCS 24-hour					Chicago6-hour
		2-year	5-year	25-year	50-year	100-year	100-year
Cul09	169.65	1.122	1.981	3.463	4.121	4.793	4.644
Cul07	9.07	0.092	0.158	0.268	0.317	0.366	0.363
Cul06	48.57	0.494	0.848	1.447	1.709	1.975	1.967
Cul05	23.17	0.235	0.402	0.684	0.807	0.932	0.923
Cul03	17.73	0.278	0.455	0.743	0.867	0.991	1.014
Cul02	22.73	0.355	0.582	0.950	1.108	1.267	1.297
Cul01	14.72	0.096	0.161	0.270	0.317	0.364	0.357

2.3 Culvert Capacity Assessment

2.3.1 Existing Condition Culvert Criteria

Glancaster Road is classified as a minor Arterial Roadway. Based on Ministry of Transportation (MTO) Highway Drainage Standards, the following criteria applies for the design of the roadway culverts (major system):

Culvert Crossings at a Watercourse:

- The design flow for culverts crossings at a watercourse and located on a main throughway (i.e. freeway, arterial, or collector highways) is the 25-year storm event. The check flow is defined as 115% of the 100-year flow.
- The minimum freeboard to the top of the highway subgrade during the design flow is 1.0 m. There is no freeboard stipulation for major flow, but the highway should not be overtopped.
- Ratio of flood depth at the upstream face of culvert to the diameter or rise of culvert HW/D smaller than 1.5.

Roadside Ditch:

- Roadside ditches shall be designed to convey 10-year flow for minor system and 100-year flow for major system.
- The maximum depth of flow associated with the minor system design flow should be less than 1.0 m.
- The maximum velocity should be less than 1.5 m/s in grass-lined channels.

Based on the City's Standards (Hamilton Comprehensive Development Guidelines and Financial Policies Manual, 2019), new roadway culverts and bridges should have sufficient conveyance to pass the Regulatory flow (larger of Hurricane Hazel or 100-year event), in order to avoid adverse backwater effects (ref. MTO Directive B-100). Freeboard and clearance requirements should be based on current MTO criteria.

2.3.2 Hydraulic Analysis

CulvertMaster was used for hydraulic assessment of culverts in this report based on hydrology results in Section 2.2. Headwater elevations at upstream of each water crossing were obtained from CulvertMaster for both the 25-year and 100-year storm events. A summary of hydraulic assessment results is presented in **Table 5**, and CulvertMaster calculation outputs for hydraulic analysis results are presented in **Appendix B**.

Table 5: Culvert Hydraulic Analysis Results – Existing Conditions

Water Crossing ID	Top of Road (m)	Peak Flow (m^3/s)		Headwater (m)		HW/D Ratio	Freeboard (m)		MTO Criteria Meet?
		25-year	100-year	25-year	100-year	25-year	25-year	100-year	
Cul09	232.373	3.463	4.793	231.38	231.92	1.16	0.99	0.45	No
Cul07	236.500	0.268	0.366	235.65	235.75	0.66	0.85	0.75	No
Cul06	236.000	1.447	1.975	235.44	235.83	1.29	0.56	0.17	No
Cul05	238.643	0.684	0.932	237.35	237.82	1.52	1.29	0.82	No
Cul03	242.106	0.743	0.991	241.23	241.42	0.98	0.88	0.69	No
Cul02	241.657	0.950	1.267	241.30	241.59	1.17	0.36	0.07	No
Cul01	240.211	0.270	0.364	239.31	239.41	0.64	0.90	0.80	No

Based on results shown in **Table 5**, all culverts can pass through the 100-year storm event without road overtopping. However, none of the culverts satisfy the MTO criteria (HW/D ratio smaller than 1.5 with minimum freeboard of 1m). Below is a summary of the current level of service for each culvert:

- **Culvert 09** - HW/D ratio (1.16) of 25-year storm meets MTO criteria, freeboard (0.99m) does not satisfy the MTO criteria, 100-year storm event do not overtop the road.
- **Culvert 07** - HW/D ratio (0.66) of 25-year storm meets MTO criteria, freeboard (0.85m) smaller than 1m do not satisfy MTO criteria, 100-year storm event do not overtop the road.
- **Culvert 06** - HW/D ratio (1.29) of 25-year storm meets MTO criteria, freeboard (0.56m) of 25-year storm do not satisfy MTO criteria, 100-year storm event do not overtop the road.
- **Culvert 05** - HW/D ratio (1.52) of 25-year storm does not meets MTO criteria, freeboard (1.29m) of 25-year storm satisfy MTO criteria, 100-year storm event do not overtop the road.

- **Culvert 03** - HW/D ratio (0.98) of 25-year storm meets MTO criteria, freeboard (0.88m) smaller than 1m do not satisfy MTO criteria, 100-year storm event do not overtop the road.
- **Culvert 02** - HW/D ratio (1.17) of 25-year storm meets MTO criteria, freeboard (0.36m) smaller than 1m do not satisfy MTO criteria, 100-year storm event do not overtop the road.
- **Culvert 01** - HW/D ratio (0.64) of 25-year storm meets MTO criteria, freeboard (0.9m) smaller than 1m do not satisfy MTO criteria, 100-year storm event do not overtop the road.

2.4 Roadside Ditch Assessment

A hydraulic analysis for a general ditch segment west of Glancaster Road was conducted. A general ditch cross section (representing roadside ditch from WC08 to Culvert 09 as described in section 2.2.1) was used (provided in **Figure 3**), with a bottom width of 1m, side slope of 4:1 and maximum depth of 0.75m.

Hydraulic analysis results are presented in **Table 6,** assuming a ditch slope of 1% and Manning's roughness of 0.03. The discharge used were assumed to be the flow rates for the 10-year and 100-year storms (0.311 m^3/s and 0.535 m^3/s respectively) for Catchments 5008 and R108. Hydraulic results show that the ditch is capable of conveying the 100-year storm with maximum depth of 0.735m and maximum velocity of 0.18 m/s. The existing ditches meet the MTO design criteria.

Figure 3: Ditch Cross Section

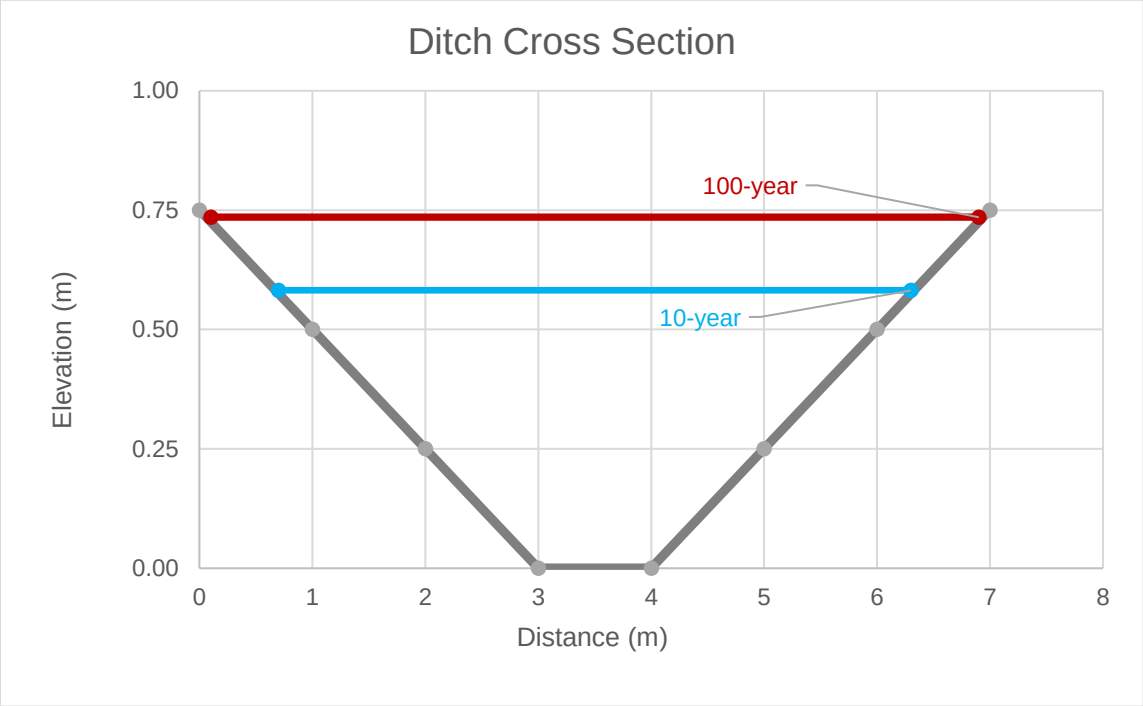

Table 6: Ditch Hydraulic Analysis Results – Existing Conditions

Depth	Cross-sectional Area	Velocity	Peak Flow	Note
m	m^2	m/s	m^3/s	
0.250	0.50	0.10	0.050	
0.375	0.94	0.12	0.117	
0.500	1.50	0.15	0.220	
0.582	1.94	0.16	0.311	10-year
0.625	2.19	0.17	0.366	
0.650	2.34	0.17	0.400	
0.675	2.50	0.17	0.437	
0.700	2.66	0.18	0.476	
0.725	2.83	0.18	0.516	
0.735	2.90	0.18	0.533	100-year
0.750	3.00	0.19	0.559	
Note: calculation based on ditch bottom = 1m, side slope = 4:1, ditch slope =1% and n = 0.03				

3. Stormwater Management Alternative Assessment

Under existing road and drainage condition, the roadside ditches are recognized as providing a certain level of stormwater quality treatment. Due to the increase in pavement for the future proposed Glancaster Road alternatives, additional stormwater management will be needed to meet current regulatory standards.

3.1 Stormwater Management Opportunities

Based on the increase in pavement for the future proposed Glancaster Road alternatives, additional stormwater controls will be required, in accordance with the applicable environmental targets, policies, acts, standards from all applicable agencies including City of Hamilton, HCA, NPCA, MTO, MNRF, DFO, and MECP.

SWM practices for the management of roadway runoff falls into two categories: water quality management and water quantity management. Details are described as below.

3.1.1 Water Quantity Management

Water quantity management include water crossing capacity analysis and conveyance roadway runoff control along the roadway corridor for minor and major storm events. It also includes strategies to addressing downstream flood and erosion potential resulting from the expansion of the roadway. Water quantity control criteria is defined in the Hamilton Airport Employment District (HAED) – Phase 2 Subwatershed Study, which includes controlling the post-condition peak flows to pre-development rates for design storms with return periods up to 100 years.

For watercourse crossings of roadway corridors, opportunities include:

- Control or reducing upstream flows to the capacity of existing crossings.
- Increase the capacity of the existing crossings to meet the design criteria.

3.1.2 Water Quality Management

Water quality management includes treatment of runoff from new pavement, and where possible, the treatment of existing pavement. Water quality treatment requirements are defined in the HAED – Phase 2 Subwatershed Study, which required Enhanced or Level 1 stormwater treatment from a water quality/fish habitat perspective for all tributaries.

Following stormwater management practices are generally used to treat contaminated stormwater runoff from roadway surfaces:

- Dry/Wet detention ponds
- Enhanced grass swales/Dry swales
- Soakaway pits
- Oil and grit separators
- Bioretention

- Filter Strips
- Permeable pavement etc.

The respective characteristics, advantages and disadvantages of the foregoing will be discussed in the next submission of the report when the proposed roadway alternatives are confirmed.

3.1.3 Low Impact Development (LID) Assessment

Opportunities to implement Low Impact Development (LID) features to achieve water quality and water quantity requirement through a “treatment train” approach will be evaluated. LID techniques involve physical measures that encourage the infiltration of water into ground and reduce stormwater runoff. Detailed LID will be evaluated when the geotechnical investigation for this project is finalized.

4. Conclusions

The current stormwater management assessment task is mainly focused on the existing condition drainage analysis. Following tasks were completed and documented in this report.

- Identification of existing crossing
- Hydrologic and hydraulic modelling to facilitate the capacity analysis
- Verify and confirm current level of service of existing culverts and road-side ditches.
- Identify deficiencies constraints and opportunities for additional stormwater management.

Stormwater functional design will be provided in the next submission when the future proposed roadway alternatives are confirmed. The proposed road ROW will likely increase the impervious of road drainage which will increase the peak flow to each culvert and roadside ditch. Stormwater management will be required to satisfy water quantity, quality, water balance requirement.

Low-Impact Development (LID) techniques and various best management practices (BMPs) will be evaluated utilizing available groundwater and geotechnical information. A functional 'treatment train' design will be proposed in the next submission with proposed stormwater function design to address quality and erosion control through different infiltration LID measures. Offsite flood control system (if any) will be designed in accordance with AEGD subwatershed study recommendations.

AECOM

Appendix A

Hydrologic Modeling Output

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

       V    V   I    SSSSS  U   U    A    L             (v 6.2.2001)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat

  Output  filename:
C:\Users\yiy\AppData\Local\Civica\VH5\3345d426-6639-42ad-84ec-6edb8902cdcc\4ba8400d-
3cf5-4062-ab29-575fa562dfd9\scenario
  Summary filename:
C:\Users\yiy\AppData\Local\Civica\VH5\3345d426-6639-42ad-84ec-6edb8902cdcc\4ba8400d-
3cf5-4062-ab29-575fa562dfd9\scenario


DATE: 12/14/2021                          TIME: 10:29:56

USER:



COMMENTS: _____________________________________________________________


--------------------------------------------------------------------------------
----------------------
  ********************************************
  ** SIMULATION : Run 05                     **
  ********************************************


--------------------
|    READ STORM    |    Filename: C:\Users\yiy\AppData\
|                  |              Local\Temp\
|                  |              0fe36290-2f37-4f2e-bdf5-8b97a4aa8f4d\31ea2a1c
```

| Ptotal=122.89 mm | Comments: SCS_100

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.17	1.35	6.17	2.46	12.17	17.70	18.17	2.21
0.33	1.35	6.33	2.46	12.33	17.70	18.33	2.21
0.50	1.35	6.50	2.46	12.50	17.70	18.50	2.21
0.67	1.35	6.67	2.46	12.67	9.09	18.67	2.21
0.83	1.35	6.83	2.46	12.83	9.09	18.83	2.21
1.00	1.35	7.00	2.46	13.00	9.09	19.00	2.21
1.17	1.35	7.17	2.46	13.17	1.72	19.17	2.21
1.33	1.35	7.33	2.46	13.33	1.72	19.33	2.21
1.50	1.35	7.50	2.46	13.50	1.72	19.50	2.21
1.67	1.35	7.67	2.46	13.67	10.08	19.67	2.21
1.83	1.35	7.83	2.46	13.83	10.08	19.83	2.21
2.00	1.35	8.00	2.46	14.00	10.08	20.00	2.21
2.17	1.60	8.17	3.32	14.17	3.69	20.17	1.47
2.33	1.60	8.33	3.32	14.33	3.69	20.33	1.47
2.50	1.60	8.50	3.32	14.50	3.69	20.50	1.47
2.67	1.60	8.67	3.32	14.67	3.69	20.67	1.47
2.83	1.60	8.83	3.32	14.83	3.69	20.83	1.47
3.00	1.60	9.00	3.32	15.00	3.69	21.00	1.47
3.17	1.60	9.17	3.93	15.17	3.69	21.17	1.47
3.33	1.60	9.33	3.93	15.33	3.69	21.33	1.47
3.50	1.60	9.50	3.93	15.50	3.69	21.50	1.47
3.67	1.60	9.67	4.42	15.67	3.69	21.67	1.47
3.83	1.60	9.83	4.42	15.83	3.69	21.83	1.47
4.00	1.60	10.00	4.42	16.00	3.69	22.00	1.47
4.17	1.97	10.17	5.65	16.17	2.21	22.17	1.47
4.33	1.97	10.33	5.65	16.33	2.21	22.33	1.47
4.50	1.97	10.50	5.65	16.50	2.21	22.50	1.47
4.67	1.97	10.67	7.62	16.67	2.21	22.67	1.47
4.83	1.97	10.83	7.62	16.83	2.21	22.83	1.47
5.00	1.97	11.00	7.62	17.00	2.21	23.00	1.47
5.17	1.97	11.17	11.80	17.17	2.21	23.17	1.47
5.33	1.97	11.33	11.80	17.33	2.21	23.33	1.47
5.50	1.97	11.50	11.80	17.50	2.21	23.50	1.47
5.67	1.97	11.67	51.13	17.67	2.21	23.67	1.47
5.83	1.97	11.83	93.40	17.83	2.21	23.83	1.47
6.00	1.97	12.00	135.68	18.00	2.21	24.00	1.47

CALIB					
NASHYD (5008)	Area (ha)=	12.91	Curve Number (CN)=	80.0
ID= 1 DT= 5.0 min	Ia (mm)=	6.40	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	1.70		

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.35	6.083	2.46	12.083	17.71	18.08	2.21
0.167	1.35	6.167	2.46	12.167	17.70	18.17	2.21
0.250	1.35	6.250	2.46	12.250	17.70	18.25	2.21
0.333	1.35	6.333	2.46	12.333	17.70	18.33	2.21
0.417	1.35	6.417	2.46	12.417	17.70	18.42	2.21
0.500	1.35	6.500	2.46	12.500	17.70	18.50	2.21
0.583	1.35	6.583	2.46	12.583	9.09	18.58	2.21
0.667	1.35	6.667	2.46	12.667	9.09	18.67	2.21
0.750	1.35	6.750	2.46	12.750	9.09	18.75	2.21
0.833	1.35	6.833	2.46	12.833	9.09	18.83	2.21
0.917	1.35	6.917	2.46	12.917	9.09	18.92	2.21
1.000	1.35	7.000	2.46	13.000	9.09	19.00	2.21
1.083	1.35	7.083	2.46	13.083	1.72	19.08	2.21
1.167	1.35	7.167	2.46	13.167	1.72	19.17	2.21
1.250	1.35	7.250	2.46	13.250	1.72	19.25	2.21
1.333	1.35	7.333	2.46	13.333	1.72	19.33	2.21
1.417	1.35	7.417	2.46	13.417	1.72	19.42	2.21
1.500	1.35	7.500	2.46	13.500	1.72	19.50	2.21
1.583	1.35	7.583	2.46	13.583	10.08	19.58	2.21
1.667	1.35	7.667	2.46	13.667	10.08	19.67	2.21
1.750	1.35	7.750	2.46	13.750	10.08	19.75	2.21
1.833	1.35	7.833	2.46	13.833	10.08	19.83	2.21
1.917	1.35	7.917	2.46	13.917	10.08	19.92	2.21
2.000	1.35	8.000	2.46	14.000	10.08	20.00	2.21
2.083	1.60	8.083	3.32	14.083	3.69	20.08	1.47
2.167	1.60	8.167	3.32	14.167	3.69	20.17	1.47
2.250	1.60	8.250	3.32	14.250	3.69	20.25	1.47
2.333	1.60	8.333	3.32	14.333	3.69	20.33	1.47
2.417	1.60	8.417	3.32	14.417	3.69	20.42	1.47
2.500	1.60	8.500	3.32	14.500	3.69	20.50	1.47
2.583	1.60	8.583	3.32	14.583	3.69	20.58	1.47
2.667	1.60	8.667	3.32	14.667	3.69	20.67	1.47
2.750	1.60	8.750	3.32	14.750	3.69	20.75	1.47
2.833	1.60	8.833	3.32	14.833	3.69	20.83	1.47
2.917	1.60	8.917	3.32	14.917	3.69	20.92	1.47
3.000	1.60	9.000	3.32	15.000	3.69	21.00	1.47
3.083	1.60	9.083	3.93	15.083	3.69	21.08	1.47
3.167	1.60	9.167	3.93	15.167	3.69	21.17	1.47
3.250	1.60	9.250	3.93	15.250	3.69	21.25	1.47
3.333	1.60	9.333	3.93	15.333	3.69	21.33	1.47
3.417	1.60	9.417	3.93	15.417	3.69	21.42	1.47
3.500	1.60	9.500	3.93	15.500	3.69	21.50	1.47
3.583	1.60	9.583	4.42	15.583	3.69	21.58	1.47
3.667	1.60	9.667	4.42	15.667	3.69	21.67	1.47
3.750	1.60	9.750	4.42	15.750	3.69	21.75	1.47
3.833	1.60	9.833	4.42	15.833	3.69	21.83	1.47
3.917	1.60	9.917	4.42	15.917	3.69	21.92	1.47

4.000	1.60	10.000	4.42	16.000	3.69	22.00	1.47
4.083	1.97	10.083	5.65	16.083	2.21	22.08	1.47
4.167	1.97	10.167	5.65	16.167	2.21	22.17	1.47
4.250	1.97	10.250	5.65	16.250	2.21	22.25	1.47
4.333	1.97	10.333	5.65	16.333	2.21	22.33	1.47
4.417	1.97	10.417	5.65	16.417	2.21	22.42	1.47
4.500	1.97	10.500	5.65	16.500	2.21	22.50	1.47
4.583	1.97	10.583	7.62	16.583	2.21	22.58	1.47
4.667	1.97	10.667	7.62	16.667	2.21	22.67	1.47
4.750	1.97	10.750	7.62	16.750	2.21	22.75	1.47
4.833	1.97	10.833	7.62	16.833	2.21	22.83	1.47
4.917	1.97	10.917	7.62	16.917	2.21	22.92	1.47
5.000	1.97	11.000	7.62	17.000	2.21	23.00	1.47
5.083	1.97	11.083	11.80	17.083	2.21	23.08	1.47
5.167	1.97	11.167	11.80	17.167	2.21	23.17	1.47
5.250	1.97	11.250	11.80	17.250	2.21	23.25	1.47
5.333	1.97	11.333	11.80	17.333	2.21	23.33	1.47
5.417	1.97	11.417	11.80	17.417	2.21	23.42	1.47
5.500	1.97	11.500	11.80	17.500	2.21	23.50	1.47
5.583	1.97	11.583	51.13	17.583	2.21	23.58	1.47
5.667	1.97	11.667	51.13	17.667	2.21	23.67	1.47
5.750	1.97	11.750	93.40	17.750	2.21	23.75	1.47
5.833	1.97	11.833	93.40	17.833	2.21	23.83	1.47
5.917	1.97	11.917	135.67	17.917	2.21	23.92	1.47
6.000	1.97	12.000	135.68	18.000	2.21	24.00	1.47

Unit Hyd Qpeak (cms)= 0.290

PEAK FLOW (cms)= 0.527 (i)
TIME TO PEAK (hrs)= 13.667
RUNOFF VOLUME (mm)= 75.390
TOTAL RAINFALL (mm)= 122.887
RUNOFF COEFFICIENT = 0.613

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

CALIB	
STANDHYD (0108)	Area (ha)= 0.39
ID= 1 DT= 5.0 min	Total Imp(%)= 35.00 Dir. Conn.(%)= 35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.14	0.25
Dep. Storage	(mm)=	1.00	6.40
Average Slope	(%)=	1.00	2.00
Length	(m)=	50.86	10.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.35	6.083	2.46	12.083	17.71	18.08	2.21
0.167	1.35	6.167	2.46	12.167	17.70	18.17	2.21
0.250	1.35	6.250	2.46	12.250	17.70	18.25	2.21
0.333	1.35	6.333	2.46	12.333	17.70	18.33	2.21
0.417	1.35	6.417	2.46	12.417	17.70	18.42	2.21
0.500	1.35	6.500	2.46	12.500	17.70	18.50	2.21
0.583	1.35	6.583	2.46	12.583	9.09	18.58	2.21
0.667	1.35	6.667	2.46	12.667	9.09	18.67	2.21
0.750	1.35	6.750	2.46	12.750	9.09	18.75	2.21
0.833	1.35	6.833	2.46	12.833	9.09	18.83	2.21
0.917	1.35	6.917	2.46	12.917	9.09	18.92	2.21
1.000	1.35	7.000	2.46	13.000	9.09	19.00	2.21
1.083	1.35	7.083	2.46	13.083	1.72	19.08	2.21
1.167	1.35	7.167	2.46	13.167	1.72	19.17	2.21
1.250	1.35	7.250	2.46	13.250	1.72	19.25	2.21
1.333	1.35	7.333	2.46	13.333	1.72	19.33	2.21
1.417	1.35	7.417	2.46	13.417	1.72	19.42	2.21
1.500	1.35	7.500	2.46	13.500	1.72	19.50	2.21
1.583	1.35	7.583	2.46	13.583	10.08	19.58	2.21
1.667	1.35	7.667	2.46	13.667	10.08	19.67	2.21
1.750	1.35	7.750	2.46	13.750	10.08	19.75	2.21
1.833	1.35	7.833	2.46	13.833	10.08	19.83	2.21
1.917	1.35	7.917	2.46	13.917	10.08	19.92	2.21
2.000	1.35	8.000	2.46	14.000	10.08	20.00	2.21
2.083	1.60	8.083	3.32	14.083	3.69	20.08	1.47
2.167	1.60	8.167	3.32	14.167	3.69	20.17	1.47
2.250	1.60	8.250	3.32	14.250	3.69	20.25	1.47
2.333	1.60	8.333	3.32	14.333	3.69	20.33	1.47
2.417	1.60	8.417	3.32	14.417	3.69	20.42	1.47
2.500	1.60	8.500	3.32	14.500	3.69	20.50	1.47
2.583	1.60	8.583	3.32	14.583	3.69	20.58	1.47
2.667	1.60	8.667	3.32	14.667	3.69	20.67	1.47
2.750	1.60	8.750	3.32	14.750	3.69	20.75	1.47
2.833	1.60	8.833	3.32	14.833	3.69	20.83	1.47
2.917	1.60	8.917	3.32	14.917	3.69	20.92	1.47
3.000	1.60	9.000	3.32	15.000	3.69	21.00	1.47
3.083	1.60	9.083	3.93	15.083	3.69	21.08	1.47
3.167	1.60	9.167	3.93	15.167	3.69	21.17	1.47
3.250	1.60	9.250	3.93	15.250	3.69	21.25	1.47
3.333	1.60	9.333	3.93	15.333	3.69	21.33	1.47
3.417	1.60	9.417	3.93	15.417	3.69	21.42	1.47
3.500	1.60	9.500	3.93	15.500	3.69	21.50	1.47
3.583	1.60	9.583	4.42	15.583	3.69	21.58	1.47
3.667	1.60	9.667	4.42	15.667	3.69	21.67	1.47
3.750	1.60	9.750	4.42	15.750	3.69	21.75	1.47
3.833	1.60	9.833	4.42	15.833	3.69	21.83	1.47
3.917	1.60	9.917	4.42	15.917	3.69	21.92	1.47

4.000	1.60	10.000	4.42	16.000	3.69	22.00	1.47
4.083	1.97	10.083	5.65	16.083	2.21	22.08	1.47
4.167	1.97	10.167	5.65	16.167	2.21	22.17	1.47
4.250	1.97	10.250	5.65	16.250	2.21	22.25	1.47
4.333	1.97	10.333	5.65	16.333	2.21	22.33	1.47
4.417	1.97	10.417	5.65	16.417	2.21	22.42	1.47
4.500	1.97	10.500	5.65	16.500	2.21	22.50	1.47
4.583	1.97	10.583	7.62	16.583	2.21	22.58	1.47
4.667	1.97	10.667	7.62	16.667	2.21	22.67	1.47
4.750	1.97	10.750	7.62	16.750	2.21	22.75	1.47
4.833	1.97	10.833	7.62	16.833	2.21	22.83	1.47
4.917	1.97	10.917	7.62	16.917	2.21	22.92	1.47
5.000	1.97	11.000	7.62	17.000	2.21	23.00	1.47
5.083	1.97	11.083	11.80	17.083	2.21	23.08	1.47
5.167	1.97	11.167	11.80	17.167	2.21	23.17	1.47
5.250	1.97	11.250	11.80	17.250	2.21	23.25	1.47
5.333	1.97	11.333	11.80	17.333	2.21	23.33	1.47
5.417	1.97	11.417	11.80	17.417	2.21	23.42	1.47
5.500	1.97	11.500	11.80	17.500	2.21	23.50	1.47
5.583	1.97	11.583	51.13	17.583	2.21	23.58	1.47
5.667	1.97	11.667	51.13	17.667	2.21	23.67	1.47
5.750	1.97	11.750	93.40	17.750	2.21	23.75	1.47
5.833	1.97	11.833	93.40	17.833	2.21	23.83	1.47
5.917	1.97	11.917	135.67	17.917	2.21	23.92	1.47
6.000	1.97	12.000	135.68	18.000	2.21	24.00	1.47

Max.Eff.Inten.(mm/hr)=	135.68	101.64	
over (min)	5.00	5.00	
Storage Coeff. (min)=	1.51 (ii)	4.99 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.33	0.22	
			TOTALS
PEAK FLOW (cms)=	0.05	0.07	0.119 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	121.89	75.39	91.66
TOTAL RAINFALL (mm)=	122.89	122.89	122.89
RUNOFF COEFFICIENT =	0.99	0.61	0.75

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0408)				
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.

```
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0108):     0.39   0.119    12.00    91.66
      + ID2= 2 (  5008):    12.91   0.527    13.67    75.39
        ================================================
        ID = 3 (  0408):    13.30   0.536    13.67    75.86

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB             |
| NASHYD   (  5009)|   Area    (ha)= 155.83   Curve Number   (CN)= 77.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.60   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   2.50

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.35	6.083	2.46	12.083	17.71	18.08	2.21
0.167	1.35	6.167	2.46	12.167	17.70	18.17	2.21
0.250	1.35	6.250	2.46	12.250	17.70	18.25	2.21
0.333	1.35	6.333	2.46	12.333	17.70	18.33	2.21
0.417	1.35	6.417	2.46	12.417	17.70	18.42	2.21
0.500	1.35	6.500	2.46	12.500	17.70	18.50	2.21
0.583	1.35	6.583	2.46	12.583	9.09	18.58	2.21
0.667	1.35	6.667	2.46	12.667	9.09	18.67	2.21
0.750	1.35	6.750	2.46	12.750	9.09	18.75	2.21
0.833	1.35	6.833	2.46	12.833	9.09	18.83	2.21
0.917	1.35	6.917	2.46	12.917	9.09	18.92	2.21
1.000	1.35	7.000	2.46	13.000	9.09	19.00	2.21
1.083	1.35	7.083	2.46	13.083	1.72	19.08	2.21
1.167	1.35	7.167	2.46	13.167	1.72	19.17	2.21
1.250	1.35	7.250	2.46	13.250	1.72	19.25	2.21
1.333	1.35	7.333	2.46	13.333	1.72	19.33	2.21
1.417	1.35	7.417	2.46	13.417	1.72	19.42	2.21
1.500	1.35	7.500	2.46	13.500	1.72	19.50	2.21
1.583	1.35	7.583	2.46	13.583	10.08	19.58	2.21
1.667	1.35	7.667	2.46	13.667	10.08	19.67	2.21
1.750	1.35	7.750	2.46	13.750	10.08	19.75	2.21
1.833	1.35	7.833	2.46	13.833	10.08	19.83	2.21
1.917	1.35	7.917	2.46	13.917	10.08	19.92	2.21
2.000	1.35	8.000	2.46	14.000	10.08	20.00	2.21
2.083	1.60	8.083	3.32	14.083	3.69	20.08	1.47
2.167	1.60	8.167	3.32	14.167	3.69	20.17	1.47
2.250	1.60	8.250	3.32	14.250	3.69	20.25	1.47
2.333	1.60	8.333	3.32	14.333	3.69	20.33	1.47
2.417	1.60	8.417	3.32	14.417	3.69	20.42	1.47
2.500	1.60	8.500	3.32	14.500	3.69	20.50	1.47
2.583	1.60	8.583	3.32	14.583	3.69	20.58	1.47

2.667	1.60	8.667	3.32	14.667	3.69	20.67	1.47
2.750	1.60	8.750	3.32	14.750	3.69	20.75	1.47
2.833	1.60	8.833	3.32	14.833	3.69	20.83	1.47
2.917	1.60	8.917	3.32	14.917	3.69	20.92	1.47
3.000	1.60	9.000	3.32	15.000	3.69	21.00	1.47
3.083	1.60	9.083	3.93	15.083	3.69	21.08	1.47
3.167	1.60	9.167	3.93	15.167	3.69	21.17	1.47
3.250	1.60	9.250	3.93	15.250	3.69	21.25	1.47
3.333	1.60	9.333	3.93	15.333	3.69	21.33	1.47
3.417	1.60	9.417	3.93	15.417	3.69	21.42	1.47
3.500	1.60	9.500	3.93	15.500	3.69	21.50	1.47
3.583	1.60	9.583	4.42	15.583	3.69	21.58	1.47
3.667	1.60	9.667	4.42	15.667	3.69	21.67	1.47
3.750	1.60	9.750	4.42	15.750	3.69	21.75	1.47
3.833	1.60	9.833	4.42	15.833	3.69	21.83	1.47
3.917	1.60	9.917	4.42	15.917	3.69	21.92	1.47
4.000	1.60	10.000	4.42	16.000	3.69	22.00	1.47
4.083	1.97	10.083	5.65	16.083	2.21	22.08	1.47
4.167	1.97	10.167	5.65	16.167	2.21	22.17	1.47
4.250	1.97	10.250	5.65	16.250	2.21	22.25	1.47
4.333	1.97	10.333	5.65	16.333	2.21	22.33	1.47
4.417	1.97	10.417	5.65	16.417	2.21	22.42	1.47
4.500	1.97	10.500	5.65	16.500	2.21	22.50	1.47
4.583	1.97	10.583	7.62	16.583	2.21	22.58	1.47
4.667	1.97	10.667	7.62	16.667	2.21	22.67	1.47
4.750	1.97	10.750	7.62	16.750	2.21	22.75	1.47
4.833	1.97	10.833	7.62	16.833	2.21	22.83	1.47
4.917	1.97	10.917	7.62	16.917	2.21	22.92	1.47
5.000	1.97	11.000	7.62	17.000	2.21	23.00	1.47
5.083	1.97	11.083	11.80	17.083	2.21	23.08	1.47
5.167	1.97	11.167	11.80	17.167	2.21	23.17	1.47
5.250	1.97	11.250	11.80	17.250	2.21	23.25	1.47
5.333	1.97	11.333	11.80	17.333	2.21	23.33	1.47
5.417	1.97	11.417	11.80	17.417	2.21	23.42	1.47
5.500	1.97	11.500	11.80	17.500	2.21	23.50	1.47
5.583	1.97	11.583	51.13	17.583	2.21	23.58	1.47
5.667	1.97	11.667	51.13	17.667	2.21	23.67	1.47
5.750	1.97	11.750	93.40	17.750	2.21	23.75	1.47
5.833	1.97	11.833	93.40	17.833	2.21	23.83	1.47
5.917	1.97	11.917	135.67	17.917	2.21	23.92	1.47
6.000	1.97	12.000	135.68	18.000	2.21	24.00	1.47

Unit Hyd Qpeak (cms)= 2.381

PEAK FLOW (cms)= 4.329 (i)
TIME TO PEAK (hrs)= 14.667
RUNOFF VOLUME (mm)= 69.529
TOTAL RAINFALL (mm)= 122.887
RUNOFF COEFFICIENT = 0.566

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

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--------------------
| CALIB            |
| STANDHYD (  0109)|   Area    (ha)=   0.52
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  50.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.26         0.26
     Dep. Storage     (mm)=       1.00         7.60
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      58.71        10.00
     Mannings n             =     0.013        0.250

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


                         ---- TRANSFORMED HYETOGRAPH ----
          TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
           hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
         0.083    1.35 | 6.083    2.46 |12.083   17.71 | 18.08    2.21
         0.167    1.35 | 6.167    2.46 |12.167   17.70 | 18.17    2.21
         0.250    1.35 | 6.250    2.46 |12.250   17.70 | 18.25    2.21
         0.333    1.35 | 6.333    2.46 |12.333   17.70 | 18.33    2.21
         0.417    1.35 | 6.417    2.46 |12.417   17.70 | 18.42    2.21
         0.500    1.35 | 6.500    2.46 |12.500   17.70 | 18.50    2.21
         0.583    1.35 | 6.583    2.46 |12.583    9.09 | 18.58    2.21
         0.667    1.35 | 6.667    2.46 |12.667    9.09 | 18.67    2.21
         0.750    1.35 | 6.750    2.46 |12.750    9.09 | 18.75    2.21
         0.833    1.35 | 6.833    2.46 |12.833    9.09 | 18.83    2.21
         0.917    1.35 | 6.917    2.46 |12.917    9.09 | 18.92    2.21
         1.000    1.35 | 7.000    2.46 |13.000    9.09 | 19.00    2.21
         1.083    1.35 | 7.083    2.46 |13.083    1.72 | 19.08    2.21
         1.167    1.35 | 7.167    2.46 |13.167    1.72 | 19.17    2.21
         1.250    1.35 | 7.250    2.46 |13.250    1.72 | 19.25    2.21
         1.333    1.35 | 7.333    2.46 |13.333    1.72 | 19.33    2.21
         1.417    1.35 | 7.417    2.46 |13.417    1.72 | 19.42    2.21
         1.500    1.35 | 7.500    2.46 |13.500    1.72 | 19.50    2.21
         1.583    1.35 | 7.583    2.46 |13.583   10.08 | 19.58    2.21
         1.667    1.35 | 7.667    2.46 |13.667   10.08 | 19.67    2.21
         1.750    1.35 | 7.750    2.46 |13.750   10.08 | 19.75    2.21
         1.833    1.35 | 7.833    2.46 |13.833   10.08 | 19.83    2.21
         1.917    1.35 | 7.917    2.46 |13.917   10.08 | 19.92    2.21
         2.000    1.35 | 8.000    2.46 |14.000   10.08 | 20.00    2.21
         2.083    1.60 | 8.083    3.32 |14.083    3.69 | 20.08    1.47
         2.167    1.60 | 8.167    3.32 |14.167    3.69 | 20.17    1.47
         2.250    1.60 | 8.250    3.32 |14.250    3.69 | 20.25    1.47
         2.333    1.60 | 8.333    3.32 |14.333    3.69 | 20.33    1.47
         2.417    1.60 | 8.417    3.32 |14.417    3.69 | 20.42    1.47
         2.500    1.60 | 8.500    3.32 |14.500    3.69 | 20.50    1.47
         2.583    1.60 | 8.583    3.32 |14.583    3.69 | 20.58    1.47
```

2.667	1.60	8.667	3.32	14.667	3.69	20.67	1.47
2.750	1.60	8.750	3.32	14.750	3.69	20.75	1.47
2.833	1.60	8.833	3.32	14.833	3.69	20.83	1.47
2.917	1.60	8.917	3.32	14.917	3.69	20.92	1.47
3.000	1.60	9.000	3.32	15.000	3.69	21.00	1.47
3.083	1.60	9.083	3.93	15.083	3.69	21.08	1.47
3.167	1.60	9.167	3.93	15.167	3.69	21.17	1.47
3.250	1.60	9.250	3.93	15.250	3.69	21.25	1.47
3.333	1.60	9.333	3.93	15.333	3.69	21.33	1.47
3.417	1.60	9.417	3.93	15.417	3.69	21.42	1.47
3.500	1.60	9.500	3.93	15.500	3.69	21.50	1.47
3.583	1.60	9.583	4.42	15.583	3.69	21.58	1.47
3.667	1.60	9.667	4.42	15.667	3.69	21.67	1.47
3.750	1.60	9.750	4.42	15.750	3.69	21.75	1.47
3.833	1.60	9.833	4.42	15.833	3.69	21.83	1.47
3.917	1.60	9.917	4.42	15.917	3.69	21.92	1.47
4.000	1.60	10.000	4.42	16.000	3.69	22.00	1.47
4.083	1.97	10.083	5.65	16.083	2.21	22.08	1.47
4.167	1.97	10.167	5.65	16.167	2.21	22.17	1.47
4.250	1.97	10.250	5.65	16.250	2.21	22.25	1.47
4.333	1.97	10.333	5.65	16.333	2.21	22.33	1.47
4.417	1.97	10.417	5.65	16.417	2.21	22.42	1.47
4.500	1.97	10.500	5.65	16.500	2.21	22.50	1.47
4.583	1.97	10.583	7.62	16.583	2.21	22.58	1.47
4.667	1.97	10.667	7.62	16.667	2.21	22.67	1.47
4.750	1.97	10.750	7.62	16.750	2.21	22.75	1.47
4.833	1.97	10.833	7.62	16.833	2.21	22.83	1.47
4.917	1.97	10.917	7.62	16.917	2.21	22.92	1.47
5.000	1.97	11.000	7.62	17.000	2.21	23.00	1.47
5.083	1.97	11.083	11.80	17.083	2.21	23.08	1.47
5.167	1.97	11.167	11.80	17.167	2.21	23.17	1.47
5.250	1.97	11.250	11.80	17.250	2.21	23.25	1.47
5.333	1.97	11.333	11.80	17.333	2.21	23.33	1.47
5.417	1.97	11.417	11.80	17.417	2.21	23.42	1.47
5.500	1.97	11.500	11.80	17.500	2.21	23.50	1.47
5.583	1.97	11.583	51.13	17.583	2.21	23.58	1.47
5.667	1.97	11.667	51.13	17.667	2.21	23.67	1.47
5.750	1.97	11.750	93.40	17.750	2.21	23.75	1.47
5.833	1.97	11.833	93.40	17.833	2.21	23.83	1.47
5.917	1.97	11.917	135.67	17.917	2.21	23.92	1.47
6.000	1.97	12.000	135.68	18.000	2.21	24.00	1.47

Max.Eff.Inten.(mm/hr)=	135.68	94.66	
over (min)	5.00	5.00	
Storage Coeff. (min)=	1.64 (ii)	4.36 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.32	0.23	
			TOTALS
PEAK FLOW (cms)=	0.10	0.07	0.163 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	121.89	69.53	95.70

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     TOTAL RAINFALL   (mm)=     122.89       122.89         122.89
     RUNOFF COEFFICIENT   =       0.99         0.57           0.78

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  77.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD  (  0409)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0109):     0.52   0.163    12.00    95.70
      + ID2= 2 (  0408):    13.30   0.536    13.67    75.86
        ====================================================
        ID = 3 (  0409):    13.82   0.549    13.67    76.61

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

--------------------
| ADD HYD  (  0409)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0409):    13.82   0.549    13.67    76.61
      + ID2= 2 (  5009):   155.83   4.329    14.67    69.53
        ====================================================
        ID = 1 (  0409):   169.65   4.793    14.58    70.11

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  5006)|   Area    (ha)=  48.21   Curve Number   (CN)= 80.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   6.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.70

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


                          ---- TRANSFORMED HYETOGRAPH ----
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
              0.083    1.35 | 6.083    2.46 |12.083   17.71 | 18.08    2.21
              0.167    1.35 | 6.167    2.46 |12.167   17.70 | 18.17    2.21
              0.250    1.35 | 6.250    2.46 |12.250   17.70 | 18.25    2.21
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0.333	1.35	6.333	2.46	12.333	17.70	18.33	2.21
0.417	1.35	6.417	2.46	12.417	17.70	18.42	2.21
0.500	1.35	6.500	2.46	12.500	17.70	18.50	2.21
0.583	1.35	6.583	2.46	12.583	9.09	18.58	2.21
0.667	1.35	6.667	2.46	12.667	9.09	18.67	2.21
0.750	1.35	6.750	2.46	12.750	9.09	18.75	2.21
0.833	1.35	6.833	2.46	12.833	9.09	18.83	2.21
0.917	1.35	6.917	2.46	12.917	9.09	18.92	2.21
1.000	1.35	7.000	2.46	13.000	9.09	19.00	2.21
1.083	1.35	7.083	2.46	13.083	1.72	19.08	2.21
1.167	1.35	7.167	2.46	13.167	1.72	19.17	2.21
1.250	1.35	7.250	2.46	13.250	1.72	19.25	2.21
1.333	1.35	7.333	2.46	13.333	1.72	19.33	2.21
1.417	1.35	7.417	2.46	13.417	1.72	19.42	2.21
1.500	1.35	7.500	2.46	13.500	1.72	19.50	2.21
1.583	1.35	7.583	2.46	13.583	10.08	19.58	2.21
1.667	1.35	7.667	2.46	13.667	10.08	19.67	2.21
1.750	1.35	7.750	2.46	13.750	10.08	19.75	2.21
1.833	1.35	7.833	2.46	13.833	10.08	19.83	2.21
1.917	1.35	7.917	2.46	13.917	10.08	19.92	2.21
2.000	1.35	8.000	2.46	14.000	10.08	20.00	2.21
2.083	1.60	8.083	3.32	14.083	3.69	20.08	1.47
2.167	1.60	8.167	3.32	14.167	3.69	20.17	1.47
2.250	1.60	8.250	3.32	14.250	3.69	20.25	1.47
2.333	1.60	8.333	3.32	14.333	3.69	20.33	1.47
2.417	1.60	8.417	3.32	14.417	3.69	20.42	1.47
2.500	1.60	8.500	3.32	14.500	3.69	20.50	1.47
2.583	1.60	8.583	3.32	14.583	3.69	20.58	1.47
2.667	1.60	8.667	3.32	14.667	3.69	20.67	1.47
2.750	1.60	8.750	3.32	14.750	3.69	20.75	1.47
2.833	1.60	8.833	3.32	14.833	3.69	20.83	1.47
2.917	1.60	8.917	3.32	14.917	3.69	20.92	1.47
3.000	1.60	9.000	3.32	15.000	3.69	21.00	1.47
3.083	1.60	9.083	3.93	15.083	3.69	21.08	1.47
3.167	1.60	9.167	3.93	15.167	3.69	21.17	1.47
3.250	1.60	9.250	3.93	15.250	3.69	21.25	1.47
3.333	1.60	9.333	3.93	15.333	3.69	21.33	1.47
3.417	1.60	9.417	3.93	15.417	3.69	21.42	1.47
3.500	1.60	9.500	3.93	15.500	3.69	21.50	1.47
3.583	1.60	9.583	4.42	15.583	3.69	21.58	1.47
3.667	1.60	9.667	4.42	15.667	3.69	21.67	1.47
3.750	1.60	9.750	4.42	15.750	3.69	21.75	1.47
3.833	1.60	9.833	4.42	15.833	3.69	21.83	1.47
3.917	1.60	9.917	4.42	15.917	3.69	21.92	1.47
4.000	1.60	10.000	4.42	16.000	3.69	22.00	1.47
4.083	1.97	10.083	5.65	16.083	2.21	22.08	1.47
4.167	1.97	10.167	5.65	16.167	2.21	22.17	1.47
4.250	1.97	10.250	5.65	16.250	2.21	22.25	1.47
4.333	1.97	10.333	5.65	16.333	2.21	22.33	1.47
4.417	1.97	10.417	5.65	16.417	2.21	22.42	1.47
4.500	1.97	10.500	5.65	16.500	2.21	22.50	1.47

4.583	1.97	10.583	7.62	16.583	2.21	22.58	1.47
4.667	1.97	10.667	7.62	16.667	2.21	22.67	1.47
4.750	1.97	10.750	7.62	16.750	2.21	22.75	1.47
4.833	1.97	10.833	7.62	16.833	2.21	22.83	1.47
4.917	1.97	10.917	7.62	16.917	2.21	22.92	1.47
5.000	1.97	11.000	7.62	17.000	2.21	23.00	1.47
5.083	1.97	11.083	11.80	17.083	2.21	23.08	1.47
5.167	1.97	11.167	11.80	17.167	2.21	23.17	1.47
5.250	1.97	11.250	11.80	17.250	2.21	23.25	1.47
5.333	1.97	11.333	11.80	17.333	2.21	23.33	1.47
5.417	1.97	11.417	11.80	17.417	2.21	23.42	1.47
5.500	1.97	11.500	11.80	17.500	2.21	23.50	1.47
5.583	1.97	11.583	51.13	17.583	2.21	23.58	1.47
5.667	1.97	11.667	51.13	17.667	2.21	23.67	1.47
5.750	1.97	11.750	93.40	17.750	2.21	23.75	1.47
5.833	1.97	11.833	93.40	17.833	2.21	23.83	1.47
5.917	1.97	11.917	135.67	17.917	2.21	23.92	1.47
6.000	1.97	12.000	135.68	18.000	2.21	24.00	1.47

Unit Hyd Qpeak (cms)= 1.083

PEAK FLOW (cms)= 1.968 (i)
TIME TO PEAK (hrs)= 13.667
RUNOFF VOLUME (mm)= 75.390
TOTAL RAINFALL (mm)= 122.887
RUNOFF COEFFICIENT = 0.613

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

CALIB
STANDHYD (0106)
ID= 1 DT= 5.0 min

Area (ha)= 0.35
Total Imp(%)= 30.00 Dir. Conn.(%)= 30.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.11	0.25
Dep. Storage	(mm)=	1.00	6.40
Average Slope	(%)=	1.00	2.00
Length	(m)=	48.65	10.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.35	6.083	2.46	12.083	17.71	18.08	2.21
0.167	1.35	6.167	2.46	12.167	17.70	18.17	2.21
0.250	1.35	6.250	2.46	12.250	17.70	18.25	2.21

0.333	1.35	6.333	2.46	12.333	17.70	18.33	2.21
0.417	1.35	6.417	2.46	12.417	17.70	18.42	2.21
0.500	1.35	6.500	2.46	12.500	17.70	18.50	2.21
0.583	1.35	6.583	2.46	12.583	9.09	18.58	2.21
0.667	1.35	6.667	2.46	12.667	9.09	18.67	2.21
0.750	1.35	6.750	2.46	12.750	9.09	18.75	2.21
0.833	1.35	6.833	2.46	12.833	9.09	18.83	2.21
0.917	1.35	6.917	2.46	12.917	9.09	18.92	2.21
1.000	1.35	7.000	2.46	13.000	9.09	19.00	2.21
1.083	1.35	7.083	2.46	13.083	1.72	19.08	2.21
1.167	1.35	7.167	2.46	13.167	1.72	19.17	2.21
1.250	1.35	7.250	2.46	13.250	1.72	19.25	2.21
1.333	1.35	7.333	2.46	13.333	1.72	19.33	2.21
1.417	1.35	7.417	2.46	13.417	1.72	19.42	2.21
1.500	1.35	7.500	2.46	13.500	1.72	19.50	2.21
1.583	1.35	7.583	2.46	13.583	10.08	19.58	2.21
1.667	1.35	7.667	2.46	13.667	10.08	19.67	2.21
1.750	1.35	7.750	2.46	13.750	10.08	19.75	2.21
1.833	1.35	7.833	2.46	13.833	10.08	19.83	2.21
1.917	1.35	7.917	2.46	13.917	10.08	19.92	2.21
2.000	1.35	8.000	2.46	14.000	10.08	20.00	2.21
2.083	1.60	8.083	3.32	14.083	3.69	20.08	1.47
2.167	1.60	8.167	3.32	14.167	3.69	20.17	1.47
2.250	1.60	8.250	3.32	14.250	3.69	20.25	1.47
2.333	1.60	8.333	3.32	14.333	3.69	20.33	1.47
2.417	1.60	8.417	3.32	14.417	3.69	20.42	1.47
2.500	1.60	8.500	3.32	14.500	3.69	20.50	1.47
2.583	1.60	8.583	3.32	14.583	3.69	20.58	1.47
2.667	1.60	8.667	3.32	14.667	3.69	20.67	1.47
2.750	1.60	8.750	3.32	14.750	3.69	20.75	1.47
2.833	1.60	8.833	3.32	14.833	3.69	20.83	1.47
2.917	1.60	8.917	3.32	14.917	3.69	20.92	1.47
3.000	1.60	9.000	3.32	15.000	3.69	21.00	1.47
3.083	1.60	9.083	3.93	15.083	3.69	21.08	1.47
3.167	1.60	9.167	3.93	15.167	3.69	21.17	1.47
3.250	1.60	9.250	3.93	15.250	3.69	21.25	1.47
3.333	1.60	9.333	3.93	15.333	3.69	21.33	1.47
3.417	1.60	9.417	3.93	15.417	3.69	21.42	1.47
3.500	1.60	9.500	3.93	15.500	3.69	21.50	1.47
3.583	1.60	9.583	4.42	15.583	3.69	21.58	1.47
3.667	1.60	9.667	4.42	15.667	3.69	21.67	1.47
3.750	1.60	9.750	4.42	15.750	3.69	21.75	1.47
3.833	1.60	9.833	4.42	15.833	3.69	21.83	1.47
3.917	1.60	9.917	4.42	15.917	3.69	21.92	1.47
4.000	1.60	10.000	4.42	16.000	3.69	22.00	1.47
4.083	1.97	10.083	5.65	16.083	2.21	22.08	1.47
4.167	1.97	10.167	5.65	16.167	2.21	22.17	1.47
4.250	1.97	10.250	5.65	16.250	2.21	22.25	1.47
4.333	1.97	10.333	5.65	16.333	2.21	22.33	1.47
4.417	1.97	10.417	5.65	16.417	2.21	22.42	1.47
4.500	1.97	10.500	5.65	16.500	2.21	22.50	1.47

4.583	1.97	10.583	7.62	16.583	2.21	22.58	1.47
4.667	1.97	10.667	7.62	16.667	2.21	22.67	1.47
4.750	1.97	10.750	7.62	16.750	2.21	22.75	1.47
4.833	1.97	10.833	7.62	16.833	2.21	22.83	1.47
4.917	1.97	10.917	7.62	16.917	2.21	22.92	1.47
5.000	1.97	11.000	7.62	17.000	2.21	23.00	1.47
5.083	1.97	11.083	11.80	17.083	2.21	23.08	1.47
5.167	1.97	11.167	11.80	17.167	2.21	23.17	1.47
5.250	1.97	11.250	11.80	17.250	2.21	23.25	1.47
5.333	1.97	11.333	11.80	17.333	2.21	23.33	1.47
5.417	1.97	11.417	11.80	17.417	2.21	23.42	1.47
5.500	1.97	11.500	11.80	17.500	2.21	23.50	1.47
5.583	1.97	11.583	51.13	17.583	2.21	23.58	1.47
5.667	1.97	11.667	51.13	17.667	2.21	23.67	1.47
5.750	1.97	11.750	93.40	17.750	2.21	23.75	1.47
5.833	1.97	11.833	93.40	17.833	2.21	23.83	1.47
5.917	1.97	11.917	135.67	17.917	2.21	23.92	1.47
6.000	1.97	12.000	135.68	18.000	2.21	24.00	1.47

Max.Eff.Inten.(mm/hr)=	135.68	101.64	
over (min)	5.00	10.00	
Storage Coeff. (min)=	1.47 (ii)	5.28 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.33	0.16	
			TOTALS
PEAK FLOW (cms)=	0.04	0.06	0.101 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	121.89	75.39	89.33
TOTAL RAINFALL (mm)=	122.89	122.89	122.89
RUNOFF COEFFICIENT =	0.99	0.61	0.73

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0406)					
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.	
	(ha)	(cms)	(hrs)	(mm)	
ID1= 1 (0106):	0.35	0.101	12.00	89.33	
+ ID2= 2 (5006):	48.21	1.968	13.67	75.39	
ID = 3 (0406):	48.57	1.975	13.67	75.49	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| CALIB            |
| NASHYD   (  5007)|   Area    (ha)=   8.87   Curve Number   (CN)= 80.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   6.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.70

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

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.35	6.083	2.46	12.083	17.71	18.08	2.21
0.167	1.35	6.167	2.46	12.167	17.70	18.17	2.21
0.250	1.35	6.250	2.46	12.250	17.70	18.25	2.21
0.333	1.35	6.333	2.46	12.333	17.70	18.33	2.21
0.417	1.35	6.417	2.46	12.417	17.70	18.42	2.21
0.500	1.35	6.500	2.46	12.500	17.70	18.50	2.21
0.583	1.35	6.583	2.46	12.583	9.09	18.58	2.21
0.667	1.35	6.667	2.46	12.667	9.09	18.67	2.21
0.750	1.35	6.750	2.46	12.750	9.09	18.75	2.21
0.833	1.35	6.833	2.46	12.833	9.09	18.83	2.21
0.917	1.35	6.917	2.46	12.917	9.09	18.92	2.21
1.000	1.35	7.000	2.46	13.000	9.09	19.00	2.21
1.083	1.35	7.083	2.46	13.083	1.72	19.08	2.21
1.167	1.35	7.167	2.46	13.167	1.72	19.17	2.21
1.250	1.35	7.250	2.46	13.250	1.72	19.25	2.21
1.333	1.35	7.333	2.46	13.333	1.72	19.33	2.21
1.417	1.35	7.417	2.46	13.417	1.72	19.42	2.21
1.500	1.35	7.500	2.46	13.500	1.72	19.50	2.21
1.583	1.35	7.583	2.46	13.583	10.08	19.58	2.21
1.667	1.35	7.667	2.46	13.667	10.08	19.67	2.21
1.750	1.35	7.750	2.46	13.750	10.08	19.75	2.21
1.833	1.35	7.833	2.46	13.833	10.08	19.83	2.21
1.917	1.35	7.917	2.46	13.917	10.08	19.92	2.21
2.000	1.35	8.000	2.46	14.000	10.08	20.00	2.21
2.083	1.60	8.083	3.32	14.083	3.69	20.08	1.47
2.167	1.60	8.167	3.32	14.167	3.69	20.17	1.47
2.250	1.60	8.250	3.32	14.250	3.69	20.25	1.47
2.333	1.60	8.333	3.32	14.333	3.69	20.33	1.47
2.417	1.60	8.417	3.32	14.417	3.69	20.42	1.47
2.500	1.60	8.500	3.32	14.500	3.69	20.50	1.47
2.583	1.60	8.583	3.32	14.583	3.69	20.58	1.47
2.667	1.60	8.667	3.32	14.667	3.69	20.67	1.47
2.750	1.60	8.750	3.32	14.750	3.69	20.75	1.47
2.833	1.60	8.833	3.32	14.833	3.69	20.83	1.47
2.917	1.60	8.917	3.32	14.917	3.69	20.92	1.47
3.000	1.60	9.000	3.32	15.000	3.69	21.00	1.47
3.083	1.60	9.083	3.93	15.083	3.69	21.08	1.47
3.167	1.60	9.167	3.93	15.167	3.69	21.17	1.47

3.250	1.60	9.250	3.93	15.250	3.69	21.25	1.47
3.333	1.60	9.333	3.93	15.333	3.69	21.33	1.47
3.417	1.60	9.417	3.93	15.417	3.69	21.42	1.47
3.500	1.60	9.500	3.93	15.500	3.69	21.50	1.47
3.583	1.60	9.583	4.42	15.583	3.69	21.58	1.47
3.667	1.60	9.667	4.42	15.667	3.69	21.67	1.47
3.750	1.60	9.750	4.42	15.750	3.69	21.75	1.47
3.833	1.60	9.833	4.42	15.833	3.69	21.83	1.47
3.917	1.60	9.917	4.42	15.917	3.69	21.92	1.47
4.000	1.60	10.000	4.42	16.000	3.69	22.00	1.47
4.083	1.97	10.083	5.65	16.083	2.21	22.08	1.47
4.167	1.97	10.167	5.65	16.167	2.21	22.17	1.47
4.250	1.97	10.250	5.65	16.250	2.21	22.25	1.47
4.333	1.97	10.333	5.65	16.333	2.21	22.33	1.47
4.417	1.97	10.417	5.65	16.417	2.21	22.42	1.47
4.500	1.97	10.500	5.65	16.500	2.21	22.50	1.47
4.583	1.97	10.583	7.62	16.583	2.21	22.58	1.47
4.667	1.97	10.667	7.62	16.667	2.21	22.67	1.47
4.750	1.97	10.750	7.62	16.750	2.21	22.75	1.47
4.833	1.97	10.833	7.62	16.833	2.21	22.83	1.47
4.917	1.97	10.917	7.62	16.917	2.21	22.92	1.47
5.000	1.97	11.000	7.62	17.000	2.21	23.00	1.47
5.083	1.97	11.083	11.80	17.083	2.21	23.08	1.47
5.167	1.97	11.167	11.80	17.167	2.21	23.17	1.47
5.250	1.97	11.250	11.80	17.250	2.21	23.25	1.47
5.333	1.97	11.333	11.80	17.333	2.21	23.33	1.47
5.417	1.97	11.417	11.80	17.417	2.21	23.42	1.47
5.500	1.97	11.500	11.80	17.500	2.21	23.50	1.47
5.583	1.97	11.583	51.13	17.583	2.21	23.58	1.47
5.667	1.97	11.667	51.13	17.667	2.21	23.67	1.47
5.750	1.97	11.750	93.40	17.750	2.21	23.75	1.47
5.833	1.97	11.833	93.40	17.833	2.21	23.83	1.47
5.917	1.97	11.917	135.67	17.917	2.21	23.92	1.47
6.000	1.97	12.000	135.68	18.000	2.21	24.00	1.47

Unit Hyd Qpeak (cms)= 0.199

PEAK FLOW (cms)= 0.362 (i)
TIME TO PEAK (hrs)= 13.667
RUNOFF VOLUME (mm)= 75.389
TOTAL RAINFALL (mm)= 122.887
RUNOFF COEFFICIENT = 0.613

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

CALIB	
STANDHYD (0107)	Area (ha)= 0.20
ID= 1 DT= 5.0 min	Total Imp(%)= 30.00 Dir. Conn.(%)= 30.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.06	0.14
Dep. Storage	(mm)=	1.00	6.40
Average Slope	(%)=	1.00	2.00
Length	(m)=	36.61	10.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.35	6.083	2.46	12.083	17.71	18.08	2.21
0.167	1.35	6.167	2.46	12.167	17.70	18.17	2.21
0.250	1.35	6.250	2.46	12.250	17.70	18.25	2.21
0.333	1.35	6.333	2.46	12.333	17.70	18.33	2.21
0.417	1.35	6.417	2.46	12.417	17.70	18.42	2.21
0.500	1.35	6.500	2.46	12.500	17.70	18.50	2.21
0.583	1.35	6.583	2.46	12.583	9.09	18.58	2.21
0.667	1.35	6.667	2.46	12.667	9.09	18.67	2.21
0.750	1.35	6.750	2.46	12.750	9.09	18.75	2.21
0.833	1.35	6.833	2.46	12.833	9.09	18.83	2.21
0.917	1.35	6.917	2.46	12.917	9.09	18.92	2.21
1.000	1.35	7.000	2.46	13.000	9.09	19.00	2.21
1.083	1.35	7.083	2.46	13.083	1.72	19.08	2.21
1.167	1.35	7.167	2.46	13.167	1.72	19.17	2.21
1.250	1.35	7.250	2.46	13.250	1.72	19.25	2.21
1.333	1.35	7.333	2.46	13.333	1.72	19.33	2.21
1.417	1.35	7.417	2.46	13.417	1.72	19.42	2.21
1.500	1.35	7.500	2.46	13.500	1.72	19.50	2.21
1.583	1.35	7.583	2.46	13.583	10.08	19.58	2.21
1.667	1.35	7.667	2.46	13.667	10.08	19.67	2.21
1.750	1.35	7.750	2.46	13.750	10.08	19.75	2.21
1.833	1.35	7.833	2.46	13.833	10.08	19.83	2.21
1.917	1.35	7.917	2.46	13.917	10.08	19.92	2.21
2.000	1.35	8.000	2.46	14.000	10.08	20.00	2.21
2.083	1.60	8.083	3.32	14.083	3.69	20.08	1.47
2.167	1.60	8.167	3.32	14.167	3.69	20.17	1.47
2.250	1.60	8.250	3.32	14.250	3.69	20.25	1.47
2.333	1.60	8.333	3.32	14.333	3.69	20.33	1.47
2.417	1.60	8.417	3.32	14.417	3.69	20.42	1.47
2.500	1.60	8.500	3.32	14.500	3.69	20.50	1.47
2.583	1.60	8.583	3.32	14.583	3.69	20.58	1.47
2.667	1.60	8.667	3.32	14.667	3.69	20.67	1.47
2.750	1.60	8.750	3.32	14.750	3.69	20.75	1.47
2.833	1.60	8.833	3.32	14.833	3.69	20.83	1.47
2.917	1.60	8.917	3.32	14.917	3.69	20.92	1.47
3.000	1.60	9.000	3.32	15.000	3.69	21.00	1.47
3.083	1.60	9.083	3.93	15.083	3.69	21.08	1.47
3.167	1.60	9.167	3.93	15.167	3.69	21.17	1.47

3.250	1.60	9.250	3.93	15.250	3.69	21.25	1.47
3.333	1.60	9.333	3.93	15.333	3.69	21.33	1.47
3.417	1.60	9.417	3.93	15.417	3.69	21.42	1.47
3.500	1.60	9.500	3.93	15.500	3.69	21.50	1.47
3.583	1.60	9.583	4.42	15.583	3.69	21.58	1.47
3.667	1.60	9.667	4.42	15.667	3.69	21.67	1.47
3.750	1.60	9.750	4.42	15.750	3.69	21.75	1.47
3.833	1.60	9.833	4.42	15.833	3.69	21.83	1.47
3.917	1.60	9.917	4.42	15.917	3.69	21.92	1.47
4.000	1.60	10.000	4.42	16.000	3.69	22.00	1.47
4.083	1.97	10.083	5.65	16.083	2.21	22.08	1.47
4.167	1.97	10.167	5.65	16.167	2.21	22.17	1.47
4.250	1.97	10.250	5.65	16.250	2.21	22.25	1.47
4.333	1.97	10.333	5.65	16.333	2.21	22.33	1.47
4.417	1.97	10.417	5.65	16.417	2.21	22.42	1.47
4.500	1.97	10.500	5.65	16.500	2.21	22.50	1.47
4.583	1.97	10.583	7.62	16.583	2.21	22.58	1.47
4.667	1.97	10.667	7.62	16.667	2.21	22.67	1.47
4.750	1.97	10.750	7.62	16.750	2.21	22.75	1.47
4.833	1.97	10.833	7.62	16.833	2.21	22.83	1.47
4.917	1.97	10.917	7.62	16.917	2.21	22.92	1.47
5.000	1.97	11.000	7.62	17.000	2.21	23.00	1.47
5.083	1.97	11.083	11.80	17.083	2.21	23.08	1.47
5.167	1.97	11.167	11.80	17.167	2.21	23.17	1.47
5.250	1.97	11.250	11.80	17.250	2.21	23.25	1.47
5.333	1.97	11.333	11.80	17.333	2.21	23.33	1.47
5.417	1.97	11.417	11.80	17.417	2.21	23.42	1.47
5.500	1.97	11.500	11.80	17.500	2.21	23.50	1.47
5.583	1.97	11.583	51.13	17.583	2.21	23.58	1.47
5.667	1.97	11.667	51.13	17.667	2.21	23.67	1.47
5.750	1.97	11.750	93.40	17.750	2.21	23.75	1.47
5.833	1.97	11.833	93.40	17.833	2.21	23.83	1.47
5.917	1.97	11.917	135.67	17.917	2.21	23.92	1.47
6.000	1.97	12.000	135.68	18.000	2.21	24.00	1.47

Max.Eff.Inten.(mm/hr)=	135.68	101.64	
over (min)	5.00	10.00	
Storage Coeff. (min)=	1.24 (ii)	5.05 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.33	0.16	
			TOTALS
PEAK FLOW (cms)=	0.02	0.03	0.057 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	121.89	75.39	89.33
TOTAL RAINFALL (mm)=	122.89	122.89	122.89
RUNOFF COEFFICIENT =	0.99	0.61	0.73

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)

(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0407)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0107):		0.20	0.057	12.00	89.33
+ ID2= 2 (5007):		8.87	0.362	13.67	75.39
ID = 3 (0407):		9.07	0.366	13.67	75.70

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (5001)	Area (ha)= 10.35	Curve Number (CN)= 82.0
ID= 1 DT= 5.0 min	Ia (mm)= 5.60	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 2.30	

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.35	6.083	2.46	12.083	17.71	18.08	2.21
0.167	1.35	6.167	2.46	12.167	17.70	18.17	2.21
0.250	1.35	6.250	2.46	12.250	17.70	18.25	2.21
0.333	1.35	6.333	2.46	12.333	17.70	18.33	2.21
0.417	1.35	6.417	2.46	12.417	17.70	18.42	2.21
0.500	1.35	6.500	2.46	12.500	17.70	18.50	2.21
0.583	1.35	6.583	2.46	12.583	9.09	18.58	2.21
0.667	1.35	6.667	2.46	12.667	9.09	18.67	2.21
0.750	1.35	6.750	2.46	12.750	9.09	18.75	2.21
0.833	1.35	6.833	2.46	12.833	9.09	18.83	2.21
0.917	1.35	6.917	2.46	12.917	9.09	18.92	2.21
1.000	1.35	7.000	2.46	13.000	9.09	19.00	2.21
1.083	1.35	7.083	2.46	13.083	1.72	19.08	2.21
1.167	1.35	7.167	2.46	13.167	1.72	19.17	2.21
1.250	1.35	7.250	2.46	13.250	1.72	19.25	2.21
1.333	1.35	7.333	2.46	13.333	1.72	19.33	2.21
1.417	1.35	7.417	2.46	13.417	1.72	19.42	2.21
1.500	1.35	7.500	2.46	13.500	1.72	19.50	2.21
1.583	1.35	7.583	2.46	13.583	10.08	19.58	2.21
1.667	1.35	7.667	2.46	13.667	10.08	19.67	2.21
1.750	1.35	7.750	2.46	13.750	10.08	19.75	2.21
1.833	1.35	7.833	2.46	13.833	10.08	19.83	2.21

1.917	1.35	7.917	2.46	13.917	10.08	19.92	2.21
2.000	1.35	8.000	2.46	14.000	10.08	20.00	2.21
2.083	1.60	8.083	3.32	14.083	3.69	20.08	1.47
2.167	1.60	8.167	3.32	14.167	3.69	20.17	1.47
2.250	1.60	8.250	3.32	14.250	3.69	20.25	1.47
2.333	1.60	8.333	3.32	14.333	3.69	20.33	1.47
2.417	1.60	8.417	3.32	14.417	3.69	20.42	1.47
2.500	1.60	8.500	3.32	14.500	3.69	20.50	1.47
2.583	1.60	8.583	3.32	14.583	3.69	20.58	1.47
2.667	1.60	8.667	3.32	14.667	3.69	20.67	1.47
2.750	1.60	8.750	3.32	14.750	3.69	20.75	1.47
2.833	1.60	8.833	3.32	14.833	3.69	20.83	1.47
2.917	1.60	8.917	3.32	14.917	3.69	20.92	1.47
3.000	1.60	9.000	3.32	15.000	3.69	21.00	1.47
3.083	1.60	9.083	3.93	15.083	3.69	21.08	1.47
3.167	1.60	9.167	3.93	15.167	3.69	21.17	1.47
3.250	1.60	9.250	3.93	15.250	3.69	21.25	1.47
3.333	1.60	9.333	3.93	15.333	3.69	21.33	1.47
3.417	1.60	9.417	3.93	15.417	3.69	21.42	1.47
3.500	1.60	9.500	3.93	15.500	3.69	21.50	1.47
3.583	1.60	9.583	4.42	15.583	3.69	21.58	1.47
3.667	1.60	9.667	4.42	15.667	3.69	21.67	1.47
3.750	1.60	9.750	4.42	15.750	3.69	21.75	1.47
3.833	1.60	9.833	4.42	15.833	3.69	21.83	1.47
3.917	1.60	9.917	4.42	15.917	3.69	21.92	1.47
4.000	1.60	10.000	4.42	16.000	3.69	22.00	1.47
4.083	1.97	10.083	5.65	16.083	2.21	22.08	1.47
4.167	1.97	10.167	5.65	16.167	2.21	22.17	1.47
4.250	1.97	10.250	5.65	16.250	2.21	22.25	1.47
4.333	1.97	10.333	5.65	16.333	2.21	22.33	1.47
4.417	1.97	10.417	5.65	16.417	2.21	22.42	1.47
4.500	1.97	10.500	5.65	16.500	2.21	22.50	1.47
4.583	1.97	10.583	7.62	16.583	2.21	22.58	1.47
4.667	1.97	10.667	7.62	16.667	2.21	22.67	1.47
4.750	1.97	10.750	7.62	16.750	2.21	22.75	1.47
4.833	1.97	10.833	7.62	16.833	2.21	22.83	1.47
4.917	1.97	10.917	7.62	16.917	2.21	22.92	1.47
5.000	1.97	11.000	7.62	17.000	2.21	23.00	1.47
5.083	1.97	11.083	11.80	17.083	2.21	23.08	1.47
5.167	1.97	11.167	11.80	17.167	2.21	23.17	1.47
5.250	1.97	11.250	11.80	17.250	2.21	23.25	1.47
5.333	1.97	11.333	11.80	17.333	2.21	23.33	1.47
5.417	1.97	11.417	11.80	17.417	2.21	23.42	1.47
5.500	1.97	11.500	11.80	17.500	2.21	23.50	1.47
5.583	1.97	11.583	51.13	17.583	2.21	23.58	1.47
5.667	1.97	11.667	51.13	17.667	2.21	23.67	1.47
5.750	1.97	11.750	93.40	17.750	2.21	23.75	1.47
5.833	1.97	11.833	93.40	17.833	2.21	23.83	1.47
5.917	1.97	11.917	135.67	17.917	2.21	23.92	1.47
6.000	1.97	12.000	135.68	18.000	2.21	24.00	1.47

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     Unit Hyd Qpeak  (cms)=   0.172

     PEAK FLOW       (cms)=   0.353 (i)
     TIME TO PEAK    (hrs)=  14.417
     RUNOFF VOLUME    (mm)=  79.495
     TOTAL RAINFALL   (mm)= 122.887
     RUNOFF COEFFICIENT   =   0.647

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

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0101)|   Area    (ha)=   0.74
|ID= 1 DT= 5.0 min |   Total Imp(%)=  30.00   Dir. Conn.(%)=  30.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.22         0.52
     Dep. Storage     (mm)=       1.00         5.60
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      70.24        10.00
     Mannings n             =     0.013        0.250

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


                          ---- TRANSFORMED HYETOGRAPH ----
      TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
       hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
     0.083    1.35 | 6.083    2.46 |12.083   17.71 | 18.08    2.21
     0.167    1.35 | 6.167    2.46 |12.167   17.70 | 18.17    2.21
     0.250    1.35 | 6.250    2.46 |12.250   17.70 | 18.25    2.21
     0.333    1.35 | 6.333    2.46 |12.333   17.70 | 18.33    2.21
     0.417    1.35 | 6.417    2.46 |12.417   17.70 | 18.42    2.21
     0.500    1.35 | 6.500    2.46 |12.500   17.70 | 18.50    2.21
     0.583    1.35 | 6.583    2.46 |12.583    9.09 | 18.58    2.21
     0.667    1.35 | 6.667    2.46 |12.667    9.09 | 18.67    2.21
     0.750    1.35 | 6.750    2.46 |12.750    9.09 | 18.75    2.21
     0.833    1.35 | 6.833    2.46 |12.833    9.09 | 18.83    2.21
     0.917    1.35 | 6.917    2.46 |12.917    9.09 | 18.92    2.21
     1.000    1.35 | 7.000    2.46 |13.000    9.09 | 19.00    2.21
     1.083    1.35 | 7.083    2.46 |13.083    1.72 | 19.08    2.21
     1.167    1.35 | 7.167    2.46 |13.167    1.72 | 19.17    2.21
     1.250    1.35 | 7.250    2.46 |13.250    1.72 | 19.25    2.21
     1.333    1.35 | 7.333    2.46 |13.333    1.72 | 19.33    2.21
     1.417    1.35 | 7.417    2.46 |13.417    1.72 | 19.42    2.21
     1.500    1.35 | 7.500    2.46 |13.500    1.72 | 19.50    2.21
     1.583    1.35 | 7.583    2.46 |13.583   10.08 | 19.58    2.21
     1.667    1.35 | 7.667    2.46 |13.667   10.08 | 19.67    2.21
     1.750    1.35 | 7.750    2.46 |13.750   10.08 | 19.75    2.21
     1.833    1.35 | 7.833    2.46 |13.833   10.08 | 19.83    2.21
```

1.917	1.35	7.917	2.46	13.917	10.08	19.92	2.21
2.000	1.35	8.000	2.46	14.000	10.08	20.00	2.21
2.083	1.60	8.083	3.32	14.083	3.69	20.08	1.47
2.167	1.60	8.167	3.32	14.167	3.69	20.17	1.47
2.250	1.60	8.250	3.32	14.250	3.69	20.25	1.47
2.333	1.60	8.333	3.32	14.333	3.69	20.33	1.47
2.417	1.60	8.417	3.32	14.417	3.69	20.42	1.47
2.500	1.60	8.500	3.32	14.500	3.69	20.50	1.47
2.583	1.60	8.583	3.32	14.583	3.69	20.58	1.47
2.667	1.60	8.667	3.32	14.667	3.69	20.67	1.47
2.750	1.60	8.750	3.32	14.750	3.69	20.75	1.47
2.833	1.60	8.833	3.32	14.833	3.69	20.83	1.47
2.917	1.60	8.917	3.32	14.917	3.69	20.92	1.47
3.000	1.60	9.000	3.32	15.000	3.69	21.00	1.47
3.083	1.60	9.083	3.93	15.083	3.69	21.08	1.47
3.167	1.60	9.167	3.93	15.167	3.69	21.17	1.47
3.250	1.60	9.250	3.93	15.250	3.69	21.25	1.47
3.333	1.60	9.333	3.93	15.333	3.69	21.33	1.47
3.417	1.60	9.417	3.93	15.417	3.69	21.42	1.47
3.500	1.60	9.500	3.93	15.500	3.69	21.50	1.47
3.583	1.60	9.583	4.42	15.583	3.69	21.58	1.47
3.667	1.60	9.667	4.42	15.667	3.69	21.67	1.47
3.750	1.60	9.750	4.42	15.750	3.69	21.75	1.47
3.833	1.60	9.833	4.42	15.833	3.69	21.83	1.47
3.917	1.60	9.917	4.42	15.917	3.69	21.92	1.47
4.000	1.60	10.000	4.42	16.000	3.69	22.00	1.47
4.083	1.97	10.083	5.65	16.083	2.21	22.08	1.47
4.167	1.97	10.167	5.65	16.167	2.21	22.17	1.47
4.250	1.97	10.250	5.65	16.250	2.21	22.25	1.47
4.333	1.97	10.333	5.65	16.333	2.21	22.33	1.47
4.417	1.97	10.417	5.65	16.417	2.21	22.42	1.47
4.500	1.97	10.500	5.65	16.500	2.21	22.50	1.47
4.583	1.97	10.583	7.62	16.583	2.21	22.58	1.47
4.667	1.97	10.667	7.62	16.667	2.21	22.67	1.47
4.750	1.97	10.750	7.62	16.750	2.21	22.75	1.47
4.833	1.97	10.833	7.62	16.833	2.21	22.83	1.47
4.917	1.97	10.917	7.62	16.917	2.21	22.92	1.47
5.000	1.97	11.000	7.62	17.000	2.21	23.00	1.47
5.083	1.97	11.083	11.80	17.083	2.21	23.08	1.47
5.167	1.97	11.167	11.80	17.167	2.21	23.17	1.47
5.250	1.97	11.250	11.80	17.250	2.21	23.25	1.47
5.333	1.97	11.333	11.80	17.333	2.21	23.33	1.47
5.417	1.97	11.417	11.80	17.417	2.21	23.42	1.47
5.500	1.97	11.500	11.80	17.500	2.21	23.50	1.47
5.583	1.97	11.583	51.13	17.583	2.21	23.58	1.47
5.667	1.97	11.667	51.13	17.667	2.21	23.67	1.47
5.750	1.97	11.750	93.40	17.750	2.21	23.75	1.47
5.833	1.97	11.833	93.40	17.833	2.21	23.83	1.47
5.917	1.97	11.917	135.67	17.917	2.21	23.92	1.47
6.000	1.97	12.000	135.68	18.000	2.21	24.00	1.47

Max.Eff.Inten.(mm/hr)=	135.68	106.29	
over (min)	5.00	10.00	
Storage Coeff. (min)=	1.83 (ii)	5.65 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.32	0.15	
			TOTALS
PEAK FLOW (cms)=	0.08	0.13	0.214 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	121.89	79.50	92.21
TOTAL RAINFALL (mm)=	122.89	122.89	122.89
RUNOFF COEFFICIENT =	0.99	0.65	0.75

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 82.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0401)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0101):		0.74	0.214	12.00	92.21
+ ID2= 2 (5001):		10.35	0.353	14.42	79.50
ID = 3 (0401):		11.09	0.364	14.00	80.34

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
NASHYD (5002)		Area (ha)=	22.38	Curve Number (CN)=	84.0
ID= 1 DT= 5.0 min		Ia (mm)=	4.80	# of Linear Res.(N)=	3.00
		U.H. Tp(hrs)=	1.30		

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.35	6.083	2.46	12.083	17.71	18.08	2.21
0.167	1.35	6.167	2.46	12.167	17.70	18.17	2.21
0.250	1.35	6.250	2.46	12.250	17.70	18.25	2.21
0.333	1.35	6.333	2.46	12.333	17.70	18.33	2.21
0.417	1.35	6.417	2.46	12.417	17.70	18.42	2.21
0.500	1.35	6.500	2.46	12.500	17.70	18.50	2.21

0.583	1.35	6.583	2.46	12.583	9.09	18.58	2.21
0.667	1.35	6.667	2.46	12.667	9.09	18.67	2.21
0.750	1.35	6.750	2.46	12.750	9.09	18.75	2.21
0.833	1.35	6.833	2.46	12.833	9.09	18.83	2.21
0.917	1.35	6.917	2.46	12.917	9.09	18.92	2.21
1.000	1.35	7.000	2.46	13.000	9.09	19.00	2.21
1.083	1.35	7.083	2.46	13.083	1.72	19.08	2.21
1.167	1.35	7.167	2.46	13.167	1.72	19.17	2.21
1.250	1.35	7.250	2.46	13.250	1.72	19.25	2.21
1.333	1.35	7.333	2.46	13.333	1.72	19.33	2.21
1.417	1.35	7.417	2.46	13.417	1.72	19.42	2.21
1.500	1.35	7.500	2.46	13.500	1.72	19.50	2.21
1.583	1.35	7.583	2.46	13.583	10.08	19.58	2.21
1.667	1.35	7.667	2.46	13.667	10.08	19.67	2.21
1.750	1.35	7.750	2.46	13.750	10.08	19.75	2.21
1.833	1.35	7.833	2.46	13.833	10.08	19.83	2.21
1.917	1.35	7.917	2.46	13.917	10.08	19.92	2.21
2.000	1.35	8.000	2.46	14.000	10.08	20.00	2.21
2.083	1.60	8.083	3.32	14.083	3.69	20.08	1.47
2.167	1.60	8.167	3.32	14.167	3.69	20.17	1.47
2.250	1.60	8.250	3.32	14.250	3.69	20.25	1.47
2.333	1.60	8.333	3.32	14.333	3.69	20.33	1.47
2.417	1.60	8.417	3.32	14.417	3.69	20.42	1.47
2.500	1.60	8.500	3.32	14.500	3.69	20.50	1.47
2.583	1.60	8.583	3.32	14.583	3.69	20.58	1.47
2.667	1.60	8.667	3.32	14.667	3.69	20.67	1.47
2.750	1.60	8.750	3.32	14.750	3.69	20.75	1.47
2.833	1.60	8.833	3.32	14.833	3.69	20.83	1.47
2.917	1.60	8.917	3.32	14.917	3.69	20.92	1.47
3.000	1.60	9.000	3.32	15.000	3.69	21.00	1.47
3.083	1.60	9.083	3.93	15.083	3.69	21.08	1.47
3.167	1.60	9.167	3.93	15.167	3.69	21.17	1.47
3.250	1.60	9.250	3.93	15.250	3.69	21.25	1.47
3.333	1.60	9.333	3.93	15.333	3.69	21.33	1.47
3.417	1.60	9.417	3.93	15.417	3.69	21.42	1.47
3.500	1.60	9.500	3.93	15.500	3.69	21.50	1.47
3.583	1.60	9.583	4.42	15.583	3.69	21.58	1.47
3.667	1.60	9.667	4.42	15.667	3.69	21.67	1.47
3.750	1.60	9.750	4.42	15.750	3.69	21.75	1.47
3.833	1.60	9.833	4.42	15.833	3.69	21.83	1.47
3.917	1.60	9.917	4.42	15.917	3.69	21.92	1.47
4.000	1.60	10.000	4.42	16.000	3.69	22.00	1.47
4.083	1.97	10.083	5.65	16.083	2.21	22.08	1.47
4.167	1.97	10.167	5.65	16.167	2.21	22.17	1.47
4.250	1.97	10.250	5.65	16.250	2.21	22.25	1.47
4.333	1.97	10.333	5.65	16.333	2.21	22.33	1.47
4.417	1.97	10.417	5.65	16.417	2.21	22.42	1.47
4.500	1.97	10.500	5.65	16.500	2.21	22.50	1.47
4.583	1.97	10.583	7.62	16.583	2.21	22.58	1.47
4.667	1.97	10.667	7.62	16.667	2.21	22.67	1.47
4.750	1.97	10.750	7.62	16.750	2.21	22.75	1.47

4.833	1.97	10.833	7.62	16.833	2.21	22.83	1.47
4.917	1.97	10.917	7.62	16.917	2.21	22.92	1.47
5.000	1.97	11.000	7.62	17.000	2.21	23.00	1.47
5.083	1.97	11.083	11.80	17.083	2.21	23.08	1.47
5.167	1.97	11.167	11.80	17.167	2.21	23.17	1.47
5.250	1.97	11.250	11.80	17.250	2.21	23.25	1.47
5.333	1.97	11.333	11.80	17.333	2.21	23.33	1.47
5.417	1.97	11.417	11.80	17.417	2.21	23.42	1.47
5.500	1.97	11.500	11.80	17.500	2.21	23.50	1.47
5.583	1.97	11.583	51.13	17.583	2.21	23.58	1.47
5.667	1.97	11.667	51.13	17.667	2.21	23.67	1.47
5.750	1.97	11.750	93.40	17.750	2.21	23.75	1.47
5.833	1.97	11.833	93.40	17.833	2.21	23.83	1.47
5.917	1.97	11.917	135.67	17.917	2.21	23.92	1.47
6.000	1.97	12.000	135.68	18.000	2.21	24.00	1.47

Unit Hyd Qpeak (cms)= 0.658

PEAK FLOW (cms)= 1.265 (i)
TIME TO PEAK (hrs)= 13.250
RUNOFF VOLUME (mm)= 83.767
TOTAL RAINFALL (mm)= 122.887
RUNOFF COEFFICIENT = 0.682

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

CALIB STANDHYD (0102)	Area (ha)= 0.35
ID= 1 DT= 5.0 min	Total Imp(%)= 40.00 Dir. Conn.(%)= 40.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.14	0.21
Dep. Storage	(mm)=	1.00	4.80
Average Slope	(%)=	1.00	2.00
Length	(m)=	48.03	10.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.35	6.083	2.46	12.083	17.71	18.08	2.21
0.167	1.35	6.167	2.46	12.167	17.70	18.17	2.21
0.250	1.35	6.250	2.46	12.250	17.70	18.25	2.21
0.333	1.35	6.333	2.46	12.333	17.70	18.33	2.21
0.417	1.35	6.417	2.46	12.417	17.70	18.42	2.21
0.500	1.35	6.500	2.46	12.500	17.70	18.50	2.21

0.583	1.35	6.583	2.46	12.583	9.09	18.58	2.21
0.667	1.35	6.667	2.46	12.667	9.09	18.67	2.21
0.750	1.35	6.750	2.46	12.750	9.09	18.75	2.21
0.833	1.35	6.833	2.46	12.833	9.09	18.83	2.21
0.917	1.35	6.917	2.46	12.917	9.09	18.92	2.21
1.000	1.35	7.000	2.46	13.000	9.09	19.00	2.21
1.083	1.35	7.083	2.46	13.083	1.72	19.08	2.21
1.167	1.35	7.167	2.46	13.167	1.72	19.17	2.21
1.250	1.35	7.250	2.46	13.250	1.72	19.25	2.21
1.333	1.35	7.333	2.46	13.333	1.72	19.33	2.21
1.417	1.35	7.417	2.46	13.417	1.72	19.42	2.21
1.500	1.35	7.500	2.46	13.500	1.72	19.50	2.21
1.583	1.35	7.583	2.46	13.583	10.08	19.58	2.21
1.667	1.35	7.667	2.46	13.667	10.08	19.67	2.21
1.750	1.35	7.750	2.46	13.750	10.08	19.75	2.21
1.833	1.35	7.833	2.46	13.833	10.08	19.83	2.21
1.917	1.35	7.917	2.46	13.917	10.08	19.92	2.21
2.000	1.35	8.000	2.46	14.000	10.08	20.00	2.21
2.083	1.60	8.083	3.32	14.083	3.69	20.08	1.47
2.167	1.60	8.167	3.32	14.167	3.69	20.17	1.47
2.250	1.60	8.250	3.32	14.250	3.69	20.25	1.47
2.333	1.60	8.333	3.32	14.333	3.69	20.33	1.47
2.417	1.60	8.417	3.32	14.417	3.69	20.42	1.47
2.500	1.60	8.500	3.32	14.500	3.69	20.50	1.47
2.583	1.60	8.583	3.32	14.583	3.69	20.58	1.47
2.667	1.60	8.667	3.32	14.667	3.69	20.67	1.47
2.750	1.60	8.750	3.32	14.750	3.69	20.75	1.47
2.833	1.60	8.833	3.32	14.833	3.69	20.83	1.47
2.917	1.60	8.917	3.32	14.917	3.69	20.92	1.47
3.000	1.60	9.000	3.32	15.000	3.69	21.00	1.47
3.083	1.60	9.083	3.93	15.083	3.69	21.08	1.47
3.167	1.60	9.167	3.93	15.167	3.69	21.17	1.47
3.250	1.60	9.250	3.93	15.250	3.69	21.25	1.47
3.333	1.60	9.333	3.93	15.333	3.69	21.33	1.47
3.417	1.60	9.417	3.93	15.417	3.69	21.42	1.47
3.500	1.60	9.500	3.93	15.500	3.69	21.50	1.47
3.583	1.60	9.583	4.42	15.583	3.69	21.58	1.47
3.667	1.60	9.667	4.42	15.667	3.69	21.67	1.47
3.750	1.60	9.750	4.42	15.750	3.69	21.75	1.47
3.833	1.60	9.833	4.42	15.833	3.69	21.83	1.47
3.917	1.60	9.917	4.42	15.917	3.69	21.92	1.47
4.000	1.60	10.000	4.42	16.000	3.69	22.00	1.47
4.083	1.97	10.083	5.65	16.083	2.21	22.08	1.47
4.167	1.97	10.167	5.65	16.167	2.21	22.17	1.47
4.250	1.97	10.250	5.65	16.250	2.21	22.25	1.47
4.333	1.97	10.333	5.65	16.333	2.21	22.33	1.47
4.417	1.97	10.417	5.65	16.417	2.21	22.42	1.47
4.500	1.97	10.500	5.65	16.500	2.21	22.50	1.47
4.583	1.97	10.583	7.62	16.583	2.21	22.58	1.47
4.667	1.97	10.667	7.62	16.667	2.21	22.67	1.47
4.750	1.97	10.750	7.62	16.750	2.21	22.75	1.47

4.833	1.97	10.833	7.62	16.833	2.21	22.83	1.47
4.917	1.97	10.917	7.62	16.917	2.21	22.92	1.47
5.000	1.97	11.000	7.62	17.000	2.21	23.00	1.47
5.083	1.97	11.083	11.80	17.083	2.21	23.08	1.47
5.167	1.97	11.167	11.80	17.167	2.21	23.17	1.47
5.250	1.97	11.250	11.80	17.250	2.21	23.25	1.47
5.333	1.97	11.333	11.80	17.333	2.21	23.33	1.47
5.417	1.97	11.417	11.80	17.417	2.21	23.42	1.47
5.500	1.97	11.500	11.80	17.500	2.21	23.50	1.47
5.583	1.97	11.583	51.13	17.583	2.21	23.58	1.47
5.667	1.97	11.667	51.13	17.667	2.21	23.67	1.47
5.750	1.97	11.750	93.40	17.750	2.21	23.75	1.47
5.833	1.97	11.833	93.40	17.833	2.21	23.83	1.47
5.917	1.97	11.917	135.67	17.917	2.21	23.92	1.47
6.000	1.97	12.000	135.68	18.000	2.21	24.00	1.47

Max.Eff.Inten.(mm/hr)=	135.68	110.89	
over (min)	5.00	5.00	
Storage Coeff. (min)=	1.46 (ii)	4.65 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.33	0.22	
			TOTALS
PEAK FLOW (cms)=	0.05	0.06	0.114 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	121.89	83.77	99.00
TOTAL RAINFALL (mm)=	122.89	122.89	122.89
RUNOFF COEFFICIENT =	0.99	0.68	0.81

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 84.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0402)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0102):		0.35	0.114	12.00	99.00
+ ID2= 2 (5002):		22.38	1.265	13.25	83.77
ID = 3 (0402):		22.73	1.267	13.25	84.00

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB

| NASHYD (5003)| Area (ha)= 17.51 Curve Number (CN)= 84.0
|ID= 1 DT= 5.0 min | Ia (mm)= 4.80 # of Linear Res.(N)= 3.00
--- U.H. Tp(hrs)= 1.30

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.35	6.083	2.46	12.083	17.71	18.08	2.21
0.167	1.35	6.167	2.46	12.167	17.70	18.17	2.21
0.250	1.35	6.250	2.46	12.250	17.70	18.25	2.21
0.333	1.35	6.333	2.46	12.333	17.70	18.33	2.21
0.417	1.35	6.417	2.46	12.417	17.70	18.42	2.21
0.500	1.35	6.500	2.46	12.500	17.70	18.50	2.21
0.583	1.35	6.583	2.46	12.583	9.09	18.58	2.21
0.667	1.35	6.667	2.46	12.667	9.09	18.67	2.21
0.750	1.35	6.750	2.46	12.750	9.09	18.75	2.21
0.833	1.35	6.833	2.46	12.833	9.09	18.83	2.21
0.917	1.35	6.917	2.46	12.917	9.09	18.92	2.21
1.000	1.35	7.000	2.46	13.000	9.09	19.00	2.21
1.083	1.35	7.083	2.46	13.083	1.72	19.08	2.21
1.167	1.35	7.167	2.46	13.167	1.72	19.17	2.21
1.250	1.35	7.250	2.46	13.250	1.72	19.25	2.21
1.333	1.35	7.333	2.46	13.333	1.72	19.33	2.21
1.417	1.35	7.417	2.46	13.417	1.72	19.42	2.21
1.500	1.35	7.500	2.46	13.500	1.72	19.50	2.21
1.583	1.35	7.583	2.46	13.583	10.08	19.58	2.21
1.667	1.35	7.667	2.46	13.667	10.08	19.67	2.21
1.750	1.35	7.750	2.46	13.750	10.08	19.75	2.21
1.833	1.35	7.833	2.46	13.833	10.08	19.83	2.21
1.917	1.35	7.917	2.46	13.917	10.08	19.92	2.21
2.000	1.35	8.000	2.46	14.000	10.08	20.00	2.21
2.083	1.60	8.083	3.32	14.083	3.69	20.08	1.47
2.167	1.60	8.167	3.32	14.167	3.69	20.17	1.47
2.250	1.60	8.250	3.32	14.250	3.69	20.25	1.47
2.333	1.60	8.333	3.32	14.333	3.69	20.33	1.47
2.417	1.60	8.417	3.32	14.417	3.69	20.42	1.47
2.500	1.60	8.500	3.32	14.500	3.69	20.50	1.47
2.583	1.60	8.583	3.32	14.583	3.69	20.58	1.47
2.667	1.60	8.667	3.32	14.667	3.69	20.67	1.47
2.750	1.60	8.750	3.32	14.750	3.69	20.75	1.47
2.833	1.60	8.833	3.32	14.833	3.69	20.83	1.47
2.917	1.60	8.917	3.32	14.917	3.69	20.92	1.47
3.000	1.60	9.000	3.32	15.000	3.69	21.00	1.47
3.083	1.60	9.083	3.93	15.083	3.69	21.08	1.47
3.167	1.60	9.167	3.93	15.167	3.69	21.17	1.47
3.250	1.60	9.250	3.93	15.250	3.69	21.25	1.47
3.333	1.60	9.333	3.93	15.333	3.69	21.33	1.47
3.417	1.60	9.417	3.93	15.417	3.69	21.42	1.47

3.500	1.60	9.500	3.93	15.500	3.69	21.50	1.47
3.583	1.60	9.583	4.42	15.583	3.69	21.58	1.47
3.667	1.60	9.667	4.42	15.667	3.69	21.67	1.47
3.750	1.60	9.750	4.42	15.750	3.69	21.75	1.47
3.833	1.60	9.833	4.42	15.833	3.69	21.83	1.47
3.917	1.60	9.917	4.42	15.917	3.69	21.92	1.47
4.000	1.60	10.000	4.42	16.000	3.69	22.00	1.47
4.083	1.97	10.083	5.65	16.083	2.21	22.08	1.47
4.167	1.97	10.167	5.65	16.167	2.21	22.17	1.47
4.250	1.97	10.250	5.65	16.250	2.21	22.25	1.47
4.333	1.97	10.333	5.65	16.333	2.21	22.33	1.47
4.417	1.97	10.417	5.65	16.417	2.21	22.42	1.47
4.500	1.97	10.500	5.65	16.500	2.21	22.50	1.47
4.583	1.97	10.583	7.62	16.583	2.21	22.58	1.47
4.667	1.97	10.667	7.62	16.667	2.21	22.67	1.47
4.750	1.97	10.750	7.62	16.750	2.21	22.75	1.47
4.833	1.97	10.833	7.62	16.833	2.21	22.83	1.47
4.917	1.97	10.917	7.62	16.917	2.21	22.92	1.47
5.000	1.97	11.000	7.62	17.000	2.21	23.00	1.47
5.083	1.97	11.083	11.80	17.083	2.21	23.08	1.47
5.167	1.97	11.167	11.80	17.167	2.21	23.17	1.47
5.250	1.97	11.250	11.80	17.250	2.21	23.25	1.47
5.333	1.97	11.333	11.80	17.333	2.21	23.33	1.47
5.417	1.97	11.417	11.80	17.417	2.21	23.42	1.47
5.500	1.97	11.500	11.80	17.500	2.21	23.50	1.47
5.583	1.97	11.583	51.13	17.583	2.21	23.58	1.47
5.667	1.97	11.667	51.13	17.667	2.21	23.67	1.47
5.750	1.97	11.750	93.40	17.750	2.21	23.75	1.47
5.833	1.97	11.833	93.40	17.833	2.21	23.83	1.47
5.917	1.97	11.917	135.67	17.917	2.21	23.92	1.47
6.000	1.97	12.000	135.68	18.000	2.21	24.00	1.47

Unit Hyd Qpeak (cms)= 0.514

PEAK FLOW (cms)= 0.990 (i)
TIME TO PEAK (hrs)= 13.250
RUNOFF VOLUME (mm)= 83.767
TOTAL RAINFALL (mm)= 122.887
RUNOFF COEFFICIENT = 0.682

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

CALIB	
STANDHYD (0103)	Area (ha)= 0.22
ID= 1 DT= 5.0 min	Total Imp(%)= 40.00 Dir. Conn.(%)= 40.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.09	0.13
Dep. Storage	(mm)=	1.00	4.80

Average Slope	(%)=	1.00	2.00
Length	(m)=	38.47	10.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.35	6.083	2.46	12.083	17.71	18.08	2.21
0.167	1.35	6.167	2.46	12.167	17.70	18.17	2.21
0.250	1.35	6.250	2.46	12.250	17.70	18.25	2.21
0.333	1.35	6.333	2.46	12.333	17.70	18.33	2.21
0.417	1.35	6.417	2.46	12.417	17.70	18.42	2.21
0.500	1.35	6.500	2.46	12.500	17.70	18.50	2.21
0.583	1.35	6.583	2.46	12.583	9.09	18.58	2.21
0.667	1.35	6.667	2.46	12.667	9.09	18.67	2.21
0.750	1.35	6.750	2.46	12.750	9.09	18.75	2.21
0.833	1.35	6.833	2.46	12.833	9.09	18.83	2.21
0.917	1.35	6.917	2.46	12.917	9.09	18.92	2.21
1.000	1.35	7.000	2.46	13.000	9.09	19.00	2.21
1.083	1.35	7.083	2.46	13.083	1.72	19.08	2.21
1.167	1.35	7.167	2.46	13.167	1.72	19.17	2.21
1.250	1.35	7.250	2.46	13.250	1.72	19.25	2.21
1.333	1.35	7.333	2.46	13.333	1.72	19.33	2.21
1.417	1.35	7.417	2.46	13.417	1.72	19.42	2.21
1.500	1.35	7.500	2.46	13.500	1.72	19.50	2.21
1.583	1.35	7.583	2.46	13.583	10.08	19.58	2.21
1.667	1.35	7.667	2.46	13.667	10.08	19.67	2.21
1.750	1.35	7.750	2.46	13.750	10.08	19.75	2.21
1.833	1.35	7.833	2.46	13.833	10.08	19.83	2.21
1.917	1.35	7.917	2.46	13.917	10.08	19.92	2.21
2.000	1.35	8.000	2.46	14.000	10.08	20.00	2.21
2.083	1.60	8.083	3.32	14.083	3.69	20.08	1.47
2.167	1.60	8.167	3.32	14.167	3.69	20.17	1.47
2.250	1.60	8.250	3.32	14.250	3.69	20.25	1.47
2.333	1.60	8.333	3.32	14.333	3.69	20.33	1.47
2.417	1.60	8.417	3.32	14.417	3.69	20.42	1.47
2.500	1.60	8.500	3.32	14.500	3.69	20.50	1.47
2.583	1.60	8.583	3.32	14.583	3.69	20.58	1.47
2.667	1.60	8.667	3.32	14.667	3.69	20.67	1.47
2.750	1.60	8.750	3.32	14.750	3.69	20.75	1.47
2.833	1.60	8.833	3.32	14.833	3.69	20.83	1.47
2.917	1.60	8.917	3.32	14.917	3.69	20.92	1.47
3.000	1.60	9.000	3.32	15.000	3.69	21.00	1.47
3.083	1.60	9.083	3.93	15.083	3.69	21.08	1.47
3.167	1.60	9.167	3.93	15.167	3.69	21.17	1.47
3.250	1.60	9.250	3.93	15.250	3.69	21.25	1.47
3.333	1.60	9.333	3.93	15.333	3.69	21.33	1.47
3.417	1.60	9.417	3.93	15.417	3.69	21.42	1.47

3.500	1.60	9.500	3.93	15.500	3.69	21.50	1.47
3.583	1.60	9.583	4.42	15.583	3.69	21.58	1.47
3.667	1.60	9.667	4.42	15.667	3.69	21.67	1.47
3.750	1.60	9.750	4.42	15.750	3.69	21.75	1.47
3.833	1.60	9.833	4.42	15.833	3.69	21.83	1.47
3.917	1.60	9.917	4.42	15.917	3.69	21.92	1.47
4.000	1.60	10.000	4.42	16.000	3.69	22.00	1.47
4.083	1.97	10.083	5.65	16.083	2.21	22.08	1.47
4.167	1.97	10.167	5.65	16.167	2.21	22.17	1.47
4.250	1.97	10.250	5.65	16.250	2.21	22.25	1.47
4.333	1.97	10.333	5.65	16.333	2.21	22.33	1.47
4.417	1.97	10.417	5.65	16.417	2.21	22.42	1.47
4.500	1.97	10.500	5.65	16.500	2.21	22.50	1.47
4.583	1.97	10.583	7.62	16.583	2.21	22.58	1.47
4.667	1.97	10.667	7.62	16.667	2.21	22.67	1.47
4.750	1.97	10.750	7.62	16.750	2.21	22.75	1.47
4.833	1.97	10.833	7.62	16.833	2.21	22.83	1.47
4.917	1.97	10.917	7.62	16.917	2.21	22.92	1.47
5.000	1.97	11.000	7.62	17.000	2.21	23.00	1.47
5.083	1.97	11.083	11.80	17.083	2.21	23.08	1.47
5.167	1.97	11.167	11.80	17.167	2.21	23.17	1.47
5.250	1.97	11.250	11.80	17.250	2.21	23.25	1.47
5.333	1.97	11.333	11.80	17.333	2.21	23.33	1.47
5.417	1.97	11.417	11.80	17.417	2.21	23.42	1.47
5.500	1.97	11.500	11.80	17.500	2.21	23.50	1.47
5.583	1.97	11.583	51.13	17.583	2.21	23.58	1.47
5.667	1.97	11.667	51.13	17.667	2.21	23.67	1.47
5.750	1.97	11.750	93.40	17.750	2.21	23.75	1.47
5.833	1.97	11.833	93.40	17.833	2.21	23.83	1.47
5.917	1.97	11.917	135.67	17.917	2.21	23.92	1.47
6.000	1.97	12.000	135.68	18.000	2.21	24.00	1.47

Max.Eff.Inten.(mm/hr)=	135.68	110.89	
over (min)	5.00	5.00	
Storage Coeff. (min)=	1.27 (ii)	4.47 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.33	0.23	
			TOTALS
PEAK FLOW (cms)=	0.03	0.04	0.073 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	121.89	83.77	99.00
TOTAL RAINFALL (mm)=	122.89	122.89	122.89
RUNOFF COEFFICIENT =	0.99	0.68	0.81

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 84.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| ADD HYD  (  0403)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0103):     0.22   0.073    12.00    99.00
      + ID2= 2 (  5003):    17.51   0.990    13.25    83.77
        ================================================
        ID = 3 (  0403):    17.73   0.991    13.25    83.96

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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| CALIB            |
| NASHYD   (  5005)|   Area    (ha)=  22.48   Curve Number   (CN)= 80.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   6.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.70

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

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.35	6.083	2.46	12.083	17.71	18.08	2.21
0.167	1.35	6.167	2.46	12.167	17.70	18.17	2.21
0.250	1.35	6.250	2.46	12.250	17.70	18.25	2.21
0.333	1.35	6.333	2.46	12.333	17.70	18.33	2.21
0.417	1.35	6.417	2.46	12.417	17.70	18.42	2.21
0.500	1.35	6.500	2.46	12.500	17.70	18.50	2.21
0.583	1.35	6.583	2.46	12.583	9.09	18.58	2.21
0.667	1.35	6.667	2.46	12.667	9.09	18.67	2.21
0.750	1.35	6.750	2.46	12.750	9.09	18.75	2.21
0.833	1.35	6.833	2.46	12.833	9.09	18.83	2.21
0.917	1.35	6.917	2.46	12.917	9.09	18.92	2.21
1.000	1.35	7.000	2.46	13.000	9.09	19.00	2.21
1.083	1.35	7.083	2.46	13.083	1.72	19.08	2.21
1.167	1.35	7.167	2.46	13.167	1.72	19.17	2.21
1.250	1.35	7.250	2.46	13.250	1.72	19.25	2.21
1.333	1.35	7.333	2.46	13.333	1.72	19.33	2.21
1.417	1.35	7.417	2.46	13.417	1.72	19.42	2.21
1.500	1.35	7.500	2.46	13.500	1.72	19.50	2.21
1.583	1.35	7.583	2.46	13.583	10.08	19.58	2.21
1.667	1.35	7.667	2.46	13.667	10.08	19.67	2.21
1.750	1.35	7.750	2.46	13.750	10.08	19.75	2.21
1.833	1.35	7.833	2.46	13.833	10.08	19.83	2.21
1.917	1.35	7.917	2.46	13.917	10.08	19.92	2.21
2.000	1.35	8.000	2.46	14.000	10.08	20.00	2.21
2.083	1.60	8.083	3.32	14.083	3.69	20.08	1.47

2.167	1.60	8.167	3.32	14.167	3.69	20.17	1.47
2.250	1.60	8.250	3.32	14.250	3.69	20.25	1.47
2.333	1.60	8.333	3.32	14.333	3.69	20.33	1.47
2.417	1.60	8.417	3.32	14.417	3.69	20.42	1.47
2.500	1.60	8.500	3.32	14.500	3.69	20.50	1.47
2.583	1.60	8.583	3.32	14.583	3.69	20.58	1.47
2.667	1.60	8.667	3.32	14.667	3.69	20.67	1.47
2.750	1.60	8.750	3.32	14.750	3.69	20.75	1.47
2.833	1.60	8.833	3.32	14.833	3.69	20.83	1.47
2.917	1.60	8.917	3.32	14.917	3.69	20.92	1.47
3.000	1.60	9.000	3.32	15.000	3.69	21.00	1.47
3.083	1.60	9.083	3.93	15.083	3.69	21.08	1.47
3.167	1.60	9.167	3.93	15.167	3.69	21.17	1.47
3.250	1.60	9.250	3.93	15.250	3.69	21.25	1.47
3.333	1.60	9.333	3.93	15.333	3.69	21.33	1.47
3.417	1.60	9.417	3.93	15.417	3.69	21.42	1.47
3.500	1.60	9.500	3.93	15.500	3.69	21.50	1.47
3.583	1.60	9.583	4.42	15.583	3.69	21.58	1.47
3.667	1.60	9.667	4.42	15.667	3.69	21.67	1.47
3.750	1.60	9.750	4.42	15.750	3.69	21.75	1.47
3.833	1.60	9.833	4.42	15.833	3.69	21.83	1.47
3.917	1.60	9.917	4.42	15.917	3.69	21.92	1.47
4.000	1.60	10.000	4.42	16.000	3.69	22.00	1.47
4.083	1.97	10.083	5.65	16.083	2.21	22.08	1.47
4.167	1.97	10.167	5.65	16.167	2.21	22.17	1.47
4.250	1.97	10.250	5.65	16.250	2.21	22.25	1.47
4.333	1.97	10.333	5.65	16.333	2.21	22.33	1.47
4.417	1.97	10.417	5.65	16.417	2.21	22.42	1.47
4.500	1.97	10.500	5.65	16.500	2.21	22.50	1.47
4.583	1.97	10.583	7.62	16.583	2.21	22.58	1.47
4.667	1.97	10.667	7.62	16.667	2.21	22.67	1.47
4.750	1.97	10.750	7.62	16.750	2.21	22.75	1.47
4.833	1.97	10.833	7.62	16.833	2.21	22.83	1.47
4.917	1.97	10.917	7.62	16.917	2.21	22.92	1.47
5.000	1.97	11.000	7.62	17.000	2.21	23.00	1.47
5.083	1.97	11.083	11.80	17.083	2.21	23.08	1.47
5.167	1.97	11.167	11.80	17.167	2.21	23.17	1.47
5.250	1.97	11.250	11.80	17.250	2.21	23.25	1.47
5.333	1.97	11.333	11.80	17.333	2.21	23.33	1.47
5.417	1.97	11.417	11.80	17.417	2.21	23.42	1.47
5.500	1.97	11.500	11.80	17.500	2.21	23.50	1.47
5.583	1.97	11.583	51.13	17.583	2.21	23.58	1.47
5.667	1.97	11.667	51.13	17.667	2.21	23.67	1.47
5.750	1.97	11.750	93.40	17.750	2.21	23.75	1.47
5.833	1.97	11.833	93.40	17.833	2.21	23.83	1.47
5.917	1.97	11.917	135.67	17.917	2.21	23.92	1.47
6.000	1.97	12.000	135.68	18.000	2.21	24.00	1.47

Unit Hyd Qpeak (cms)= 0.505

PEAK FLOW (cms)= 0.917 (i)

TIME TO PEAK (hrs)= 13.667
RUNOFF VOLUME (mm)= 75.390
TOTAL RAINFALL (mm)= 122.887
RUNOFF COEFFICIENT = 0.613

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

CALIB	
STANDHYD (0105)	Area (ha)= 0.70
ID= 1 DT= 5.0 min	Total Imp(%)= 35.00 Dir. Conn.(%)= 35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.24	0.45
Dep. Storage	(mm)=	1.00	6.40
Average Slope	(%)=	1.00	2.00
Length	(m)=	68.12	10.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.35	6.083	2.46	12.083	17.71	18.08	2.21
0.167	1.35	6.167	2.46	12.167	17.70	18.17	2.21
0.250	1.35	6.250	2.46	12.250	17.70	18.25	2.21
0.333	1.35	6.333	2.46	12.333	17.70	18.33	2.21
0.417	1.35	6.417	2.46	12.417	17.70	18.42	2.21
0.500	1.35	6.500	2.46	12.500	17.70	18.50	2.21
0.583	1.35	6.583	2.46	12.583	9.09	18.58	2.21
0.667	1.35	6.667	2.46	12.667	9.09	18.67	2.21
0.750	1.35	6.750	2.46	12.750	9.09	18.75	2.21
0.833	1.35	6.833	2.46	12.833	9.09	18.83	2.21
0.917	1.35	6.917	2.46	12.917	9.09	18.92	2.21
1.000	1.35	7.000	2.46	13.000	9.09	19.00	2.21
1.083	1.35	7.083	2.46	13.083	1.72	19.08	2.21
1.167	1.35	7.167	2.46	13.167	1.72	19.17	2.21
1.250	1.35	7.250	2.46	13.250	1.72	19.25	2.21
1.333	1.35	7.333	2.46	13.333	1.72	19.33	2.21
1.417	1.35	7.417	2.46	13.417	1.72	19.42	2.21
1.500	1.35	7.500	2.46	13.500	1.72	19.50	2.21
1.583	1.35	7.583	2.46	13.583	10.08	19.58	2.21
1.667	1.35	7.667	2.46	13.667	10.08	19.67	2.21
1.750	1.35	7.750	2.46	13.750	10.08	19.75	2.21
1.833	1.35	7.833	2.46	13.833	10.08	19.83	2.21
1.917	1.35	7.917	2.46	13.917	10.08	19.92	2.21
2.000	1.35	8.000	2.46	14.000	10.08	20.00	2.21
2.083	1.60	8.083	3.32	14.083	3.69	20.08	1.47

2.167	1.60	8.167	3.32	14.167	3.69	20.17	1.47
2.250	1.60	8.250	3.32	14.250	3.69	20.25	1.47
2.333	1.60	8.333	3.32	14.333	3.69	20.33	1.47
2.417	1.60	8.417	3.32	14.417	3.69	20.42	1.47
2.500	1.60	8.500	3.32	14.500	3.69	20.50	1.47
2.583	1.60	8.583	3.32	14.583	3.69	20.58	1.47
2.667	1.60	8.667	3.32	14.667	3.69	20.67	1.47
2.750	1.60	8.750	3.32	14.750	3.69	20.75	1.47
2.833	1.60	8.833	3.32	14.833	3.69	20.83	1.47
2.917	1.60	8.917	3.32	14.917	3.69	20.92	1.47
3.000	1.60	9.000	3.32	15.000	3.69	21.00	1.47
3.083	1.60	9.083	3.93	15.083	3.69	21.08	1.47
3.167	1.60	9.167	3.93	15.167	3.69	21.17	1.47
3.250	1.60	9.250	3.93	15.250	3.69	21.25	1.47
3.333	1.60	9.333	3.93	15.333	3.69	21.33	1.47
3.417	1.60	9.417	3.93	15.417	3.69	21.42	1.47
3.500	1.60	9.500	3.93	15.500	3.69	21.50	1.47
3.583	1.60	9.583	4.42	15.583	3.69	21.58	1.47
3.667	1.60	9.667	4.42	15.667	3.69	21.67	1.47
3.750	1.60	9.750	4.42	15.750	3.69	21.75	1.47
3.833	1.60	9.833	4.42	15.833	3.69	21.83	1.47
3.917	1.60	9.917	4.42	15.917	3.69	21.92	1.47
4.000	1.60	10.000	4.42	16.000	3.69	22.00	1.47
4.083	1.97	10.083	5.65	16.083	2.21	22.08	1.47
4.167	1.97	10.167	5.65	16.167	2.21	22.17	1.47
4.250	1.97	10.250	5.65	16.250	2.21	22.25	1.47
4.333	1.97	10.333	5.65	16.333	2.21	22.33	1.47
4.417	1.97	10.417	5.65	16.417	2.21	22.42	1.47
4.500	1.97	10.500	5.65	16.500	2.21	22.50	1.47
4.583	1.97	10.583	7.62	16.583	2.21	22.58	1.47
4.667	1.97	10.667	7.62	16.667	2.21	22.67	1.47
4.750	1.97	10.750	7.62	16.750	2.21	22.75	1.47
4.833	1.97	10.833	7.62	16.833	2.21	22.83	1.47
4.917	1.97	10.917	7.62	16.917	2.21	22.92	1.47
5.000	1.97	11.000	7.62	17.000	2.21	23.00	1.47
5.083	1.97	11.083	11.80	17.083	2.21	23.08	1.47
5.167	1.97	11.167	11.80	17.167	2.21	23.17	1.47
5.250	1.97	11.250	11.80	17.250	2.21	23.25	1.47
5.333	1.97	11.333	11.80	17.333	2.21	23.33	1.47
5.417	1.97	11.417	11.80	17.417	2.21	23.42	1.47
5.500	1.97	11.500	11.80	17.500	2.21	23.50	1.47
5.583	1.97	11.583	51.13	17.583	2.21	23.58	1.47
5.667	1.97	11.667	51.13	17.667	2.21	23.67	1.47
5.750	1.97	11.750	93.40	17.750	2.21	23.75	1.47
5.833	1.97	11.833	93.40	17.833	2.21	23.83	1.47
5.917	1.97	11.917	135.67	17.917	2.21	23.92	1.47
6.000	1.97	12.000	135.68	18.000	2.21	24.00	1.47

Max.Eff.Inten.(mm/hr)=	135.68	101.64
over (min)	5.00	10.00
Storage Coeff. (min)=	1.80 (ii)	5.28 (ii)

```
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.32         0.16
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.09         0.11          0.202 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=     121.89        75.39          91.66
     TOTAL RAINFALL   (mm)=     122.89       122.89         122.89
     RUNOFF COEFFICIENT   =       0.99         0.61           0.75

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  80.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| ADD HYD  (  0405)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0105):     0.70   0.202    12.00    91.66
     + ID2= 2 (  5005):    22.48   0.917    13.67    75.39
       ================================================
       ID = 3 (  0405):    23.17   0.932    13.67    75.88

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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| CALIB            |
| STANDHYD (  0209)|   Area    (ha)=   0.33
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  45.00
--------------------
                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.15         0.18
     Dep. Storage     (mm)=       1.00         7.60
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      46.62        10.00
     Mannings n             =     0.013        0.250

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


                          ---- TRANSFORMED HYETOGRAPH ----
              TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
               hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
             0.083    1.35 | 6.083    2.46 |12.083   17.71 | 18.08    2.21
             0.167    1.35 | 6.167    2.46 |12.167   17.70 | 18.17    2.21
             0.250    1.35 | 6.250    2.46 |12.250   17.70 | 18.25    2.21
```

0.333	1.35	6.333	2.46	12.333	17.70	18.33	2.21
0.417	1.35	6.417	2.46	12.417	17.70	18.42	2.21
0.500	1.35	6.500	2.46	12.500	17.70	18.50	2.21
0.583	1.35	6.583	2.46	12.583	9.09	18.58	2.21
0.667	1.35	6.667	2.46	12.667	9.09	18.67	2.21
0.750	1.35	6.750	2.46	12.750	9.09	18.75	2.21
0.833	1.35	6.833	2.46	12.833	9.09	18.83	2.21
0.917	1.35	6.917	2.46	12.917	9.09	18.92	2.21
1.000	1.35	7.000	2.46	13.000	9.09	19.00	2.21
1.083	1.35	7.083	2.46	13.083	1.72	19.08	2.21
1.167	1.35	7.167	2.46	13.167	1.72	19.17	2.21
1.250	1.35	7.250	2.46	13.250	1.72	19.25	2.21
1.333	1.35	7.333	2.46	13.333	1.72	19.33	2.21
1.417	1.35	7.417	2.46	13.417	1.72	19.42	2.21
1.500	1.35	7.500	2.46	13.500	1.72	19.50	2.21
1.583	1.35	7.583	2.46	13.583	10.08	19.58	2.21
1.667	1.35	7.667	2.46	13.667	10.08	19.67	2.21
1.750	1.35	7.750	2.46	13.750	10.08	19.75	2.21
1.833	1.35	7.833	2.46	13.833	10.08	19.83	2.21
1.917	1.35	7.917	2.46	13.917	10.08	19.92	2.21
2.000	1.35	8.000	2.46	14.000	10.08	20.00	2.21
2.083	1.60	8.083	3.32	14.083	3.69	20.08	1.47
2.167	1.60	8.167	3.32	14.167	3.69	20.17	1.47
2.250	1.60	8.250	3.32	14.250	3.69	20.25	1.47
2.333	1.60	8.333	3.32	14.333	3.69	20.33	1.47
2.417	1.60	8.417	3.32	14.417	3.69	20.42	1.47
2.500	1.60	8.500	3.32	14.500	3.69	20.50	1.47
2.583	1.60	8.583	3.32	14.583	3.69	20.58	1.47
2.667	1.60	8.667	3.32	14.667	3.69	20.67	1.47
2.750	1.60	8.750	3.32	14.750	3.69	20.75	1.47
2.833	1.60	8.833	3.32	14.833	3.69	20.83	1.47
2.917	1.60	8.917	3.32	14.917	3.69	20.92	1.47
3.000	1.60	9.000	3.32	15.000	3.69	21.00	1.47
3.083	1.60	9.083	3.93	15.083	3.69	21.08	1.47
3.167	1.60	9.167	3.93	15.167	3.69	21.17	1.47
3.250	1.60	9.250	3.93	15.250	3.69	21.25	1.47
3.333	1.60	9.333	3.93	15.333	3.69	21.33	1.47
3.417	1.60	9.417	3.93	15.417	3.69	21.42	1.47
3.500	1.60	9.500	3.93	15.500	3.69	21.50	1.47
3.583	1.60	9.583	4.42	15.583	3.69	21.58	1.47
3.667	1.60	9.667	4.42	15.667	3.69	21.67	1.47
3.750	1.60	9.750	4.42	15.750	3.69	21.75	1.47
3.833	1.60	9.833	4.42	15.833	3.69	21.83	1.47
3.917	1.60	9.917	4.42	15.917	3.69	21.92	1.47
4.000	1.60	10.000	4.42	16.000	3.69	22.00	1.47
4.083	1.97	10.083	5.65	16.083	2.21	22.08	1.47
4.167	1.97	10.167	5.65	16.167	2.21	22.17	1.47
4.250	1.97	10.250	5.65	16.250	2.21	22.25	1.47
4.333	1.97	10.333	5.65	16.333	2.21	22.33	1.47
4.417	1.97	10.417	5.65	16.417	2.21	22.42	1.47
4.500	1.97	10.500	5.65	16.500	2.21	22.50	1.47

4.583	1.97	10.583	7.62	16.583	2.21	22.58	1.47
4.667	1.97	10.667	7.62	16.667	2.21	22.67	1.47
4.750	1.97	10.750	7.62	16.750	2.21	22.75	1.47
4.833	1.97	10.833	7.62	16.833	2.21	22.83	1.47
4.917	1.97	10.917	7.62	16.917	2.21	22.92	1.47
5.000	1.97	11.000	7.62	17.000	2.21	23.00	1.47
5.083	1.97	11.083	11.80	17.083	2.21	23.08	1.47
5.167	1.97	11.167	11.80	17.167	2.21	23.17	1.47
5.250	1.97	11.250	11.80	17.250	2.21	23.25	1.47
5.333	1.97	11.333	11.80	17.333	2.21	23.33	1.47
5.417	1.97	11.417	11.80	17.417	2.21	23.42	1.47
5.500	1.97	11.500	11.80	17.500	2.21	23.50	1.47
5.583	1.97	11.583	51.13	17.583	2.21	23.58	1.47
5.667	1.97	11.667	51.13	17.667	2.21	23.67	1.47
5.750	1.97	11.750	93.40	17.750	2.21	23.75	1.47
5.833	1.97	11.833	93.40	17.833	2.21	23.83	1.47
5.917	1.97	11.917	135.67	17.917	2.21	23.92	1.47
6.000	1.97	12.000	135.68	18.000	2.21	24.00	1.47

Max.Eff.Inten.(mm/hr)=	135.68	94.66	
over (min)	5.00	5.00	
Storage Coeff. (min)=	1.43 (ii)	4.38 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.33	0.23	
			TOTALS
PEAK FLOW (cms)=	0.06	0.05	0.101 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	121.89	69.53	93.08
TOTAL RAINFALL (mm)=	122.89	122.89	122.89
RUNOFF COEFFICIENT =	0.99	0.57	0.76

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 77.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

Junction Command(0509)

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2(0209)	0.33	0.10	12.00	93.08
OUTFLOW: ID= 2(0509)	0.33	0.10	12.00	93.08

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| CALIB            |
| STANDHYD (  0208)|   Area    (ha)=   0.38
|ID= 1 DT= 5.0 min |   Total Imp(%)=  40.00   Dir. Conn.(%)=  40.00
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		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.15	0.23
Dep. Storage	(mm)=	1.00	6.40
Average Slope	(%)=	1.00	2.00
Length	(m)=	50.13	10.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.35	6.083	2.46	12.083	17.71	18.08	2.21
0.167	1.35	6.167	2.46	12.167	17.70	18.17	2.21
0.250	1.35	6.250	2.46	12.250	17.70	18.25	2.21
0.333	1.35	6.333	2.46	12.333	17.70	18.33	2.21
0.417	1.35	6.417	2.46	12.417	17.70	18.42	2.21
0.500	1.35	6.500	2.46	12.500	17.70	18.50	2.21
0.583	1.35	6.583	2.46	12.583	9.09	18.58	2.21
0.667	1.35	6.667	2.46	12.667	9.09	18.67	2.21
0.750	1.35	6.750	2.46	12.750	9.09	18.75	2.21
0.833	1.35	6.833	2.46	12.833	9.09	18.83	2.21
0.917	1.35	6.917	2.46	12.917	9.09	18.92	2.21
1.000	1.35	7.000	2.46	13.000	9.09	19.00	2.21
1.083	1.35	7.083	2.46	13.083	1.72	19.08	2.21
1.167	1.35	7.167	2.46	13.167	1.72	19.17	2.21
1.250	1.35	7.250	2.46	13.250	1.72	19.25	2.21
1.333	1.35	7.333	2.46	13.333	1.72	19.33	2.21
1.417	1.35	7.417	2.46	13.417	1.72	19.42	2.21
1.500	1.35	7.500	2.46	13.500	1.72	19.50	2.21
1.583	1.35	7.583	2.46	13.583	10.08	19.58	2.21
1.667	1.35	7.667	2.46	13.667	10.08	19.67	2.21
1.750	1.35	7.750	2.46	13.750	10.08	19.75	2.21
1.833	1.35	7.833	2.46	13.833	10.08	19.83	2.21
1.917	1.35	7.917	2.46	13.917	10.08	19.92	2.21
2.000	1.35	8.000	2.46	14.000	10.08	20.00	2.21
2.083	1.60	8.083	3.32	14.083	3.69	20.08	1.47
2.167	1.60	8.167	3.32	14.167	3.69	20.17	1.47
2.250	1.60	8.250	3.32	14.250	3.69	20.25	1.47
2.333	1.60	8.333	3.32	14.333	3.69	20.33	1.47
2.417	1.60	8.417	3.32	14.417	3.69	20.42	1.47
2.500	1.60	8.500	3.32	14.500	3.69	20.50	1.47
2.583	1.60	8.583	3.32	14.583	3.69	20.58	1.47
2.667	1.60	8.667	3.32	14.667	3.69	20.67	1.47
2.750	1.60	8.750	3.32	14.750	3.69	20.75	1.47

2.833	1.60	8.833	3.32	14.833	3.69	20.83	1.47
2.917	1.60	8.917	3.32	14.917	3.69	20.92	1.47
3.000	1.60	9.000	3.32	15.000	3.69	21.00	1.47
3.083	1.60	9.083	3.93	15.083	3.69	21.08	1.47
3.167	1.60	9.167	3.93	15.167	3.69	21.17	1.47
3.250	1.60	9.250	3.93	15.250	3.69	21.25	1.47
3.333	1.60	9.333	3.93	15.333	3.69	21.33	1.47
3.417	1.60	9.417	3.93	15.417	3.69	21.42	1.47
3.500	1.60	9.500	3.93	15.500	3.69	21.50	1.47
3.583	1.60	9.583	4.42	15.583	3.69	21.58	1.47
3.667	1.60	9.667	4.42	15.667	3.69	21.67	1.47
3.750	1.60	9.750	4.42	15.750	3.69	21.75	1.47
3.833	1.60	9.833	4.42	15.833	3.69	21.83	1.47
3.917	1.60	9.917	4.42	15.917	3.69	21.92	1.47
4.000	1.60	10.000	4.42	16.000	3.69	22.00	1.47
4.083	1.97	10.083	5.65	16.083	2.21	22.08	1.47
4.167	1.97	10.167	5.65	16.167	2.21	22.17	1.47
4.250	1.97	10.250	5.65	16.250	2.21	22.25	1.47
4.333	1.97	10.333	5.65	16.333	2.21	22.33	1.47
4.417	1.97	10.417	5.65	16.417	2.21	22.42	1.47
4.500	1.97	10.500	5.65	16.500	2.21	22.50	1.47
4.583	1.97	10.583	7.62	16.583	2.21	22.58	1.47
4.667	1.97	10.667	7.62	16.667	2.21	22.67	1.47
4.750	1.97	10.750	7.62	16.750	2.21	22.75	1.47
4.833	1.97	10.833	7.62	16.833	2.21	22.83	1.47
4.917	1.97	10.917	7.62	16.917	2.21	22.92	1.47
5.000	1.97	11.000	7.62	17.000	2.21	23.00	1.47
5.083	1.97	11.083	11.80	17.083	2.21	23.08	1.47
5.167	1.97	11.167	11.80	17.167	2.21	23.17	1.47
5.250	1.97	11.250	11.80	17.250	2.21	23.25	1.47
5.333	1.97	11.333	11.80	17.333	2.21	23.33	1.47
5.417	1.97	11.417	11.80	17.417	2.21	23.42	1.47
5.500	1.97	11.500	11.80	17.500	2.21	23.50	1.47
5.583	1.97	11.583	51.13	17.583	2.21	23.58	1.47
5.667	1.97	11.667	51.13	17.667	2.21	23.67	1.47
5.750	1.97	11.750	93.40	17.750	2.21	23.75	1.47
5.833	1.97	11.833	93.40	17.833	2.21	23.83	1.47
5.917	1.97	11.917	135.67	17.917	2.21	23.92	1.47
6.000	1.97	12.000	135.68	18.000	2.21	24.00	1.47

Max.Eff.Inten.(mm/hr)=	135.68	101.64	
over (min)	5.00	5.00	
Storage Coeff. (min)=	1.49 (ii)	4.69 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.33	0.22	
			TOTALS
PEAK FLOW (cms)=	0.06	0.06	0.118 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	121.89	75.39	93.98
TOTAL RAINFALL (mm)=	122.89	122.89	122.89
RUNOFF COEFFICIENT =	0.99	0.61	0.76

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| Junction Command(0508) |

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2(0208)	0.38	0.12	12.00	93.98
OUTFLOW: ID= 2(0508)	0.38	0.12	12.00	93.98

| CALIB |
| STANDHYD (0207) |
| ID= 1 DT= 5.0 min |

Area (ha)= 0.20
Total Imp(%)= 35.00 Dir. Conn.(%)= 35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.07	0.13
Dep. Storage	(mm)=	1.00	6.40
Average Slope	(%)=	1.00	2.00
Length	(m)=	36.70	10.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.35	6.083	2.46	12.083	17.71	18.08	2.21
0.167	1.35	6.167	2.46	12.167	17.70	18.17	2.21
0.250	1.35	6.250	2.46	12.250	17.70	18.25	2.21
0.333	1.35	6.333	2.46	12.333	17.70	18.33	2.21
0.417	1.35	6.417	2.46	12.417	17.70	18.42	2.21
0.500	1.35	6.500	2.46	12.500	17.70	18.50	2.21
0.583	1.35	6.583	2.46	12.583	9.09	18.58	2.21
0.667	1.35	6.667	2.46	12.667	9.09	18.67	2.21
0.750	1.35	6.750	2.46	12.750	9.09	18.75	2.21
0.833	1.35	6.833	2.46	12.833	9.09	18.83	2.21
0.917	1.35	6.917	2.46	12.917	9.09	18.92	2.21
1.000	1.35	7.000	2.46	13.000	9.09	19.00	2.21

1.083	1.35	7.083	2.46	13.083	1.72	19.08	2.21
1.167	1.35	7.167	2.46	13.167	1.72	19.17	2.21
1.250	1.35	7.250	2.46	13.250	1.72	19.25	2.21
1.333	1.35	7.333	2.46	13.333	1.72	19.33	2.21
1.417	1.35	7.417	2.46	13.417	1.72	19.42	2.21
1.500	1.35	7.500	2.46	13.500	1.72	19.50	2.21
1.583	1.35	7.583	2.46	13.583	10.08	19.58	2.21
1.667	1.35	7.667	2.46	13.667	10.08	19.67	2.21
1.750	1.35	7.750	2.46	13.750	10.08	19.75	2.21
1.833	1.35	7.833	2.46	13.833	10.08	19.83	2.21
1.917	1.35	7.917	2.46	13.917	10.08	19.92	2.21
2.000	1.35	8.000	2.46	14.000	10.08	20.00	2.21
2.083	1.60	8.083	3.32	14.083	3.69	20.08	1.47
2.167	1.60	8.167	3.32	14.167	3.69	20.17	1.47
2.250	1.60	8.250	3.32	14.250	3.69	20.25	1.47
2.333	1.60	8.333	3.32	14.333	3.69	20.33	1.47
2.417	1.60	8.417	3.32	14.417	3.69	20.42	1.47
2.500	1.60	8.500	3.32	14.500	3.69	20.50	1.47
2.583	1.60	8.583	3.32	14.583	3.69	20.58	1.47
2.667	1.60	8.667	3.32	14.667	3.69	20.67	1.47
2.750	1.60	8.750	3.32	14.750	3.69	20.75	1.47
2.833	1.60	8.833	3.32	14.833	3.69	20.83	1.47
2.917	1.60	8.917	3.32	14.917	3.69	20.92	1.47
3.000	1.60	9.000	3.32	15.000	3.69	21.00	1.47
3.083	1.60	9.083	3.93	15.083	3.69	21.08	1.47
3.167	1.60	9.167	3.93	15.167	3.69	21.17	1.47
3.250	1.60	9.250	3.93	15.250	3.69	21.25	1.47
3.333	1.60	9.333	3.93	15.333	3.69	21.33	1.47
3.417	1.60	9.417	3.93	15.417	3.69	21.42	1.47
3.500	1.60	9.500	3.93	15.500	3.69	21.50	1.47
3.583	1.60	9.583	4.42	15.583	3.69	21.58	1.47
3.667	1.60	9.667	4.42	15.667	3.69	21.67	1.47
3.750	1.60	9.750	4.42	15.750	3.69	21.75	1.47
3.833	1.60	9.833	4.42	15.833	3.69	21.83	1.47
3.917	1.60	9.917	4.42	15.917	3.69	21.92	1.47
4.000	1.60	10.000	4.42	16.000	3.69	22.00	1.47
4.083	1.97	10.083	5.65	16.083	2.21	22.08	1.47
4.167	1.97	10.167	5.65	16.167	2.21	22.17	1.47
4.250	1.97	10.250	5.65	16.250	2.21	22.25	1.47
4.333	1.97	10.333	5.65	16.333	2.21	22.33	1.47
4.417	1.97	10.417	5.65	16.417	2.21	22.42	1.47
4.500	1.97	10.500	5.65	16.500	2.21	22.50	1.47
4.583	1.97	10.583	7.62	16.583	2.21	22.58	1.47
4.667	1.97	10.667	7.62	16.667	2.21	22.67	1.47
4.750	1.97	10.750	7.62	16.750	2.21	22.75	1.47
4.833	1.97	10.833	7.62	16.833	2.21	22.83	1.47
4.917	1.97	10.917	7.62	16.917	2.21	22.92	1.47
5.000	1.97	11.000	7.62	17.000	2.21	23.00	1.47
5.083	1.97	11.083	11.80	17.083	2.21	23.08	1.47
5.167	1.97	11.167	11.80	17.167	2.21	23.17	1.47
5.250	1.97	11.250	11.80	17.250	2.21	23.25	1.47

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                5.333    1.97 |11.333   11.80 |17.333    2.21 | 23.33    1.47
                5.417    1.97 |11.417   11.80 |17.417    2.21 | 23.42    1.47
                5.500    1.97 |11.500   11.80 |17.500    2.21 | 23.50    1.47
                5.583    1.97 |11.583   51.13 |17.583    2.21 | 23.58    1.47
                5.667    1.97 |11.667   51.13 |17.667    2.21 | 23.67    1.47
                5.750    1.97 |11.750   93.40 |17.750    2.21 | 23.75    1.47
                5.833    1.97 |11.833   93.40 |17.833    2.21 | 23.83    1.47
                5.917    1.97 |11.917  135.67 |17.917    2.21 | 23.92    1.47
                6.000    1.97 |12.000  135.68 |18.000    2.21 | 24.00    1.47

     Max.Eff.Inten.(mm/hr)=     135.68       101.64
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       1.24 (ii)    4.72 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.33         0.22
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.04          0.062 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=     121.89        75.39          91.65
     TOTAL RAINFALL   (mm)=     122.89       122.89         122.89
     RUNOFF COEFFICIENT   =       0.99         0.61           0.75

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  80.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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  | Junction Command(0507) |
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                           AREA     QPEAK   TPEAK     R.V.
                           (ha)     (cms)    (hrs)    (mm)
  INFLOW : ID= 2(  0207)    0.20     0.06   12.00    91.65
  OUTFLOW: ID= 2(  0507)    0.20     0.06   12.00    91.65

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| CALIB            |
| STANDHYD (  0203)|   Area    (ha)=   0.54
|ID= 1 DT= 5.0 min |   Total Imp(%)=  35.00   Dir. Conn.(%)=  35.00
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                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.19         0.35
     Dep. Storage     (mm)=       1.00         4.80
     Average Slope     (%)=       1.00         2.00
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Length (m)= 60.17 10.00
Mannings n = 0.013 0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.35	6.083	2.46	12.083	17.71	18.08	2.21
0.167	1.35	6.167	2.46	12.167	17.70	18.17	2.21
0.250	1.35	6.250	2.46	12.250	17.70	18.25	2.21
0.333	1.35	6.333	2.46	12.333	17.70	18.33	2.21
0.417	1.35	6.417	2.46	12.417	17.70	18.42	2.21
0.500	1.35	6.500	2.46	12.500	17.70	18.50	2.21
0.583	1.35	6.583	2.46	12.583	9.09	18.58	2.21
0.667	1.35	6.667	2.46	12.667	9.09	18.67	2.21
0.750	1.35	6.750	2.46	12.750	9.09	18.75	2.21
0.833	1.35	6.833	2.46	12.833	9.09	18.83	2.21
0.917	1.35	6.917	2.46	12.917	9.09	18.92	2.21
1.000	1.35	7.000	2.46	13.000	9.09	19.00	2.21
1.083	1.35	7.083	2.46	13.083	1.72	19.08	2.21
1.167	1.35	7.167	2.46	13.167	1.72	19.17	2.21
1.250	1.35	7.250	2.46	13.250	1.72	19.25	2.21
1.333	1.35	7.333	2.46	13.333	1.72	19.33	2.21
1.417	1.35	7.417	2.46	13.417	1.72	19.42	2.21
1.500	1.35	7.500	2.46	13.500	1.72	19.50	2.21
1.583	1.35	7.583	2.46	13.583	10.08	19.58	2.21
1.667	1.35	7.667	2.46	13.667	10.08	19.67	2.21
1.750	1.35	7.750	2.46	13.750	10.08	19.75	2.21
1.833	1.35	7.833	2.46	13.833	10.08	19.83	2.21
1.917	1.35	7.917	2.46	13.917	10.08	19.92	2.21
2.000	1.35	8.000	2.46	14.000	10.08	20.00	2.21
2.083	1.60	8.083	3.32	14.083	3.69	20.08	1.47
2.167	1.60	8.167	3.32	14.167	3.69	20.17	1.47
2.250	1.60	8.250	3.32	14.250	3.69	20.25	1.47
2.333	1.60	8.333	3.32	14.333	3.69	20.33	1.47
2.417	1.60	8.417	3.32	14.417	3.69	20.42	1.47
2.500	1.60	8.500	3.32	14.500	3.69	20.50	1.47
2.583	1.60	8.583	3.32	14.583	3.69	20.58	1.47
2.667	1.60	8.667	3.32	14.667	3.69	20.67	1.47
2.750	1.60	8.750	3.32	14.750	3.69	20.75	1.47
2.833	1.60	8.833	3.32	14.833	3.69	20.83	1.47
2.917	1.60	8.917	3.32	14.917	3.69	20.92	1.47
3.000	1.60	9.000	3.32	15.000	3.69	21.00	1.47
3.083	1.60	9.083	3.93	15.083	3.69	21.08	1.47
3.167	1.60	9.167	3.93	15.167	3.69	21.17	1.47
3.250	1.60	9.250	3.93	15.250	3.69	21.25	1.47
3.333	1.60	9.333	3.93	15.333	3.69	21.33	1.47
3.417	1.60	9.417	3.93	15.417	3.69	21.42	1.47
3.500	1.60	9.500	3.93	15.500	3.69	21.50	1.47

3.583	1.60	9.583	4.42	15.583	3.69	21.58	1.47
3.667	1.60	9.667	4.42	15.667	3.69	21.67	1.47
3.750	1.60	9.750	4.42	15.750	3.69	21.75	1.47
3.833	1.60	9.833	4.42	15.833	3.69	21.83	1.47
3.917	1.60	9.917	4.42	15.917	3.69	21.92	1.47
4.000	1.60	10.000	4.42	16.000	3.69	22.00	1.47
4.083	1.97	10.083	5.65	16.083	2.21	22.08	1.47
4.167	1.97	10.167	5.65	16.167	2.21	22.17	1.47
4.250	1.97	10.250	5.65	16.250	2.21	22.25	1.47
4.333	1.97	10.333	5.65	16.333	2.21	22.33	1.47
4.417	1.97	10.417	5.65	16.417	2.21	22.42	1.47
4.500	1.97	10.500	5.65	16.500	2.21	22.50	1.47
4.583	1.97	10.583	7.62	16.583	2.21	22.58	1.47
4.667	1.97	10.667	7.62	16.667	2.21	22.67	1.47
4.750	1.97	10.750	7.62	16.750	2.21	22.75	1.47
4.833	1.97	10.833	7.62	16.833	2.21	22.83	1.47
4.917	1.97	10.917	7.62	16.917	2.21	22.92	1.47
5.000	1.97	11.000	7.62	17.000	2.21	23.00	1.47
5.083	1.97	11.083	11.80	17.083	2.21	23.08	1.47
5.167	1.97	11.167	11.80	17.167	2.21	23.17	1.47
5.250	1.97	11.250	11.80	17.250	2.21	23.25	1.47
5.333	1.97	11.333	11.80	17.333	2.21	23.33	1.47
5.417	1.97	11.417	11.80	17.417	2.21	23.42	1.47
5.500	1.97	11.500	11.80	17.500	2.21	23.50	1.47
5.583	1.97	11.583	51.13	17.583	2.21	23.58	1.47
5.667	1.97	11.667	51.13	17.667	2.21	23.67	1.47
5.750	1.97	11.750	93.40	17.750	2.21	23.75	1.47
5.833	1.97	11.833	93.40	17.833	2.21	23.83	1.47
5.917	1.97	11.917	135.67	17.917	2.21	23.92	1.47
6.000	1.97	12.000	135.68	18.000	2.21	24.00	1.47

Max.Eff.Inten.(mm/hr)=	135.68	110.89	
over (min)	5.00	10.00	
Storage Coeff. (min)=	1.67 (ii)	5.15 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.32	0.16	
			TOTALS
PEAK FLOW (cms)=	0.07	0.09	0.166 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	121.89	83.77	97.10
TOTAL RAINFALL (mm)=	122.89	122.89	122.89
RUNOFF COEFFICIENT =	0.99	0.68	0.79

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 84.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

Junction Command(0503)

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2(0203)	0.54	0.17	12.00	97.10
OUTFLOW: ID= 2(0503)	0.54	0.17	12.00	97.10

CALIB STANDHYD (0206) ID= 1 DT= 5.0 min	Area (ha)= 0.33 Total Imp(%)= 40.00 Dir. Conn.(%)= 40.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.13	0.20
Dep. Storage	(mm)=	1.00	6.40
Average Slope	(%)=	1.00	2.00
Length	(m)=	46.98	10.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.35	6.083	2.46	12.083	17.71	18.08	2.21
0.167	1.35	6.167	2.46	12.167	17.70	18.17	2.21
0.250	1.35	6.250	2.46	12.250	17.70	18.25	2.21
0.333	1.35	6.333	2.46	12.333	17.70	18.33	2.21
0.417	1.35	6.417	2.46	12.417	17.70	18.42	2.21
0.500	1.35	6.500	2.46	12.500	17.70	18.50	2.21
0.583	1.35	6.583	2.46	12.583	9.09	18.58	2.21
0.667	1.35	6.667	2.46	12.667	9.09	18.67	2.21
0.750	1.35	6.750	2.46	12.750	9.09	18.75	2.21
0.833	1.35	6.833	2.46	12.833	9.09	18.83	2.21
0.917	1.35	6.917	2.46	12.917	9.09	18.92	2.21
1.000	1.35	7.000	2.46	13.000	9.09	19.00	2.21
1.083	1.35	7.083	2.46	13.083	1.72	19.08	2.21
1.167	1.35	7.167	2.46	13.167	1.72	19.17	2.21
1.250	1.35	7.250	2.46	13.250	1.72	19.25	2.21
1.333	1.35	7.333	2.46	13.333	1.72	19.33	2.21
1.417	1.35	7.417	2.46	13.417	1.72	19.42	2.21
1.500	1.35	7.500	2.46	13.500	1.72	19.50	2.21
1.583	1.35	7.583	2.46	13.583	10.08	19.58	2.21
1.667	1.35	7.667	2.46	13.667	10.08	19.67	2.21
1.750	1.35	7.750	2.46	13.750	10.08	19.75	2.21

1.833	1.35	7.833	2.46	13.833	10.08	19.83	2.21
1.917	1.35	7.917	2.46	13.917	10.08	19.92	2.21
2.000	1.35	8.000	2.46	14.000	10.08	20.00	2.21
2.083	1.60	8.083	3.32	14.083	3.69	20.08	1.47
2.167	1.60	8.167	3.32	14.167	3.69	20.17	1.47
2.250	1.60	8.250	3.32	14.250	3.69	20.25	1.47
2.333	1.60	8.333	3.32	14.333	3.69	20.33	1.47
2.417	1.60	8.417	3.32	14.417	3.69	20.42	1.47
2.500	1.60	8.500	3.32	14.500	3.69	20.50	1.47
2.583	1.60	8.583	3.32	14.583	3.69	20.58	1.47
2.667	1.60	8.667	3.32	14.667	3.69	20.67	1.47
2.750	1.60	8.750	3.32	14.750	3.69	20.75	1.47
2.833	1.60	8.833	3.32	14.833	3.69	20.83	1.47
2.917	1.60	8.917	3.32	14.917	3.69	20.92	1.47
3.000	1.60	9.000	3.32	15.000	3.69	21.00	1.47
3.083	1.60	9.083	3.93	15.083	3.69	21.08	1.47
3.167	1.60	9.167	3.93	15.167	3.69	21.17	1.47
3.250	1.60	9.250	3.93	15.250	3.69	21.25	1.47
3.333	1.60	9.333	3.93	15.333	3.69	21.33	1.47
3.417	1.60	9.417	3.93	15.417	3.69	21.42	1.47
3.500	1.60	9.500	3.93	15.500	3.69	21.50	1.47
3.583	1.60	9.583	4.42	15.583	3.69	21.58	1.47
3.667	1.60	9.667	4.42	15.667	3.69	21.67	1.47
3.750	1.60	9.750	4.42	15.750	3.69	21.75	1.47
3.833	1.60	9.833	4.42	15.833	3.69	21.83	1.47
3.917	1.60	9.917	4.42	15.917	3.69	21.92	1.47
4.000	1.60	10.000	4.42	16.000	3.69	22.00	1.47
4.083	1.97	10.083	5.65	16.083	2.21	22.08	1.47
4.167	1.97	10.167	5.65	16.167	2.21	22.17	1.47
4.250	1.97	10.250	5.65	16.250	2.21	22.25	1.47
4.333	1.97	10.333	5.65	16.333	2.21	22.33	1.47
4.417	1.97	10.417	5.65	16.417	2.21	22.42	1.47
4.500	1.97	10.500	5.65	16.500	2.21	22.50	1.47
4.583	1.97	10.583	7.62	16.583	2.21	22.58	1.47
4.667	1.97	10.667	7.62	16.667	2.21	22.67	1.47
4.750	1.97	10.750	7.62	16.750	2.21	22.75	1.47
4.833	1.97	10.833	7.62	16.833	2.21	22.83	1.47
4.917	1.97	10.917	7.62	16.917	2.21	22.92	1.47
5.000	1.97	11.000	7.62	17.000	2.21	23.00	1.47
5.083	1.97	11.083	11.80	17.083	2.21	23.08	1.47
5.167	1.97	11.167	11.80	17.167	2.21	23.17	1.47
5.250	1.97	11.250	11.80	17.250	2.21	23.25	1.47
5.333	1.97	11.333	11.80	17.333	2.21	23.33	1.47
5.417	1.97	11.417	11.80	17.417	2.21	23.42	1.47
5.500	1.97	11.500	11.80	17.500	2.21	23.50	1.47
5.583	1.97	11.583	51.13	17.583	2.21	23.58	1.47
5.667	1.97	11.667	51.13	17.667	2.21	23.67	1.47
5.750	1.97	11.750	93.40	17.750	2.21	23.75	1.47
5.833	1.97	11.833	93.40	17.833	2.21	23.83	1.47
5.917	1.97	11.917	135.67	17.917	2.21	23.92	1.47
6.000	1.97	12.000	135.68	18.000	2.21	24.00	1.47

```
     Max.Eff.Inten.(mm/hr)=     135.68       101.64
               over (min)         5.00         5.00
     Storage Coeff.  (min)=       1.44 (ii)    4.63 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.33         0.22
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.05         0.05          0.104 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=     121.89        75.39          93.98
     TOTAL RAINFALL   (mm)=     122.89       122.89         122.89
     RUNOFF COEFFICIENT   =       0.99         0.61           0.76

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  80.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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  | Junction Command(0505) |
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                           AREA     QPEAK   TPEAK     R.V.
                           (ha)     (cms)    (hrs)    (mm)
  INFLOW : ID= 2(  0206)    0.33     0.10   12.00    93.98
  OUTFLOW: ID= 2(  0505)    0.33     0.10   12.00    93.98

  ------------------------------------------------------------------------------
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| CALIB            |
| STANDHYD (  0201)|   Area    (ha)=   0.63
|ID= 1 DT= 5.0 min |   Total Imp(%)=  35.00   Dir. Conn.(%)=  35.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.22         0.41
     Dep. Storage     (mm)=       1.00         5.60
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      64.81        10.00
     Mannings n             =     0.013        0.250

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


                          ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
```

0.083	1.35	6.083	2.46	12.083	17.71	18.08	2.21
0.167	1.35	6.167	2.46	12.167	17.70	18.17	2.21
0.250	1.35	6.250	2.46	12.250	17.70	18.25	2.21
0.333	1.35	6.333	2.46	12.333	17.70	18.33	2.21
0.417	1.35	6.417	2.46	12.417	17.70	18.42	2.21
0.500	1.35	6.500	2.46	12.500	17.70	18.50	2.21
0.583	1.35	6.583	2.46	12.583	9.09	18.58	2.21
0.667	1.35	6.667	2.46	12.667	9.09	18.67	2.21
0.750	1.35	6.750	2.46	12.750	9.09	18.75	2.21
0.833	1.35	6.833	2.46	12.833	9.09	18.83	2.21
0.917	1.35	6.917	2.46	12.917	9.09	18.92	2.21
1.000	1.35	7.000	2.46	13.000	9.09	19.00	2.21
1.083	1.35	7.083	2.46	13.083	1.72	19.08	2.21
1.167	1.35	7.167	2.46	13.167	1.72	19.17	2.21
1.250	1.35	7.250	2.46	13.250	1.72	19.25	2.21
1.333	1.35	7.333	2.46	13.333	1.72	19.33	2.21
1.417	1.35	7.417	2.46	13.417	1.72	19.42	2.21
1.500	1.35	7.500	2.46	13.500	1.72	19.50	2.21
1.583	1.35	7.583	2.46	13.583	10.08	19.58	2.21
1.667	1.35	7.667	2.46	13.667	10.08	19.67	2.21
1.750	1.35	7.750	2.46	13.750	10.08	19.75	2.21
1.833	1.35	7.833	2.46	13.833	10.08	19.83	2.21
1.917	1.35	7.917	2.46	13.917	10.08	19.92	2.21
2.000	1.35	8.000	2.46	14.000	10.08	20.00	2.21
2.083	1.60	8.083	3.32	14.083	3.69	20.08	1.47
2.167	1.60	8.167	3.32	14.167	3.69	20.17	1.47
2.250	1.60	8.250	3.32	14.250	3.69	20.25	1.47
2.333	1.60	8.333	3.32	14.333	3.69	20.33	1.47
2.417	1.60	8.417	3.32	14.417	3.69	20.42	1.47
2.500	1.60	8.500	3.32	14.500	3.69	20.50	1.47
2.583	1.60	8.583	3.32	14.583	3.69	20.58	1.47
2.667	1.60	8.667	3.32	14.667	3.69	20.67	1.47
2.750	1.60	8.750	3.32	14.750	3.69	20.75	1.47
2.833	1.60	8.833	3.32	14.833	3.69	20.83	1.47
2.917	1.60	8.917	3.32	14.917	3.69	20.92	1.47
3.000	1.60	9.000	3.32	15.000	3.69	21.00	1.47
3.083	1.60	9.083	3.93	15.083	3.69	21.08	1.47
3.167	1.60	9.167	3.93	15.167	3.69	21.17	1.47
3.250	1.60	9.250	3.93	15.250	3.69	21.25	1.47
3.333	1.60	9.333	3.93	15.333	3.69	21.33	1.47
3.417	1.60	9.417	3.93	15.417	3.69	21.42	1.47
3.500	1.60	9.500	3.93	15.500	3.69	21.50	1.47
3.583	1.60	9.583	4.42	15.583	3.69	21.58	1.47
3.667	1.60	9.667	4.42	15.667	3.69	21.67	1.47
3.750	1.60	9.750	4.42	15.750	3.69	21.75	1.47
3.833	1.60	9.833	4.42	15.833	3.69	21.83	1.47
3.917	1.60	9.917	4.42	15.917	3.69	21.92	1.47
4.000	1.60	10.000	4.42	16.000	3.69	22.00	1.47
4.083	1.97	10.083	5.65	16.083	2.21	22.08	1.47
4.167	1.97	10.167	5.65	16.167	2.21	22.17	1.47
4.250	1.97	10.250	5.65	16.250	2.21	22.25	1.47

4.333	1.97	10.333	5.65	16.333	2.21	22.33	1.47
4.417	1.97	10.417	5.65	16.417	2.21	22.42	1.47
4.500	1.97	10.500	5.65	16.500	2.21	22.50	1.47
4.583	1.97	10.583	7.62	16.583	2.21	22.58	1.47
4.667	1.97	10.667	7.62	16.667	2.21	22.67	1.47
4.750	1.97	10.750	7.62	16.750	2.21	22.75	1.47
4.833	1.97	10.833	7.62	16.833	2.21	22.83	1.47
4.917	1.97	10.917	7.62	16.917	2.21	22.92	1.47
5.000	1.97	11.000	7.62	17.000	2.21	23.00	1.47
5.083	1.97	11.083	11.80	17.083	2.21	23.08	1.47
5.167	1.97	11.167	11.80	17.167	2.21	23.17	1.47
5.250	1.97	11.250	11.80	17.250	2.21	23.25	1.47
5.333	1.97	11.333	11.80	17.333	2.21	23.33	1.47
5.417	1.97	11.417	11.80	17.417	2.21	23.42	1.47
5.500	1.97	11.500	11.80	17.500	2.21	23.50	1.47
5.583	1.97	11.583	51.13	17.583	2.21	23.58	1.47
5.667	1.97	11.667	51.13	17.667	2.21	23.67	1.47
5.750	1.97	11.750	93.40	17.750	2.21	23.75	1.47
5.833	1.97	11.833	93.40	17.833	2.21	23.83	1.47
5.917	1.97	11.917	135.67	17.917	2.21	23.92	1.47
6.000	1.97	12.000	135.68	18.000	2.21	24.00	1.47

Max.Eff.Inten.(mm/hr)=	135.68	106.29	
over (min)	5.00	10.00	
Storage Coeff. (min)=	1.74 (ii)	5.23 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.32	0.16	
			TOTALS
PEAK FLOW (cms)=	0.08	0.10	0.188 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	121.89	79.50	94.33
TOTAL RAINFALL (mm)=	122.89	122.89	122.89
RUNOFF COEFFICIENT =	0.99	0.65	0.77

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 82.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

Junction Command(0501)

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2(0201)	0.63	0.19	12.00	94.33

OUTFLOW: ID= 2(0501) 0.63 0.19 12.00 94.33

CALIB	
STANDHYD (0202)	Area (ha)= 0.39
ID= 1 DT= 5.0 min	Total Imp(%)= 35.00 Dir. Conn.(%)= 35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.14	0.25
Dep. Storage	(mm)=	1.00	4.80
Average Slope	(%)=	1.00	2.00
Length	(m)=	50.92	10.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.35	6.083	2.46	12.083	17.71	18.08	2.21
0.167	1.35	6.167	2.46	12.167	17.70	18.17	2.21
0.250	1.35	6.250	2.46	12.250	17.70	18.25	2.21
0.333	1.35	6.333	2.46	12.333	17.70	18.33	2.21
0.417	1.35	6.417	2.46	12.417	17.70	18.42	2.21
0.500	1.35	6.500	2.46	12.500	17.70	18.50	2.21
0.583	1.35	6.583	2.46	12.583	9.09	18.58	2.21
0.667	1.35	6.667	2.46	12.667	9.09	18.67	2.21
0.750	1.35	6.750	2.46	12.750	9.09	18.75	2.21
0.833	1.35	6.833	2.46	12.833	9.09	18.83	2.21
0.917	1.35	6.917	2.46	12.917	9.09	18.92	2.21
1.000	1.35	7.000	2.46	13.000	9.09	19.00	2.21
1.083	1.35	7.083	2.46	13.083	1.72	19.08	2.21
1.167	1.35	7.167	2.46	13.167	1.72	19.17	2.21
1.250	1.35	7.250	2.46	13.250	1.72	19.25	2.21
1.333	1.35	7.333	2.46	13.333	1.72	19.33	2.21
1.417	1.35	7.417	2.46	13.417	1.72	19.42	2.21
1.500	1.35	7.500	2.46	13.500	1.72	19.50	2.21
1.583	1.35	7.583	2.46	13.583	10.08	19.58	2.21
1.667	1.35	7.667	2.46	13.667	10.08	19.67	2.21
1.750	1.35	7.750	2.46	13.750	10.08	19.75	2.21
1.833	1.35	7.833	2.46	13.833	10.08	19.83	2.21
1.917	1.35	7.917	2.46	13.917	10.08	19.92	2.21
2.000	1.35	8.000	2.46	14.000	10.08	20.00	2.21
2.083	1.60	8.083	3.32	14.083	3.69	20.08	1.47
2.167	1.60	8.167	3.32	14.167	3.69	20.17	1.47
2.250	1.60	8.250	3.32	14.250	3.69	20.25	1.47
2.333	1.60	8.333	3.32	14.333	3.69	20.33	1.47
2.417	1.60	8.417	3.32	14.417	3.69	20.42	1.47
2.500	1.60	8.500	3.32	14.500	3.69	20.50	1.47

2.583	1.60	8.583	3.32	14.583	3.69	20.58	1.47
2.667	1.60	8.667	3.32	14.667	3.69	20.67	1.47
2.750	1.60	8.750	3.32	14.750	3.69	20.75	1.47
2.833	1.60	8.833	3.32	14.833	3.69	20.83	1.47
2.917	1.60	8.917	3.32	14.917	3.69	20.92	1.47
3.000	1.60	9.000	3.32	15.000	3.69	21.00	1.47
3.083	1.60	9.083	3.93	15.083	3.69	21.08	1.47
3.167	1.60	9.167	3.93	15.167	3.69	21.17	1.47
3.250	1.60	9.250	3.93	15.250	3.69	21.25	1.47
3.333	1.60	9.333	3.93	15.333	3.69	21.33	1.47
3.417	1.60	9.417	3.93	15.417	3.69	21.42	1.47
3.500	1.60	9.500	3.93	15.500	3.69	21.50	1.47
3.583	1.60	9.583	4.42	15.583	3.69	21.58	1.47
3.667	1.60	9.667	4.42	15.667	3.69	21.67	1.47
3.750	1.60	9.750	4.42	15.750	3.69	21.75	1.47
3.833	1.60	9.833	4.42	15.833	3.69	21.83	1.47
3.917	1.60	9.917	4.42	15.917	3.69	21.92	1.47
4.000	1.60	10.000	4.42	16.000	3.69	22.00	1.47
4.083	1.97	10.083	5.65	16.083	2.21	22.08	1.47
4.167	1.97	10.167	5.65	16.167	2.21	22.17	1.47
4.250	1.97	10.250	5.65	16.250	2.21	22.25	1.47
4.333	1.97	10.333	5.65	16.333	2.21	22.33	1.47
4.417	1.97	10.417	5.65	16.417	2.21	22.42	1.47
4.500	1.97	10.500	5.65	16.500	2.21	22.50	1.47
4.583	1.97	10.583	7.62	16.583	2.21	22.58	1.47
4.667	1.97	10.667	7.62	16.667	2.21	22.67	1.47
4.750	1.97	10.750	7.62	16.750	2.21	22.75	1.47
4.833	1.97	10.833	7.62	16.833	2.21	22.83	1.47
4.917	1.97	10.917	7.62	16.917	2.21	22.92	1.47
5.000	1.97	11.000	7.62	17.000	2.21	23.00	1.47
5.083	1.97	11.083	11.80	17.083	2.21	23.08	1.47
5.167	1.97	11.167	11.80	17.167	2.21	23.17	1.47
5.250	1.97	11.250	11.80	17.250	2.21	23.25	1.47
5.333	1.97	11.333	11.80	17.333	2.21	23.33	1.47
5.417	1.97	11.417	11.80	17.417	2.21	23.42	1.47
5.500	1.97	11.500	11.80	17.500	2.21	23.50	1.47
5.583	1.97	11.583	51.13	17.583	2.21	23.58	1.47
5.667	1.97	11.667	51.13	17.667	2.21	23.67	1.47
5.750	1.97	11.750	93.40	17.750	2.21	23.75	1.47
5.833	1.97	11.833	93.40	17.833	2.21	23.83	1.47
5.917	1.97	11.917	135.67	17.917	2.21	23.92	1.47
6.000	1.97	12.000	135.68	18.000	2.21	24.00	1.47

Max.Eff.Inten.(mm/hr)=	135.68	110.89	
over (min)	5.00	5.00	
Storage Coeff. (min)=	1.51 (ii)	4.99 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.33	0.22	
			TOTALS
PEAK FLOW (cms)=	0.05	0.07	0.125 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00

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     RUNOFF VOLUME    (mm)=     121.89        83.77          97.10
     TOTAL RAINFALL   (mm)=     122.89       122.89         122.89
     RUNOFF COEFFICIENT   =       0.99         0.68           0.79

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  84.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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  | Junction Command(0502) |
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                           AREA     QPEAK   TPEAK     R.V.
                           (ha)     (cms)    (hrs)    (mm)
  INFLOW : ID= 2(  0202)    0.39     0.13   12.00    97.10
  OUTFLOW: ID= 2(  0502)    0.39     0.13   12.00    97.10

  ------------------------------------------------------------------------------
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| CALIB            |
| STANDHYD (  0205)|   Area    (ha)=   0.36
|ID= 1 DT= 5.0 min |   Total Imp(%)=  45.00   Dir. Conn.(%)=  45.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.16         0.20
     Dep. Storage     (mm)=       1.00         6.40
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      49.19        10.00
     Mannings n           =      0.013        0.250

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


                          ---- TRANSFORMED HYETOGRAPH ----
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
              0.083    1.35 | 6.083    2.46 |12.083   17.71 | 18.08    2.21
              0.167    1.35 | 6.167    2.46 |12.167   17.70 | 18.17    2.21
              0.250    1.35 | 6.250    2.46 |12.250   17.70 | 18.25    2.21
              0.333    1.35 | 6.333    2.46 |12.333   17.70 | 18.33    2.21
              0.417    1.35 | 6.417    2.46 |12.417   17.70 | 18.42    2.21
              0.500    1.35 | 6.500    2.46 |12.500   17.70 | 18.50    2.21
              0.583    1.35 | 6.583    2.46 |12.583    9.09 | 18.58    2.21
              0.667    1.35 | 6.667    2.46 |12.667    9.09 | 18.67    2.21
              0.750    1.35 | 6.750    2.46 |12.750    9.09 | 18.75    2.21
```

0.833	1.35	6.833	2.46	12.833	9.09	18.83	2.21
0.917	1.35	6.917	2.46	12.917	9.09	18.92	2.21
1.000	1.35	7.000	2.46	13.000	9.09	19.00	2.21
1.083	1.35	7.083	2.46	13.083	1.72	19.08	2.21
1.167	1.35	7.167	2.46	13.167	1.72	19.17	2.21
1.250	1.35	7.250	2.46	13.250	1.72	19.25	2.21
1.333	1.35	7.333	2.46	13.333	1.72	19.33	2.21
1.417	1.35	7.417	2.46	13.417	1.72	19.42	2.21
1.500	1.35	7.500	2.46	13.500	1.72	19.50	2.21
1.583	1.35	7.583	2.46	13.583	10.08	19.58	2.21
1.667	1.35	7.667	2.46	13.667	10.08	19.67	2.21
1.750	1.35	7.750	2.46	13.750	10.08	19.75	2.21
1.833	1.35	7.833	2.46	13.833	10.08	19.83	2.21
1.917	1.35	7.917	2.46	13.917	10.08	19.92	2.21
2.000	1.35	8.000	2.46	14.000	10.08	20.00	2.21
2.083	1.60	8.083	3.32	14.083	3.69	20.08	1.47
2.167	1.60	8.167	3.32	14.167	3.69	20.17	1.47
2.250	1.60	8.250	3.32	14.250	3.69	20.25	1.47
2.333	1.60	8.333	3.32	14.333	3.69	20.33	1.47
2.417	1.60	8.417	3.32	14.417	3.69	20.42	1.47
2.500	1.60	8.500	3.32	14.500	3.69	20.50	1.47
2.583	1.60	8.583	3.32	14.583	3.69	20.58	1.47
2.667	1.60	8.667	3.32	14.667	3.69	20.67	1.47
2.750	1.60	8.750	3.32	14.750	3.69	20.75	1.47
2.833	1.60	8.833	3.32	14.833	3.69	20.83	1.47
2.917	1.60	8.917	3.32	14.917	3.69	20.92	1.47
3.000	1.60	9.000	3.32	15.000	3.69	21.00	1.47
3.083	1.60	9.083	3.93	15.083	3.69	21.08	1.47
3.167	1.60	9.167	3.93	15.167	3.69	21.17	1.47
3.250	1.60	9.250	3.93	15.250	3.69	21.25	1.47
3.333	1.60	9.333	3.93	15.333	3.69	21.33	1.47
3.417	1.60	9.417	3.93	15.417	3.69	21.42	1.47
3.500	1.60	9.500	3.93	15.500	3.69	21.50	1.47
3.583	1.60	9.583	4.42	15.583	3.69	21.58	1.47
3.667	1.60	9.667	4.42	15.667	3.69	21.67	1.47
3.750	1.60	9.750	4.42	15.750	3.69	21.75	1.47
3.833	1.60	9.833	4.42	15.833	3.69	21.83	1.47
3.917	1.60	9.917	4.42	15.917	3.69	21.92	1.47
4.000	1.60	10.000	4.42	16.000	3.69	22.00	1.47
4.083	1.97	10.083	5.65	16.083	2.21	22.08	1.47
4.167	1.97	10.167	5.65	16.167	2.21	22.17	1.47
4.250	1.97	10.250	5.65	16.250	2.21	22.25	1.47
4.333	1.97	10.333	5.65	16.333	2.21	22.33	1.47
4.417	1.97	10.417	5.65	16.417	2.21	22.42	1.47
4.500	1.97	10.500	5.65	16.500	2.21	22.50	1.47
4.583	1.97	10.583	7.62	16.583	2.21	22.58	1.47
4.667	1.97	10.667	7.62	16.667	2.21	22.67	1.47
4.750	1.97	10.750	7.62	16.750	2.21	22.75	1.47
4.833	1.97	10.833	7.62	16.833	2.21	22.83	1.47
4.917	1.97	10.917	7.62	16.917	2.21	22.92	1.47
5.000	1.97	11.000	7.62	17.000	2.21	23.00	1.47

```
               5.083    1.97 |11.083   11.80 |17.083    2.21 | 23.08    1.47
               5.167    1.97 |11.167   11.80 |17.167    2.21 | 23.17    1.47
               5.250    1.97 |11.250   11.80 |17.250    2.21 | 23.25    1.47
               5.333    1.97 |11.333   11.80 |17.333    2.21 | 23.33    1.47
               5.417    1.97 |11.417   11.80 |17.417    2.21 | 23.42    1.47
               5.500    1.97 |11.500   11.80 |17.500    2.21 | 23.50    1.47
               5.583    1.97 |11.583   51.13 |17.583    2.21 | 23.58    1.47
               5.667    1.97 |11.667   51.13 |17.667    2.21 | 23.67    1.47
               5.750    1.97 |11.750   93.40 |17.750    2.21 | 23.75    1.47
               5.833    1.97 |11.833   93.40 |17.833    2.21 | 23.83    1.47
               5.917    1.97 |11.917  135.67 |17.917    2.21 | 23.92    1.47
               6.000    1.97 |12.000  135.68 |18.000    2.21 | 24.00    1.47

    Max.Eff.Inten.(mm/hr)=     135.68       101.64
              over (min)        5.00         5.00
    Storage Coeff.  (min)=      1.48 (ii)    4.42 (ii)
    Unit Hyd. Tpeak (min)=      5.00         5.00
    Unit Hyd. peak  (cms)=      0.33         0.23
                                                        *TOTALS*
    PEAK FLOW       (cms)=      0.06         0.05          0.116 (iii)
    TIME TO PEAK    (hrs)=     12.00        12.00          12.00
    RUNOFF VOLUME    (mm)=    121.89        75.39          96.30
    TOTAL RAINFALL   (mm)=    122.89       122.89         122.89
    RUNOFF COEFFICIENT   =      0.99         0.61           0.78

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

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  80.0    Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

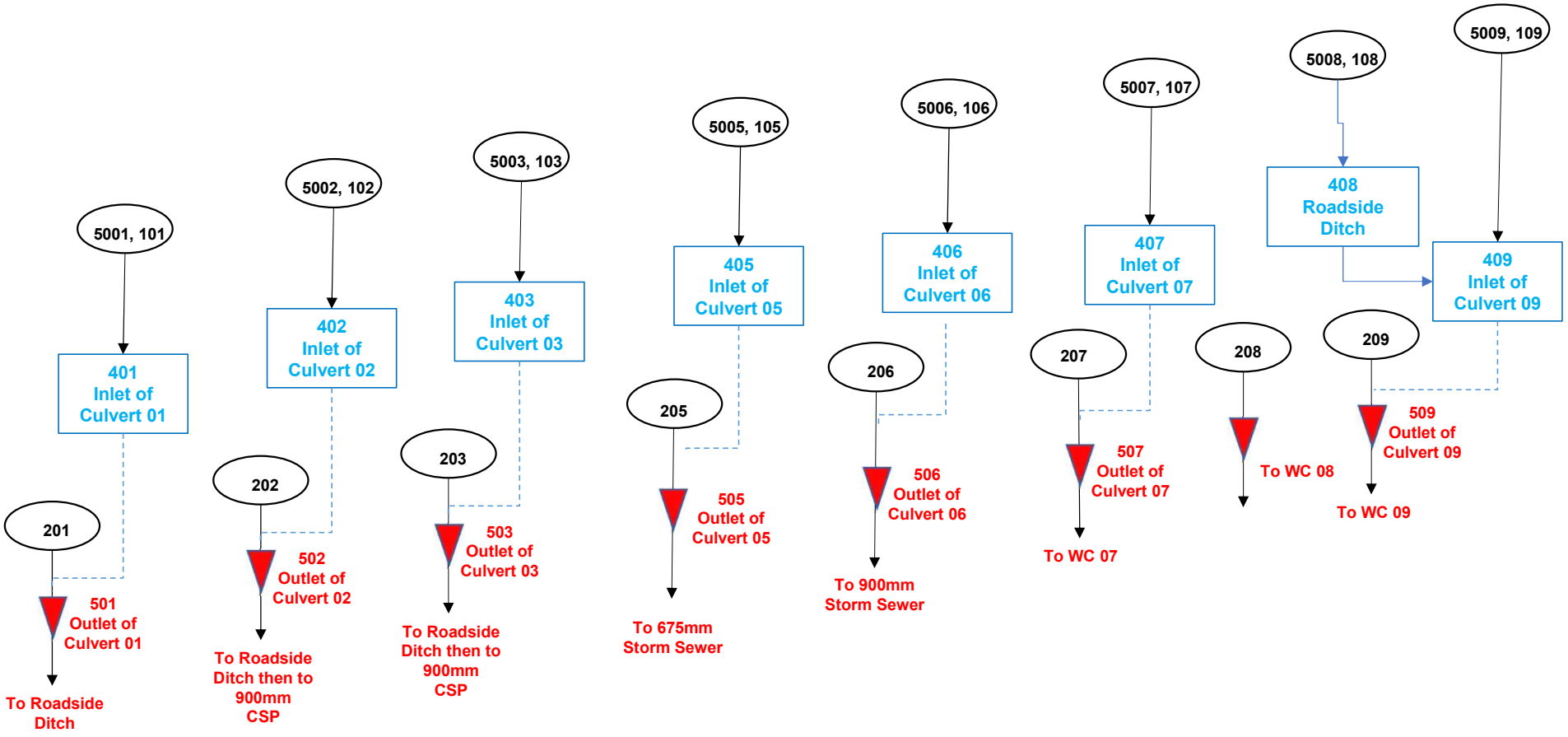
--------------------------------------------------------------------------------

  -------------------------
  | Junction Command(0506) |
  -------------------------

                           AREA     QPEAK   TPEAK     R.V.
                           (ha)     (cms)    (hrs)    (mm)
  INFLOW : ID= 2(  0205)    0.36     0.12   12.00    96.30
  OUTFLOW: ID= 2(  0506)    0.36     0.12   12.00    96.30

  ------------------------------------------------------------------------------
```

Existing Conditions Flow Schematic



Rating Table Report
WC01 Culvert01

Range Data:				
	Minimum	Maximum	Increment	
Discharge	0.0000	1.0000	0.1000	m³/s

Discharge (m³/s)	HW Elev. (m)
0.0000	238.79
0.1000	239.10
0.2000	239.24
0.3000	239.35
0.4000	239.45
0.5000	239.54
0.6000	239.64
0.7000	239.73
0.8000	239.86
0.9000	240.01
1.0000	240.17

Rating Table Report
WC02 Culvert02

Range Data:				
	Minimum	Maximum	Increment	
Discharge	0.0000	2.2000	0.2000	m³/s

Discharge (m³/s)	HW Elev. (m)
0.0000	240.26
0.2000	240.70
0.4000	240.88
0.6000	241.04
0.8000	241.19
1.0000	241.34
1.2000	241.52
1.4000	241.74
1.6000	241.98
1.8000	242.23
2.0000	242.51
2.2000	242.82

Rating Table Report
WC03 Culvert03

Range Data:				
	Minimum	Maximum	Increment	
Discharge	0.0000	2.0000	0.2000	m³/s

Discharge (m³/s)	HW Elev. (m)
0.0000	240.35
0.2000	240.77
0.4000	240.96
0.6000	241.12
0.8000	241.27
1.0000	241.43
1.2000	241.62
1.4000	241.85
1.6000	242.12
1.8000	242.40
2.0000	242.71

Rating Table Report
WC05 Culvert05

Range Data:				
	Minimum	Maximum	Increment	
Discharge	0.0000	2.0000	0.2000	m³/s

Discharge (m³/s)	HW Elev. (m)
0.0000	236.36
0.2000	236.81
0.4000	237.03
0.6000	237.23
0.8000	237.55
1.0000	237.98
1.2000	238.50
1.4000	239.12
1.6000	239.83
1.8000	240.64
2.0000	241.54

Rating Table Report
WC06 Culvert06

Range Data:				
	Minimum	Maximum	Increment	
Discharge	0.0000	4.1000	0.4000	m³/s

Discharge (m³/s)	HW Elev. (m)
0.0000	234.15
0.4000	234.66
0.8000	234.90
1.2000	235.12
1.6000	235.34
2.0000	235.67
2.4000	236.06
2.8000	236.49
3.2000	236.97
3.6000	237.51
4.0000	238.11
4.1000	238.27

Rating Table Report
WC07 Culvert07

Range Data:				
	Minimum	Maximum	Increment	
Discharge	0.0000	1.0000	0.1000	m³/s

Discharge (m³/s)	HW Elev. (m)
0.0000	235.12
0.1000	235.43
0.2000	235.57
0.3000	235.68
0.4000	235.78
0.5000	235.87
0.6000	235.96
0.7000	236.05
0.8000	236.13
0.9000	236.22
1.0000	236.29

Rating Table Report
WC09 Culvert09

Range Data:				
	Minimum	Maximum	Increment	
Discharge	0.0000	12.0000	0.5000	m³/s

Discharge (m³/s)	HW Elev. (m)
0.0000	229.64
0.5000	230.24
1.0000	230.51
1.5000	230.70
2.0000	230.88
2.5000	231.06
3.0000	231.22
3.5000	231.39
4.0000	231.57
4.5000	231.78
5.0000	232.02
5.5000	232.28
6.0000	232.55
6.5000	232.83
7.0000	233.14
7.5000	233.53
8.0000	233.95
8.5000	234.40
9.0000	234.88
9.5000	235.39
10.0000	235.92
10.5000	236.48
11.0000	237.06
11.5000	237.68
12.0000	238.32

AECOM

Appendix B

Culvert Master Output for Hydraulic Analysis

Culvert Calculator Report
WC01 Culvert01 100yr

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	240.21	m	Headwater Depth/Height	0.77	
Computed Headwater Elevation	239.41	m	Discharge	0.3640	m³/s
Inlet Control HW Elev.	239.34	m	Tailwater Elevation	239.09	m
Outlet Control HW Elev.	239.41	m	Control Type	Outlet Control	

Grades					
Upstream Invert	238.79	m	Downstream Invert	238.73	m
Length	18.47	m	Constructed Slope	0.003681	m/m

Hydraulic Profile					
Profile	M2		Depth, Downstream	0.36	m
Slope Type	Mild		Normal Depth	0.56	m
Flow Regime	Subcritical		Critical Depth	0.36	m
Velocity Downstream	1.64	m/s	Critical Slope	0.014624	m/m

Section					
Section Shape	Circular		Mannings Coefficient	0.024	
Section Material	CMP		Span	0.80	m
Section Size	800mm		Rise	0.80	m
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	239.41	m	Upstream Velocity Head	0.06	m
Ke	0.90		Entrance Loss	0.06	m

Inlet Control Properties					
Inlet Control HW Elev.	239.34	m	Flow Control	N/A	
Inlet Type	Projecting		Area Full	0.5	m²
K	0.03400		HDS 5 Chart	2	
M	1.50000		HDS 5 Scale	3	
C	0.05530		Equation Form	1	
Y	0.54000				

Culvert Calculator Report
WC01 Culvert01 25yr

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	240.21	m	Headwater Depth/Height	0.65	
Computed Headwater Elevation	239.31	m	Discharge	0.2700	m³/s
Inlet Control HW Elev.	239.25	m	Tailwater Elevation	239.06	m
Outlet Control HW Elev.	239.31	m	Control Type	Outlet Control	

Grades					
Upstream Invert	238.79	m	Downstream Invert	238.73	m
Length	18.47	m	Constructed Slope	0.003681	m/m

Hydraulic Profile					
Profile	M2		Depth, Downstream	0.33	m
Slope Type	Mild		Normal Depth	0.46	m
Flow Regime	Subcritical		Critical Depth	0.31	m
Velocity Downstream	1.36	m/s	Critical Slope	0.014134	m/m

Section					
Section Shape	Circular		Mannings Coefficient	0.024	
Section Material	CMP		Span	0.80	m
Section Size	800mm		Rise	0.80	m
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	239.31	m	Upstream Velocity Head	0.05	m
Ke	0.90		Entrance Loss	0.05	m

Inlet Control Properties					
Inlet Control HW Elev.	239.25	m	Flow Control	N/A	
Inlet Type	Projecting		Area Full	0.5	m²
K	0.03400		HDS 5 Chart	2	
M	1.50000		HDS 5 Scale	3	
C	0.05530		Equation Form	1	
Y	0.54000				

Culvert Calculator Report
WC02 Culvert02 100yr

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	241.66	m	Headwater Depth/Height	1.48	
Computed Headwater Elevation	241.59	m	Discharge	1.2670	m³/s
Inlet Control HW Elev.	241.46	m	Tailwater Elevation	240.88	m
Outlet Control HW Elev.	241.59	m	Control Type	Outlet Control	

Grades					
Upstream Invert	240.24	m	Downstream Invert	240.26	m
Length	12.72	m	Constructed Slope	-0.001101	m/m

Hydraulic Profile					
Profile	CompositeA2PressureProfile		Depth, Downstream	0.66	m
Slope Type	Adverse		Normal Depth	N/A	m
Flow Regime	Subcritical		Critical Depth	0.66	m
Velocity Downstream	2.48	m/s	Critical Slope	0.019912	m/m

Section					
Section Shape	Circular		Mannings Coefficient	0.024	
Section Material	CMP		Span	0.91	m
Section Size	900 mm		Rise	0.91	m
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	241.59	m	Upstream Velocity Head	0.19	m
Ke	0.90		Entrance Loss	0.17	m

Inlet Control Properties					
Inlet Control HW Elev.	241.46	m	Flow Control	Transition	
Inlet Type	Projecting		Area Full	0.7	m²
K	0.03400		HDS 5 Chart	2	
M	1.50000		HDS 5 Scale	3	
C	0.05530		Equation Form	1	
Y	0.54000				

Culvert Calculator Report
WC02 Culvert02 25yr

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	241.66	m	Headwater Depth/Height	1.15	
Computed Headwater Elevation	241.30	m	Discharge	0.9500	m³/s
Inlet Control HW Elev.	241.22	m	Tailwater Elevation	240.83	m
Outlet Control HW Elev.	241.30	m	Control Type	Outlet Control	

Grades					
Upstream Invert	240.24	m	Downstream Invert	240.26	m
Length	12.72	m	Constructed Slope	-0.001101	m/m

Hydraulic Profile					
Profile	A2		Depth, Downstream	0.57	m
Slope Type	Adverse		Normal Depth	N/A	m
Flow Regime	Subcritical		Critical Depth	0.57	m
Velocity Downstream	2.19	m/s	Critical Slope	0.016734	m/m

Section					
Section Shape	Circular		Mannings Coefficient	0.024	
Section Material	CMP		Span	0.91	m
Section Size	900 mm		Rise	0.91	m
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	241.30	m	Upstream Velocity Head	0.12	m
Ke	0.90		Entrance Loss	0.10	m

Inlet Control Properties					
Inlet Control HW Elev.	241.22	m	Flow Control	Unsubmerged	
Inlet Type	Projecting		Area Full	0.7	m²
K	0.03400		HDS 5 Chart	2	
M	1.50000		HDS 5 Scale	3	
C	0.05530		Equation Form	1	
Y	0.54000				

Culvert Calculator Report
WC03 Culvert03 100yr

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	242.11	m	Headwater Depth/Height	1.17	
Computed Headwater Elevation	241.42	m	Discharge	0.9910	m³/s
Inlet Control HW Elev.	241.34	m	Tailwater Elevation	240.89	m
Outlet Control HW Elev.	241.42	m	Control Type	Outlet Control	

Grades					
Upstream Invert	240.35	m	Downstream Invert	240.30	m
Length	16.92	m	Constructed Slope	0.003132	m/m

Hydraulic Profile					
Profile	M2		Depth, Downstream	0.59	m
Slope Type	Mild		Normal Depth	N/A	m
Flow Regime	Subcritical		Critical Depth	0.59	m
Velocity Downstream	2.19	m/s	Critical Slope	0.017080	m/m

Section					
Section Shape	Circular		Mannings Coefficient	0.024	
Section Material	CMP		Span	0.91	m
Section Size	900 mm		Rise	0.91	m
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	241.42	m	Upstream Velocity Head	0.13	m
Ke	0.90		Entrance Loss	0.12	m

Inlet Control Properties					
Inlet Control HW Elev.	241.34	m	Flow Control	Unsubmerged	
Inlet Type	Projecting		Area Full	0.7	m²
K	0.03400		HDS 5 Chart	2	
M	1.50000		HDS 5 Scale	3	
C	0.05530		Equation Form	1	
Y	0.54000				

Culvert Calculator Report
WC03 Culvert03 25yr

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	242.11	m	Headwater Depth/Height	0.96	
Computed Headwater Elevation	241.23	m	Discharge	0.7430	m³/s
Inlet Control HW Elev.	241.15	m	Tailwater Elevation	240.80	m
Outlet Control HW Elev.	241.23	m	Control Type	Outlet Control	

Grades					
Upstream Invert	240.35	m	Downstream Invert	240.30	m
Length	16.92	m	Constructed Slope	0.003132	m/m

Hydraulic Profile					
Profile	M2		Depth, Downstream	0.50	m
Slope Type	Mild		Normal Depth	N/A	m
Flow Regime	Subcritical		Critical Depth	0.50	m
Velocity Downstream	2.00	m/s	Critical Slope	0.015247	m/m

Section					
Section Shape	Circular		Mannings Coefficient	0.024	
Section Material	CMP		Span	0.91	m
Section Size	900 mm		Rise	0.91	m
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	241.23	m	Upstream Velocity Head	0.10	m
Ke	0.90		Entrance Loss	0.09	m

Inlet Control Properties					
Inlet Control HW Elev.	241.15	m	Flow Control	Unsubmerged	
Inlet Type	Projecting		Area Full	0.7	m²
K	0.03400		HDS 5 Chart	2	
M	1.50000		HDS 5 Scale	3	
C	0.05530		Equation Form	1	
Y	0.54000				

Culvert Calculator Report
WC05 Culvert05 100yr

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	238.64	m	Headwater Depth/Height	2.25	
Computed Headwater Elevation	237.82	m	Discharge	0.9320	m³/s
Inlet Control HW Elev.	237.82	m	Tailwater Elevation	236.68	m
Outlet Control HW Elev.	237.68	m	Control Type	Inlet Control	

Grades					
Upstream Invert	236.36	m	Downstream Invert	236.08	m
Length	24.80	m	Constructed Slope	0.011290	m/m

Hydraulic Profile					
Profile	CompositeM2PressureProfile		Depth, Downstream	0.60	m
Slope Type	Mild		Normal Depth	N/A	m
Flow Regime	Subcritical		Critical Depth	0.59	m
Velocity Downstream	2.92	m/s	Critical Slope	0.013089	m/m

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	0.65	m
Section Size	650 mm		Rise	0.65	m
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	237.68	m	Upstream Velocity Head	0.40	m
Ke	0.50		Entrance Loss	0.20	m

Inlet Control Properties					
Inlet Control HW Elev.	237.82	m	Flow Control	Submerged	
Inlet Type	Square edge w/headwall		Area Full	0.3	m²
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

Culvert Calculator Report
WC05 Culvert05 25yr

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	238.64	m	Headwater Depth/Height	1.52	
Computed Headwater Elevation	237.35	m	Discharge	0.6840	m³/s
Inlet Control HW Elev.	237.35	m	Tailwater Elevation	236.54	m
Outlet Control HW Elev.	237.32	m	Control Type	Inlet Control	

Grades					
Upstream Invert	236.36	m	Downstream Invert	236.08	m
Length	24.80	m	Constructed Slope	0.011290	m/m

Hydraulic Profile					
Profile	S2		Depth, Downstream	0.46	m
Slope Type	Steep		Normal Depth	0.46	m
Flow Regime	Supercritical		Critical Depth	0.53	m
Velocity Downstream	2.71	m/s	Critical Slope	0.008209	m/m

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	0.65	m
Section Size	650 mm		Rise	0.65	m
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	237.32	m	Upstream Velocity Head	0.29	m
Ke	0.50		Entrance Loss	0.14	m

Inlet Control Properties					
Inlet Control HW Elev.	237.35	m	Flow Control	Submerged	
Inlet Type	Square edge w/headwall		Area Full	0.3	m²
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

Culvert Calculator Report
WC06 Culvert06 100yr

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	236.00	m	Headwater Depth/Height	1.68	
Computed Headwater Elevation	235.83	m	Discharge	1.9750	m³/s
Inlet Control HW Elev.	235.83	m	Tailwater Elevation	234.71	m
Outlet Control HW Elev.	235.77	m	Control Type	Inlet Control	

Grades					
Upstream Invert	234.15	m	Downstream Invert	233.99	m
Length	16.31	m	Constructed Slope	0.009994	m/m

Hydraulic Profile					
Profile	S2		Depth, Downstream	0.72	m
Slope Type	Steep		Normal Depth	0.69	m
Flow Regime	Supercritical		Critical Depth	0.81	m
Velocity Downstream	3.27	m/s	Critical Slope	0.006976	m/m

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Steel		Span	1.00	m
Section Size	1000 mm		Rise	1.00	m
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	235.77	m	Upstream Velocity Head	0.43	m
Ke	0.90		Entrance Loss	0.39	m

Inlet Control Properties					
Inlet Control HW Elev.	235.83	m	Flow Control	Submerged	
Inlet Type	Projecting		Area Full	0.8	m²
K	0.03400		HDS 5 Chart	2	
M	1.50000		HDS 5 Scale	3	
C	0.05530		Equation Form	1	
Y	0.54000				

Culvert Calculator Report
WC06 Culvert06 25yr

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	236.00	m	Headwater Depth/Height	1.29	
Computed Headwater Elevation	235.44	m	Discharge	1.4470	m³/s
Inlet Control HW Elev.	235.36	m	Tailwater Elevation	234.68	m
Outlet Control HW Elev.	235.44	m	Control Type	Entrance Control	

Grades					
Upstream Invert	234.15	m	Downstream Invert	233.99	m
Length	16.31	m	Constructed Slope	0.009994	m/m

Hydraulic Profile					
Profile	S2		Depth, Downstream	0.59	m
Slope Type	Steep		Normal Depth	0.56	m
Flow Regime	Supercritical		Critical Depth	0.69	m
Velocity Downstream	3.01	m/s	Critical Slope	0.005316	m/m

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Steel		Span	1.00	m
Section Size	1000 mm		Rise	1.00	m
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	235.44	m	Upstream Velocity Head	0.32	m
Ke	0.90		Entrance Loss	0.28	m

Inlet Control Properties					
Inlet Control HW Elev.	235.36	m	Flow Control	Unsubmerged	
Inlet Type	Projecting		Area Full	0.8	m²
K	0.03400		HDS 5 Chart	2	
M	1.50000		HDS 5 Scale	3	
C	0.05530		Equation Form	1	
Y	0.54000				

Culvert Calculator Report
WC07 Culvert07 100yr

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	236.50	m	Headwater Depth/Height	0.78	
Computed Headwater Elevation	235.75	m	Discharge	0.3660	m³/s
Inlet Control HW Elev.	235.66	m	Tailwater Elevation	235.06	m
Outlet Control HW Elev.	235.75	m	Control Type	Entrance Control	

Grades					
Upstream Invert	235.12	m	Downstream Invert	234.73	m
Length	18.47	m	Constructed Slope	0.020896	m/m

Hydraulic Profile					
Profile	S2		Depth, Downstream	0.33	m
Slope Type	Steep		Normal Depth	0.33	m
Flow Regime	Supercritical		Critical Depth	0.36	m
Velocity Downstream	1.88	m/s	Critical Slope	0.014638	m/m

Section					
Section Shape	Circular		Mannings Coefficient	0.024	
Section Material	CMP		Span	0.80	m
Section Size	800mm		Rise	0.80	m
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	235.75	m	Upstream Velocity Head	0.14	m
Ke	0.90		Entrance Loss	0.13	m

Inlet Control Properties					
Inlet Control HW Elev.	235.66	m	Flow Control	N/A	
Inlet Type	Projecting		Area Full	0.5	m²
K	0.03400		HDS 5 Chart	2	
M	1.50000		HDS 5 Scale	3	
C	0.05530		Equation Form	1	
Y	0.54000				

Culvert Calculator Report
WC07 Culvert07 25yr

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	236.50	m	Headwater Depth/Height	0.66	
Computed Headwater Elevation	235.65	m	Discharge	0.2680	m³/s
Inlet Control HW Elev.	235.57	m	Tailwater Elevation	235.01	m
Outlet Control HW Elev.	235.65	m	Control Type	Entrance Control	

Grades					
Upstream Invert	235.12	m	Downstream Invert	234.73	m
Length	18.47	m	Constructed Slope	0.020896	m/m

Hydraulic Profile					
Profile	S2		Depth, Downstream	0.28	m
Slope Type	Steep		Normal Depth	0.28	m
Flow Regime	Supercritical		Critical Depth	0.31	m
Velocity Downstream	1.73	m/s	Critical Slope	0.014125	m/m

Section					
Section Shape	Circular		Mannings Coefficient	0.024	
Section Material	CMP		Span	0.80	m
Section Size	800mm		Rise	0.80	m
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	235.65	m	Upstream Velocity Head	0.11	m
Ke	0.90		Entrance Loss	0.10	m

Inlet Control Properties					
Inlet Control HW Elev.	235.57	m	Flow Control	N/A	
Inlet Type	Projecting		Area Full	0.5	m²
K	0.03400		HDS 5 Chart	2	
M	1.50000		HDS 5 Scale	3	
C	0.05530		Equation Form	1	
Y	0.54000				

Culvert Calculator Report
WC09 Culvert09 100yr

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	232.37	m	Headwater Depth/Height	1.50	
Computed Headwater Elevation	231.92	m	Discharge	4.7930	m³/s
Inlet Control HW Elev.	231.74	m	Tailwater Elevation	230.76	m
Outlet Control HW Elev.	231.92	m	Control Type	Outlet Control	

Grades					
Upstream Invert	229.64	m	Downstream Invert	229.64	m
Length	20.09	m	Constructed Slope	-0.000050	m/m

Hydraulic Profile					
Profile	CompositeA2PressureProfile		Depth, Downstream	1.14	m
Slope Type	Adverse		Normal Depth	N/A	m
Flow Regime	Subcritical		Critical Depth	1.14	m
Velocity Downstream	3.28	m/s	Critical Slope	0.017534	m/m

Section					
Section Shape	Circular		Mannings Coefficient	0.024	
Section Material	CMP		Span	1.52	m
Section Size	1500 mm		Rise	1.52	m
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	231.92	m	Upstream Velocity Head	0.35	m
Ke	0.90		Entrance Loss	0.32	m

Inlet Control Properties					
Inlet Control HW Elev.	231.74	m	Flow Control	N/A	
Inlet Type	Projecting		Area Full	1.8	m²
K	0.03400		HDS 5 Chart	2	
M	1.50000		HDS 5 Scale	3	
C	0.05530		Equation Form	1	
Y	0.54000				

Culvert Calculator Report
WC09 Culvert09 25yr

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	231.14	m	Headwater Depth/Height	1.14	
Computed Headwater Elevation	231.38	m	Discharge	3.4630	m³/s
Inlet Control HW Elev.	231.26	m	Tailwater Elevation	230.60	m
Outlet Control HW Elev.	231.38	m	Control Type	Outlet Control	

Grades					
Upstream Invert	229.64	m	Downstream Invert	229.64	m
Length	20.09	m	Constructed Slope	-0.000050	m/m

Hydraulic Profile					
Profile	A2		Depth, Downstream	0.96	m
Slope Type	Adverse		Normal Depth	N/A	m
Flow Regime	Subcritical		Critical Depth	0.96	m
Velocity Downstream	2.85	m/s	Critical Slope	0.014226	m/m

Section					
Section Shape	Circular		Mannings Coefficient	0.024	
Section Material	CMP		Span	1.52	m
Section Size	1500 mm		Rise	1.52	m
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	231.38	m	Upstream Velocity Head	0.21	m
Ke	0.90		Entrance Loss	0.19	m

Inlet Control Properties					
Inlet Control HW Elev.	231.26	m	Flow Control	N/A	
Inlet Type	Projecting		Area Full	1.8	m²
K	0.03400		HDS 5 Chart	2	
M	1.50000		HDS 5 Scale	3	
C	0.05530		Equation Form	1	
Y	0.54000				

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