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FUNCTIONAL SERVICING AND STORMWATER MANAGEMENT REPORT

FOR

168 COUNTY ROAD 49

MUNICIPALITY OF TRENT LAKES

PROJECT NO. 122169

DATE: March 2024

March 15, 2024

Jeffery Homes
1200 Airport Boulevard, Suite 201
Oshawa, ON
L1J 8P5

Attention: Mr. Scott Jeffery

Re: Draft Plan of Subdivision
Functional Servicing and Stormwater Management Report
168 County Road 49, Part Lot 19, Concession 19
Municipality of Trent Lakes
Our File: 122169

Dear Sir:

In support of the Draft Plan of Subdivision for the above reference proposal, we herewith submit the following Functional Servicing and Stormwater Management Report. This report has been prepared to identify the method in which the proposed development will meet the stormwater management requirements for the City of Kawartha Lakes and Kawartha Conservation Authority and identify the infrastructure required to service the proposed development.

We trust the City of Kawartha Lakes will concur with our recommendations. Please provide positive comments on the Draft Plan of Subdivision to facilitate development. Should you have any questions on the foregoing, please do not hesitate to contact our office.

Yours Truly,
D.G. Biddle & Associates Limited

Matt Holmes, B. Eng.
Intermediate Designer
Civil Group

David McNaull, P. Eng.
Senior Project Engineer, Associate
Civil Group

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Encl.
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1.0 INTRODUCTION

1.1 Purpose

This Preliminary Functional Servicing and Stormwater Management Report has been prepared to satisfy the Conditions of Draft Approval for the proposed development. It will address sanitary services, watermain services, stormwater drainage works, and site grading required to proceed with the development. This report will also discuss the stormwater quality and quantity control objectives in accordance with the requirements of the local governing authorities.

1.2 Site Location and Description

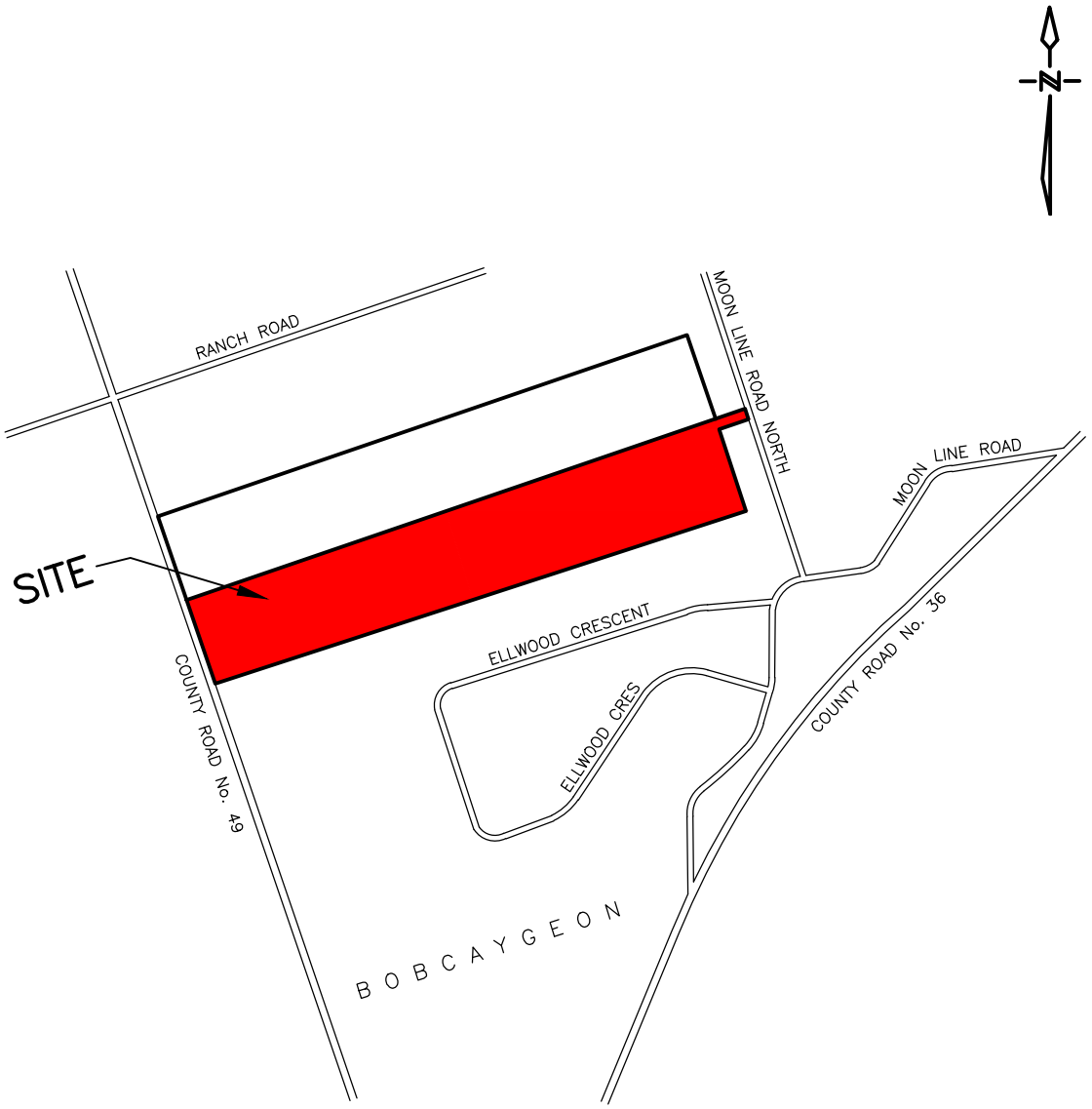
The subject property is located approximately 200m south of the intersection of County Road 49 and Ranch Road. The subject site is approximately 48.33 hectares, consisting of farmland, forest and un-evaluated wetland. The proposed development is to be divided into 2 phases. Currently, the urban development boundary runs through the proposed development as outlined on the Site Location Plan, Figure 1. Phase 1 will be defined as the development south of the urban boundary line, encompassing 25 lots, while Phase 2 will be defined as the development north of the urban boundary line, encompassing 44 lots. The proposed development is bounded on the north by existing agricultural lands, on the south by existing residential units, on the west by County Road 49 and on the east by Moon Line Road and existing residential units.

The proposed development is divided by the Provincially Significant Wetland (PSW) in the centre of the development, which splits the lands into a western and eastern parcel. The drainage for the western side of the development is divided into two areas, draining south to the adjacent lands and to the Provincially Significant Wetland. The drainage for the eastern side of the development is divided into three areas – the most significant draining area flows east towards Moon Line Drive, the remaining two drainage areas both drain south through the existing residential area.

2.0 WATER SUPPLY & DISTRIBUTION

2.1 Existing System

Currently, the site is not serviced with a connection to a municipal water system. There is no municipal water infrastructure present on County Road 49.



JEFFERY SUBDIVISION, BOBCAYGEON, ON

SITE LOCATION PLAN

D.G. BIDDLE & ASSOCIATES
CONSULTING ENGINEERS & PLANNERS

96 King Street East
Oshawa, Ontario, L1H 1B6
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SCALE	N.T.S.
DRAWN	M.J.H.
DESIGN	M.J.H.
CHECKED	D.D.M.
DATE	MAR 2024

PROJECT 122169

DWG FIG 1

2.3 Proposed System

The domestic and firefighting water will be provided privately on-site. Domestic water supply for each dwelling will be supplied by individual water wells located on each lot installed by a well driller who has been licensed by the Ministry of Environment and Climate Change. On-site firefighting water supply will be provided through the implementation of a dry hydrant system and underground water supply tank. The dry hydrant system has been designed in accordance with the Ontario Building Code.

The layout of the dry hydrant system is illustrated on the Site Servicing Plan (Drawing 122169 SS-1) attached at the end of this report. Supporting calculations are appended in Schedule 1.

3.0 SANITARY SERVICING

3.1 Existing System

Currently, the site is not serviced with a connection to a municipal sanitary system. There is no municipal sanitary infrastructure present on County Road 49.

3.2 Proposed System

Individual on-site septic systems will provide treatment of the sanitary sewage from the proposed dwellings. Detailed sizing of the individual septic systems will occur at building permit submission.

4.0 STORM SERVICING

4.1 Existing System

Currently, the site is not serviced with a connection to a municipal storm system. There is no municipal storm infrastructure present on County Road 49.

4.2 Proposed System

The stormwater runoff will continue to the conveyed tributaries which includes the County Road 49 ditch, the provincially significant wetland, and the Moon Line Road ditch by way of open ditch drainage system conveyance. These systems will include the use of culverts to maintain positive drainage to the outlets and infiltration galleries to promote ground water recharge prior to discharging to the site's outlet locations.

The proposed stormwater drainage system is illustrated on the attached Conceptual Grading and Servicing Plan, drawing 122169 LG-1 for the west parcel, and drawing 122169 LG-2 for the east parcel, attached at the end of this report.

5.0 STORMWATER QUANTITY CONTROLS

As mentioned above, stormwater drainage from the proposed development is to be conveyed to the above-mentioned tributaries using a combination of open ditch drainage system conveyance directed to infiltration galleries sized at the site's low points in the roadside ditches. The galleries are proposed at the low points of the roads and not proposed where ditch grades would exceed 2.0% due to the increased stone depth and reduced ability to infiltrate stormwater with increased flow velocities. These galleries will primarily reduce the post development flow volumes to each outlet by capturing and infiltrating smaller storm events. The remaining flows up to the 100-year storm event will then be attenuated within the open ditch system in conjunction with orifices to reduce post development flows to pre-development levels.

The DUHYD sub-routine in the computer model Visual Otthymo 6.0 was used to simulate the flow capture for each infiltration gallery. It should be noted the flow capture volume varies for each tributary. The NASHYD sub-routine in the computer model Visual Otthymo 6.0 was used to simulate runoff volumes and post-development peak flows for the site. Peak flows were computed using 4-hour Chicago distribution rainfall for the 2-year to 100-year return frequency events. The 2-year to 100-year IDF parameters used are as per the "City of Kawartha Lakes 2019 Storm and Stormwater Infrastructure Guidelines". The results for the flows calculated draining to the County Road 49 ditch are appended at the end of this report. The areas draining to each infiltration gallery are illustrated on the Post-Development Drainage Schemes, drawings 122169-SD-3 & 122169-SD-4. Sizing calculations for the infiltration galleries are attached at the end of this report.

5.1 County Road 49 Ditch Outlet – Hydraulic Point A

The existing drainage pattern for the western portion of land of the subject site drains south to the adjacent lands. The post development flows will continue to drain to the southern area of the site to the adjacent lands by discharging into the rural side ditch of County Road 49, namely hydraulic point A. Infiltration Gallery A is located within the proposed roadside ditch of the subject side and has been sized to infiltrate 60% of the 2-year storm. Flow volumes exceeding the gallery's capacity will be stored within the roadside ditch and be attenuated in conjunction with 2 orifices. Tabulated below in Table 1 is a comparison of the post-development peak flows to the pre-development peak flows.

TABLE 1: POST-DEVELOPMENT PEAK FLOWS TO COUNTY ROAD 49 DITCH (HYDRAULIC POINT A)

RETURN FREQUENCY (YEARS)	*PRE-DEVELOPMENT PEAK FLOWS (L/s)	**TOTAL POST-DEVELOPMENT PEAK FLOW FROM SITE (L/s)	CHANGE (L/s)
2	119	76	-43
5	185	132	-53
10	245	189	-56
25	339	319	-20
50	414	412	-2
100	505	502	-3

*Refer to Figure 2 (Schedule 2) NasHyd 1
**Refer to Figure 3 (Schedule 2) AddHyd14

As is reported above, all storm events are effectively reduced when compared to the pre-development levels. The use of LID measures provides sufficient storm reductions such that, no adverse impacts are anticipated on the existing downstream drainage network. The Visual Otthymo output files are appended in Schedule 2.

5.2 West Parcel Wetland Outlet – Hydraulic Point B

The existing drainage pattern for the central portion of the subject site west of the Provincially Significant Wetland (PSW) area drains eastward to the wetland. The post development flows will continue to drain to the east to the PSW area via a overland flow route, namely hydraulic point B. Infiltration gallery B has been sized on the central parcel west of the PSW to infiltrate 90% of the 5-year storm event with 967m^3 of water storage being required in infiltration gallery B. Flow volumes exceeding the gallery's capacity will be stored within the roadside ditch and be attenuated in conjunction with 1 orifice. Tabulated below in Table 2 is a comparison of the post-development peak flows to the pre-development peak flows for the western parcel draining to the PSW.

TABLE 2: POST-DEVELOPMENT PEAK FLOWS TO THE WEST PARCEL DRAINING TO PROVINCIALLY SIGNIFICANT WETLAND (HYDRAULIC POINT B)

RETURN FREQUENCY (YEARS)	*PRE-DEVELOPMENT PEAK FLOWS (L/s)	**TOTAL POST-DEVELOPMENT PEAK FLOW FROM SITE (L/s)	CHANGE (L/s)
2	265	131	-134
5	415	199	-216
10	551	463	-88
25	766	755	-11
50	938	919	-19
100	1147	1077	-70

*Refer to Figure 2 (Schedule 2) NasHyd2
**Refer to Figure 4 (Schedule 3) AddHyd20

As is reported above, all post-development flows are effectively reduced when compared to the pre-development levels. The use of LID measures provides sufficient and frequent storm reductions such that, no adverse impacts are anticipated on the existing downstream drainage network. The Visual Otthymo output files are appended in Schedule 2.

5.3 Moon Line Road Ditch Outlet - Hydraulic Point C

The existing drainage pattern for the eastern parcel of the subject site, east of the wetland area, drains eastward to Moon Line Drive. The post development flows will continue to drain to the east to the rural side ditch within Moon Line Drive, namely hydraulic point C. Infiltration galley C has been sized on the eastern parcel of land at the site outlet to Moon Line Road to infiltrate 90% of the 5-year storm event with 1201m^3 of water storage being required in infiltration gallery C. Flow volumes exceeding the gallery's capacity will be stored within the roadside ditch and be attenuated in conjunction with 2 orifices. Tabulated below in Table 3 is a comparison of the post-development peak flows to the pre-development peak flows for the eastern parcel draining to Moon Line Drive.

TABLE 3: POST-DEVELOPMENT PEAK FLOWS DRAINING TO MOON LINE DR. (HYDRAULIC POINT C)

RETURN FREQUENCY (YEARS)	*PRE-DEVELOPMENT PEAK FLOWS (L/s)	+TOTAL POST-DEVELOPMENT PEAK FLOW FROM SITE (L/s)	CHANGE (L/s)
2	192	80	-112
5	300	131	-169
10	398	260	-138
25	554	430	-124
50	679	622	-57
100	830	765	-65

*Refer to Figure 2 (Schedule 2) NasHyd4
**Refer to Figure 5 (Schedule 3) AddHyd29

As is reported above, all post-development flows are effectively reduced when compared to the pre-development levels. The use of LID measures provides sufficient and frequent storm reductions such that, no adverse impacts are anticipated on the existing downstream drainage network. The Visual Otthymo output files are appended in Schedule 2.

5.4 East Parcel Existing Residential – Hydraulic Point D

There are currently 2 low points located near the south property line east of the wetland area, one at the far southeast corner and the second low point is approximately 430m west of the far southeast corner.

The post-development area draining to the second low point with similar imperviousness compared to pre-development area, is proposed to be reduced, therefore, this was not assessed.

The first low point on the southeast corner will attenuate the post-development flows to the pre-development levels. The post development flows will continue to drain to the southeast corner of the site, namely hydraulic Point D, then through the existing residential area and ultimately to Moone Line Drive ditch. Infiltration galley D, located in the rear yards of lots 35 to 38, has been sized to infiltrate 75% of the 2-year storm even with 98m^3 of water storage being required in infiltration gallery D. Flow volumes exceeding the gallery's capacity will be continuing to flow through the existing residential subdivision. Tabulated below in Table 3 is a comparison of the post-

development peak flows to the pre-development peak flows for the eastern parcel draining through the existing subdivision.

TABLE 4: POST DEVELOPMENT PEAK FLOWS TO SOUTHEAST CORNER OF EAST PARCEL (HYDRAULIC POINTS D)

RETURN FREQUENCY (YEARS)	*PRE-DEVELOPMENT PEAK FLOWS (L/s)	**TOTAL POST-DEVELOPMENT PEAK FLOW FROM SITE (L/s)	CHANGE (L/s)
2	41	1	-40
5	62	28	-34
10	82	51	-31
25	111	88	-23
50	135	118	-17
100	163	153	-10

*Refer to Figure 2 (Schedule 2) NasHyd5
**Refer to Figure 6 (Schedule 3) Junction 61

As is reported above, all post-development flows are effectively reduced when compared to the pre-development levels. The use of LID measures provides sufficient and frequent storm reductions such that, no adverse impacts are anticipated on the existing downstream drainage network. The Visual Otthymo output files are appended in Schedule 2.

6.0 STORMWATER QUALITY CONTROLS

As illustrated on the Conceptual Grading and Servicing Plan, drawing 122169 LG-1, most of the site will be covered with landscape area. As the proposed development is to be serviced by an open ditch system, quality treatment will occur as the stormwater runoff is conveyed through the grassed roadside ditches. In addition to the stormwater quantity controls, the site will be required to provide on-site stormwater quality control.

Stormwater quality treatment prior to discharge will be provided through the implementation of infiltration galleries to achieve 80% total suspended solids (T.S.S.) removal. To ensure 80% TSS removal was achieved, the infiltration galleries were sized in accordance with infiltration section of Table 3.2 “Water Quality Storage Requirements based on Receiving Waters” in the Ministry of Environment Stormwater Management Planning and Design Manual, March 2003. Each gallery was sized to treat at least the 25mm rainfall event which is a requirement to achieve the 80% removal efficiency. Since all percent imperviousness

were less than the lowest requirement of 35% which would require 25m^3/ha, 25m^3/ha was used as a conservative sizing volume.

Through the implementation of the above outlined approach, this will provide a T.S.S. removal of 80% prior to discharging from the site at the site outlets. Supporting calculations are appended in Schedule 1.

7.0 SITE GRADING

In general, the site will be graded in a manner which will satisfy the following goals:

- Satisfy the City of Kawartha Lakes boulevard and road grading criteria including:
- Minimum Road Grade: 0.5%
- Maximum Road Grade: 5.0%
- Minimum Landscape Area Grade: 2.0%
- Maximum Landscape Area Grade: 5.0%
- Provide continuous grades for overland flow conveyance.
- Minimize the volume of earth to be moved and minimize cut/fill differential.
- Achieve stormwater management objectives required for the site.

Details of the site grading design is illustrated on the Conceptual Grading and Servicing Plan, drawings 122169 LG-1 & LG-2, attached at the end of this report.

8.0 EROSION & SEDIMENT CONTROL

During the construction period, the removal of natural vegetation causes the transport of large amounts of sediment during rainfall events. To minimize the sediment laden storm water leaving the site during construction, the following sediment control techniques are proposed to be implemented. These measures are detailed on the Erosion and Sediment Control Plan included in the site plan submission.

1. Construction Vehicle Access Route (Mud Mat)
2. Rock Check Dams
3. Perimeter Enviro Fence
4. Good Engineering Practices

The above techniques will be detailed on the Erosion and Sediment Control Plans (Drawing 122169 ES-1 & ES-2).

9.0 CONCLUSIONS

The preceding report identifies the functional servicing and stormwater management requirements for the development proposal. The investigations into these requirements have resulted in the following conclusions for the development proposal:

- Sanitary servicing for each dwelling will be provided through individual septic systems on each lot. Detailed sizing of the individual septic systems will occur during the building permit process.
- On-site firefighting water supply will be provided through the implementation of a dry hydrant system and on-site underground water supply tank;

  Domestic water supply for each dwelling will be supplied by individual water wells located on each lot installed by a well driller who has been licensed by the Ministry of Environment and Climate Change;
- LID techniques in the form of infiltration galleries will be implemented to facilitate offsetting the increase in stormwater runoff. Open ditches in conjunction with orifice control devices will be used to attenuate the remaining flows to pre-development levels;
- Stormwater quality controls are implemented through the use of open ditches and infiltration galleries located in the low points/outlets;
- Temporary sediment controls during construction can be managed by the use of perimeter enviro fence, construction vehicle access route, rip rap check dams and good engineering practices;

APPENDIX 1

CURVE NUMBER DESIGN CHARTS

POST-DEVELOPMENT WEIGHTED CURVE NUMBERS

PRE-DEVELOPMENT TIME OF CONCENTRATION CALCULATIONS
– WESTERN PARCEL
– EASTERN PARCEL

POST DEVELOPMENT TIME OF CONCENTRATION CALCULATIONS
– WESTERN PARCEL
– EASTERN PARCEL

STAGE-STORAGE DISCHARGE
– WESTERN PARCEL FLOWS TO COUNTY ROAD 49
– WESTERN PARCEL FLOWS OVERLAND FLOW ROUTE
– EASTERN PARCEL FLOWS TO MOON LINE ROAD

WATER QUALITY STORAGE REQUIREMENTS

INFILTRATION GALLERY SIZING CALCULATIONS

DRY HYDRANT DESIGN CALCULATIONS

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Design Chart 1.08: Hydrologic Soil Groups (Continued)

- Based on Soil Texture

Sands, Sandy Loams and Gravels	
- overlying sand, gravel or limestone bedrock, very well drained	A
- ditto, imperfectly drained	AB
- shallow, overlying Precambrian bedrock or clay subsoil	B
Medium to Coarse Loams	
- overlying sand, gravel or limestone, well drained	AB
- shallow, overlying Precambrian bedrock or clay subsoil	B
Medium Textured Loams	
- shallow, overlying limestone bedrock	B
- overlying medium textured subsoil	BC
Silt Loams, Some Loams	
- with good internal drainage	BC
- with slow internal drainage and good external drainage	C
Clays, Clay Loams, Silty Clay Loams	
- with good internal drainage	C
- with imperfect or poor external drainage	C
- with slow internal drainage and good external drainage	D

Source: U.S. Department of Agriculture (1972)

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Design Chart 1.09: Soil/Land Use Curve Numbers

Land Use	Treatment or Practice	Hydrologic Condition[4]	Hydrologic Soil Group			
			A	B	C	D
Fallow	Straight row	—	77	86	91	94
Row crops	"	Poor	72	81	88	91
	"	Good	67	78	85	89
	Contoured	Poor	70	79	84	88
	"	Good	65	75	82	86
	" and terraced	Poor	66	74	8	82
	" " "	Good	62	71	78	81
Small grain	Straight row	Poor	65	76	84	88
		Good	63	75	83	87
	Contoured	Poor	63	74	82	85
		Good	61	73	81	84
	" and terraced	Poor	61	72	79	82
		Good	59	70	78	81
Close-seeded legumes[2] or rotation meadow	Straight row	Poor	66	77	85	89
	" "	Good	58	72	81	85
	Contoured	Poor	64	75	83	85
	"	Good	55	69	78	83
	" and terraced	Poor	63	73	80	83
	" and terraced	Good	51	67	76	80
Pasture or range		Poor	68	79	86	89
		Fair	49	69	79	84
	Contoured	Good	39	61	74	80
	"	Poor	47	67	81	88
	"	Fair	25	59	75	83
		Good	6	35	70	79
Meadow		Good	30	58	71	78
Woods		Poor	45	66	77	83
		Fair	36	60	73	79
		Good	25	55	70	77
Farmsteads		—	59	74	82	86
		—	72	82	87	89
		—	74	84	90	92

For average anticedent soil moisture condition (AMC II)
[2] Close-drilled or broadcast.

[4] The hydrologic condition of cropland is good if a good crop rotation practice is used; it is poor if one crop is grown continuously.

Source: U.S. Department of Agriculture (1972)

Weighted Curve Number Calculations - Eastern Parcel

Note: Assume House Area of 370.80m^2 and Garage of 102.30 m^2 per Henley Contracting Ltd. Therefore, assume 500m^2 per lot for house, driveway and garage/office.

Eastern Parcel Flows to Provincially Significant Wetland (PSW)

Node 16 - Lot 42 to 45 Rears (Uncontrolled Flows from Eastern Parcel)			Area =	1.29 ha
Material	**Area (ha)**	**Curve Number (CN)**	**Ratio**	
House/Garage (5)	0.250	98	24.5	
Grassed Area	1.043	67	69.90004	
Total	1.29		94.40004	
Weighted CN =	72.99			

Eastern Parcel Flows to Existing Residential Subdivision

Node 21 - Lot 39 to 41 Rears			Area =	1.88 ha
Material	**Area (ha)**	**Curve Number (CN)**	**Ratio**	
House/Garage (3)	0.150	98	14.7	
Grassed Area	1.730	67	115.9431	
Total	1.88		130.6431	
Weighted CN =	69.47			

Node 30 - Lot 35 to 38 Rears			Area =	1.91 ha
Material	**Area (ha)**	**Curve Number (CN)**	**Ratio**	
House/Garage (2)	0.100	98	9.8	
Grassed Area	1.815	67	121.6038	
Total	1.91		131.4038	
Weighted CN =	68.62			

Weighted Curve Number Calculations - Eastern Parcel

Eastern Parcel Flows to Moon Line Road Ditch

Node 22 - Lot 34 to 43 Fronts, 56 to 59, Street C & D Draining to Moon Line Road (Controlled Flows to Moon Line Road - Phase 1) Area = 5.66 ha

Material	Area (ha)	Curve Number (CN)	Ratio
House/Garage (9)	0.450	98	44.1
Grassed Area	4.581	67	306.948
Asphalt/Shoulder	0.625	98	61.29017
Total	5.66		412.3382
Weighted CN =	72.89		

Node 23 - Lots 44 to 56 & Street D Draining to Moon Line Road (Controlled Flows to Moon Line Road - PH 2) Area = 5.69 ha

Material	Area (ha)	Curve Number (CN)	Ratio
House/Garage (8)	0.400	98	39.2
Grassed Area	4.843	67	324.4491
Asphalt/Shoulder	0.447	98	43.80466
Total	5.69		407.4537
Weighted CN =	71.61		

Node 28 - Lots 47 to 51 Rears & BLK 61 Area = 3.06 ha

Material	Area (ha)	Curve Number (CN)	Ratio
House/Garage (4)	0.200	98	19.6
Grassed Area	2.855	67	191.3119
Total	3.06		210.9119
Weighted CN =	69.03		

Time of Concentration & Time to Peak Calculation (Pre-Development)

1) Node 1 - Western Portion of Site Draining West to CR 49

Upstream Invert 304.81
Downstream Invert 291.08
Length (m) 442.13
Assume Pasture - Contoured

Slope = (304.81-291.08) / 442.13 = 3.11%

From Figure A.5.2 : Upland Method for Estimating Tc (SCS National Engineering Handbook, 1971)

v = 0.38 m/s

t_c = 442.13 / 0.38 = 1156.50 s = 0.32125 h

t_{p1} = 2 x t_c / 3 = 0.214167 h

2) Node 2 - Western Portion of Site Draining East to Wetland

Part 1

Upstream Invert 306.95
Downstream Invert 293.55
Length (m) 277.99
Assume Pasture - Contoured

Slope = (306.95 - 293.55) / 277.99 = 4.82%

From Figure A.5.2 : Upland Method for Estimating Tc (SCS National Engineering Handbook, 1971)

v = 0.48 m/s

t_c = 277.99 / 0.48 = 573.65 s = 0.159347 h

t_{p1} = 2 x t_c / 3 = 0.106231 h

3) Node 2 - Western Portion of Site Draining East to Wetland

Part 2

Upstream Invert 293.55
Downstream Invert 290.79
Length (m) 331.68
Assume Pasture - Contoured

Slope = (293.55 - 290.79) / 331.68 = 0.83%

From Figure A.5.2 : Upland Method for Estimating Tc (SCS National Engineering Handbook, 1971)

v = 0.19 m/s

t_c = 331.68 / 0.19 = 1727.48 s = 0.479855 h

t_{p1} = 2 x t_c / 3 = 0.319904 h

$t_{p\ TOTAL}$ = t_{p1} + t_{p2} = 0.426135 h

3) Node 3 -Eastern Portion of Site Draining South to Ex Residential

Upstream Invert 292.81
Downstream Invert 285.40
Length (m) 229.89
Assume Pasture - Contoured

Slope = (292.81-285.40) / 229.89 = 3.22%

From Figure A.5.2 : Upland Method for Estimating Tc (SCS National Engineering Handbook, 1971)

v = 0.39 m/s

t_c = 229.89 / 0.39 = 597.12 s = 0.165868 h

t_{p2} = 2 x t_c / 3 = 0.110579 h

Time of Concentration & Time to Peak Calculation (Pre-Development)

4)	Node 4 -Eastern Portion of Site Draining East to Moon Line Road North		Slope =	293.29 - 286.84 / 103.63	=	6.22%	
Part 1	Upstream Invert	293.29	**From Figure A.5.2 : Upland Method for Estimating Tc**				
	Downstream Invert	286.84	**(SCS National Engineering Handbook, 1971)**				
	Length (m)	103.63	v =	0.56 m/s			
	Assume Pasture - Contoured		t_c =	103.63 / 0.56	=	185.05 s	
					=	0.051403 h	
			t_{p2} =	2 x t_c / 3	=	0.034269 h	

5)	Node 4 -Eastern Portion of Site Draining East to Moon Line Road North		Slope =	286.84 - 286.00 / 171.18	=	0.49%	
Part 2	Upstream Invert	286.84	**From Figure A.5.2 : Upland Method for Estimating Tc**				
	Downstream Invert	286.00	**(SCS National Engineering Handbook, 1971)**				
	Length (m)	171.18	v =	0.16 m/s			
	Assume Pasture - Contoured		t_c =	171.18 / 0.16	=	1053.43 s	
					=	0.29262 h	
			t_{p2} =	2 x t_c / 3	=	0.19508 h	

6)	Node 4 -Eastern Portion of Site Draining East to Moon Line Road North		Slope =	286.00 - 280.70 / 322.16	=	1.65%	
Part 3	Upstream Invert	286.00	**From Figure A.5.2 : Upland Method for Estimating Tc**				
	Downstream Invert	280.70	**(SCS National Engineering Handbook, 1971)**				
	Length (m)	322.16	v =	0.28 m/s			
	Assume Pasture - Contoured		t_c =	322.16 / 0.28	=	1138.38 s	
					=	0.316217 h	
			t_{p2} =	2 x t_c / 3	=	0.210811 h	

$t_{p\ TOTAL}$ = $t_{p1} + t_{p2} + t_{p3}$ = 0.4401597 h

7)	Node 5 - Eastern Parcel Draining South through ex residential to Moon Line Road		Slope =	289.23 - 281.01 / 187.09	=	4.39%	
	Upstream Invert	289.23	**From Figure A.5.2 : Upland Method for Estimating Tc**				
	Downstream Invert	281.01	**(SCS National Engineering Handbook, 1971)**				
	Length (m)	187.09	v =	0.48 m/s			
	Assume Pasture - Contoured		t_c =	187.09 / 0.48	=	389.78 s	
					=	0.108271 h	
			t_{p2} =	2 x t_c / 3	=	0.072181 h	

Time of Concentration & Time to Peak Calculation (Post-Development) - Western Side of Site

1) Node 6 - Lot 1 - 4 Rears
Upstream Invert 296.30
Downstream Invert 292.56
Length (m) 70.22
Assume Pasture - Contoured

Slope = (296.30 - 292.56) / 70.22 = 5.33%

From Figure A.5.2 : Upland Method for Estimating Tc (SCS National Engineering Handbook, 1971)

v = 0.50 m/s

t_c = 70.22 / 0.50 = 141.86 s = 0.039407 h

t_p = 2 x t_c / 3 = 0.026271 h

Note: Since 0.026h is less than the minimum allowable, a t_p of 0.11h was used.

2) Node 7 - Lots 23 & 24
Upstream Invert 301.11
Downstream Invert 296.38
Length (m) 156.20
Assume Woodland/Contour

Slope = (301.11 - 296.38) / 156.20 = 3.03%

From Figure A.5.2 : Upland Method for Estimating Tc (SCS National Engineering Handbook, 1971)

v = 0.39 m/s

t_c = 156.20 / 0.39 = 405.72 s = 0.1127 h

t_p = 2 x t_c / 3 = 0.075133 h

Note: Since 0.075h is less than the minimum allowable, a t_p of 0.11h was used.

3) Node 8 - Lot 5 - 13 Rears
Upstream Invert 294.98
Downstream Invert 292.34
Length (m) 93.81
Assume Pasture - Contoured

Slope = (294.98 - 292.34) / 93.81 = 2.81%

From Figure A.5.2 : Upland Method for Estimating Tc (SCS National Engineering Handbook, 1971)

v = 0.36 m/s

t_c = 93.81 / 0.36 = 257.22 s = 0.071451 h

t_p = 2 x t_c / 3 = 0.047634 h

Note: Since 0.023h is less than the minimum allowable, a t_p of 0.11h was used.

4) Node 9 - Lot 1 to 7 Fronts, Street A , Lots 25, 26, 30-33 to Street A - Part 1
Upstream Invert 299.79
Downstream Invert 295.68
Length (m) 188.48
Assume Pasture - Contoured

Slope = (296.62 - 296.16) / 188.48 = 2.18%

From Figure A.5.2 : Upland Method for Estimating Tc (SCS National Engineering Handbook, 1971)

v = 0.32 m/s

t_c = 188.48 / 0.32 = 582.57 s = 0.161826 h

Part 1 t_{p1} = 2 x t_c / 3 = 0.107884 h

5) Node 9 - Lot 1 to 7 Fronts, Street A , Lots 25, 26, 30-33 to Street A - Part 2
Upstream Invert 295.68
Downstream Invert 294.40
Length (m) 128.29
Assume Grassed Waterway

Slope = (295.68 - 294.40) / 128.29 = 1.00%

From Figure A.5.2 : Upland Method for Estimating Tc (SCS National Engineering Handbook, 1971)

v = 0.46 m/s

t_c = 128.29 / 0.46 = 280.72 s = 0.077977 h

Part 2 t_{p2} = 2 x t_c / 3 = 0.051984 h

$t_p = t_{p1} + t_{p2}$ = 0.10788 + 0.051984 = 0.159869 h

Time of Concentration & Time to Peak Calculation (Post-Development) - Western Side of Site

6)	Node 15 - Lots 8, 9, 11 to 22, 24 to 29 and Street B Draining to OLF Route			Slope =	302.80 - 297.52 / 113.06	=		5.41%
	Upstream Invert	302.80			**From Figure A.5.2 : Upland Method for Estimating Tc**			
	Downstream Invert	296.68			**(SCS National Engineering Handbook, 1971)**			
	Length (m)	113.06						
	Assume Pasture - Contoured			v =	0.50 m/s			
				t_c =	113.06 / 0.50	=	226.12 s	
						=	0.062812 h	
			Part 1	t_{p1} =	2 x t_c / 3	=	0.041875 h	

7)	Node 15 - Lots 8, 9, 11 to 22, 24 to 29 and Street B Draining to OLF Route			Slope =	297.52 - 293.29 / 205.68	=		1.65%
	Upstream Invert	296.68			**From Figure A.5.2 : Upland Method for Estimating Tc**			
	Downstream Invert	293.29			**(SCS National Engineering Handbook, 1971)**			
	Length (m)	205.68						
	Assume Grassed Waterway			v =	0.58 m/s			
				t_c =	205.68 / 0.58	=	354.63 s	
						=	0.098508 h	
			Part 2	t_{p2} =	2 x t_c / 3	=	0.065672 h	
	$t_p = t_{p1} + t_{p2}$ =	0.04187	+	0.065672	=	0.107547 h		

Time of Concentration & Time to Peak Calculation (Post-Development) - Eastern Side of Site

1) Node 16 - Lot 42 to 45 Rears (Uncontrolled Flows from Eastern Parcel)

Upstream Invert 291.88
Downstream Invert 290.56
Length (m) 66.27
Assume Pasture - Contoured

Slope = (291.88 - 290.56) / 66.27 = 2.00%

From Figure A.5.2 : Upland Method for Estimating Tc (SCS National Engineering Handbook, 1971)

v = 0.30 m/s

t_c = 66.27 / 0.30 = 220.89 s = 0.061358 h

t_p = 2 x t_c / 3 = 0.040905 h

2) Node 21 - Lot 39 to 41 Rears

Upstream Invert 289.66
Downstream Invert 287.51
Length (m) 96.46
Assume Pasture - Contoured

Slope = (289.66 - 287.51) / 96.46 = 2.23%

From Figure A.5.2 : Upland Method for Estimating Tc (SCS National Engineering Handbook, 1971)

v = 0.33 m/s

t_c = 96.46 / 0.33 = 296.81 s = 0.082446 h

t_p = 2 x t_c / 3 = 0.054964 h

3) Node 22 - Lot 34 to 43 Fronts, 56 to 59, Street C & D Draining to Moon Line - Pt. 1

Upstream Invert 292.17
Downstream Invert 289.62
Length (m) 127.19
Assume Pasture - Contoured

Slope = (292.17 - 289.62) / 127.19 = 2.00%

From Figure A.5.2 : Upland Method for Estimating Tc (SCS National Engineering Handbook, 1971)

v = 0.30 m/s

t_c = 127.19 / 0.30 = 423.96 s = 0.117767 h

Part 1 t_{p1} = 2 x t_c / 3 = 0.078511 h

4) Node 22 - Lot 34 to 43 Fronts, 56 to 59, Street C & D Draining to Moon Line - Pt. 2

Upstream Invert 289.62
Downstream Invert 281.6
Length (m) 511.40
Assume Grassed Waterway

Slope = (292.17 - 289.62) / 511.40 = 1.57%

From Figure A.5.2 : Upland Method for Estimating Tc (SCS National Engineering Handbook, 1971)

v = 0.57 m/s

t_c = 511.40 / 0.57 = 897.19 s = 0.249219 h

Part 2 t_{p2} = 2 x t_c / 3 = 0.166146 h

$t_p = t_{p1} + t_{p2}$ = 0.07851 + 0.166146 = 0.244658 h

Time of Concentration & Time to Peak Calculation (Post-Development) - Eastern Side of Site

5) Node 23 - Lots 44 to 56 & Street D Draining to Moon Line (Controlled Flows - Phase 2)
Upstream Invert 291.65
Downstream Invert 288.73
Length (m) 96.56
Assume Pasture - Contoured

Slope = (291.65 - 288.73) / 96.56 = 3.02%

From Figure A.5.2 : Upland Method for Estimating Tc (SCS National Engineering Handbook, 1971)

v = 0.39 m/s

t_c = 96.56 / 0.39 = 247.58 s = 0.068774 h

Part 1 $t_{p1} = \frac{2 \times t_c}{3}$ = 0.045849 h

6) Node 23 - Lots 44 to 56 & Street D Draining to Moon Line (Controlled Flows - Phase 2)
Upstream Invert 288.73
Downstream Invert 285.05
Length (m) 309.66
Assume Grassed Waterway

Slope = (291.65 - 288.73) / 309.66 = 1.19%

From Figure A.5.2 : Upland Method for Estimating Tc (SCS National Engineering Handbook, 1971)

v = 0.39 m/s

t_c = 309.66 / 0.39 = 804.30 s = 0.223417 h

Part 2 $t_{p2} = \frac{2 \times t_c}{3}$ = 0.148944 h

$t_p = t_{p1} + t_{p2}$ = 0.04585 + 0.148944 = 0.194793 h

7) Node 28 - Lot 47 to 49 Rears
Upstream Invert 288.24
Downstream Invert 286.83
Length (m) 70.77
Assume Pasture - Contoured

Slope = (288.24 - 286.83) / 70.77 = 2.00%

From Figure A.5.2 : Upland Method for Estimating Tc (SCS National Engineering Handbook, 1971)

v = 0.30 m/s

t_c = 70.77 / 0.30 = 235.89 s = 0.065525 h

$t_p = \frac{2 \times t_c}{3}$ = 0.043683 h

8) Node 30 - Lot 35 to 38 Rears
Upstream Invert 288.68
Downstream Invert 287.14
Length (m) 127.19
Assume Pasture - Contoured

Slope = (288.68 - 287.14) / 127.19 = 1.21%

From Figure A.5.2 : Upland Method for Estimating Tc (SCS National Engineering Handbook, 1971)

v = 0.25 m/s

t_c = 127.19 / 0.25 = 508.75 s = 0.14132 h

$t_p = \frac{2 \times t_c}{3}$ = 0.094214 h

Project: Jeffery Subdivision - Bobcaygeon
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Western Parcel Flows to County Road 49 - Hydraulic Pt. A

Stage - Storage - Discharge

C/L Orifice 1: 294.53 C/L Orifice 2: 294.74 m
Orifice Diameter: 250 mm Plate Orifice Diameter: 385 mm Plate

Elevation (m)	Head (m)	Ditch Storage (m3)	Total Storage (m3)	Orifice 1 Discharge (m3/s)	Orifice 2 Discharge (m3/s)	Total Orifice Discharge (m3/s)	Storage (ha.m)
294.40	0.00	0.000	0.000	0.000	0.000	0.0000	0.000000
294.50	0.00	4.210	4.210	0.000	0.000	0.0000	0.000421
294.60	0.08	8.420	8.420	0.036	0.000	0.0363	0.000842
294.70	0.18	26.815	26.815	0.055	0.000	0.0555	0.002682
294.80	0.28	45.210	45.210	0.070	0.075	0.1450	0.004521
294.90	0.38	90.085	90.085	0.081	0.125	0.2061	0.009009
295.00	0.48	134.960	134.960	0.091	0.160	0.2510	0.013496
295.10	0.58	201.110	201.110	0.101	0.188	0.2886	0.020111

Western Parcel Flows to County Road 49 - Hydraulic Pt. A

Orifice Discharge

Orifice 1 Diameter:	250	mm
Orifice Type:	PLATE	
Orifice Coeff	0.61	
Centreline:	294.53	m
X-Sectional Area:	0.049087	m2
Gravity Constant	9.81	m/s2

Elevation (m)	Head (m)	Discharge (m3/s)	Discharge (L/s)
294.50	0.00	0.00000	0.00
294.60	0.08	0.03632	36.32
294.70	0.18	0.05548	55.48
294.80	0.28	0.06955	69.55
294.90	0.38	0.08122	81.22
295.00	0.48	0.09141	91.41
295.10	0.58	0.10057	100.57

Orifice 2 Diameter:	385	mm
Orifice Type:	PLATE	
Orifice Coeff	0.61	
Centreline:	294.74	m
X-Sectional Area:	0.116416	m2
Gravity Constant	9.81	m/s2

Elevation (m)	Head (m)	Discharge (m3/s)	Discharge (L/s)
294.70	0.00	0.00000	0.00
294.80	0.06	0.07543	75.43
294.90	0.16	0.12483	124.83
295.00	0.26	0.15962	159.62
295.10	0.36	0.18807	188.07

Orifice Discharge Equation

Q= 0.132632 Sqrt(H)

G = Gravitational Constant
H = Head (m)
A = X-Sectional Area (m2)
C = Orifice Coefficient

Note: Orifice Coefficient for PLATE orfice = 0.61
Orifice Coefficient for TUBE orfice = 0.80

Orifice Equation based on:
$Q=CA\sqrt{2GH}$

Roadside Ditch Storage Calculations - Hydraulic Pt. A

West Parcel - Phase 1 North Ditch to County Road 49 - North side Ditch					
Elevation (m)	Area (m^2)	Average Area (m^2)	Depth (m)	Volume (m^3)	Total Volume (m^3)
294.40	0.00				0.00
		21.05	0.20	4.21	
294.60	42.09				4.21
		91.88	0.20	18.38	
294.80	141.67				22.59
		224.06	0.20	44.81	
295.00	306.44				67.40
		332.63	0.10	33.26	
295.10	358.83				100.66

West Parcel - Phase 1 South Ditch to County Road 49 - North side Ditch					
Elevation (m)	Area (m^2)	Average Area (m^2)	Depth (m)	Volume (m^3)	Total Volume (m^3)
294.40	0.00				0.00
		21.06	0.20	4.21	
294.60	42.12				4.21
		92.06	0.20	18.41	
294.80	142.00				22.63
		224.67	0.20	44.93	
295.00	307.33				67.56
		328.81	0.10	32.88	
295.10	350.30				100.44

Elevation	Cumulative Volume
294.40	**0.00**
294.60	**8.42**
294.80	**45.21**
295.00	**134.96**
295.10	**201.10**

Project: Jeffery Subdivision - Bobcaygeon
Project #: 122169
Date: February 2024

Western Parcel Flows to Overland Flow Route - Hydraulic Pt. B

Stage - Storage - Discharge

C/L Orifice 1: 293.56
Orifice Diameter: 600 mm TUBE

Elevation (m)	Head (m)	Ditch Storage (m3)	Total Storage (m3)	Discharge (m3/s)	Storage (ha.m)
293.30	0.00	0.000	0.000	0.0000	0.000000
293.40	0.00	1.670	1.670	0.0000	0.000167
293.50	0.00	13.575	13.575	0.0000	0.001358
293.60	0.00	25.480	25.480	0.0000	0.002548
293.70	0.14	62.090	62.090	0.3715	0.006209
293.80	0.24	98.700	98.700	0.4883	0.009870
293.90	0.34	178.945	178.945	0.5821	0.017895
294.00	0.44	259.190	259.190	0.6627	0.025919

Western Parcel Flows to Overland Flow Route - Hydraulic Pt. B

Orifice Discharge

Orifice 1 Diameter:	600	mm
Orifice Type:	TUBE	
Orifice Coeff	0.8	
Centreline:	293.56	m
X-Sectional Area:	0.282743	m2
Gravity Constant	9.81	m/s2

Elevation (m)	Head (m)	Discharge (m3/s)	Discharge (L/s)
293.50	0.00	0.00000	0.00
293.60	0.00	0.00000	0.00
293.70	0.14	0.37152	371.52
293.80	0.24	0.48827	488.27
293.90	0.34	0.58206	582.06
294.00	0.44	0.66271	662.71

Orifice Discharge Equation

Q= 1.001917 Sqrt(H)

G = Gravitational Constant
H = Head (m)
A = X-Sectional Area (m2)
C = Orifice Coefficient

Note: Orifice Coefficient for PLATE orfice = 0.61
Orifice Coefficient for TUBE orfice = 0.80

Orifice Equation based on:
Q=CAv2GH

PROJECT Jeffery Subdivision - Bobcaygeon
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Roadside Ditch Storage Calculations - Hydraulic Pt. B

West Parcel - Phase 2 North Ditch to OLF Route - North side Ditch					
Elevation (m)	Area (m^2)	Average Area (m^2)	Depth (m)	Volume (m^3)	Total Volume (m^3)
293.30	0.00				0.00
		7.96	0.10	0.80	
293.40	15.93				0.80
		58.02	0.20	11.60	
293.60	100.10				12.40
		180.24	0.20	36.05	
293.80	260.38				48.45
		434.41	0.20	86.88	
294.00	608.44				135.33

West Parcel - Phase 2 South Ditch to OLF Route - South side Ditch					
Elevation (m)	Area (m^2)	Average Area (m^2)	Depth (m)	Volume (m^3)	Total Volume (m^3)
293.30	0.00				0.00
		8.71	0.10	0.87	
293.40	17.42				0.87
		61.04	0.20	12.21	
293.60	104.66				13.08
		185.89	0.20	37.18	
293.80	267.11				50.26
		368.02	0.20	73.60	
294.00	468.92				123.86

Elevation	Cumulative Volume
293.30	**0.00**
293.40	**1.67**
293.60	**25.48**
293.80	**98.70**
294.00	**259.19**

Project: Jeffery Subdivision - Bobcaygeon
Project #: 122169
Date: February 2024

Eastern Parcel Flows to Moon Line Road - Hydraulic Pt. C

Stage - Storage - Discharge

C/L Orifice 1: 281.74 m
Orifice Diameter: 375 mm TUBE

C/L Orifice 2: 282.13 m
Orifice Diameter 450 mm TUBE

Elevation (m)	Head (m)	Ditch Storage (m3)	Total Storage (m3)	Orifice 1 Discharge (m3/s)	Orifice 2 Discharge (m3/s)	Discharge (m3/s)	Storage (ha.m)
281.70	0.00	0.000	0.00	0.000	0.000	0.000	0.000000
281.80	0.06	36.486	7.140	0.098	0.000	0.098	0.000714
281.90	0.16	72.971	23.780	0.158	0.000	0.158	0.002378
282.00	0.26	109.457	40.420	0.201	0.000	0.201	0.004042
282.10	0.36	145.943	80.615	0.236	0.000	0.236	0.008062
282.20	0.46	182.429	120.810	0.266	0.154	0.421	0.012081
282.30	0.56	218.914	188.105	0.294	0.236	0.529	0.018811
282.40	0.66	255.400	255.400	0.319	0.296	0.614	0.025540

Eastern Parcel Flows to Moon Line Road - Hydraulic Pt. C

Orifice Discharge

Orifice 1 Diameter:	375	mm
Orifice Type:	TUBE	
Orifice Coeff	0.8	
Centreline:	281.74	m
X-Sectional Area:	0.110447	m2
Gravity Constant	9.81	m/s2

Elevation (m)	Head (m)	Discharge (m3/s)	Discharge (L/s)
281.70	0.00	0.00000	0.00
281.80	0.06	0.09784	97.84
281.90	0.16	0.15777	157.77
282.00	0.26	0.20052	200.52
282.10	0.36	0.23564	235.64
282.20	0.46	0.26616	266.16
282.30	0.56	0.29353	293.53
282.40	0.66	0.31856	318.56

Orifice 2 Diameter:	450	mm
Orifice Type:	TUBE	
Orifice Coeff	0.8	
Centreline:	282.13	m
X-Sectional Area:	0.159043	m2
Gravity Constant	9.81	m/s2

Elevation (m)	Head (m)	Discharge (m3/s)	Discharge (L/s)
282.10	0.00	0.00000	0.00
282.20	0.08	0.15434	154.34
282.30	0.18	0.23576	235.76
282.40	0.28	0.29554	295.54

Orifice Discharge Equation

Q= 0.391374 Sqrt(H)

G = Gravitational Constant
H = Head (m)
A = X-Sectional Area (m2)
C = Orifice Coefficient

Note: Orifice Coefficient for PLATE orfice = 0.61
Orifice Coefficient for TUBE orfice = 0.80

Orifice Equation based on:
Q=CAV2GH

PROJECT Jeffery Subdivision - Bobcaygeon
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Roadside Ditch Storage Calculations - Hydraulic Pt. C

East Parcel - Phase 1 North Ditch to Moon Line Road - North side Ditch					
Elevation (m)	Area (m^2)	Average Area (m^2)	Depth (m)	Volume (m^3)	Total Volume (m^3)
281.60	0.00				0.00
		18.06	0.20	3.61	
281.80	36.11				3.61
		83.85	0.20	16.77	
282.00	131.59				20.38
		202.66	0.20	40.53	
282.20	273.73				60.91
		339.48	0.20	67.90	
282.40	405.23				128.81

East Parcel - Phase 1 North Ditch to Moon Line Road - North side Ditch					
Elevation (m)	Area (m^2)	Average Area (m^2)	Depth (m)	Volume (m^3)	Total Volume (m^3)
281.60	0.00				0.00
		17.64	0.20	3.53	
281.80	35.28				3.53
		82.57	0.20	16.51	
282.00	129.86				20.04
		199.25	0.20	39.85	
282.20	268.65				59.89
		333.43	0.20	66.69	
282.40	398.22				126.58

Elevation	Cumulative Volume
281.60	**0.00**
281.80	**7.14**
282.00	**40.42**
282.20	**120.81**
282.40	**255.39**

Water Quality Storage Requirements Based on Receiving Waters

Area Draining to Moon Line Road North - East Parcel

Node	Area	RC	A x I
22	5.656723	0.20	1.131345
23	5.688604	0.20	1.137721
Total	11.34533 ha		2.269066

Weighted RC = 0.200
% IMP = 0.00%

For conservatism, we assumed a maximum imperviousness of 20%.

In order to provide 80% TSS Removal, refer to Table 3.2 from MOE SWM Planning and Design Manual.

Since the calculated imperviousness, 20% < 35%, size galleries to store 25m^3/ha.

Storage = 11.34533 x 25m^3/ha = 283.63 m^3 Required

Storage Provided = 1201.00 m^3

Therefore, adequate storage provided to ensure 80% TSS removal by infiltration gallery C.

Area Draining to County Road 49 - Western Parcel

Node	Area	RC	A x I
9	4.025538	0.20	0.805108
Total	4.025538		0.805108

Weighted RC = 0.200
% IMP = 0.00%

For conservatism, we assumed a maximum imperviousness of 20%.

Since the calculated imperviousness, 20% < 35%, size galleries to store 25m^3/ha.

Storage = 4.025538 x 25m^3/ha = 100.64 m^3 Required

Storage Provided = 185.35 m^3

Therefore, adequate storage provided to ensure 80% TSS removal by infiltration gallery A.

Area Draining to Wetland - West Parcel

Node	Area	RC	A x I
15	9.307348	0.20	1.86147
Total	9.307348		1.86147

Weighted RC = 0.20000
% IMP = 0.00%

For conservatism, we assumed a maximum imperviousness of 20%.

Since the calculated imperviousness, 20% < 35%, size galleries to store 25m^3/ha.

Storage = 9.307348 x 25m^3/ha = 232.68 m^3 Required

Storage Provided = 943.36 m^3

Therefore, adequate storage provided to ensure 80% TSS removal by infiltration gallery B

Area Draining to Ex Residential (Lots 35 to 38) - East Parcel

Node	Area	RC	A x I
30	1.914983	0.20	0.382997
Total	1.914983		0.382997

Weighted RC = 0.20000
% IMP = 0.00%

For conservatism, we assumed a maximum imperviousness of 20%.

Since the calculated imperviousness, 20% < 35%, size galleries to store 25m^3/ha.

Storage = 1.914983 x 25m^3/ha = 47.87 m^3 Required

Storage Provided = 124.22 m^3

Therefore, adequate storage provided to ensure 80% TSS removal by infiltration gallery D

PROJECT Jeffery Subdivision - Bobcaygeon
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Infiltration Gallery A - West Parcel Draining West to County Road 49
(Hydraulic Pt. A)

* Size Infiltration gallery to hold 60% of the 2-year event*

Area (ha) 4.026 IN meters 40260 m^2

Storm	Flow (m^3/s)	RV (mm)	RV (m)
2-year	0.101	7.673	0.007673
60% of 2-year	0.0606**	4.6038	0.004604

* RV from NasHyd 9 (Controlled Flows to CR 49) in VO Output
** Flow divide to be input at Node 11 (DuHyd - 11)

Volume Required to store 60% of the 2-year = event 185.349 m^3

Stone Volume Required = $\frac{185.348988}{0.4}$ = 463.3725 m^3

Therefore, store the 60% of the 2-year event.

Length	98.00	m
Width	3.65	m
Depth	1.30	m
Volume =	465.01	m^3

Therefore, to store the 60% of the 2-year event, 98.00m in total length of infiltration gallery will be required with a width of 3.65m and a depth of 1.30m. This should be sufficient clearance above groundwater levels as borehole data from the "Preliminary Stormwater Management Report" provided by Greer Galloway outlines that at the location of proposed Infiltration Gallery A, groundwater was encountered 1.0 mbgs in BH 1, however this section has been raised approximately 1.50m due to fill requirements.

Infiltration Gallery B - West Parcel Draining East to Wetland
(Hydraulic Pt. B)

* Size Infiltration gallery at Outlet to hold 90% of the 5-year event*

Area (ha) 9.307 IN meters 93070 m^2

Storm	Flow (m^3/s)	RV (mm)	RV (m)
5- Year	0.424	11.545	0.011545
90% of 5-year	0.3816**	10.3905	0.010391

*RV from NasHyd 15 in VO Output
** Flow divide to be input at Node 17 (DuHyd - 17)

Volume Required to store to Hold 90% of = the 5-year event 967.04 m^3

Note: Due to quantity control requirements, the 5-yr (913.32m^3) are required to be stored in infiltration galleries.

Stone Volume Required = $\frac{967.04}{0.4}$ = 2417.61 m^3

Therefore, store 90% of the 5-year rainfall event.

Length	262.00	m
Width	4.30	m
Depth	2.15	m
Volume =	2422.19	m^3

Therefore, to provide the required quantity control and contain 90% of the 5-year runoff, 262.00m in length of infiltration gallery will be required with a width of 4.30m and a depth of 2.15m. This should be sufficient clearance above groundwater levels as borehole data from the "Preliminary Stormwater Management Report" provided by Greer Galloway outlines that at the location of proposed Infiltration Gallery A, there was no groundwater encountered in either BH 4 or 5.

PROJECT Jeffery Subdivision - Bobcaygeon
PROJECT # 122169
DATE 2024-03-04

Infiltration Gallery C - South Side of East Parcel Draining to Moon Line Road (Hydraulic Pt. C)

* Size Infiltration gallery at Outlet to hold 90% of the 5-year event*

Area (ha) 11.305 IN meters 113050 m^2

Storm	Flow (m^3/s)	RV (mm)	RV (m)
5-Year	0.382	11.8	0.0118
90% of 5- Year	0.3438**	10.62	0.01062

* RV from Add-Hyd 24 in "*Inf Galleries at Outlets* " section - VO Output
** Flow divide to be input at Node 25 (DuHyd - 25)

Volume Required to store to Hold 90% of the 5-year = 1200.59 m^3 event

Note: Due to quantity control requirements, 1201m^3 are required to be stored in infiltration galleries.

Stone Volume Required = $\frac{1200.59}{0.4}$ = 3001.478 m^3

Length	334.0	m
Width	4.50	m
Depth	2.00	m
Volume =	3006	m^3

Therefore, to provide the required quantity control, 334.00m in total length of infiltration gallery will be required with a width of 4.50m and a depth of 2.00m. This should be sufficient clearance above groundwater levels as borehole data from the "Preliminary Stormwater Management Report" provided by Greer Galloway outlines that at the location of proposed Infiltration Gallery A, there was no groundwater encountered in BHs 6 to 10.

Infiltration Gallery D - Lot 35 to 38 Rears (Hydraulic Pt. D)

* Size Infiltration gallery at Outlet to hold 75% of the 2 year storm*

Area (ha) 1.915 IN meters 19150 m^2

Storm	Flow (m^3/s)	RV (mm)	RV (m)
2-Year	0.076	6.812	0.006812
75% of 2-Year	0.064	5.109	0.005109

* RV from NasHyd 30 in "*Inf Galleries at Outlets* " section - VO Output
** Flow divide to be input at Node 31 (DuHyd - 31)

Volume Required to store to Hold 75% of the 2 Yr = 97.83735 m^3

Stone Volume Required = $\frac{97.83735}{0.4}$ = 244.5934 m^3

Therefore, store 75% of the 2 year storm

Length	48.0	m
Width	3.65	m
Depth	1.40	m
Volume =	245.28	m^3

Therefore, to store 75% of the 2-year storm event, 48.00m in length of infiltration gallery will be required with a width of 4.85m and a depth of 1.80m. This should be sufficient clearance above groundwater levels as borehole data from the "Preliminary Stormwater Management Report" provided by Greer Galloway outlines that at the location of proposed Infiltration Gallery A, there was no groundwater encountered in BHs 6 to 10.

Jeffery Subdivision - Bobcaygeon
Job File: 122169
City of Kawartha Lakes
Dry Hydrant Design Calculations

4. Design Flow Rate			951.02	gpm
5. Elevation Above Sea Level			539.70	ft
6. Normal Atmospheric Pressure [From Table I.1(a)]			14.22	psi
7. Lift	Height x 0.434 =	3 m x 0.434		
	=	9.84 ft x 0.434 =	4.27	psi
8. Water Temperature Vapour Pressure [From Table I.1(f)]			0.18	psi
9. Pressure Loss at pump intake			5.0	psi
Available Site Pressure				
10. Line 6 minus (Line 7 + 8 + 9)			4.77	psi
11. Pressure Loss in pipe & fittings (From Dry Hydrant Hardware Layout Worksheet)			1.71	psi
12. Pressure Loss from Sudden Reduction [From Table I.1(f)]				
Reduction: 6" x 6"			0	psi
13. Velocity in Suction Pipe [From Table I.1(g)]			0.79	psi
14. Pressure Loss in Suction Hose [From Table I.1(h)]			0.236	psi
15. Pressure to overcome piping and water movement loss Add (Line 11 + 12 + 13 + 14)			2.73	psi
16. Available Site Pressure (ASP) Available Site Pressure = Line 10 - Line 15			2.04	psi

Dry Hydrant Hardware Layout Worksheet 2/4

Job No. 122169

Dry Hydrant A

Friction Loss Per Foot (Table I.1e) Based on 951.02 gpm Design Flow: 0.028359 psi

Description & Size	Straight Line Equivalent feet of Pipe	Conversion for Pipe Coefficient	Loss (psi)
Strainer	5.00	0.02836	0.141795
90° Bend (8")	18.92	0.02836	0.536552
90° Bend (8")	18.92	0.02836	0.536552
6" PVC Pipe	6.56	0.02836	0.186035
6" PVC Pipe	9.84	0.02836	0.279053
1 ft of 6" pipe	1.00	0.02836	0.028359

Total Loss 1.71 psi

4. Design Flow Rate (L/min to gpm)

3600 L/min = 951.02 gallons per minute

5. Elevation Above Sea Level

291.65m = 956.86 ft (Mean Site Elevation)

6. Normal Atmospheric Pressure [From Table I.1(a)]

Elevation Above Sea Level: 956.86 feet
Normal Atmospheric Pressure @ 0 ft = 14.70 psi
Normal Atmospheric Pressure @ 1000 ft = 14.20 psi

Normal Atmosperic Pressure @ 539.70 ft

14.70 - [(956.86/1000)*(14.70-14.20)] = 14.22 psi

7. Lift

Lift = Depth from FDC to Pipe Invert (Refer to Detail on Site Sevicing Drawing)
Lift = 2.10 + 0.3 + 0.6 = 3.00m = 9.84 ft
Lift = 9.84 ft x 0.434 = 4.27 psi

8. Vapour Pressure

Assume a water temperature of 50 Fahrenheit
From Table I.1(b): Vapour Pressure = 0.180 psi

10. Available Site Pressure

Atmospheric Pressure - Lift - Vapour Pressure - Pressure Loss @ Pump Intake
= 14.22 - 4.27 - 0.18 - 5.0 = **4.77 psi**

11. Friction Loss Per Foot of Pipe (psi)

Based on a Design Flow Rate of 713.26 gpm
Friction Loss/Foot of Pipe = 0.028359 psi [From Table I.1(e)]

12. Pressure Loss from Sudden Reduction

Since system is a 6" pipe, no reduction required.
Pressure Loss = 0 psi [From Table I.1(f)]

13. Velocity in Suction Pipe

Based on a Design Flow Rate of 713.26 gpm
Velocity in Suction Pipe = 0.79 psi [From Table I.1(g)]

14. Pressure Loss in Suction Hose

Based on a Design Flow Rate of 713.26 gpm
Pressure Loss in Section Hose = 0.236 psi [From Table I.1(h)]

Job File: 122169
City of Kawartha Lakes
Water Storage Tank Design Calculations

Building Classification from Table 3.1.2.1: Type C - Residential Occupancies

Water Supply Coefficient (K): 23 (Table 1 - OBC Appendix A , Vol. 2)

Building Volume

Assume Average House Square Footage of 4000 ft^2 (370.8m^2) and Average Building Height of 10m (3.00m basement, 3.00m 1st & second floors, 1.00m roof pitch) Each lot will have an additional Garage/Office with an assumed square footage of 1100 ft^2 (102.30m^2) with an assumed height of 3.00m and a 1.00m roof pitch.

Average House Volume = (370.80 x 10) = 3708.00 m^3
Average Garage/Office Volume = (102.30 x 10) = 1023 m^3

Total Building Volume per Lot = 4731.00 m^3

Spatial Coefficient

*Assume an average exposure distance of 20.0m for distance between houses

S_{side} = 0.00 (From Figure 1 - OBC Appendix A, Vol. 2)
S_{side} = 0.00 (Front & Back of House)
S_{tot} = 1.0 + [Sside + Sside2 + Sside3 + Sside 4] = 1.0 + [0 + 0 + 0 + 0]
S_{tot} = 1.00

Requred Minimum Water Supply Flow Rate (L/min)

$Q = KVS_{tot}$ = (23 x 4731.00 x 1.00) = 108813.00 L

As per Table 2 , since Q > 108,000 L & Q <= 135,000 L:
Required Minimum Water Supply Flow Rate = 3600 L/min

Minimum 30 Minute Water Supply Based on Table 2 Flow Rate

Water Supply Flow Rate = 3600 L/min
Water Supply = 108813.00 L
A minimum Water Supply of 30 minutes is required
Water Supply/Water Supply Flow Rate = 108,813/3600 = 30.23 minutes

Since 30.23 minutes > 30 minutes required, a storage tank is to be sized to hold 108,813.00 L (108.81 m^3).

Note: We cannot draw down the bottom 6" of water below the strainer, so only 2.25m can be counted towards the storage volume. The true height of the tank will be 2.40m.

Length: 7.00
Width: 7.00
Height: 2.25

Volume = (7.00 x 7.00 x 2.25) = 110.25 m^3

Since 110.25 m^3 > 108.81 m^3, a storage tank 7.00m long, 7.00m wide and 2.40m deep will provide the required on site water supply for fire protection.

APPENDIX 2

VISUAL OTTHYMO SCHEMATICS & OUTPUT FILES

1 **Western Portion of Site Draining West to CR 49 (Hydraulic Pt. A)**
AREA [ha] - 6.533

2 **Western Portion of Site Draining East to Wetland (Hydraulic Pt. B)**
AREA [ha] - 21.856

3 **Eastern Portion of Site Draining South to Existing Residential**
AREA [ha] - 2.431

4 **Eastern Portion of Site Draining East to Moon Line Road (Hydraulic Pt. C)**
AREA [ha] - 16.162

5 **South East Corner of East Portion Draining to Moonline Road (Hydraulic Pt. D)**
AREA [ha] - 1.347

JEFFERY SUBDIVISION, BOBCAYGEON, ON

VISUAL OTTHYMO SCHEMATIC PRE-DEVELOPMENT FLOWS

D.G. BIDDLE & ASSOCIATES
CONSULTING ENGINEERS & PLANNERS
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SCALE	N.T.S.
DRAWN	M.J.H.
DESIGN	M.J.H.
CHECKED	D.D.M.
DATE	MAR 2024

PROJECT 122169

DWG FIG 2

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*********************************
** SIMULATION:1) CKL 2 Yr      **
*********************************
--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 858.000
| Ptotal= 37.06 mm |                          B=   6.800
--------------------                          C=   0.822
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    = 10.00 min
                       Time to peak ratio =  0.33

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    2.15 |  1.00   20.33 |  2.00    5.50 |  3.00    2.59
                0.17    2.49 |  1.17   84.39 |  2.17    4.60 |  3.17    2.39
                0.33    2.98 |  1.33   26.99 |  2.33    3.97 |  3.33    2.23
                0.50    3.73 |  1.50   13.71 |  2.50    3.49 |  3.50    2.08
                0.67    5.04 |  1.67    9.12 |  2.67    3.13 |  3.67    1.95
                0.83    7.98 |  1.83    6.85 |  2.83    2.83 |  3.83    1.84


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0001)|   Area    (ha)=   6.53   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.21

        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    2.15 | 1.083   20.33 | 2.083    5.50 |  3.08    2.59
               0.167    2.15 | 1.167   20.33 | 2.167    5.50 |  3.17    2.59
               0.250    2.49 | 1.250   84.39 | 2.250    4.60 |  3.25    2.39
               0.333    2.49 | 1.333   84.39 | 2.333    4.60 |  3.33    2.39
               0.417    2.98 | 1.417   26.99 | 2.417    3.97 |  3.42    2.23
               0.500    2.98 | 1.500   26.99 | 2.500    3.97 |  3.50    2.23
               0.583    3.73 | 1.583   13.71 | 2.583    3.49 |  3.58    2.08
               0.667    3.73 | 1.667   13.71 | 2.667    3.49 |  3.67    2.08
               0.750    5.04 | 1.750    9.12 | 2.750    3.13 |  3.75    1.95
               0.833    5.04 | 1.833    9.12 | 2.833    3.13 |  3.83    1.95
               0.917    7.98 | 1.917    6.85 | 2.917    2.83 |  3.92    1.84
               1.000    7.98 | 2.000    6.85 | 3.000    2.83 |  4.00    1.84

     Unit Hyd Qpeak  (cms)=   1.166

     PEAK FLOW       (cms)=   0.119 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=   6.530
     TOTAL RAINFALL   (mm)=  37.060
     RUNOFF COEFFICIENT   =   0.176

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=  21.86   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.43

        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    2.15 | 1.083   20.33 | 2.083    5.50 |  3.08    2.59
               0.167    2.15 | 1.167   20.33 | 2.167    5.50 |  3.17    2.59
               0.250    2.49 | 1.250   84.39 | 2.250    4.60 |  3.25    2.39
               0.333    2.49 | 1.333   84.39 | 2.333    4.60 |  3.33    2.39
               0.417    2.98 | 1.417   26.99 | 2.417    3.97 |  3.42    2.23
               0.500    2.98 | 1.500   26.99 | 2.500    3.97 |  3.50    2.23
               0.583    3.73 | 1.583   13.71 | 2.583    3.49 |  3.58    2.08
               0.667    3.73 | 1.667   13.71 | 2.667    3.49 |  3.67    2.08
               0.750    5.04 | 1.750    9.12 | 2.750    3.13 |  3.75    1.95
               0.833    5.04 | 1.833    9.12 | 2.833    3.13 |  3.83    1.95
               0.917    7.98 | 1.917    6.85 | 2.917    2.83 |  3.92    1.84
               1.000    7.98 | 2.000    6.85 | 3.000    2.83 |  4.00    1.84

     Unit Hyd Qpeak  (cms)=   1.959

     PEAK FLOW       (cms)=   0.265 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=   6.539
     TOTAL RAINFALL   (mm)=  37.060
     RUNOFF COEFFICIENT   =   0.176

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0003)|   Area    (ha)=   2.43   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

        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    2.15 | 1.083   20.33 | 2.083    5.50 |  3.08    2.59
               0.167    2.15 | 1.167   20.33 | 2.167    5.50 |  3.17    2.59
               0.250    2.49 | 1.250   84.39 | 2.250    4.60 |  3.25    2.39
               0.333    2.49 | 1.333   84.39 | 2.333    4.60 |  3.33    2.39
               0.417    2.98 | 1.417   26.99 | 2.417    3.97 |  3.42    2.23
               0.500    2.98 | 1.500   26.99 | 2.500    3.97 |  3.50    2.23
               0.583    3.73 | 1.583   13.71 | 2.583    3.49 |  3.58    2.08
               0.667    3.73 | 1.667   13.71 | 2.667    3.49 |  3.67    2.08
               0.750    5.04 | 1.750    9.12 | 2.750    3.13 |  3.75    1.95
               0.833    5.04 | 1.833    9.12 | 2.833    3.13 |  3.83    1.95
               0.917    7.98 | 1.917    6.85 | 2.917    2.83 |  3.92    1.84
               1.000    7.98 | 2.000    6.85 | 3.000    2.83 |  4.00    1.84

     Unit Hyd Qpeak  (cms)=   0.840

     PEAK FLOW       (cms)=   0.059 (i)
     TIME TO PEAK    (hrs)=   1.417
     RUNOFF VOLUME    (mm)=   6.422
     TOTAL RAINFALL   (mm)=  37.060
     RUNOFF COEFFICIENT   =   0.173

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0004)|   Area    (ha)=  16.16   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.44

        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    2.15 | 1.083   20.33 | 2.083    5.50 |  3.08    2.59
               0.167    2.15 | 1.167   20.33 | 2.167    5.50 |  3.17    2.59
               0.250    2.49 | 1.250   84.39 | 2.250    4.60 |  3.25    2.39
               0.333    2.49 | 1.333   84.39 | 2.333    4.60 |  3.33    2.39
               0.417    2.98 | 1.417   26.99 | 2.417    3.97 |  3.42    2.23
               0.500    2.98 | 1.500   26.99 | 2.500    3.97 |  3.50    2.23
               0.583    3.73 | 1.583   13.71 | 2.583    3.49 |  3.58    2.08
               0.667    3.73 | 1.667   13.71 | 2.667    3.49 |  3.67    2.08
               0.750    5.04 | 1.750    9.12 | 2.750    3.13 |  3.75    1.95
               0.833    5.04 | 1.833    9.12 | 2.833    3.13 |  3.83    1.95
               0.917    7.98 | 1.917    6.85 | 2.917    2.83 |  3.92    1.84
               1.000    7.98 | 2.000    6.85 | 3.000    2.83 |  4.00    1.84

     Unit Hyd Qpeak  (cms)=   1.402

     PEAK FLOW       (cms)=   0.192 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=   6.539
     TOTAL RAINFALL   (mm)=  37.060
     RUNOFF COEFFICIENT   =   0.176

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

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--------------------
| CALIB            |
| NASHYD   (  0005)|   Area    (ha)=   1.35   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.07

        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    2.15 | 1.083   20.33 | 2.083    5.50 |  3.08    2.59
 0.167    2.15 | 1.167   20.33 | 2.167    5.50 |  3.17    2.59
 0.250    2.49 | 1.250   84.39 | 2.250    4.60 |  3.25    2.39
 0.333    2.49 | 1.333   84.39 | 2.333    4.60 |  3.33    2.39
 0.417    2.98 | 1.417   26.99 | 2.417    3.97 |  3.42    2.23
 0.500    2.98 | 1.500   26.99 | 2.500    3.97 |  3.50    2.23
 0.583    3.73 | 1.583   13.71 | 2.583    3.49 |  3.58    2.08
 0.667    3.73 | 1.667   13.71 | 2.667    3.49 |  3.67    2.08
 0.750    5.04 | 1.750    9.12 | 2.750    3.13 |  3.75    1.95
 0.833    5.04 | 1.833    9.12 | 2.833    3.13 |  3.83    1.95
 0.917    7.98 | 1.917    6.85 | 2.917    2.83 |  3.92    1.84
 1.000    7.98 | 2.000    6.85 | 3.000    2.83 |  4.00    1.84

     Unit Hyd Qpeak  (cms)=   0.713

     PEAK FLOW       (cms)=   0.041 (i)
     TIME TO PEAK    (hrs)=   1.333
     RUNOFF VOLUME    (mm)=   6.019
     TOTAL RAINFALL   (mm)=  37.060
     RUNOFF COEFFICIENT   =   0.162

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

--------------------------------------------------------------------------------
*********************************
** SIMULATION:2) CKL 5 Yr     **
*********************************
--------------------
| CHICAGO STORM    |    IDF curve parameters: A=1214.000
| Ptotal= 45.35 mm |                          B=   9.000
--------------------                          C=   0.847
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    = 10.00 min
                       Time to peak ratio =  0.33

  TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
   hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
  0.00    2.43 |  1.00   26.49 |  2.00    6.72 |  3.00    2.98
  0.17    2.85 |  1.17  100.26 |  2.17    5.55 |  3.17    2.73
  0.33    3.46 |  1.33   35.24 |  2.33    4.72 |  3.33    2.53
  0.50    4.41 |  1.50   17.77 |  2.50    4.12 |  3.50    2.35
  0.67    6.13 |  1.67   11.59 |  2.67    3.65 |  3.67    2.20
  0.83   10.04 |  1.83    8.52 |  2.83    3.28 |  3.83    2.06


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0001)|   Area    (ha)=   6.53   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.21

        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    2.43 | 1.083   26.49 | 2.083    6.72 |  3.08    2.98
 0.167    2.43 | 1.167   26.49 | 2.167    6.72 |  3.17    2.98
 0.250    2.85 | 1.250  100.26 | 2.250    5.55 |  3.25    2.73
 0.333    2.85 | 1.333  100.26 | 2.333    5.55 |  3.33    2.73
 0.417    3.46 | 1.417   35.24 | 2.417    4.72 |  3.42    2.53
 0.500    3.46 | 1.500   35.24 | 2.500    4.72 |  3.50    2.53
 0.583    4.41 | 1.583   17.77 | 2.583    4.12 |  3.58    2.35
 0.667    4.41 | 1.667   17.77 | 2.667    4.12 |  3.67    2.35
 0.750    6.13 | 1.750   11.59 | 2.750    3.65 |  3.75    2.20
 0.833    6.13 | 1.833   11.59 | 2.833    3.65 |  3.83    2.20
 0.917   10.04 | 1.917    8.52 | 2.917    3.28 |  3.92    2.06
 1.000   10.04 | 2.000    8.52 | 3.000    3.28 |  4.00    2.06

     Unit Hyd Qpeak  (cms)=   1.166

     PEAK FLOW       (cms)=   0.185 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=   9.825
     TOTAL RAINFALL   (mm)=  45.348
     RUNOFF COEFFICIENT   =   0.217

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

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--------------------
| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=  21.86   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.43

        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    2.43 | 1.083   26.49 | 2.083    6.72 |  3.08    2.98
 0.167    2.43 | 1.167   26.49 | 2.167    6.72 |  3.17    2.98
 0.250    2.85 | 1.250  100.26 | 2.250    5.55 |  3.25    2.73
 0.333    2.85 | 1.333  100.26 | 2.333    5.55 |  3.33    2.73
 0.417    3.46 | 1.417   35.24 | 2.417    4.72 |  3.42    2.53
 0.500    3.46 | 1.500   35.24 | 2.500    4.72 |  3.50    2.53
 0.583    4.41 | 1.583   17.77 | 2.583    4.12 |  3.58    2.35
 0.667    4.41 | 1.667   17.77 | 2.667    4.12 |  3.67    2.35
 0.750    6.13 | 1.750   11.59 | 2.750    3.65 |  3.75    2.20
 0.833    6.13 | 1.833   11.59 | 2.833    3.65 |  3.83    2.20
 0.917   10.04 | 1.917    8.52 | 2.917    3.28 |  3.92    2.06
 1.000   10.04 | 2.000    8.52 | 3.000    3.28 |  4.00    2.06

     Unit Hyd Qpeak  (cms)=   1.959

     PEAK FLOW       (cms)=   0.415 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=   9.839
     TOTAL RAINFALL   (mm)=  45.348
     RUNOFF COEFFICIENT   =   0.217

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

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--------------------
| CALIB            |
| NASHYD   (  0003)|   Area    (ha)=   2.43   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

        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    2.43 | 1.083   26.49 | 2.083    6.72 |  3.08    2.98
 0.167    2.43 | 1.167   26.49 | 2.167    6.72 |  3.17    2.98
 0.250    2.85 | 1.250  100.26 | 2.250    5.55 |  3.25    2.73
 0.333    2.85 | 1.333  100.26 | 2.333    5.55 |  3.33    2.73
 0.417    3.46 | 1.417   35.24 | 2.417    4.72 |  3.42    2.53
 0.500    3.46 | 1.500   35.24 | 2.500    4.72 |  3.50    2.53
 0.583    4.41 | 1.583   17.77 | 2.583    4.12 |  3.58    2.35
 0.667    4.41 | 1.667   17.77 | 2.667    4.12 |  3.67    2.35
 0.750    6.13 | 1.750   11.59 | 2.750    3.65 |  3.75    2.20
 0.833    6.13 | 1.833   11.59 | 2.833    3.65 |  3.83    2.20
 0.917   10.04 | 1.917    8.52 | 2.917    3.28 |  3.92    2.06
 1.000   10.04 | 2.000    8.52 | 3.000    3.28 |  4.00    2.06

     Unit Hyd Qpeak  (cms)=   0.840

     PEAK FLOW       (cms)=   0.090 (i)
     TIME TO PEAK    (hrs)=   1.417
     RUNOFF VOLUME    (mm)=   9.662
     TOTAL RAINFALL   (mm)=  45.348
     RUNOFF COEFFICIENT   =   0.213

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

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| CALIB            |
| NASHYD   (  0004)|   Area    (ha)=  16.16   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.44

        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    2.43 | 1.083   26.49 | 2.083    6.72 |  3.08    2.98
  0.167    2.43 | 1.167   26.49 | 2.167    6.72 |  3.17    2.98
  0.250    2.85 | 1.250  100.26 | 2.250    5.55 |  3.25    2.73
  0.333    2.85 | 1.333  100.26 | 2.333    5.55 |  3.33    2.73
  0.417    3.46 | 1.417   35.24 | 2.417    4.72 |  3.42    2.53
  0.500    3.46 | 1.500   35.24 | 2.500    4.72 |  3.50    2.53
  0.583    4.41 | 1.583   17.77 | 2.583    4.12 |  3.58    2.35
  0.667    4.41 | 1.667   17.77 | 2.667    4.12 |  3.67    2.35
  0.750    6.13 | 1.750   11.59 | 2.750    3.65 |  3.75    2.20
  0.833    6.13 | 1.833   11.59 | 2.833    3.65 |  3.83    2.20
  0.917   10.04 | 1.917    8.52 | 2.917    3.28 |  3.92    2.06
  1.000   10.04 | 2.000    8.52 | 3.000    3.28 |  4.00    2.06

     Unit Hyd Qpeak  (cms)=   1.402

     PEAK FLOW       (cms)=   0.300 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=   9.839
     TOTAL RAINFALL   (mm)=  45.348
     RUNOFF COEFFICIENT   =   0.217

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

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--------------------
| CALIB            |
| NASHYD   (  0005)|   Area    (ha)=   1.35   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.07

        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    2.43 | 1.083   26.49 | 2.083    6.72 |  3.08    2.98
  0.167    2.43 | 1.167   26.49 | 2.167    6.72 |  3.17    2.98
  0.250    2.85 | 1.250  100.26 | 2.250    5.55 |  3.25    2.73
  0.333    2.85 | 1.333  100.26 | 2.333    5.55 |  3.33    2.73
  0.417    3.46 | 1.417   35.24 | 2.417    4.72 |  3.42    2.53
  0.500    3.46 | 1.500   35.24 | 2.500    4.72 |  3.50    2.53
  0.583    4.41 | 1.583   17.77 | 2.583    4.12 |  3.58    2.35
  0.667    4.41 | 1.667   17.77 | 2.667    4.12 |  3.67    2.35
  0.750    6.13 | 1.750   11.59 | 2.750    3.65 |  3.75    2.20
  0.833    6.13 | 1.833   11.59 | 2.833    3.65 |  3.83    2.20
  0.917   10.04 | 1.917    8.52 | 2.917    3.28 |  3.92    2.06
  1.000   10.04 | 2.000    8.52 | 3.000    3.28 |  4.00    2.06

     Unit Hyd Qpeak  (cms)=   0.713

     PEAK FLOW       (cms)=   0.062 (i)
     TIME TO PEAK    (hrs)=   1.333
     RUNOFF VOLUME    (mm)=   9.056
     TOTAL RAINFALL   (mm)=  45.348
     RUNOFF COEFFICIENT   =   0.200

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

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*********************************
** SIMULATION:3) CKL 10 Yr    **
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--------------------
| CHICAGO STORM    |    IDF curve parameters: A=1487.000
| Ptotal= 52.06 mm |                          B=  10.200
--------------------                          C=   0.858
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    = 10.00 min
                       Time to peak ratio =  0.33

   TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
    hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
  0.00     2.71 |  1.00   31.26 |  2.00    7.77 |  3.00    3.34
  0.17     3.20 |  1.17  112.80 |  2.17    6.37 |  3.17    3.06
  0.33     3.90 |  1.33   41.55 |  2.33    5.39 |  3.33    2.82
  0.50     5.03 |  1.50   21.01 |  2.50    4.67 |  3.50    2.61
  0.67     7.06 |  1.67   13.60 |  2.67    4.13 |  3.67    2.43
  0.83    11.75 |  1.83    9.93 |  2.83    3.69 |  3.83    2.28

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--------------------
| CALIB            |
| NASHYD   (  0001)|   Area    (ha)=   6.53   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.21

        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    2.71 | 1.083   31.26 | 2.083    7.77 |  3.08    3.34
  0.167    2.71 | 1.167   31.26 | 2.167    7.77 |  3.17    3.34
  0.250    3.20 | 1.250  112.80 | 2.250    6.37 |  3.25    3.06
  0.333    3.20 | 1.333  112.80 | 2.333    6.37 |  3.33    3.06
  0.417    3.90 | 1.417   41.55 | 2.417    5.39 |  3.42    2.82
  0.500    3.90 | 1.500   41.55 | 2.500    5.39 |  3.50    2.82
  0.583    5.03 | 1.583   21.01 | 2.583    4.67 |  3.58    2.61
  0.667    5.03 | 1.667   21.01 | 2.667    4.67 |  3.67    2.61
  0.750    7.06 | 1.750   13.60 | 2.750    4.13 |  3.75    2.43
  0.833    7.06 | 1.833   13.60 | 2.833    4.13 |  3.83    2.43
  0.917   11.75 | 1.917    9.93 | 2.917    3.69 |  3.92    2.28
  1.000   11.75 | 2.000    9.93 | 3.000    3.69 |  4.00    2.28

     Unit Hyd Qpeak  (cms)=   1.166

     PEAK FLOW       (cms)=   0.245 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  12.845
     TOTAL RAINFALL   (mm)=  52.060
     RUNOFF COEFFICIENT   =   0.247

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

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--------------------
| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=  21.86   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.43

        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    2.71 | 1.083   31.26 | 2.083    7.77 |  3.08    3.34
  0.167    2.71 | 1.167   31.26 | 2.167    7.77 |  3.17    3.34
  0.250    3.20 | 1.250  112.80 | 2.250    6.37 |  3.25    3.06
  0.333    3.20 | 1.333  112.80 | 2.333    6.37 |  3.33    3.06
  0.417    3.90 | 1.417   41.55 | 2.417    5.39 |  3.42    2.82
  0.500    3.90 | 1.500   41.55 | 2.500    5.39 |  3.50    2.82
  0.583    5.03 | 1.583   21.01 | 2.583    4.67 |  3.58    2.61
  0.667    5.03 | 1.667   21.01 | 2.667    4.67 |  3.67    2.61
  0.750    7.06 | 1.750   13.60 | 2.750    4.13 |  3.75    2.43
  0.833    7.06 | 1.833   13.60 | 2.833    4.13 |  3.83    2.43
  0.917   11.75 | 1.917    9.93 | 2.917    3.69 |  3.92    2.28
  1.000   11.75 | 2.000    9.93 | 3.000    3.69 |  4.00    2.28

     Unit Hyd Qpeak  (cms)=   1.959

     PEAK FLOW       (cms)=   0.551 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  12.862
     TOTAL RAINFALL   (mm)=  52.060
     RUNOFF COEFFICIENT   =   0.247

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

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| CALIB            |
| NASHYD   (  0003)|   Area    (ha)=   2.43   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

        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    2.71 | 1.083   31.26 | 2.083    7.77 |  3.08    3.34
 0.167    2.71 | 1.167   31.26 | 2.167    7.77 |  3.17    3.34
 0.250    3.20 | 1.250  112.80 | 2.250    6.37 |  3.25    3.06
 0.333    3.20 | 1.333  112.80 | 2.333    6.37 |  3.33    3.06
 0.417    3.90 | 1.417   41.55 | 2.417    5.39 |  3.42    2.82
 0.500    3.90 | 1.500   41.55 | 2.500    5.39 |  3.50    2.82
 0.583    5.03 | 1.583   21.01 | 2.583    4.67 |  3.58    2.61
 0.667    5.03 | 1.667   21.01 | 2.667    4.67 |  3.67    2.61
 0.750    7.06 | 1.750   13.60 | 2.750    4.13 |  3.75    2.43
 0.833    7.06 | 1.833   13.60 | 2.833    4.13 |  3.83    2.43
 0.917   11.75 | 1.917    9.93 | 2.917    3.69 |  3.92    2.28
 1.000   11.75 | 2.000    9.93 | 3.000    3.69 |  4.00    2.28

     Unit Hyd Qpeak  (cms)=   0.840

     PEAK FLOW       (cms)=   0.119 (i)
     TIME TO PEAK    (hrs)=   1.417
     RUNOFF VOLUME    (mm)=  12.631
     TOTAL RAINFALL   (mm)=  52.060
     RUNOFF COEFFICIENT   =   0.243

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

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--------------------
| CALIB            |
| NASHYD   (  0004)|   Area    (ha)=  16.16   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.44

        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    2.71 | 1.083   31.26 | 2.083    7.77 |  3.08    3.34
 0.167    2.71 | 1.167   31.26 | 2.167    7.77 |  3.17    3.34
 0.250    3.20 | 1.250  112.80 | 2.250    6.37 |  3.25    3.06
 0.333    3.20 | 1.333  112.80 | 2.333    6.37 |  3.33    3.06
 0.417    3.90 | 1.417   41.55 | 2.417    5.39 |  3.42    2.82
 0.500    3.90 | 1.500   41.55 | 2.500    5.39 |  3.50    2.82
 0.583    5.03 | 1.583   21.01 | 2.583    4.67 |  3.58    2.61
 0.667    5.03 | 1.667   21.01 | 2.667    4.67 |  3.67    2.61
 0.750    7.06 | 1.750   13.60 | 2.750    4.13 |  3.75    2.43
 0.833    7.06 | 1.833   13.60 | 2.833    4.13 |  3.83    2.43
 0.917   11.75 | 1.917    9.93 | 2.917    3.69 |  3.92    2.28
 1.000   11.75 | 2.000    9.93 | 3.000    3.69 |  4.00    2.28

     Unit Hyd Qpeak  (cms)=   1.402

     PEAK FLOW       (cms)=   0.398 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  12.862
     TOTAL RAINFALL   (mm)=  52.060
     RUNOFF COEFFICIENT   =   0.247

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

-------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0005)|   Area    (ha)=   1.35   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.07

        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    2.71 | 1.083   31.26 | 2.083    7.77 |  3.08    3.34
 0.167    2.71 | 1.167   31.26 | 2.167    7.77 |  3.17    3.34
 0.250    3.20 | 1.250  112.80 | 2.250    6.37 |  3.25    3.06
 0.333    3.20 | 1.333  112.80 | 2.333    6.37 |  3.33    3.06
 0.417    3.90 | 1.417   41.55 | 2.417    5.39 |  3.42    2.82
 0.500    3.90 | 1.500   41.55 | 2.500    5.39 |  3.50    2.82
 0.583    5.03 | 1.583   21.01 | 2.583    4.67 |  3.58    2.61
 0.667    5.03 | 1.667   21.01 | 2.667    4.67 |  3.67    2.61
 0.750    7.06 | 1.750   13.60 | 2.750    4.13 |  3.75    2.43
 0.833    7.06 | 1.833   13.60 | 2.833    4.13 |  3.83    2.43
 0.917   11.75 | 1.917    9.93 | 2.917    3.69 |  3.92    2.28
 1.000   11.75 | 2.000    9.93 | 3.000    3.69 |  4.00    2.28

     Unit Hyd Qpeak  (cms)=   0.713

     PEAK FLOW       (cms)=   0.082 (i)
     TIME TO PEAK    (hrs)=   1.333
     RUNOFF VOLUME    (mm)=  11.838
     TOTAL RAINFALL   (mm)=  52.060
     RUNOFF COEFFICIENT   =   0.227

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

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**********************************
** SIMULATION:4) CKL 25 Yr     **
**********************************
--------------------
| CHICAGO STORM    |    IDF curve parameters: A=1898.000
| Ptotal= 61.52 mm |                          B=  11.700
--------------------                          C=   0.871
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    = 10.00 min
                       Time to peak ratio =  0.33

  TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
   hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
 0.00    3.09 |  1.00   38.05 |  2.00    9.28 |  3.00    3.85
 0.17    3.67 |  1.17  130.09 |  2.17    7.55 |  3.17    3.50
 0.33    4.53 |  1.33   50.47 |  2.33    6.34 |  3.33    3.22
 0.50    5.90 |  1.50   25.68 |  2.50    5.46 |  3.50    2.97
 0.67    8.40 |  1.67   16.52 |  2.67    4.80 |  3.67    2.76
 0.83   14.22 |  1.83   11.95 |  2.83    4.27 |  3.83    2.58

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| CALIB            |
| NASHYD   (  0001)|   Area    (ha)=   6.53   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.21

        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    3.09 | 1.083   38.05 | 2.083    9.28 |  3.08    3.85
 0.167    3.09 | 1.167   38.05 | 2.167    9.28 |  3.17    3.85
 0.250    3.67 | 1.250  130.09 | 2.250    7.55 |  3.25    3.50
 0.333    3.67 | 1.333  130.09 | 2.333    7.55 |  3.33    3.50
 0.417    4.53 | 1.417   50.47 | 2.417    6.34 |  3.42    3.22
 0.500    4.53 | 1.500   50.47 | 2.500    6.34 |  3.50    3.22
 0.583    5.90 | 1.583   25.68 | 2.583    5.46 |  3.58    2.97
 0.667    5.90 | 1.667   25.68 | 2.667    5.46 |  3.67    2.97
 0.750    8.40 | 1.750   16.52 | 2.750    4.80 |  3.75    2.76
 0.833    8.40 | 1.833   16.52 | 2.833    4.80 |  3.83    2.76
 0.917   14.22 | 1.917   11.95 | 2.917    4.27 |  3.92    2.58
 1.000   14.22 | 2.000   11.95 | 3.000    4.27 |  4.00    2.58

     Unit Hyd Qpeak  (cms)=   1.166

     PEAK FLOW       (cms)=   0.339 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  17.565
     TOTAL RAINFALL   (mm)=  61.525
     RUNOFF COEFFICIENT   =   0.285

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

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| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=  21.86   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.43

        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    3.09 | 1.083   38.05 | 2.083    9.28 |  3.08    3.85
 0.167    3.09 | 1.167   38.05 | 2.167    9.28 |  3.17    3.85
 0.250    3.67 | 1.250  130.09 | 2.250    7.55 |  3.25    3.50
 0.333    3.67 | 1.333  130.09 | 2.333    7.55 |  3.33    3.50
 0.417    4.53 | 1.417   50.47 | 2.417    6.34 |  3.42    3.22
 0.500    4.53 | 1.500   50.47 | 2.500    6.34 |  3.50    3.22
 0.583    5.90 | 1.583   25.68 | 2.583    5.46 |  3.58    2.97
 0.667    5.90 | 1.667   25.68 | 2.667    5.46 |  3.67    2.97
 0.750    8.40 | 1.750   16.52 | 2.750    4.80 |  3.75    2.76
 0.833    8.40 | 1.833   16.52 | 2.833    4.80 |  3.83    2.76
 0.917   14.22 | 1.917   11.95 | 2.917    4.27 |  3.92    2.58
 1.000   14.22 | 2.000   11.95 | 3.000    4.27 |  4.00    2.58

     Unit Hyd Qpeak  (cms)=   1.959

     PEAK FLOW       (cms)=   0.766 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  17.589
     TOTAL RAINFALL   (mm)=  61.525
     RUNOFF COEFFICIENT   =   0.286

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

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--------------------
| CALIB            |
| NASHYD   (  0003)|   Area    (ha)=   2.43   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

        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    3.09 | 1.083   38.05 | 2.083    9.28 |  3.08    3.85
 0.167    3.09 | 1.167   38.05 | 2.167    9.28 |  3.17    3.85
 0.250    3.67 | 1.250  130.09 | 2.250    7.55 |  3.25    3.50
 0.333    3.67 | 1.333  130.09 | 2.333    7.55 |  3.33    3.50
 0.417    4.53 | 1.417   50.47 | 2.417    6.34 |  3.42    3.22
 0.500    4.53 | 1.500   50.47 | 2.500    6.34 |  3.50    3.22
 0.583    5.90 | 1.583   25.68 | 2.583    5.46 |  3.58    2.97
 0.667    5.90 | 1.667   25.68 | 2.667    5.46 |  3.67    2.97
 0.750    8.40 | 1.750   16.52 | 2.750    4.80 |  3.75    2.76
 0.833    8.40 | 1.833   16.52 | 2.833    4.80 |  3.83    2.76
 0.917   14.22 | 1.917   11.95 | 2.917    4.27 |  3.92    2.58
 1.000   14.22 | 2.000   11.95 | 3.000    4.27 |  4.00    2.58

     Unit Hyd Qpeak  (cms)=   0.840

     PEAK FLOW       (cms)=   0.164 (i)
     TIME TO PEAK    (hrs)=   1.417
     RUNOFF VOLUME    (mm)=  17.273
     TOTAL RAINFALL   (mm)=  61.525
     RUNOFF COEFFICIENT   =   0.281

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

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--------------------
| CALIB            |
| NASHYD   (  0004)|   Area    (ha)=  16.16   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.44

        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    3.09 | 1.083   38.05 | 2.083    9.28 |  3.08    3.85
 0.167    3.09 | 1.167   38.05 | 2.167    9.28 |  3.17    3.85
 0.250    3.67 | 1.250  130.09 | 2.250    7.55 |  3.25    3.50
 0.333    3.67 | 1.333  130.09 | 2.333    7.55 |  3.33    3.50
 0.417    4.53 | 1.417   50.47 | 2.417    6.34 |  3.42    3.22
 0.500    4.53 | 1.500   50.47 | 2.500    6.34 |  3.50    3.22
 0.583    5.90 | 1.583   25.68 | 2.583    5.46 |  3.58    2.97
 0.667    5.90 | 1.667   25.68 | 2.667    5.46 |  3.67    2.97
 0.750    8.40 | 1.750   16.52 | 2.750    4.80 |  3.75    2.76
 0.833    8.40 | 1.833   16.52 | 2.833    4.80 |  3.83    2.76
 0.917   14.22 | 1.917   11.95 | 2.917    4.27 |  3.92    2.58
 1.000   14.22 | 2.000   11.95 | 3.000    4.27 |  4.00    2.58

     Unit Hyd Qpeak  (cms)=   1.402

     PEAK FLOW       (cms)=   0.554 (i)
     TIME TO PEAK    (hrs)=   1.833
     RUNOFF VOLUME    (mm)=  17.590
     TOTAL RAINFALL   (mm)=  61.525
     RUNOFF COEFFICIENT   =   0.286

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

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--------------------
| CALIB            |
| NASHYD   (  0005)|   Area    (ha)=   1.35   Curve Number   (CN)= 67.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.07

        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    3.09 | 1.083   38.05 | 2.083    9.28 |  3.08    3.85
 0.167    3.09 | 1.167   38.05 | 2.167    9.28 |  3.17    3.85
 0.250    3.67 | 1.250  130.09 | 2.250    7.55 |  3.25    3.50
 0.333    3.67 | 1.333  130.09 | 2.333    7.55 |  3.33    3.50
 0.417    4.53 | 1.417   50.47 | 2.417    6.34 |  3.42    3.22
 0.500    4.53 | 1.500   50.47 | 2.500    6.34 |  3.50    3.22
 0.583    5.90 | 1.583   25.68 | 2.583    5.46 |  3.58    2.97
 0.667    5.90 | 1.667   25.68 | 2.667    5.46 |  3.67    2.97
 0.750    8.40 | 1.750   16.52 | 2.750    4.80 |  3.75    2.76
 0.833    8.40 | 1.833   16.52 | 2.833    4.80 |  3.83    2.76
 0.917   14.22 | 1.917   11.95 | 2.917    4.27 |  3.92    2.58
 1.000   14.22 | 2.000   11.95 | 3.000    4.27 |  4.00    2.58

     Unit Hyd Qpeak  (cms)=   0.713

     PEAK FLOW       (cms)=   0.111 (i)
     TIME TO PEAK    (hrs)=   1.333
     RUNOFF VOLUME    (mm)=  16.189
     TOTAL RAINFALL   (mm)=  61.525
     RUNOFF COEFFICIENT   =   0.263

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

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********************************
** SIMULATION:5) CKL 50 Yr    **
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--------------------
| CHICAGO STORM    |    IDF curve parameters: A=2110.000
| Ptotal= 68.70 mm |                          B=  12.000
--------------------                          C=   0.870
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    = 10.00 min
                       Time to peak ratio =  0.33

  TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
   hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
 0.00     3.49 |  1.00   42.63 |  2.00   10.48 |  3.00    4.35
 0.17     4.15 |  1.17  143.34 |  2.17    8.52 |  3.17    3.96
 0.33     5.11 |  1.33   56.43 |  2.33    7.17 |  3.33    3.63
 0.50     6.66 |  1.50   28.88 |  2.50    6.17 |  3.50    3.36
 0.67     9.49 |  1.67   18.62 |  2.67    5.42 |  3.67    3.12
 0.83    16.03 |  1.83   13.49 |  2.83    4.82 |  3.83    2.92


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CALIB					
NASHYD (0001)	Area (ha)= 6.53	Curve Number (CN)= 67.0			
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00			
	U.H. Tp(hrs)= 0.21				

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	3.49	1.083	42.63	2.083	10.48	3.08	4.35
0.167	3.49	1.167	42.63	2.167	10.48	3.17	4.35
0.250	4.15	1.250	143.34	2.250	8.52	3.25	3.96
0.333	4.15	1.333	143.34	2.333	8.52	3.33	3.96
0.417	5.11	1.417	56.43	2.417	7.17	3.42	3.63
0.500	5.11	1.500	56.43	2.500	7.17	3.50	3.63
0.583	6.66	1.583	28.88	2.583	6.17	3.58	3.36
0.667	6.66	1.667	28.88	2.667	6.17	3.67	3.36
0.750	9.49	1.750	18.62	2.750	5.42	3.75	3.12
0.833	9.49	1.833	18.62	2.833	5.42	3.83	3.12
0.917	16.03	1.917	13.49	2.917	4.82	3.92	2.92
1.000	16.03	2.000	13.49	3.000	4.82	4.00	2.92

Unit Hyd Qpeak (cms)= 1.166

PEAK FLOW (cms)= 0.414 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 21.463
TOTAL RAINFALL (mm)= 68.705
RUNOFF COEFFICIENT = 0.312

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

CALIB					
NASHYD (0002)	Area (ha)= 21.86	Curve Number (CN)= 67.0			
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00			
	U.H. Tp(hrs)= 0.43				

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	3.49	1.083	42.63	2.083	10.48	3.08	4.35
0.167	3.49	1.167	42.63	2.167	10.48	3.17	4.35
0.250	4.15	1.250	143.34	2.250	8.52	3.25	3.96
0.333	4.15	1.333	143.34	2.333	8.52	3.33	3.96
0.417	5.11	1.417	56.43	2.417	7.17	3.42	3.63
0.500	5.11	1.500	56.43	2.500	7.17	3.50	3.63
0.583	6.66	1.583	28.88	2.583	6.17	3.58	3.36
0.667	6.66	1.667	28.88	2.667	6.17	3.67	3.36
0.750	9.49	1.750	18.62	2.750	5.42	3.75	3.12
0.833	9.49	1.833	18.62	2.833	5.42	3.83	3.12
0.917	16.03	1.917	13.49	2.917	4.82	3.92	2.92
1.000	16.03	2.000	13.49	3.000	4.82	4.00	2.92

Unit Hyd Qpeak (cms)= 1.959

PEAK FLOW (cms)= 0.938 (i)
TIME TO PEAK (hrs)= 1.833
RUNOFF VOLUME (mm)= 21.492
TOTAL RAINFALL (mm)= 68.705
RUNOFF COEFFICIENT = 0.313

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

CALIB					
NASHYD (0003)	Area (ha)= 2.43	Curve Number (CN)= 67.0			
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00			
	U.H. Tp(hrs)= 0.11				

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	3.49	1.083	42.63	2.083	10.48	3.08	4.35
0.167	3.49	1.167	42.63	2.167	10.48	3.17	4.35
0.250	4.15	1.250	143.34	2.250	8.52	3.25	3.96
0.333	4.15	1.333	143.34	2.333	8.52	3.33	3.96
0.417	5.11	1.417	56.43	2.417	7.17	3.42	3.63
0.500	5.11	1.500	56.43	2.500	7.17	3.50	3.63
0.583	6.66	1.583	28.88	2.583	6.17	3.58	3.36
0.667	6.66	1.667	28.88	2.667	6.17	3.67	3.36
0.750	9.49	1.750	18.62	2.750	5.42	3.75	3.12
0.833	9.49	1.833	18.62	2.833	5.42	3.83	3.12
0.917	16.03	1.917	13.49	2.917	4.82	3.92	2.92
1.000	16.03	2.000	13.49	3.000	4.82	4.00	2.92

Unit Hyd Qpeak (cms)= 0.840

PEAK FLOW (cms)= 0.200 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 21.106
TOTAL RAINFALL (mm)= 68.705
RUNOFF COEFFICIENT = 0.307

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

CALIB					
NASHYD (0004)	Area (ha)= 16.16	Curve Number (CN)= 67.0			
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00			
	U.H. Tp(hrs)= 0.44				

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	3.49	1.083	42.63	2.083	10.48	3.08	4.35
0.167	3.49	1.167	42.63	2.167	10.48	3.17	4.35
0.250	4.15	1.250	143.34	2.250	8.52	3.25	3.96
0.333	4.15	1.333	143.34	2.333	8.52	3.33	3.96
0.417	5.11	1.417	56.43	2.417	7.17	3.42	3.63
0.500	5.11	1.500	56.43	2.500	7.17	3.50	3.63
0.583	6.66	1.583	28.88	2.583	6.17	3.58	3.36
0.667	6.66	1.667	28.88	2.667	6.17	3.67	3.36
0.750	9.49	1.750	18.62	2.750	5.42	3.75	3.12
0.833	9.49	1.833	18.62	2.833	5.42	3.83	3.12
0.917	16.03	1.917	13.49	2.917	4.82	3.92	2.92
1.000	16.03	2.000	13.49	3.000	4.82	4.00	2.92

Unit Hyd Qpeak (cms)= 1.402

PEAK FLOW (cms)= 0.679 (i)
TIME TO PEAK (hrs)= 1.833
RUNOFF VOLUME (mm)= 21.492
TOTAL RAINFALL (mm)= 68.705
RUNOFF COEFFICIENT = 0.313

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

CALIB					
NASHYD (0005)	Area (ha)= 1.35	Curve Number (CN)= 67.0			
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00			
	U.H. Tp(hrs)= 0.07				

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	3.49	1.083	42.63	2.083	10.48	3.08	4.35
0.167	3.49	1.167	42.63	2.167	10.48	3.17	4.35
0.250	4.15	1.250	143.34	2.250	8.52	3.25	3.96
0.333	4.15	1.333	143.34	2.333	8.52	3.33	3.96
0.417	5.11	1.417	56.43	2.417	7.17	3.42	3.63
0.500	5.11	1.500	56.43	2.500	7.17	3.50	3.63
0.583	6.66	1.583	28.88	2.583	6.17	3.58	3.36
0.667	6.66	1.667	28.88	2.667	6.17	3.67	3.36
0.750	9.49	1.750	18.62	2.750	5.42	3.75	3.12
0.833	9.49	1.833	18.62	2.833	5.42	3.83	3.12
0.917	16.03	1.917	13.49	2.917	4.82	3.92	2.92
1.000	16.03	2.000	13.49	3.000	4.82	4.00	2.92

Unit Hyd Qpeak (cms)= 0.713

PEAK FLOW (cms)= 0.135 (i)
TIME TO PEAK (hrs)= 1.333
RUNOFF VOLUME (mm)= 19.782
TOTAL RAINFALL (mm)= 68.705
RUNOFF COEFFICIENT = 0.288

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

****
** SIMULATION:6) CKL 100 Yr **
****

| CHICAGO STORM | IDF curve parameters: A=2518.000
| Ptotal= 76.41 mm | B= 13.200
C= 0.882
used in: INTENSITY = A / (t + B)^C

Duration of storm = 4.00 hrs
Storm time step = 10.00 min
Time to peak ratio = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	3.74	1.00	48.41	2.00	11.70	3.00	4.70
0.17	4.47	1.17	157.29	2.17	9.45	3.17	4.26
0.33	5.56	1.33	64.01	2.33	7.90	3.33	3.90
0.50	7.32	1.50	32.88	2.50	6.77	3.50	3.59
0.67	10.56	1.67	21.09	2.67	5.91	3.67	3.33
0.83	18.10	1.83	15.17	2.83	5.24	3.83	3.10

| CALIB | NASHYD (0001) | ID= 1 DT= 5.0 min |

Area (ha)= 6.53 Curve Number (CN)= 67.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.21

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	3.74	1.083	48.41	2.083	11.70	3.08	4.70
0.167	3.74	1.167	48.41	2.167	11.70	3.17	4.70
0.250	4.47	1.250	157.29	2.250	9.45	3.25	4.26
0.333	4.47	1.333	157.29	2.333	9.45	3.33	4.26
0.417	5.56	1.417	64.01	2.417	7.90	3.42	3.90
0.500	5.56	1.500	64.01	2.500	7.90	3.50	3.90
0.583	7.32	1.583	32.88	2.583	6.77	3.58	3.59
0.667	7.32	1.667	32.88	2.667	6.77	3.67	3.59
0.750	10.56	1.750	21.09	2.750	5.91	3.75	3.33
0.833	10.56	1.833	21.09	2.833	5.91	3.83	3.33
0.917	18.10	1.917	15.17	2.917	5.24	3.92	3.10
1.000	18.10	2.000	15.17	3.000	5.24	4.00	3.10

Unit Hyd Qpeak (cms)= 1.166

PEAK FLOW (cms)= 0.505 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 25.908
TOTAL RAINFALL (mm)= 76.405
RUNOFF COEFFICIENT = 0.339

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

| CALIB | NASHYD (0002) | ID= 1 DT= 5.0 min |

Area (ha)= 21.86 Curve Number (CN)= 67.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.43

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	3.74	1.083	48.41	2.083	11.70	3.08	4.70
0.167	3.74	1.167	48.41	2.167	11.70	3.17	4.70
0.250	4.47	1.250	157.29	2.250	9.45	3.25	4.26
0.333	4.47	1.333	157.29	2.333	9.45	3.33	4.26
0.417	5.56	1.417	64.01	2.417	7.90	3.42	3.90
0.500	5.56	1.500	64.01	2.500	7.90	3.50	3.90
0.583	7.32	1.583	32.88	2.583	6.77	3.58	3.59
0.667	7.32	1.667	32.88	2.667	6.77	3.67	3.59
0.750	10.56	1.750	21.09	2.750	5.91	3.75	3.33
0.833	10.56	1.833	21.09	2.833	5.91	3.83	3.33
0.917	18.10	1.917	15.17	2.917	5.24	3.92	3.10
1.000	18.10	2.000	15.17	3.000	5.24	4.00	3.10

Unit Hyd Qpeak (cms)= 1.959

PEAK FLOW (cms)= 1.147 (i)
TIME TO PEAK (hrs)= 1.833
RUNOFF VOLUME (mm)= 25.944
TOTAL RAINFALL (mm)= 76.405
RUNOFF COEFFICIENT = 0.340

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

| CALIB | NASHYD (0003) | ID= 1 DT= 5.0 min |

Area (ha)= 2.43 Curve Number (CN)= 67.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.11

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	3.74	1.083	48.41	2.083	11.70	3.08	4.70
0.167	3.74	1.167	48.41	2.167	11.70	3.17	4.70
0.250	4.47	1.250	157.29	2.250	9.45	3.25	4.26
0.333	4.47	1.333	157.29	2.333	9.45	3.33	4.26
0.417	5.56	1.417	64.01	2.417	7.90	3.42	3.90
0.500	5.56	1.500	64.01	2.500	7.90	3.50	3.90
0.583	7.32	1.583	32.88	2.583	6.77	3.58	3.59
0.667	7.32	1.667	32.88	2.667	6.77	3.67	3.59
0.750	10.56	1.750	21.09	2.750	5.91	3.75	3.33
0.833	10.56	1.833	21.09	2.833	5.91	3.83	3.33
0.917	18.10	1.917	15.17	2.917	5.24	3.92	3.10
1.000	18.10	2.000	15.17	3.000	5.24	4.00	3.10

Unit Hyd Qpeak (cms)= 0.840

PEAK FLOW (cms)= 0.242 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 25.478
TOTAL RAINFALL (mm)= 76.405
RUNOFF COEFFICIENT = 0.333

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

| CALIB | NASHYD (0004) | ID= 1 DT= 5.0 min |

Area (ha)= 16.16 Curve Number (CN)= 67.0
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.44

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	3.74	1.083	48.41	2.083	11.70	3.08	4.70
0.167	3.74	1.167	48.41	2.167	11.70	3.17	4.70
0.250	4.47	1.250	157.29	2.250	9.45	3.25	4.26
0.333	4.47	1.333	157.29	2.333	9.45	3.33	4.26
0.417	5.56	1.417	64.01	2.417	7.90	3.42	3.90
0.500	5.56	1.500	64.01	2.500	7.90	3.50	3.90
0.583	7.32	1.583	32.88	2.583	6.77	3.58	3.59
0.667	7.32	1.667	32.88	2.667	6.77	3.67	3.59
0.750	10.56	1.750	21.09	2.750	5.91	3.75	3.33
0.833	10.56	1.833	21.09	2.833	5.91	3.83	3.33
0.917	18.10	1.917	15.17	2.917	5.24	3.92	3.10
1.000	18.10	2.000	15.17	3.000	5.24	4.00	3.10

Unit Hyd Qpeak (cms)= 1.402

PEAK FLOW (cms)= 0.830 (i)
TIME TO PEAK (hrs)= 1.833
RUNOFF VOLUME (mm)= 25.944
TOTAL RAINFALL (mm)= 76.405
RUNOFF COEFFICIENT = 0.340

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

CALIB								
NASHYD (0005)	Area (ha)=	1.35	Curve Number (CN)=	67.0				
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00				
	U.H. Tp(hrs)=	0.07						

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	3.74	1.083	48.41	2.083	11.70	3.08	4.70
0.167	3.74	1.167	48.41	2.167	11.70	3.17	4.70
0.250	4.47	1.250	157.29	2.250	9.45	3.25	4.26
0.333	4.47	1.333	157.29	2.333	9.45	3.33	4.26
0.417	5.56	1.417	64.01	2.417	7.90	3.42	3.90
0.500	5.56	1.500	64.01	2.500	7.90	3.50	3.90
0.583	7.32	1.583	32.88	2.583	6.77	3.58	3.59
0.667	7.32	1.667	32.88	2.667	6.77	3.67	3.59
0.750	10.56	1.750	21.09	2.750	5.91	3.75	3.33
0.833	10.56	1.833	21.09	2.833	5.91	3.83	3.33
0.917	18.10	1.917	15.17	2.917	5.24	3.92	3.10
1.000	18.10	2.000	15.17	3.000	5.24	4.00	3.10

Unit Hyd Qpeak (cms)= 0.713

PEAK FLOW (cms)= 0.163 (i)
TIME TO PEAK (hrs)= 1.333
RUNOFF VOLUME (mm)= 23.879
TOTAL RAINFALL (mm)= 76.405
RUNOFF COEFFICIENT = 0.313

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

****
** SIMULATION:7) 25mm Event **
****

READ STORM	Filename: C:\Users\matthew.holmes\AppData\Local\Temp\300156d9-62fc-4f5f-b4bc-b52383454e71\44756453
Ptotal= 25.00 mm	Comments: 25MM4HR

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	2.07	1.00	5.70	2.00	5.19	3.00	2.80
0.17	2.27	1.17	10.78	2.17	4.47	3.17	2.62
0.33	2.52	1.33	50.21	2.33	3.95	3.33	2.48
0.50	2.88	1.50	13.37	2.50	3.56	3.50	2.35
0.67	3.38	1.67	8.29	2.67	3.25	3.67	2.23
0.83	4.18	1.83	6.30	2.83	3.01	3.83	2.14

CALIB								
NASHYD (0001)	Area (ha)=	6.53	Curve Number (CN)=	67.0				
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00				
	U.H. Tp(hrs)=	0.21						

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	2.07	1.083	5.70	2.083	5.19	3.08	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.250	2.27	1.250	10.78	2.250	4.47	3.25	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.417	2.52	1.417	50.21	2.417	3.95	3.42	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.583	2.88	1.583	13.37	2.583	3.56	3.58	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.750	3.38	1.750	8.29	2.750	3.25	3.75	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.917	4.18	1.917	6.30	2.917	3.01	3.92	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

Unit Hyd Qpeak (cms)= 1.166

PEAK FLOW (cms)= 0.037 (i)
TIME TO PEAK (hrs)= 1.750
RUNOFF VOLUME (mm)= 2.752
TOTAL RAINFALL (mm)= 24.997
RUNOFF COEFFICIENT = 0.110

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

CALIB								
NASHYD (0002)	Area (ha)=	21.86	Curve Number (CN)=	67.0				
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00				
	U.H. Tp(hrs)=	0.43						

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	2.07	1.083	5.70	2.083	5.19	3.08	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.250	2.27	1.250	10.78	2.250	4.47	3.25	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.417	2.52	1.417	50.21	2.417	3.95	3.42	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.583	2.88	1.583	13.37	2.583	3.56	3.58	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.750	3.38	1.750	8.29	2.750	3.25	3.75	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.917	4.18	1.917	6.30	2.917	3.01	3.92	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

Unit Hyd Qpeak (cms)= 1.959

PEAK FLOW (cms)= 0.086 (i)
TIME TO PEAK (hrs)= 2.083
RUNOFF VOLUME (mm)= 2.756
TOTAL RAINFALL (mm)= 24.997
RUNOFF COEFFICIENT = 0.110

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

CALIB								
NASHYD (0003)	Area (ha)=	2.43	Curve Number (CN)=	67.0				
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00				
	U.H. Tp(hrs)=	0.11						

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	2.07	1.083	5.70	2.083	5.19	3.08	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.250	2.27	1.250	10.78	2.250	4.47	3.25	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.417	2.52	1.417	50.21	2.417	3.95	3.42	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.583	2.88	1.583	13.37	2.583	3.56	3.58	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.750	3.38	1.750	8.29	2.750	3.25	3.75	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.917	4.18	1.917	6.30	2.917	3.01	3.92	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

Unit Hyd Qpeak (cms)= 0.840

PEAK FLOW (cms)= 0.019 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 2.706
TOTAL RAINFALL (mm)= 24.997
RUNOFF COEFFICIENT = 0.108

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

CALIB					
NASHYD (0004)	Area (ha)= 16.16	Curve Number (CN)= 67.0			
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00			
	U.H. Tp(hrs)= 0.44				

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	2.07	1.083	5.70	2.083	5.19	3.08	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.250	2.27	1.250	10.78	2.250	4.47	3.25	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.417	2.52	1.417	50.21	2.417	3.95	3.42	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.583	2.88	1.583	13.37	2.583	3.56	3.58	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.750	3.38	1.750	8.29	2.750	3.25	3.75	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.917	4.18	1.917	6.30	2.917	3.01	3.92	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

Unit Hyd Qpeak (cms)= 1.402

PEAK FLOW (cms)= 0.063 (i)
TIME TO PEAK (hrs)= 2.083
RUNOFF VOLUME (mm)= 2.756
TOTAL RAINFALL (mm)= 24.997
RUNOFF COEFFICIENT = 0.110

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

CALIB					
NASHYD (0005)	Area (ha)= 1.35	Curve Number (CN)= 67.0			
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00			
	U.H. Tp(hrs)= 0.07				

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

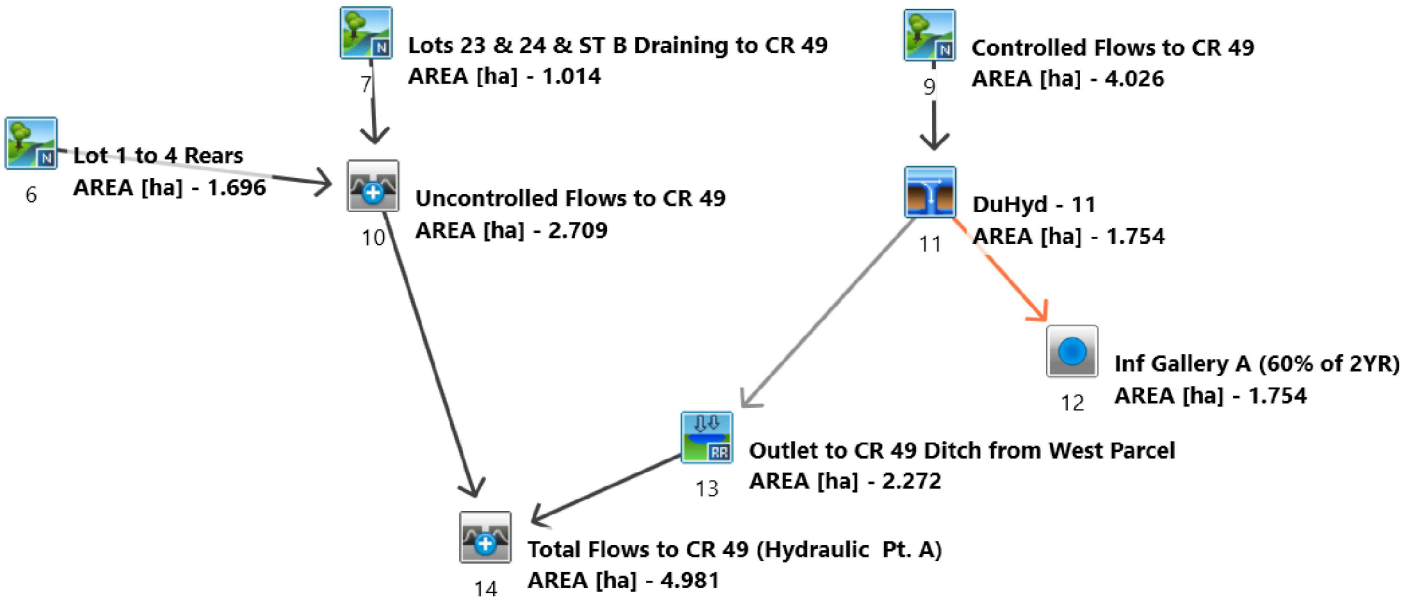
---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.07	1.083	5.70	2.083	5.19	3.08	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.250	2.27	1.250	10.78	2.250	4.47	3.25	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.417	2.52	1.417	50.21	2.417	3.95	3.42	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.583	2.88	1.583	13.37	2.583	3.56	3.58	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.750	3.38	1.750	8.29	2.750	3.25	3.75	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.917	4.18	1.917	6.30	2.917	3.01	3.92	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

Unit Hyd Qpeak (cms)= 0.713

PEAK FLOW (cms)= 0.014 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 2.536
TOTAL RAINFALL (mm)= 24.997
RUNOFF COEFFICIENT = 0.101

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



JEFFERY SUBDIVISION, BOBCAYGEON, ON

V.O. SCHEMATIC – POST-DEVELOPMENT FLOWS TO COUNTY ROAD 49

D.G. BIDDLE & ASSOCIATES
CONSULTING ENGINEERS & PLANNERS
96 King Street East
Oshawa, Ontario, L1H 1B6
Phone: 905-576-8500
info@dgbiddle.com
dgbiddle.com

SCALE	N.T.S.
DRAWN	M.J.H.
DESIGN	M.J.H.
CHECKED	D.D.M.
DATE	MAR 2024

PROJECT 122169

DWG FIG 3

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**********
** SIMULATION:1) CKL 2 Yr     **
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CALIB	NASHYD (0006)	ID= 1 DT= 5.0 min

Area (ha)= 1.70 Curve Number (CN)= 70.7
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.11

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	2.15	1.083	20.33	2.083	5.50	3.08	2.59
0.167	2.15	1.167	20.33	2.167	5.50	3.17	2.59
0.250	2.49	1.250	84.39	2.250	4.60	3.25	2.39
0.333	2.49	1.333	84.39	2.333	4.60	3.33	2.39
0.417	2.98	1.417	26.99	2.417	3.97	3.42	2.23
0.500	2.98	1.500	26.99	2.500	3.97	3.50	2.23
0.583	3.73	1.583	13.71	2.583	3.49	3.58	2.08
0.667	3.73	1.667	13.71	2.667	3.49	3.67	2.08
0.750	5.04	1.750	9.12	2.750	3.13	3.75	1.95
0.833	5.04	1.833	9.12	2.833	3.13	3.83	1.95
0.917	7.98	1.917	6.85	2.917	2.83	3.92	1.84
1.000	7.98	2.000	6.85	3.000	2.83	4.00	1.84

Unit Hyd Qpeak (cms)= 0.583

PEAK FLOW (cms)= 0.047 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 7.341
TOTAL RAINFALL (mm)= 37.060
RUNOFF COEFFICIENT = 0.198

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

CALIB	NASHYD (0007)	ID= 1 DT= 5.0 min

Area (ha)= 1.01 Curve Number (CN)= 70.4
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.11

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	2.15	1.083	20.33	2.083	5.50	3.08	2.59
0.167	2.15	1.167	20.33	2.167	5.50	3.17	2.59
0.250	2.49	1.250	84.39	2.250	4.60	3.25	2.39
0.333	2.49	1.333	84.39	2.333	4.60	3.33	2.39
0.417	2.98	1.417	26.99	2.417	3.97	3.42	2.23
0.500	2.98	1.500	26.99	2.500	3.97	3.50	2.23
0.583	3.73	1.583	13.71	2.583	3.49	3.58	2.08
0.667	3.73	1.667	13.71	2.667	3.49	3.67	2.08
0.750	5.04	1.750	9.12	2.750	3.13	3.75	1.95
0.833	5.04	1.833	9.12	2.833	3.13	3.83	1.95
0.917	7.98	1.917	6.85	2.917	2.83	3.92	1.84
1.000	7.98	2.000	6.85	3.000	2.83	4.00	1.84

Unit Hyd Qpeak (cms)= 0.352

PEAK FLOW (cms)= 0.028 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 7.260
TOTAL RAINFALL (mm)= 37.060
RUNOFF COEFFICIENT = 0.196

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

ADD HYD (0010)	1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0006):	1.70	0.047	1.42	7.34
+ ID2= 2 (0007):	1.01	0.028	1.42	7.26
ID = 3 (0010):	2.71	0.076	1.42	7.31

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	NASHYD (0009)	ID= 1 DT= 5.0 min

Area (ha)= 4.03 Curve Number (CN)= 71.5
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.16

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	2.15	1.083	20.33	2.083	5.50	3.08	2.59
0.167	2.15	1.167	20.33	2.167	5.50	3.17	2.59
0.250	2.49	1.250	84.39	2.250	4.60	3.25	2.39
0.333	2.49	1.333	84.39	2.333	4.60	3.33	2.39
0.417	2.98	1.417	26.99	2.417	3.97	3.42	2.23
0.500	2.98	1.500	26.99	2.500	3.97	3.50	2.23
0.583	3.73	1.583	13.71	2.583	3.49	3.58	2.08
0.667	3.73	1.667	13.71	2.667	3.49	3.67	2.08
0.750	5.04	1.750	9.12	2.750	3.13	3.75	1.95
0.833	5.04	1.833	9.12	2.833	3.13	3.83	1.95
0.917	7.98	1.917	6.85	2.917	2.83	3.92	1.84
1.000	7.98	2.000	6.85	3.000	2.83	4.00	1.84

Unit Hyd Qpeak (cms)= 0.962

PEAK FLOW (cms)= 0.101 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 7.673
TOTAL RAINFALL (mm)= 37.060
RUNOFF COEFFICIENT = 0.207

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

DUHYD (0011)	Inlet Cap.= 0.061	#of Inlets= 1	Total(cms)= 0.1

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	4.03	0.10	1.50	7.67
MAJOR SYS.(ID= 2):	0.52	0.04	1.50	7.67
MINOR SYS.(ID= 3):	3.51	0.06	1.33	7.67

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0013)	IN= 2---> OUT= 1	DT= 5.0 min

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.1442	0.0115
0.0000	0.0029	0.2015	0.0144
0.0363	0.0057	0.2443	0.0172
0.0555	0.0086	0.2802	0.0201

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0011)	0.518	0.041	1.50	7.67
OUTFLOW: ID= 1 (0013)	0.518	0.008	1.67	2.12

PEAK FLOW REDUCTION [Qout/Qin](%)= 20.70
TIME SHIFT OF PEAK FLOW (min)= 10.00
MAXIMUM STORAGE USED (ha.m.)= 0.0036

ADD HYD (0014)	1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0010):	2.71	0.076	1.42	7.31
+ ID2= 2 (0013):	0.52	0.008	1.67	2.12
ID = 3 (0014):	3.23	0.076	1.42	6.48

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

Junction Command(0012)

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 9(0011)	3.51	0.06	1.33	7.67
OUTFLOW: ID= 2(0012)	3.51	0.06	1.33	7.67

****
** SIMULATION:2) CKL 5 Yr **
****

CALIB NASHYD (0006) | ID= 1 DT= 5.0 min	Area (ha)= 1.70 Curve Number (CN)= 70.7 Ia (mm)= 5.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.11

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	2.43	1.083	26.49	2.083	6.72	3.08	2.98
0.167	2.43	1.167	26.49	2.167	6.72	3.17	2.98
0.250	2.85	1.250	100.26	2.250	5.55	3.25	2.73
0.333	2.85	1.333	100.26	2.333	5.55	3.33	2.73
0.417	3.46	1.417	35.24	2.417	4.72	3.42	2.53
0.500	3.46	1.500	35.24	2.500	4.72	3.50	2.53
0.583	4.41	1.583	17.77	2.583	4.12	3.58	2.35
0.667	4.41	1.667	17.77	2.667	4.12	3.67	2.35
0.750	6.13	1.750	11.59	2.750	3.65	3.75	2.20
0.833	6.13	1.833	11.59	2.833	3.65	3.83	2.20
0.917	10.04	1.917	8.52	2.917	3.28	3.92	2.06
1.000	10.04	2.000	8.52	3.000	3.28	4.00	2.06

Unit Hyd Qpeak (cms)= 0.583

PEAK FLOW (cms)= 0.072 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 10.967
TOTAL RAINFALL (mm)= 45.348
RUNOFF COEFFICIENT = 0.242

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

CALIB NASHYD (0007) | ID= 1 DT= 5.0 min	Area (ha)= 1.01 Curve Number (CN)= 70.4 Ia (mm)= 5.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.11

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	2.43	1.083	26.49	2.083	6.72	3.08	2.98
0.167	2.43	1.167	26.49	2.167	6.72	3.17	2.98
0.250	2.85	1.250	100.26	2.250	5.55	3.25	2.73
0.333	2.85	1.333	100.26	2.333	5.55	3.33	2.73
0.417	3.46	1.417	35.24	2.417	4.72	3.42	2.53
0.500	3.46	1.500	35.24	2.500	4.72	3.50	2.53
0.583	4.41	1.583	17.77	2.583	4.12	3.58	2.35
0.667	4.41	1.667	17.77	2.667	4.12	3.67	2.35
0.750	6.13	1.750	11.59	2.750	3.65	3.75	2.20
0.833	6.13	1.833	11.59	2.833	3.65	3.83	2.20
0.917	10.04	1.917	8.52	2.917	3.28	3.92	2.06
1.000	10.04	2.000	8.52	3.000	3.28	4.00	2.06

Unit Hyd Qpeak (cms)= 0.352

PEAK FLOW (cms)= 0.043 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 10.852
TOTAL RAINFALL (mm)= 45.348
RUNOFF COEFFICIENT = 0.239

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

ADD HYD (0010) | 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0006):	1.70	0.072	1.42	10.97
+ ID2= 2 (0007):	1.01	0.043	1.42	10.85
ID = 3 (0010):	2.71	0.115	1.42	10.92

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB NASHYD (0009) | ID= 1 DT= 5.0 min	Area (ha)= 4.03 Curve Number (CN)= 71.5 Ia (mm)= 5.00 # of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.16

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	2.43	1.083	26.49	2.083	6.72	3.08	2.98
0.167	2.43	1.167	26.49	2.167	6.72	3.17	2.98
0.250	2.85	1.250	100.26	2.250	5.55	3.25	2.73
0.333	2.85	1.333	100.26	2.333	5.55	3.33	2.73
0.417	3.46	1.417	35.24	2.417	4.72	3.42	2.53
0.500	3.46	1.500	35.24	2.500	4.72	3.50	2.53
0.583	4.41	1.583	17.77	2.583	4.12	3.58	2.35
0.667	4.41	1.667	17.77	2.667	4.12	3.67	2.35
0.750	6.13	1.750	11.59	2.750	3.65	3.75	2.20
0.833	6.13	1.833	11.59	2.833	3.65	3.83	2.20
0.917	10.04	1.917	8.52	2.917	3.28	3.92	2.06
1.000	10.04	2.000	8.52	3.000	3.28	4.00	2.06

Unit Hyd Qpeak (cms)= 0.962

PEAK FLOW (cms)= 0.156 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 11.442
TOTAL RAINFALL (mm)= 45.348
RUNOFF COEFFICIENT = 0.252

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

DUHYD (0011) | Inlet Cap.= 0.061 | #of Inlets= 1 | Total(cms)= 0.1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	4.03	0.16	1.50	11.44
MAJOR SYS.(ID= 2):	1.11	0.10	1.50	11.44
MINOR SYS.(ID= 3):	2.92	0.06	1.33	11.44

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0013) | IN= 2---> OUT= 1 | DT= 5.0 min	OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.1442	0.0115
0.0000	0.0029	0.2015	0.0144
0.0363	0.0057	0.2443	0.0172
0.0555	0.0086	0.2802	0.0201

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0011)	1.105	0.095	1.50	11.44
OUTFLOW: ID= 1 (0013)	1.105	0.047	1.67	8.84

PEAK FLOW REDUCTION [Qout/Qin](%)= 49.46
TIME SHIFT OF PEAK FLOW (min)= 10.00
MAXIMUM STORAGE USED (ha.m.)= 0.0075

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--------------------
| ADD HYD  (  0014)|
|   1 +  2 =  3    |          AREA     QPEAK     TPEAK      R.V.
--------------------          (ha)     (cms)     (hrs)      (mm)
       ID1= 1 (  0010):      2.71    0.115      1.42     10.92
     + ID2= 2 (  0013):      1.11    0.047      1.67      8.84
       ================================================
       ID = 3 (  0014):      3.81    0.132      1.50     10.32

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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  --------------------------
  | Junction Command(0012) |
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                          AREA      QPEAK    TPEAK      R.V.
                          (ha)      (cms)    (hrs)      (mm)
  INFLOW : ID= 9(  0011)    2.92      0.06     1.33     11.44
  OUTFLOW: ID= 2(  0012)    2.92      0.06     1.33     11.44

  --------------------------------------------------------------------------------
*********************************
** SIMULATION:3) CKL 10 Yr    **
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--------------------
| CALIB            |
| NASHYD   (  0006)|   Area    (ha)=   1.70   Curve Number   (CN)= 70.7
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

        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    2.71 | 1.083   31.26 | 2.083    7.77 |  3.08    3.34
 0.167    2.71 | 1.167   31.26 | 2.167    7.77 |  3.17    3.34
 0.250    3.20 | 1.250  112.80 | 2.250    6.37 |  3.25    3.06
 0.333    3.20 | 1.333  112.80 | 2.333    6.37 |  3.33    3.06
 0.417    3.90 | 1.417   41.55 | 2.417    5.39 |  3.42    2.82
 0.500    3.90 | 1.500   41.55 | 2.500    5.39 |  3.50    2.82
 0.583    5.03 | 1.583   21.01 | 2.583    4.67 |  3.58    2.61
 0.667    5.03 | 1.667   21.01 | 2.667    4.67 |  3.67    2.61
 0.750    7.06 | 1.750   13.60 | 2.750    4.13 |  3.75    2.43
 0.833    7.06 | 1.833   13.60 | 2.833    4.13 |  3.83    2.43
 0.917   11.75 | 1.917    9.93 | 2.917    3.69 |  3.92    2.28
 1.000   11.75 | 2.000    9.93 | 3.000    3.69 |  4.00    2.28

    Unit Hyd Qpeak  (cms)=   0.583

    PEAK FLOW       (cms)=   0.095 (i)
    TIME TO PEAK    (hrs)=   1.417
    RUNOFF VOLUME    (mm)=  14.262
    TOTAL RAINFALL   (mm)=  52.060
    RUNOFF COEFFICIENT   =   0.274

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

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--------------------
| CALIB            |
| NASHYD   (  0007)|   Area    (ha)=   1.01   Curve Number   (CN)= 70.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

        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    2.71 | 1.083   31.26 | 2.083    7.77 |  3.08    3.34
 0.167    2.71 | 1.167   31.26 | 2.167    7.77 |  3.17    3.34
 0.250    3.20 | 1.250  112.80 | 2.250    6.37 |  3.25    3.06
 0.333    3.20 | 1.333  112.80 | 2.333    6.37 |  3.33    3.06
 0.417    3.90 | 1.417   41.55 | 2.417    5.39 |  3.42    2.82
 0.500    3.90 | 1.500   41.55 | 2.500    5.39 |  3.50    2.82
 0.583    5.03 | 1.583   21.01 | 2.583    4.67 |  3.58    2.61
 0.667    5.03 | 1.667   21.01 | 2.667    4.67 |  3.67    2.61
 0.750    7.06 | 1.750   13.60 | 2.750    4.13 |  3.75    2.43
 0.833    7.06 | 1.833   13.60 | 2.833    4.13 |  3.83    2.43
 0.917   11.75 | 1.917    9.93 | 2.917    3.69 |  3.92    2.28
 1.000   11.75 | 2.000    9.93 | 3.000    3.69 |  4.00    2.28

    Unit Hyd Qpeak  (cms)=   0.352

    PEAK FLOW       (cms)=   0.056 (i)
    TIME TO PEAK    (hrs)=   1.417
    RUNOFF VOLUME    (mm)=  14.120
    TOTAL RAINFALL   (mm)=  52.060
    RUNOFF COEFFICIENT   =   0.271

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

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--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |          AREA     QPEAK     TPEAK      R.V.
--------------------          (ha)     (cms)     (hrs)      (mm)
       ID1= 1 (  0006):      1.70    0.095      1.42     14.26
     + ID2= 2 (  0007):      1.01    0.056      1.42     14.12
       ================================================
       ID = 3 (  0010):      2.71    0.151      1.42     14.21

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| CALIB            |
| NASHYD   (  0009)|   Area    (ha)=   4.03   Curve Number   (CN)= 71.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.16

        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    2.71 | 1.083   31.26 | 2.083    7.77 |  3.08    3.34
 0.167    2.71 | 1.167   31.26 | 2.167    7.77 |  3.17    3.34
 0.250    3.20 | 1.250  112.80 | 2.250    6.37 |  3.25    3.06
 0.333    3.20 | 1.333  112.80 | 2.333    6.37 |  3.33    3.06
 0.417    3.90 | 1.417   41.55 | 2.417    5.39 |  3.42    2.82
 0.500    3.90 | 1.500   41.55 | 2.500    5.39 |  3.50    2.82
 0.583    5.03 | 1.583   21.01 | 2.583    4.67 |  3.58    2.61
 0.667    5.03 | 1.667   21.01 | 2.667    4.67 |  3.67    2.61
 0.750    7.06 | 1.750   13.60 | 2.750    4.13 |  3.75    2.43
 0.833    7.06 | 1.833   13.60 | 2.833    4.13 |  3.83    2.43
 0.917   11.75 | 1.917    9.93 | 2.917    3.69 |  3.92    2.28
 1.000   11.75 | 2.000    9.93 | 3.000    3.69 |  4.00    2.28

    Unit Hyd Qpeak  (cms)=   0.962

    PEAK FLOW       (cms)=   0.205 (i)
    TIME TO PEAK    (hrs)=   1.500
    RUNOFF VOLUME    (mm)=  14.860
    TOTAL RAINFALL   (mm)=  52.060
    RUNOFF COEFFICIENT   =   0.285

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

--------------------------------------------------------------------------------
--------------------
| DUHYD    (  0011)|
| Inlet Cap.= 0.061|
| #of Inlets=     1|
| Total(cms)=   0.1|      AREA     QPEAK     TPEAK     R.V.
--------------------      (ha)     (cms)     (hrs)     (mm)
    TOTAL HYD.(ID= 1):   4.03      0.20      1.50    14.86
    ================================================
    MAJOR SYS.(ID= 2):   1.45      0.14      1.50    14.86
    MINOR SYS.(ID= 3):   2.58      0.06      1.33    14.86

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| RESERVOIR(  0013)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000    |   0.1442      0.0115
                         0.0000     0.0029    |   0.2015      0.0144
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                        0.0363     0.0057   |   0.2443      0.0172
                        0.0555     0.0086   |   0.2802      0.0201

                                  AREA      QPEAK     TPEAK       R.V.
                                  (ha)      (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0011)       1.446      0.144      1.50      14.86
   OUTFLOW: ID= 1 (  0013)       1.446      0.099      1.67      12.87

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 68.75
                  TIME SHIFT OF PEAK FLOW          (min)= 10.00
                  MAXIMUM  STORAGE   USED        (ha.m.)=  0.0101

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--------------------
| ADD HYD  (  0014)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0010):      2.71   0.151     1.42     14.21
     + ID2= 2 (  0013):      1.45   0.099     1.67     12.87
       ================================================
       ID = 3 (  0014):      4.16   0.189     1.58     13.74

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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  --------------------------
  | Junction Command(0012) |
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                           AREA      QPEAK    TPEAK     R.V.
                           (ha)      (cms)    (hrs)     (mm)
  INFLOW : ID= 9(  0011)    2.58      0.06     1.33     14.86
  OUTFLOW: ID= 2(  0012)    2.58      0.06     1.33     14.86

  --------------------------------------------------------------------------------
*********************************
** SIMULATION:4) CKL 25 Yr     **
*********************************
--------------------
| CALIB            |
| NASHYD   (  0006)|   Area    (ha)=   1.70   Curve Number   (CN)= 70.7
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

        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    3.09 | 1.083   38.05 | 2.083    9.28 |  3.08    3.85
             0.167    3.09 | 1.167   38.05 | 2.167    9.28 |  3.17    3.85
             0.250    3.67 | 1.250  130.09 | 2.250    7.55 |  3.25    3.50
             0.333    3.67 | 1.333  130.09 | 2.333    7.55 |  3.33    3.50
             0.417    4.53 | 1.417   50.47 | 2.417    6.34 |  3.42    3.22
             0.500    4.53 | 1.500   50.47 | 2.500    6.34 |  3.50    3.22
             0.583    5.90 | 1.583   25.68 | 2.583    5.46 |  3.58    2.97
             0.667    5.90 | 1.667   25.68 | 2.667    5.46 |  3.67    2.97
             0.750    8.40 | 1.750   16.52 | 2.750    4.80 |  3.75    2.76
             0.833    8.40 | 1.833   16.52 | 2.833    4.80 |  3.83    2.76
             0.917   14.22 | 1.917   11.95 | 2.917    4.27 |  3.92    2.58
             1.000   14.22 | 2.000   11.95 | 3.000    4.27 |  4.00    2.58

    Unit Hyd Qpeak  (cms)=   0.583

    PEAK FLOW       (cms)=   0.130 (i)
    TIME TO PEAK    (hrs)=   1.417
    RUNOFF VOLUME    (mm)=  19.374
    TOTAL RAINFALL   (mm)=  61.525
    RUNOFF COEFFICIENT   =   0.315

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0007)|   Area    (ha)=   1.01   Curve Number   (CN)= 70.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

        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    3.09 | 1.083   38.05 | 2.083    9.28 |  3.08    3.85
             0.167    3.09 | 1.167   38.05 | 2.167    9.28 |  3.17    3.85
             0.250    3.67 | 1.250  130.09 | 2.250    7.55 |  3.25    3.50
             0.333    3.67 | 1.333  130.09 | 2.333    7.55 |  3.33    3.50
             0.417    4.53 | 1.417   50.47 | 2.417    6.34 |  3.42    3.22
             0.500    4.53 | 1.500   50.47 | 2.500    6.34 |  3.50    3.22
             0.583    5.90 | 1.583   25.68 | 2.583    5.46 |  3.58    2.97
             0.667    5.90 | 1.667   25.68 | 2.667    5.46 |  3.67    2.97
             0.750    8.40 | 1.750   16.52 | 2.750    4.80 |  3.75    2.76
             0.833    8.40 | 1.833   16.52 | 2.833    4.80 |  3.83    2.76
             0.917   14.22 | 1.917   11.95 | 2.917    4.27 |  3.92    2.58
             1.000   14.22 | 2.000   11.95 | 3.000    4.27 |  4.00    2.58

    Unit Hyd Qpeak  (cms)=   0.352

    PEAK FLOW       (cms)=   0.077 (i)
    TIME TO PEAK    (hrs)=   1.417
    RUNOFF VOLUME    (mm)=  19.191
    TOTAL RAINFALL   (mm)=  61.525
    RUNOFF COEFFICIENT   =   0.312

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

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

--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0006):      1.70   0.130     1.42     19.37
     + ID2= 2 (  0007):      1.01   0.077     1.42     19.19
       ================================================
       ID = 3 (  0010):      2.71   0.206     1.42     19.31

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0009)|   Area    (ha)=   4.03   Curve Number   (CN)= 71.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.16

        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    3.09 | 1.083   38.05 | 2.083    9.28 |  3.08    3.85
             0.167    3.09 | 1.167   38.05 | 2.167    9.28 |  3.17    3.85
             0.250    3.67 | 1.250  130.09 | 2.250    7.55 |  3.25    3.50
             0.333    3.67 | 1.333  130.09 | 2.333    7.55 |  3.33    3.50
             0.417    4.53 | 1.417   50.47 | 2.417    6.34 |  3.42    3.22
             0.500    4.53 | 1.500   50.47 | 2.500    6.34 |  3.50    3.22
             0.583    5.90 | 1.583   25.68 | 2.583    5.46 |  3.58    2.97
             0.667    5.90 | 1.667   25.68 | 2.667    5.46 |  3.67    2.97
             0.750    8.40 | 1.750   16.52 | 2.750    4.80 |  3.75    2.76
             0.833    8.40 | 1.833   16.52 | 2.833    4.80 |  3.83    2.76
             0.917   14.22 | 1.917   11.95 | 2.917    4.27 |  3.92    2.58
             1.000   14.22 | 2.000   11.95 | 3.000    4.27 |  4.00    2.58

    Unit Hyd Qpeak  (cms)=   0.962

    PEAK FLOW       (cms)=   0.280 (i)
    TIME TO PEAK    (hrs)=   1.500
    RUNOFF VOLUME    (mm)=  20.153
    TOTAL RAINFALL   (mm)=  61.525
    RUNOFF COEFFICIENT   =   0.328

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

--------------------------------------------------------------------------------
--------------------
| DUHYD    (  0011)|
| Inlet Cap.= 0.061|
| #of Inlets=     1|
| Total(cms)=   0.1|      AREA     QPEAK     TPEAK     R.V.
--------------------      (ha)     (cms)     (hrs)     (mm)
    TOTAL HYD.(ID= 1):   4.03      0.28      1.50     20.15
    ================================================
    MAJOR SYS.(ID= 2):   1.84      0.22      1.50     20.15
```

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     MINOR SYS.(ID= 3):   2.18      0.06      1.25   20.15

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0013)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.1442     0.0115
                          0.0000     0.0029   |   0.2015     0.0144
                          0.0363     0.0057   |   0.2443     0.0172
                          0.0555     0.0086   |   0.2802     0.0201

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
    INFLOW : ID= 2 (  0011)    1.841     0.220      1.50      20.15
    OUTFLOW: ID= 1 (  0013)    1.841     0.170      1.67      18.59

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 77.17
                   TIME SHIFT OF PEAK FLOW          (min)= 10.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.0131

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

--------------------
| ADD HYD  (  0014)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0010):      2.71   0.206     1.42    19.31
     + ID2= 2 (  0013):      1.84   0.170     1.67    18.59
       ================================================
       ID = 3 (  0014):      4.55   0.319     1.50    19.02

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

  --------------------------
  | Junction Command(0012) |
  --------------------------

                            AREA     QPEAK   TPEAK     R.V.
                            (ha)     (cms)   (hrs)     (mm)
  INFLOW : ID= 9(  0011)     2.18      0.06    1.25    20.15
  OUTFLOW: ID= 2(  0012)     2.18      0.06    1.25    20.15

  --------------------------------------------------------------------------------
*********************************
** SIMULATION:5) CKL 50 Yr    **
*********************************
--------------------
| CALIB            |
| NASHYD   (  0006)|   Area    (ha)=   1.70   Curve Number   (CN)= 70.7
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

        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     3.49 | 1.083    42.63 | 2.083    10.48 |  3.08     4.35
   0.167     3.49 | 1.167    42.63 | 2.167    10.48 |  3.17     4.35
   0.250     4.15 | 1.250   143.34 | 2.250     8.52 |  3.25     3.96
   0.333     4.15 | 1.333   143.34 | 2.333     8.52 |  3.33     3.96
   0.417     5.11 | 1.417    56.43 | 2.417     7.17 |  3.42     3.63
   0.500     5.11 | 1.500    56.43 | 2.500     7.17 |  3.50     3.63
   0.583     6.66 | 1.583    28.88 | 2.583     6.17 |  3.58     3.36
   0.667     6.66 | 1.667    28.88 | 2.667     6.17 |  3.67     3.36
   0.750     9.49 | 1.750    18.62 | 2.750     5.42 |  3.75     3.12
   0.833     9.49 | 1.833    18.62 | 2.833     5.42 |  3.83     3.12
   0.917    16.03 | 1.917    13.49 | 2.917     4.82 |  3.92     2.92
   1.000    16.03 | 2.000    13.49 | 3.000     4.82 |  4.00     2.92

     Unit Hyd Qpeak  (cms)=   0.583

     PEAK FLOW       (cms)=   0.158 (i)
     TIME TO PEAK    (hrs)=   1.417
     RUNOFF VOLUME    (mm)=  23.563
     TOTAL RAINFALL   (mm)=  68.705
     RUNOFF COEFFICIENT   =   0.343

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0007)|   Area    (ha)=   1.01   Curve Number   (CN)= 70.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

        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     3.49 | 1.083    42.63 | 2.083    10.48 |  3.08     4.35
   0.167     3.49 | 1.167    42.63 | 2.167    10.48 |  3.17     4.35
   0.250     4.15 | 1.250   143.34 | 2.250     8.52 |  3.25     3.96
   0.333     4.15 | 1.333   143.34 | 2.333     8.52 |  3.33     3.96
   0.417     5.11 | 1.417    56.43 | 2.417     7.17 |  3.42     3.63
   0.500     5.11 | 1.500    56.43 | 2.500     7.17 |  3.50     3.63
   0.583     6.66 | 1.583    28.88 | 2.583     6.17 |  3.58     3.36
   0.667     6.66 | 1.667    28.88 | 2.667     6.17 |  3.67     3.36
   0.750     9.49 | 1.750    18.62 | 2.750     5.42 |  3.75     3.12
   0.833     9.49 | 1.833    18.62 | 2.833     5.42 |  3.83     3.12
   0.917    16.03 | 1.917    13.49 | 2.917     4.82 |  3.92     2.92
   1.000    16.03 | 2.000    13.49 | 3.000     4.82 |  4.00     2.92

     Unit Hyd Qpeak  (cms)=   0.352

     PEAK FLOW       (cms)=   0.093 (i)
     TIME TO PEAK    (hrs)=   1.417
     RUNOFF VOLUME    (mm)=  23.350
     TOTAL RAINFALL   (mm)=  68.705
     RUNOFF COEFFICIENT   =   0.340

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

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

--------------------
| ADD HYD  (  0010)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0006):      1.70   0.158     1.42    23.56
     + ID2= 2 (  0007):      1.01   0.093     1.42    23.35
       ================================================
       ID = 3 (  0010):      2.71   0.251     1.42    23.48

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0009)|   Area    (ha)=   4.03   Curve Number   (CN)= 71.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.16

        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     3.49 | 1.083    42.63 | 2.083    10.48 |  3.08     4.35
   0.167     3.49 | 1.167    42.63 | 2.167    10.48 |  3.17     4.35
   0.250     4.15 | 1.250   143.34 | 2.250     8.52 |  3.25     3.96
   0.333     4.15 | 1.333   143.34 | 2.333     8.52 |  3.33     3.96
   0.417     5.11 | 1.417    56.43 | 2.417     7.17 |  3.42     3.63
   0.500     5.11 | 1.500    56.43 | 2.500     7.17 |  3.50     3.63
   0.583     6.66 | 1.583    28.88 | 2.583     6.17 |  3.58     3.36
   0.667     6.66 | 1.667    28.88 | 2.667     6.17 |  3.67     3.36
   0.750     9.49 | 1.750    18.62 | 2.750     5.42 |  3.75     3.12
   0.833     9.49 | 1.833    18.62 | 2.833     5.42 |  3.83     3.12
   0.917    16.03 | 1.917    13.49 | 2.917     4.82 |  3.92     2.92
   1.000    16.03 | 2.000    13.49 | 3.000     4.82 |  4.00     2.92

     Unit Hyd Qpeak  (cms)=   0.962

     PEAK FLOW       (cms)=   0.341 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=  24.485
     TOTAL RAINFALL   (mm)=  68.705
     RUNOFF COEFFICIENT   =   0.356
```

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

DUHYD (0011)		AREA	QPEAK	TPEAK	R.V.
Inlet Cap.= 0.061		(ha)	(cms)	(hrs)	(mm)
#of Inlets= 1	TOTAL HYD.(ID= 1):	4.03	0.34	1.50	24.48
Total(cms)= 0.1	MAJOR SYS.(ID= 2):	2.06	0.28	1.50	24.48
	MINOR SYS.(ID= 3):	1.97	0.06	1.25	24.48

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0013)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.1442	0.0115
	0.0000	0.0029	0.2015	0.0144
	0.0363	0.0057	0.2443	0.0172
	0.0555	0.0086	0.2802	0.0201

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0011)	2.058	0.280	1.50	24.48
OUTFLOW: ID= 1 (0013)	2.058	0.218	1.67	23.09

PEAK FLOW REDUCTION [Qout/Qin](%)= 77.78
TIME SHIFT OF PEAK FLOW (min)= 10.00
MAXIMUM STORAGE USED (ha.m.)= 0.0158

ADD HYD (0014)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0010):	2.71	0.251	1.42	23.48
	+ ID2= 2 (0013):	2.06	0.218	1.67	23.09
	ID = 3 (0014):	4.77	0.412	1.50	23.31

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

Junction Command(0012)

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 9(0011)	1.97	0.06	1.25	24.48
OUTFLOW: ID= 2(0012)	1.97	0.06	1.25	24.48

****
** SIMULATION:6) CKL 100 Yr **
****

CALIB				
NASHYD (0006)	Area (ha)=	1.70	Curve Number (CN)=	70.7
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.11		

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	3.74	1.083	48.41	2.083	11.70	3.08	4.70
0.167	3.74	1.167	48.41	2.167	11.70	3.17	4.70
0.250	4.47	1.250	157.29	2.250	9.45	3.25	4.26
0.333	4.47	1.333	157.29	2.333	9.45	3.33	4.26
0.417	5.56	1.417	64.01	2.417	7.90	3.42	3.90
0.500	5.56	1.500	64.01	2.500	7.90	3.50	3.90
0.583	7.32	1.583	32.88	2.583	6.77	3.58	3.59
0.667	7.32	1.667	32.88	2.667	6.77	3.67	3.59
0.750	10.56	1.750	21.09	2.750	5.91	3.75	3.33
0.833	10.56	1.833	21.09	2.833	5.91	3.83	3.33
0.917	18.10	1.917	15.17	2.917	5.24	3.92	3.10
1.000	18.10	2.000	15.17	3.000	5.24	4.00	3.10

Unit Hyd Qpeak (cms)= 0.583

PEAK FLOW (cms)= 0.190 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 28.316
TOTAL RAINFALL (mm)= 76.405
RUNOFF COEFFICIENT = 0.371

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

CALIB				
NASHYD (0007)	Area (ha)=	1.01	Curve Number (CN)=	70.4
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.11		

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	3.74	1.083	48.41	2.083	11.70	3.08	4.70
0.167	3.74	1.167	48.41	2.167	11.70	3.17	4.70
0.250	4.47	1.250	157.29	2.250	9.45	3.25	4.26
0.333	4.47	1.333	157.29	2.333	9.45	3.33	4.26
0.417	5.56	1.417	64.01	2.417	7.90	3.42	3.90
0.500	5.56	1.500	64.01	2.500	7.90	3.50	3.90
0.583	7.32	1.583	32.88	2.583	6.77	3.58	3.59
0.667	7.32	1.667	32.88	2.667	6.77	3.67	3.59
0.750	10.56	1.750	21.09	2.750	5.91	3.75	3.33
0.833	10.56	1.833	21.09	2.833	5.91	3.83	3.33
0.917	18.10	1.917	15.17	2.917	5.24	3.92	3.10
1.000	18.10	2.000	15.17	3.000	5.24	4.00	3.10

Unit Hyd Qpeak (cms)= 0.352

PEAK FLOW (cms)= 0.113 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 28.069
TOTAL RAINFALL (mm)= 76.405
RUNOFF COEFFICIENT = 0.367

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

ADD HYD (0010)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0006):	1.70	0.190	1.42	28.32
	+ ID2= 2 (0007):	1.01	0.113	1.42	28.07
	ID = 3 (0010):	2.71	0.303	1.42	28.22

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB				
NASHYD (0009)	Area (ha)=	4.03	Curve Number (CN)=	71.5
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.16		

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	3.74	1.083	48.41	2.083	11.70	3.08	4.70
0.167	3.74	1.167	48.41	2.167	11.70	3.17	4.70
0.250	4.47	1.250	157.29	2.250	9.45	3.25	4.26
0.333	4.47	1.333	157.29	2.333	9.45	3.33	4.26
0.417	5.56	1.417	64.01	2.417	7.90	3.42	3.90
0.500	5.56	1.500	64.01	2.500	7.90	3.50	3.90
0.583	7.32	1.583	32.88	2.583	6.77	3.58	3.59
0.667	7.32	1.667	32.88	2.667	6.77	3.67	3.59
0.750	10.56	1.750	21.09	2.750	5.91	3.75	3.33

0.833	10.56	1.833	21.09	2.833	5.91	3.83	3.33
0.917	18.10	1.917	15.17	2.917	5.24	3.92	3.10
1.000	18.10	2.000	15.17	3.000	5.24	4.00	3.10

Unit Hyd Qpeak (cms)= 0.962

PEAK FLOW (cms)= 0.412 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 29.390
TOTAL RAINFALL (mm)= 76.405
RUNOFF COEFFICIENT = 0.385

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

DUHYD (0011)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
Inlet Cap.= 0.061				
#of Inlets= 1				
Total(cms)= 0.1				
TOTAL HYD.(ID= 1):	4.03	0.41	1.50	29.39
MAJOR SYS.(ID= 2):	2.27	0.35	1.50	29.39
MINOR SYS.(ID= 3):	1.75	0.06	1.25	29.39

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0013)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.1442	0.0115
	0.0000	0.0029	0.2015	0.0144
	0.0363	0.0057	0.2443	0.0172
	0.0555	0.0086	0.2802	0.0201

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0011)	2.272	0.352	1.50	29.39
OUTFLOW: ID= 1 (0013)	2.272	0.268	1.67	28.13

PEAK FLOW REDUCTION [Qout/Qin](%)= 76.15
TIME SHIFT OF PEAK FLOW (min)= 10.00
MAXIMUM STORAGE USED (ha.m.)= 0.0194

ADD HYD (0014)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3				
ID1= 1 (0010):	2.71	0.303	1.42	28.22
+ ID2= 2 (0013):	2.27	0.268	1.67	28.13
ID = 3 (0014):	4.98	0.502	1.50	28.18

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

Junction Command(0012)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 9(0011)	1.75	0.06	1.25	29.39
OUTFLOW: ID= 2(0012)	1.75	0.06	1.25	29.39

****
** SIMULATION:7) 25mm Event **
****

CALIB				
NASHYD (0006)	Area (ha)=	1.70	Curve Number (CN)=	70.7
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.11		

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	2.07	1.083	5.70	2.083	5.19	3.08	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.250	2.27	1.250	10.78	2.250	4.47	3.25	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.417	2.52	1.417	50.21	2.417	3.95	3.42	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.583	2.88	1.583	13.37	2.583	3.56	3.58	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.750	3.38	1.750	8.29	2.750	3.25	3.75	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.917	4.18	1.917	6.30	2.917	3.01	3.92	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

Unit Hyd Qpeak (cms)= 0.583

PEAK FLOW (cms)= 0.015 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 3.130
TOTAL RAINFALL (mm)= 24.997
RUNOFF COEFFICIENT = 0.125

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

CALIB				
NASHYD (0007)	Area (ha)=	1.01	Curve Number (CN)=	70.4
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.11		

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	2.07	1.083	5.70	2.083	5.19	3.08	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.250	2.27	1.250	10.78	2.250	4.47	3.25	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.417	2.52	1.417	50.21	2.417	3.95	3.42	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.583	2.88	1.583	13.37	2.583	3.56	3.58	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.750	3.38	1.750	8.29	2.750	3.25	3.75	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.917	4.18	1.917	6.30	2.917	3.01	3.92	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

Unit Hyd Qpeak (cms)= 0.352

PEAK FLOW (cms)= 0.009 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 3.093
TOTAL RAINFALL (mm)= 24.997
RUNOFF COEFFICIENT = 0.124

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

ADD HYD (0010)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3				
ID1= 1 (0006):	1.70	0.015	1.58	3.13
+ ID2= 2 (0007):	1.01	0.009	1.58	3.09
ID = 3 (0010):	2.71	0.024	1.58	3.12

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB				
NASHYD (0009)	Area (ha)=	4.03	Curve Number (CN)=	71.5
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.16		

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    2.07 | 1.083    5.70 | 2.083    5.19 |  3.08    2.80
 0.167    2.07 | 1.167    5.70 | 2.167    5.19 |  3.17    2.80
 0.250    2.27 | 1.250   10.78 | 2.250    4.47 |  3.25    2.62
 0.333    2.27 | 1.333   10.78 | 2.333    4.47 |  3.33    2.62
 0.417    2.52 | 1.417   50.21 | 2.417    3.95 |  3.42    2.48
 0.500    2.52 | 1.500   50.21 | 2.500    3.95 |  3.50    2.48
 0.583    2.88 | 1.583   13.37 | 2.583    3.56 |  3.58    2.35
 0.667    2.88 | 1.667   13.37 | 2.667    3.56 |  3.67    2.35
 0.750    3.38 | 1.750    8.29 | 2.750    3.25 |  3.75    2.23
 0.833    3.38 | 1.833    8.29 | 2.833    3.25 |  3.83    2.23
 0.917    4.18 | 1.917    6.30 | 2.917    3.01 |  3.92    2.14
 1.000    4.18 | 2.000    6.30 | 3.000    3.01 |  4.00    2.14

     Unit Hyd Qpeak  (cms)=   0.962

     PEAK FLOW       (cms)=   0.032 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=   3.282
     TOTAL RAINFALL   (mm)=  24.997
     RUNOFF COEFFICIENT   =   0.131

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

--------------------------------------------------------------------------------
--------------------
| DUHYD    (  0011)|
| Inlet Cap.= 0.061|
| #of Inlets=     1|
| Total(cms)=   0.1|      AREA     QPEAK     TPEAK    R.V.
--------------------      (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   4.03      0.03      1.67    3.28
     ================================================
     MAJOR SYS.(ID= 2):   0.00      0.00      0.00    0.00
     MINOR SYS.(ID= 3):   4.03      0.03      1.67    3.28

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0013)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.1442     0.0115
                          0.0000     0.0029   |   0.2015     0.0144
                          0.0363     0.0057   |   0.2443     0.0172
                          0.0555     0.0086   |   0.2802     0.0201

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0011)     0.000      0.000      0.00       0.00
   OUTFLOW: ID= 1 (  0013)     0.000      0.000      0.00        NaN

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=   NaN
                  TIME SHIFT OF PEAK FLOW         (min)=  0.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0000
                  MAXIMUM  STORAGE   USED       (cu.m.)=  0.000000

     **** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
                    CHECK OUTFLOW/STORAGE TABLE  OR REDUCE DT.
--------------------------------------------------------------------------------

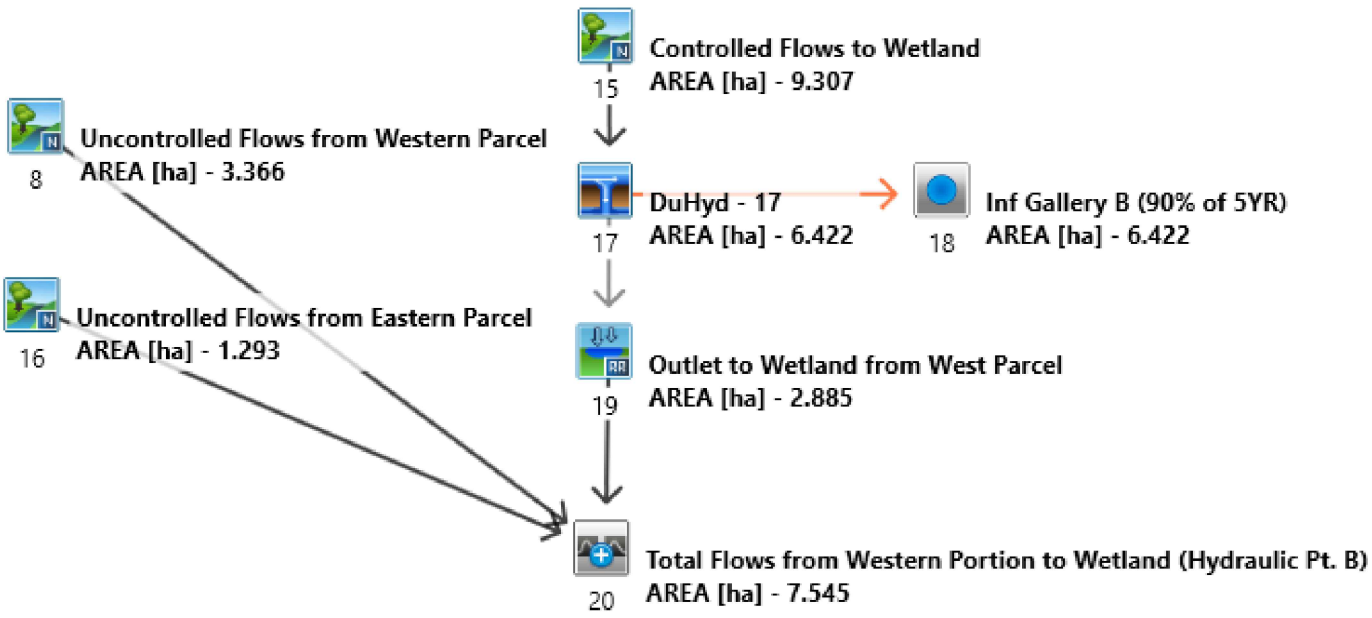
--------------------
| ADD HYD  (  0014)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
*** W A R N I N G :  HYDROGRAPH   0013 <ID= 2> IS DRY.
*** W A R N I N G :  HYDROGRAPH   0003 = HYDROGRAPH 0001
       ID1= 1 (  0010):     2.71   0.024     1.58     3.12
     + ID2= 2 (  0013):     0.00   0.000     0.00      NaN
       ================================================
       ID = 3 (  0014):     2.71   0.024     1.58     3.12

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

  --------------------------
  | Junction Command(0012) |
  --------------------------

                           AREA     QPEAK   TPEAK     R.V.
                           (ha)     (cms)    (hrs)     (mm)
INFLOW : ID= 9(  0011)     4.03      0.03     1.67      3.28
OUTFLOW: ID= 2(  0012)     4.03      0.03     1.67      3.28

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



JEFFERY SUBDIVISION, BOBCAYGEON, ON

V.O. SCHEMATIC – POST-DEVELOPMENT FLOWS TO WEST PARCEL WETLAND OUTLET

D.G. BIDDLE & ASSOCIATES
CONSULTING ENGINEERS & PLANNERS

96 King Street East
Oshawa, Ontario, L1H 1B6
Phone: 905-576-8500
info@dgbiddle.com
dgbiddle.com

SCALE	N.T.S.
DRAWN	M.J.H.
DESIGN	M.J.H.
CHECKED	D.D.M.
DATE	MAR 2024

PROJECT 122169

DWG FIG 4

```
*********************************
** SIMULATION:1) CKL 2 Yr      **
*********************************
--------------------
| CALIB            |
| NASHYD   (  0008)|   Area    (ha)=   3.37   Curve Number   (CN)= 69.8
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

        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    2.15 | 1.083   20.33 | 2.083    5.50 |  3.08    2.59
 0.167    2.15 | 1.167   20.33 | 2.167    5.50 |  3.17    2.59
 0.250    2.49 | 1.250   84.39 | 2.250    4.60 |  3.25    2.39
 0.333    2.49 | 1.333   84.39 | 2.333    4.60 |  3.33    2.39
 0.417    2.98 | 1.417   26.99 | 2.417    3.97 |  3.42    2.23
 0.500    2.98 | 1.500   26.99 | 2.500    3.97 |  3.50    2.23
 0.583    3.73 | 1.583   13.71 | 2.583    3.49 |  3.58    2.08
 0.667    3.73 | 1.667   13.71 | 2.667    3.49 |  3.67    2.08
 0.750    5.04 | 1.750    9.12 | 2.750    3.13 |  3.75    1.95
 0.833    5.04 | 1.833    9.12 | 2.833    3.13 |  3.83    1.95
 0.917    7.98 | 1.917    6.85 | 2.917    2.83 |  3.92    1.84
 1.000    7.98 | 2.000    6.85 | 3.000    2.83 |  4.00    1.84

     Unit Hyd Qpeak  (cms)=   1.157

     PEAK FLOW       (cms)=   0.091 (i)
     TIME TO PEAK    (hrs)=   1.417
     RUNOFF VOLUME    (mm)=   7.101
     TOTAL RAINFALL   (mm)=  37.060
     RUNOFF COEFFICIENT   =   0.192

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0015)|   Area    (ha)=   9.31   Curve Number   (CN)= 72.2
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

        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    2.15 | 1.083   20.33 | 2.083    5.50 |  3.08    2.59
 0.167    2.15 | 1.167   20.33 | 2.167    5.50 |  3.17    2.59
 0.250    2.49 | 1.250   84.39 | 2.250    4.60 |  3.25    2.39
 0.333    2.49 | 1.333   84.39 | 2.333    4.60 |  3.33    2.39
 0.417    2.98 | 1.417   26.99 | 2.417    3.97 |  3.42    2.23
 0.500    2.98 | 1.500   26.99 | 2.500    3.97 |  3.50    2.23
 0.583    3.73 | 1.583   13.71 | 2.583    3.49 |  3.58    2.08
 0.667    3.73 | 1.667   13.71 | 2.667    3.49 |  3.67    2.08
 0.750    5.04 | 1.750    9.12 | 2.750    3.13 |  3.75    1.95
 0.833    5.04 | 1.833    9.12 | 2.833    3.13 |  3.83    1.95
 0.917    7.98 | 1.917    6.85 | 2.917    2.83 |  3.92    1.84
 1.000    7.98 | 2.000    6.85 | 3.000    2.83 |  4.00    1.84

     Unit Hyd Qpeak  (cms)=   3.305

     PEAK FLOW       (cms)=   0.279 (i)
     TIME TO PEAK    (hrs)=   1.417
     RUNOFF VOLUME    (mm)=   7.754
     TOTAL RAINFALL   (mm)=  37.060
     RUNOFF COEFFICIENT   =   0.209

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

--------------------------------------------------------------------------------
--------------------
| DUHYD    (  0017)|
| Inlet Cap.= 0.382|
| #of Inlets=     1|
| Total(cms)=   0.4|      AREA     QPEAK     TPEAK     R.V.
--------------------      (ha)     (cms)     (hrs)     (mm)
     TOTAL HYD.(ID= 1):   9.31      0.28      1.42     7.75
     ================================================
     MAJOR SYS.(ID= 2):   0.00      0.00      0.00     0.00
     MINOR SYS.(ID= 3):   9.31      0.28      1.42     7.75

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0019)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.3715     0.0062
                          0.0000     0.0002   |   0.4883     0.0099
                          0.0000     0.0014   |   0.5821     0.0179
                          0.0000     0.0025   |   0.6627     0.0259

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0017)      0.000     0.000      0.00       0.00
   OUTFLOW: ID= 1 (  0019)      0.000     0.000      0.00       -Inf

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=   NaN
                  TIME SHIFT OF PEAK FLOW          (min)=  0.00
                  MAXIMUM  STORAGE   USED        (ha.m.)=  0.0000
                  MAXIMUM  STORAGE   USED        (cu.m.)=  0.000000

     **** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
                    CHECK OUTFLOW/STORAGE TABLE  OR REDUCE DT.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0016)|   Area    (ha)=   1.29   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

        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    2.15 | 1.083   20.33 | 2.083    5.50 |  3.08    2.59
 0.167    2.15 | 1.167   20.33 | 2.167    5.50 |  3.17    2.59
 0.250    2.49 | 1.250   84.39 | 2.250    4.60 |  3.25    2.39
 0.333    2.49 | 1.333   84.39 | 2.333    4.60 |  3.33    2.39
 0.417    2.98 | 1.417   26.99 | 2.417    3.97 |  3.42    2.23
 0.500    2.98 | 1.500   26.99 | 2.500    3.97 |  3.50    2.23
 0.583    3.73 | 1.583   13.71 | 2.583    3.49 |  3.58    2.08
 0.667    3.73 | 1.667   13.71 | 2.667    3.49 |  3.67    2.08
 0.750    5.04 | 1.750    9.12 | 2.750    3.13 |  3.75    1.95
 0.833    5.04 | 1.833    9.12 | 2.833    3.13 |  3.83    1.95
 0.917    7.98 | 1.917    6.85 | 2.917    2.83 |  3.92    1.84
 1.000    7.98 | 2.000    6.85 | 3.000    2.83 |  4.00    1.84

     Unit Hyd Qpeak  (cms)=   0.445

     PEAK FLOW       (cms)=   0.040 (i)
     TIME TO PEAK    (hrs)=   1.417
     RUNOFF VOLUME    (mm)=   8.009
     TOTAL RAINFALL   (mm)=  37.060
     RUNOFF COEFFICIENT   =   0.216

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

--------------------------------------------------------------------------------
--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
*** W A R N I N G :  HYDROGRAPH   0019 <ID= 2> IS DRY.
*** W A R N I N G :  HYDROGRAPH   0003 = HYDROGRAPH 0001
       ID1= 1 (  0016):     1.29   0.040     1.42     8.01
     + ID2= 2 (  0019):     0.00   0.000     0.00     -Inf
       ================================================
       ID = 3 (  0020):     1.29   0.040     1.42     8.01

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0020):     1.29   0.040     1.42     8.01
```

```
      + ID2= 2 (  0008):     3.37   0.091     1.42     7.10
        ================================================
        ID = 1 (  0020):     4.66   0.131     1.42     7.35

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

   --------------------------
   | Junction Command(0018) |
   --------------------------

                           AREA     QPEAK   TPEAK     R.V.
                           (ha)     (cms)    (hrs)    (mm)
   INFLOW : ID= 9(  0017)    9.31     0.28    1.42     7.75
   OUTFLOW: ID= 2(  0018)    9.31     0.28    1.42     7.75

   ------------------------------------------------------------------------------------------
**********
** SIMULATION:2) CKL 5 Yr     **
**********
--------------------
| CALIB            |
| NASHYD   (  0008)|   Area     (ha)=   3.37   Curve Number   (CN)= 69.8
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

         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    2.43 | 1.083   26.49 | 2.083    6.72 |  3.08    2.98
              0.167    2.43 | 1.167   26.49 | 2.167    6.72 |  3.17    2.98
              0.250    2.85 | 1.250  100.26 | 2.250    5.55 |  3.25    2.73
              0.333    2.85 | 1.333  100.26 | 2.333    5.55 |  3.33    2.73
              0.417    3.46 | 1.417   35.24 | 2.417    4.72 |  3.42    2.53
              0.500    3.46 | 1.500   35.24 | 2.500    4.72 |  3.50    2.53
              0.583    4.41 | 1.583   17.77 | 2.583    4.12 |  3.58    2.35
              0.667    4.41 | 1.667   17.77 | 2.667    4.12 |  3.67    2.35
              0.750    6.13 | 1.750   11.59 | 2.750    3.65 |  3.75    2.20
              0.833    6.13 | 1.833   11.59 | 2.833    3.65 |  3.83    2.20
              0.917   10.04 | 1.917    8.52 | 2.917    3.28 |  3.92    2.06
              1.000   10.04 | 2.000    8.52 | 3.000    3.28 |  4.00    2.06

     Unit Hyd Qpeak  (cms)=   1.157

     PEAK FLOW       (cms)=   0.139 (i)
     TIME TO PEAK    (hrs)=   1.417
     RUNOFF VOLUME    (mm)=  10.629
     TOTAL RAINFALL   (mm)=  45.348
     RUNOFF COEFFICIENT   =   0.234

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0015)|   Area     (ha)=   9.31   Curve Number   (CN)= 72.2
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

         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    2.43 | 1.083   26.49 | 2.083    6.72 |  3.08    2.98
              0.167    2.43 | 1.167   26.49 | 2.167    6.72 |  3.17    2.98
              0.250    2.85 | 1.250  100.26 | 2.250    5.55 |  3.25    2.73
              0.333    2.85 | 1.333  100.26 | 2.333    5.55 |  3.33    2.73
              0.417    3.46 | 1.417   35.24 | 2.417    4.72 |  3.42    2.53
              0.500    3.46 | 1.500   35.24 | 2.500    4.72 |  3.50    2.53
              0.583    4.41 | 1.583   17.77 | 2.583    4.12 |  3.58    2.35
              0.667    4.41 | 1.667   17.77 | 2.667    4.12 |  3.67    2.35
              0.750    6.13 | 1.750   11.59 | 2.750    3.65 |  3.75    2.20
              0.833    6.13 | 1.833   11.59 | 2.833    3.65 |  3.83    2.20
              0.917   10.04 | 1.917    8.52 | 2.917    3.28 |  3.92    2.06
              1.000   10.04 | 2.000    8.52 | 3.000    3.28 |  4.00    2.06

     Unit Hyd Qpeak  (cms)=   3.305

     PEAK FLOW       (cms)=   0.424 (i)

     TIME TO PEAK    (hrs)=   1.417
     RUNOFF VOLUME    (mm)=  11.545
     TOTAL RAINFALL   (mm)=  45.348
     RUNOFF COEFFICIENT   =   0.255

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

--------------------------------------------------------------------------------
--------------------
| DUHYD    (  0017)|
| Inlet Cap.= 0.382|
| #of Inlets=     1|
| Total(cms)=   0.4|      AREA     QPEAK     TPEAK    R.V.
--------------------      (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   9.31      0.42      1.42   11.54
     ================================================
     MAJOR SYS.(ID= 2):   0.20      0.04      1.42   11.54
     MINOR SYS.(ID= 3):   9.11      0.38      1.33   11.54

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0019)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |  0.3715      0.0062
                          0.0000     0.0002   |  0.4883      0.0099
                          0.0000     0.0014   |  0.5821      0.0179
                          0.0000     0.0025   |  0.6627      0.0259

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0017)     0.202     0.042      1.42      11.54
   OUTFLOW: ID= 1 (  0019)     0.202     0.000      1.50       0.00

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  0.00
                  TIME SHIFT OF PEAK FLOW          (min)=  5.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0023

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0016)|   Area     (ha)=   1.29   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

         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    2.43 | 1.083   26.49 | 2.083    6.72 |  3.08    2.98
              0.167    2.43 | 1.167   26.49 | 2.167    6.72 |  3.17    2.98
              0.250    2.85 | 1.250  100.26 | 2.250    5.55 |  3.25    2.73
              0.333    2.85 | 1.333  100.26 | 2.333    5.55 |  3.33    2.73
              0.417    3.46 | 1.417   35.24 | 2.417    4.72 |  3.42    2.53
              0.500    3.46 | 1.500   35.24 | 2.500    4.72 |  3.50    2.53
              0.583    4.41 | 1.583   17.77 | 2.583    4.12 |  3.58    2.35
              0.667    4.41 | 1.667   17.77 | 2.667    4.12 |  3.67    2.35
              0.750    6.13 | 1.750   11.59 | 2.750    3.65 |  3.75    2.20
              0.833    6.13 | 1.833   11.59 | 2.833    3.65 |  3.83    2.20
              0.917   10.04 | 1.917    8.52 | 2.917    3.28 |  3.92    2.06
              1.000   10.04 | 2.000    8.52 | 3.000    3.28 |  4.00    2.06

     Unit Hyd Qpeak  (cms)=   0.445

     PEAK FLOW       (cms)=   0.060 (i)
     TIME TO PEAK    (hrs)=   1.417
     RUNOFF VOLUME    (mm)=  11.903
     TOTAL RAINFALL   (mm)=  45.348
     RUNOFF COEFFICIENT   =   0.262

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

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0016):     1.29   0.060     1.42    11.90
```

```
      + ID2= 2 (  0019):     0.20   0.000     1.50     0.00
        ==================================================
        ID = 3 (  0020):     1.50   0.060     1.42    10.30

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 3 (  0020):     1.50   0.060     1.42    10.30
      + ID2= 2 (  0008):     3.37   0.139     1.42    10.63
        ==================================================
        ID = 1 (  0020):     4.86   0.199     1.42    10.53

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

   --------------------------
   | Junction Command(0018) |
   --------------------------

                           AREA     QPEAK    TPEAK     R.V.
                           (ha)     (cms)    (hrs)     (mm)
   INFLOW : ID= 9(  0017)    9.11     0.38     1.33    11.54
   OUTFLOW: ID= 2(  0018)    9.11     0.38     1.33    11.54

   --------------------------------------------------------------------------------
**********************************
** SIMULATION:3) CKL 10 Yr     **
**********************************
--------------------
| CALIB            |
| NASHYD   (  0008)|   Area     (ha)=   3.37   Curve Number    (CN)= 69.8
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

         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    2.71 | 1.083   31.26 | 2.083    7.77 |  3.08    3.34
               0.167    2.71 | 1.167   31.26 | 2.167    7.77 |  3.17    3.34
               0.250    3.20 | 1.250  112.80 | 2.250    6.37 |  3.25    3.06
               0.333    3.20 | 1.333  112.80 | 2.333    6.37 |  3.33    3.06
               0.417    3.90 | 1.417   41.55 | 2.417    5.39 |  3.42    2.82
               0.500    3.90 | 1.500   41.55 | 2.500    5.39 |  3.50    2.82
               0.583    5.03 | 1.583   21.01 | 2.583    4.67 |  3.58    2.61
               0.667    5.03 | 1.667   21.01 | 2.667    4.67 |  3.67    2.61
               0.750    7.06 | 1.750   13.60 | 2.750    4.13 |  3.75    2.43
               0.833    7.06 | 1.833   13.60 | 2.833    4.13 |  3.83    2.43
               0.917   11.75 | 1.917    9.93 | 2.917    3.69 |  3.92    2.28
               1.000   11.75 | 2.000    9.93 | 3.000    3.69 |  4.00    2.28

     Unit Hyd Qpeak  (cms)=   1.157

     PEAK FLOW       (cms)=   0.182 (i)
     TIME TO PEAK    (hrs)=   1.417
     RUNOFF VOLUME    (mm)=  13.841
     TOTAL RAINFALL   (mm)=  52.060
     RUNOFF COEFFICIENT   =   0.266

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0015)|   Area     (ha)=   9.31   Curve Number    (CN)= 72.2
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

         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    2.71 | 1.083   31.26 | 2.083    7.77 |  3.08    3.34
               0.167    2.71 | 1.167   31.26 | 2.167    7.77 |  3.17    3.34
               0.250    3.20 | 1.250  112.80 | 2.250    6.37 |  3.25    3.06
               0.333    3.20 | 1.333  112.80 | 2.333    6.37 |  3.33    3.06
               0.417    3.90 | 1.417   41.55 | 2.417    5.39 |  3.42    2.82
               0.500    3.90 | 1.500   41.55 | 2.500    5.39 |  3.50    2.82
               0.583    5.03 | 1.583   21.01 | 2.583    4.67 |  3.58    2.61
               0.667    5.03 | 1.667   21.01 | 2.667    4.67 |  3.67    2.61
               0.750    7.06 | 1.750   13.60 | 2.750    4.13 |  3.75    2.43
               0.833    7.06 | 1.833   13.60 | 2.833    4.13 |  3.83    2.43
               0.917   11.75 | 1.917    9.93 | 2.917    3.69 |  3.92    2.28
               1.000   11.75 | 2.000    9.93 | 3.000    3.69 |  4.00    2.28

     Unit Hyd Qpeak  (cms)=   3.305

     PEAK FLOW       (cms)=   0.553 (i)
     TIME TO PEAK    (hrs)=   1.417
     RUNOFF VOLUME    (mm)=  14.978
     TOTAL RAINFALL   (mm)=  52.060
     RUNOFF COEFFICIENT   =   0.288

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

--------------------------------------------------------------------------------
--------------------
| DUHYD    (  0017)|
| Inlet Cap.= 0.382|
| #of Inlets=   1|
| Total(cms)=   0.4|          AREA     QPEAK     TPEAK     R.V.
--------------------          (ha)     (cms)     (hrs)     (mm)
     TOTAL HYD.(ID= 1):    9.31      0.55      1.42    14.98
     ==========================================================
     MAJOR SYS.(ID= 2):    0.89      0.17      1.42    14.98
     MINOR SYS.(ID= 3):    8.41      0.38      1.33    14.98

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0019)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.3715      0.0062
                          0.0000     0.0002   |   0.4883      0.0099
                          0.0000     0.0014   |   0.5821      0.0179
                          0.0000     0.0025   |   0.6627      0.0259

                               AREA     QPEAK     TPEAK        R.V.
                               (ha)     (cms)     (hrs)        (mm)
   INFLOW : ID= 2 (  0017)     0.893     0.172      1.42       14.98
   OUTFLOW: ID= 1 (  0019)     0.893     0.202      1.42       12.35

                PEAK   FLOW   REDUCTION [Qout/Qin](%)=117.45
                TIME SHIFT OF PEAK FLOW          (min)=  0.00
                MAXIMUM  STORAGE   USED       (ha.m.)=  0.0050

    **** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
                   CHECK OUTFLOW/STORAGE TABLE  OR REDUCE DT.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0016)|   Area     (ha)=   1.29   Curve Number    (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

         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    2.71 | 1.083   31.26 | 2.083    7.77 |  3.08    3.34
               0.167    2.71 | 1.167   31.26 | 2.167    7.77 |  3.17    3.34
               0.250    3.20 | 1.250  112.80 | 2.250    6.37 |  3.25    3.06
               0.333    3.20 | 1.333  112.80 | 2.333    6.37 |  3.33    3.06
               0.417    3.90 | 1.417   41.55 | 2.417    5.39 |  3.42    2.82
               0.500    3.90 | 1.500   41.55 | 2.500    5.39 |  3.50    2.82
               0.583    5.03 | 1.583   21.01 | 2.583    4.67 |  3.58    2.61
               0.667    5.03 | 1.667   21.01 | 2.667    4.67 |  3.67    2.61
               0.750    7.06 | 1.750   13.60 | 2.750    4.13 |  3.75    2.43
               0.833    7.06 | 1.833   13.60 | 2.833    4.13 |  3.83    2.43
               0.917   11.75 | 1.917    9.93 | 2.917    3.69 |  3.92    2.28
               1.000   11.75 | 2.000    9.93 | 3.000    3.69 |  4.00    2.28

     Unit Hyd Qpeak  (cms)=   0.445

     PEAK FLOW       (cms)=   0.079 (i)
```

```
     TIME TO PEAK    (hrs)=   1.417
     RUNOFF VOLUME    (mm)=  15.422
     TOTAL RAINFALL   (mm)=  52.060
     RUNOFF COEFFICIENT   =   0.296

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

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0016):     1.29   0.079     1.42    15.42
     + ID2= 2 (  0019):     0.89   0.202     1.42    12.35
       ================================================
       ID = 3 (  0020):     2.19   0.281     1.42    14.17

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0020):     2.19   0.281     1.42    14.17
     + ID2= 2 (  0008):     3.37   0.182     1.42    13.84
       ================================================
       ID = 1 (  0020):     5.55   0.463     1.42    13.97

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

   --------------------------
   | Junction Command(0018) |
   --------------------------

                           AREA     QPEAK   TPEAK     R.V.
                           (ha)     (cms)    (hrs)    (mm)
   INFLOW : ID= 9(  0017)    8.41     0.38    1.33    14.98
   OUTFLOW: ID= 2(  0018)    8.41     0.38    1.33    14.98

   ------------------------------------------------------------------------------------------
**********************************
** SIMULATION:4) CKL 25 Yr    **
**********************************
--------------------
| CALIB            |
| NASHYD   (  0008)|   Area     (ha)=   3.37   Curve Number   (CN)= 69.8
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

         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    3.09 | 1.083   38.05 | 2.083    9.28 |  3.08    3.85
               0.167    3.09 | 1.167   38.05 | 2.167    9.28 |  3.17    3.85
               0.250    3.67 | 1.250  130.09 | 2.250    7.55 |  3.25    3.50
               0.333    3.67 | 1.333  130.09 | 2.333    7.55 |  3.33    3.50
               0.417    4.53 | 1.417   50.47 | 2.417    6.34 |  3.42    3.22
               0.500    4.53 | 1.500   50.47 | 2.500    6.34 |  3.50    3.22
               0.583    5.90 | 1.583   25.68 | 2.583    5.46 |  3.58    2.97
               0.667    5.90 | 1.667   25.68 | 2.667    5.46 |  3.67    2.97
               0.750    8.40 | 1.750   16.52 | 2.750    4.80 |  3.75    2.76
               0.833    8.40 | 1.833   16.52 | 2.833    4.80 |  3.83    2.76
               0.917   14.22 | 1.917   11.95 | 2.917    4.27 |  3.92    2.58
               1.000   14.22 | 2.000   11.95 | 3.000    4.27 |  4.00    2.58

     Unit Hyd Qpeak  (cms)=   1.157

     PEAK FLOW       (cms)=   0.249 (i)
     TIME TO PEAK    (hrs)=   1.417
     RUNOFF VOLUME    (mm)=  18.834
     TOTAL RAINFALL   (mm)=  61.525
     RUNOFF COEFFICIENT   =   0.306

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0015)|   Area     (ha)=   9.31   Curve Number   (CN)= 72.2
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

         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    3.09 | 1.083   38.05 | 2.083    9.28 |  3.08    3.85
               0.167    3.09 | 1.167   38.05 | 2.167    9.28 |  3.17    3.85
               0.250    3.67 | 1.250  130.09 | 2.250    7.55 |  3.25    3.50
               0.333    3.67 | 1.333  130.09 | 2.333    7.55 |  3.33    3.50
               0.417    4.53 | 1.417   50.47 | 2.417    6.34 |  3.42    3.22
               0.500    4.53 | 1.500   50.47 | 2.500    6.34 |  3.50    3.22
               0.583    5.90 | 1.583   25.68 | 2.583    5.46 |  3.58    2.97
               0.667    5.90 | 1.667   25.68 | 2.667    5.46 |  3.67    2.97
               0.750    8.40 | 1.750   16.52 | 2.750    4.80 |  3.75    2.76
               0.833    8.40 | 1.833   16.52 | 2.833    4.80 |  3.83    2.76
               0.917   14.22 | 1.917   11.95 | 2.917    4.27 |  3.92    2.58
               1.000   14.22 | 2.000   11.95 | 3.000    4.27 |  4.00    2.58

     Unit Hyd Qpeak  (cms)=   3.305

     PEAK FLOW       (cms)=   0.753 (i)
     TIME TO PEAK    (hrs)=   1.417
     RUNOFF VOLUME    (mm)=  20.283
     TOTAL RAINFALL   (mm)=  61.525
     RUNOFF COEFFICIENT   =   0.330

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

--------------------------------------------------------------------------------
--------------------
| DUHYD    (  0017)|
| Inlet Cap.= 0.382|
| #of Inlets=    1|
| Total(cms)=   0.4|      AREA     QPEAK     TPEAK    R.V.
--------------------      (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   9.31      0.75      1.42   20.28
     ================================================
     MAJOR SYS.(ID= 2):   1.74      0.37      1.42   20.28
     MINOR SYS.(ID= 3):   7.57      0.38      1.33   20.28

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0019)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |  0.3715      0.0062
                          0.0000     0.0002   |  0.4883      0.0099
                          0.0000     0.0014   |  0.5821      0.0179
                          0.0000     0.0025   |  0.6627      0.0259

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0017)     1.738     0.371      1.42      20.28
   OUTFLOW: ID= 1 (  0019)     1.738     0.398      1.42      18.82

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=107.21
                  TIME SHIFT OF PEAK FLOW          (min)=  0.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0075

     **** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
                    CHECK OUTFLOW/STORAGE TABLE  OR REDUCE DT.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0016)|   Area     (ha)=   1.29   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

         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    3.09 | 1.083   38.05 | 2.083    9.28 |  3.08    3.85
               0.167    3.09 | 1.167   38.05 | 2.167    9.28 |  3.17    3.85
```

0.250	3.67	1.250	130.09	2.250	7.55	3.25	3.50
0.333	3.67	1.333	130.09	2.333	7.55	3.33	3.50
0.417	4.53	1.417	50.47	2.417	6.34	3.42	3.22
0.500	4.53	1.500	50.47	2.500	6.34	3.50	3.22
0.583	5.90	1.583	25.68	2.583	5.46	3.58	2.97
0.667	5.90	1.667	25.68	2.667	5.46	3.67	2.97
0.750	8.40	1.750	16.52	2.750	4.80	3.75	2.76
0.833	8.40	1.833	16.52	2.833	4.80	3.83	2.76
0.917	14.22	1.917	11.95	2.917	4.27	3.92	2.58
1.000	14.22	2.000	11.95	3.000	4.27	4.00	2.58

Unit Hyd Qpeak (cms)= 0.445

PEAK FLOW (cms)= 0.107 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 20.851
TOTAL RAINFALL (mm)= 61.525
RUNOFF COEFFICIENT = 0.339

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

ADD HYD (0020)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0016):		1.29	0.107	1.42	20.85
+ ID2= 2 (0019):		1.74	0.398	1.42	18.82
ID = 3 (0020):		3.03	0.506	1.42	19.69

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0020)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0020):		3.03	0.506	1.42	19.69
+ ID2= 2 (0008):		3.37	0.249	1.42	18.83
ID = 1 (0020):		6.40	0.755	1.42	19.24

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

Junction Command(0018)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 9(0017)	7.57	0.38	1.33	20.28
OUTFLOW: ID= 2(0018)	7.57	0.38	1.33	20.28

****
** SIMULATION:5) CKL 50 Yr **
****

CALIB					
NASHYD (0008)	Area	(ha)=	3.37	Curve Number	(CN)= 69.8
ID= 1 DT= 5.0 min	Ia	(mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=		0.11		

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	3.49	1.083	42.63	2.083	10.48	3.08	4.35
0.167	3.49	1.167	42.63	2.167	10.48	3.17	4.35
0.250	4.15	1.250	143.34	2.250	8.52	3.25	3.96
0.333	4.15	1.333	143.34	2.333	8.52	3.33	3.96
0.417	5.11	1.417	56.43	2.417	7.17	3.42	3.63
0.500	5.11	1.500	56.43	2.500	7.17	3.50	3.63
0.583	6.66	1.583	28.88	2.583	6.17	3.58	3.36
0.667	6.66	1.667	28.88	2.667	6.17	3.67	3.36
0.750	9.49	1.750	18.62	2.750	5.42	3.75	3.12
0.833	9.49	1.833	18.62	2.833	5.42	3.83	3.12
0.917	16.03	1.917	13.49	2.917	4.82	3.92	2.92
1.000	16.03	2.000	13.49	3.000	4.82	4.00	2.92

Unit Hyd Qpeak (cms)= 1.157

PEAK FLOW (cms)= 0.303 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 22.935
TOTAL RAINFALL (mm)= 68.705
RUNOFF COEFFICIENT = 0.334

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

CALIB					
NASHYD (0015)	Area	(ha)=	9.31	Curve Number	(CN)= 72.2
ID= 1 DT= 5.0 min	Ia	(mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=		0.11		

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	3.49	1.083	42.63	2.083	10.48	3.08	4.35
0.167	3.49	1.167	42.63	2.167	10.48	3.17	4.35
0.250	4.15	1.250	143.34	2.250	8.52	3.25	3.96
0.333	4.15	1.333	143.34	2.333	8.52	3.33	3.96
0.417	5.11	1.417	56.43	2.417	7.17	3.42	3.63
0.500	5.11	1.500	56.43	2.500	7.17	3.50	3.63
0.583	6.66	1.583	28.88	2.583	6.17	3.58	3.36
0.667	6.66	1.667	28.88	2.667	6.17	3.67	3.36
0.750	9.49	1.750	18.62	2.750	5.42	3.75	3.12
0.833	9.49	1.833	18.62	2.833	5.42	3.83	3.12
0.917	16.03	1.917	13.49	2.917	4.82	3.92	2.92
1.000	16.03	2.000	13.49	3.000	4.82	4.00	2.92

Unit Hyd Qpeak (cms)= 3.305

PEAK FLOW (cms)= 0.916 (i)
TIME TO PEAK (hrs)= 1.333
RUNOFF VOLUME (mm)= 24.618
TOTAL RAINFALL (mm)= 68.705
RUNOFF COEFFICIENT = 0.358

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

DUHYD (0017)		AREA	QPEAK	TPEAK	R.V.
Inlet Cap.= 0.382		(ha)	(cms)	(hrs)	(mm)
#of Inlets= 1					
Total(cms)= 0.4	TOTAL HYD.(ID= 1):	9.31	0.92	1.33	24.62
	MAJOR SYS.(ID= 2):	2.30	0.53	1.33	24.62
	MINOR SYS.(ID= 3):	7.01	0.38	1.25	24.62

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0019)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.3715	0.0062
	0.0000	0.0002	0.4883	0.0099
	0.0000	0.0014	0.5821	0.0179
	0.0000	0.0025	0.6627	0.0259

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0017)	2.298	0.535	1.33	24.62
OUTFLOW: ID= 1 (0019)	2.298	0.485	1.42	23.59

PEAK FLOW REDUCTION [Qout/Qin](%)= 90.78
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.0105

CALIB

```
| NASHYD   (  0016)|   Area     (ha)=   1.29   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.11

        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    3.49 | 1.083   42.63 | 2.083   10.48 |  3.08    4.35
  0.167    3.49 | 1.167   42.63 | 2.167   10.48 |  3.17    4.35
  0.250    4.15 | 1.250  143.34 | 2.250    8.52 |  3.25    3.96
  0.333    4.15 | 1.333  143.34 | 2.333    8.52 |  3.33    3.96
  0.417    5.11 | 1.417   56.43 | 2.417    7.17 |  3.42    3.63
  0.500    5.11 | 1.500   56.43 | 2.500    7.17 |  3.50    3.63
  0.583    6.66 | 1.583   28.88 | 2.583    6.17 |  3.58    3.36
  0.667    6.66 | 1.667   28.88 | 2.667    6.17 |  3.67    3.36
  0.750    9.49 | 1.750   18.62 | 2.750    5.42 |  3.75    3.12
  0.833    9.49 | 1.833   18.62 | 2.833    5.42 |  3.83    3.12
  0.917   16.03 | 1.917   13.49 | 2.917    4.82 |  3.92    2.92
  1.000   16.03 | 2.000   13.49 | 3.000    4.82 |  4.00    2.92

     Unit Hyd Qpeak  (cms)=   0.445

     PEAK FLOW       (cms)=   0.130 (i)
     TIME TO PEAK    (hrs)=   1.417
     RUNOFF VOLUME    (mm)=  25.278
     TOTAL RAINFALL   (mm)=  68.705
     RUNOFF COEFFICIENT   =   0.368

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

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0016):     1.29   0.130     1.42    25.28
     + ID2= 2 (  0019):     2.30   0.485     1.42    23.59
       ================================================
       ID = 3 (  0020):     3.59   0.615     1.42    24.20

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

--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0020):     3.59   0.615     1.42    24.20
     + ID2= 2 (  0008):     3.37   0.303     1.42    22.93
       ================================================
       ID = 1 (  0020):     6.96   0.919     1.42    23.59

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

   --------------------------
   | Junction Command(0018) |
   --------------------------

                          AREA     QPEAK   TPEAK     R.V.
                          (ha)     (cms)    (hrs)    (mm)
  INFLOW : ID= 9(  0017)    7.01     0.38    1.25    24.62
  OUTFLOW: ID= 2(  0018)    7.01     0.38    1.25    24.62

   ------------------------------------------------------------------------------
*********************************
** SIMULATION:6) CKL 100 Yr   **
*********************************
--------------------
| CALIB            |
| NASHYD   (  0008)|   Area     (ha)=   3.37   Curve Number   (CN)= 69.8
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.11

        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    3.74 | 1.083   48.41 | 2.083   11.70 |  3.08    4.70
  0.167    3.74 | 1.167   48.41 | 2.167   11.70 |  3.17    4.70
  0.250    4.47 | 1.250  157.29 | 2.250    9.45 |  3.25    4.26
  0.333    4.47 | 1.333  157.29 | 2.333    9.45 |  3.33    4.26
  0.417    5.56 | 1.417   64.01 | 2.417    7.90 |  3.42    3.90
  0.500    5.56 | 1.500   64.01 | 2.500    7.90 |  3.50    3.90
  0.583    7.32 | 1.583   32.88 | 2.583    6.77 |  3.58    3.59
  0.667    7.32 | 1.667   32.88 | 2.667    6.77 |  3.67    3.59
  0.750   10.56 | 1.750   21.09 | 2.750    5.91 |  3.75    3.33
  0.833   10.56 | 1.833   21.09 | 2.833    5.91 |  3.83    3.33
  0.917   18.10 | 1.917   15.17 | 2.917    5.24 |  3.92    3.10
  1.000   18.10 | 2.000   15.17 | 3.000    5.24 |  4.00    3.10

     Unit Hyd Qpeak  (cms)=   1.157

     PEAK FLOW       (cms)=   0.367 (i)
     TIME TO PEAK    (hrs)=   1.417
     RUNOFF VOLUME    (mm)=  27.592
     TOTAL RAINFALL   (mm)=  76.405
     RUNOFF COEFFICIENT   =   0.361

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0015)|   Area     (ha)=   9.31   Curve Number   (CN)= 72.2
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.11

        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    3.74 | 1.083   48.41 | 2.083   11.70 |  3.08    4.70
  0.167    3.74 | 1.167   48.41 | 2.167   11.70 |  3.17    4.70
  0.250    4.47 | 1.250  157.29 | 2.250    9.45 |  3.25    4.26
  0.333    4.47 | 1.333  157.29 | 2.333    9.45 |  3.33    4.26
  0.417    5.56 | 1.417   64.01 | 2.417    7.90 |  3.42    3.90
  0.500    5.56 | 1.500   64.01 | 2.500    7.90 |  3.50    3.90
  0.583    7.32 | 1.583   32.88 | 2.583    6.77 |  3.58    3.59
  0.667    7.32 | 1.667   32.88 | 2.667    6.77 |  3.67    3.59
  0.750   10.56 | 1.750   21.09 | 2.750    5.91 |  3.75    3.33
  0.833   10.56 | 1.833   21.09 | 2.833    5.91 |  3.83    3.33
  0.917   18.10 | 1.917   15.17 | 2.917    5.24 |  3.92    3.10
  1.000   18.10 | 2.000   15.17 | 3.000    5.24 |  4.00    3.10

     Unit Hyd Qpeak  (cms)=   3.305

     PEAK FLOW       (cms)=   1.106 (i)
     TIME TO PEAK    (hrs)=   1.333
     RUNOFF VOLUME    (mm)=  29.523
     TOTAL RAINFALL   (mm)=  76.405
     RUNOFF COEFFICIENT   =   0.386

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

--------------------------------------------------------------------------------
--------------------
| DUHYD    (  0017)|
| Inlet Cap.= 0.382|
| #of Inlets=     1|
| Total(cms)=   0.4|      AREA     QPEAK     TPEAK    R.V.
--------------------      (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):   9.31      1.11      1.33   29.52
     ================================================
     MAJOR SYS.(ID= 2):   2.89      0.72      1.33   29.52
     MINOR SYS.(ID= 3):   6.42      0.38      1.25   29.52

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0019)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000    |  0.3715     0.0062
                         0.0000     0.0002    |  0.4883     0.0099
                         0.0000     0.0014    |  0.5821     0.0179
                         0.0000     0.0025    |  0.6627     0.0259
```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0017)	2.885	0.724	1.33	29.52
OUTFLOW: ID= 1 (0019)	2.885	0.584	1.50	28.66

PEAK FLOW REDUCTION [Qout/Qin](%)= 80.60
TIME SHIFT OF PEAK FLOW (min)= 10.00
MAXIMUM STORAGE USED (ha.m.)= 0.0182

CALIB											
NASHYD (0016)	Area (ha)= 1.29	Curve Number (CN)= 73.0									
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00									
	U.H. Tp(hrs)= 0.11										

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	3.74	1.083	48.41	2.083	11.70	3.08	4.70
0.167	3.74	1.167	48.41	2.167	11.70	3.17	4.70
0.250	4.47	1.250	157.29	2.250	9.45	3.25	4.26
0.333	4.47	1.333	157.29	2.333	9.45	3.33	4.26
0.417	5.56	1.417	64.01	2.417	7.90	3.42	3.90
0.500	5.56	1.500	64.01	2.500	7.90	3.50	3.90
0.583	7.32	1.583	32.88	2.583	6.77	3.58	3.59
0.667	7.32	1.667	32.88	2.667	6.77	3.67	3.59
0.750	10.56	1.750	21.09	2.750	5.91	3.75	3.33
0.833	10.56	1.833	21.09	2.833	5.91	3.83	3.33
0.917	18.10	1.917	15.17	2.917	5.24	3.92	3.10
1.000	18.10	2.000	15.17	3.000	5.24	4.00	3.10

Unit Hyd Qpeak (cms)= 0.445

PEAK FLOW (cms)= 0.157 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 30.280
TOTAL RAINFALL (mm)= 76.405
RUNOFF COEFFICIENT = 0.396

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

ADD HYD (0020)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0016):	1.29	0.157	1.42	30.28
	+ ID2= 2 (0019):	2.89	0.584	1.50	28.66
	ID = 3 (0020):	4.18	0.724	1.50	29.16

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0020)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
3 + 2 = 1	ID1= 3 (0020):	4.18	0.724	1.50	29.16
	+ ID2= 2 (0008):	3.37	0.367	1.42	27.59
	ID = 1 (0020):	7.54	1.077	1.42	28.46

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

Junction Command(0018)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 9(0017)	6.42	0.38	1.25	29.52
OUTFLOW: ID= 2(0018)	6.42	0.38	1.25	29.52

****
** SIMULATION:7) 25mm Event **
****

CALIB											
NASHYD (0008)	Area (ha)= 3.37	Curve Number (CN)= 69.8									
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00									
	U.H. Tp(hrs)= 0.11										

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	2.07	1.083	5.70	2.083	5.19	3.08	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.250	2.27	1.250	10.78	2.250	4.47	3.25	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.417	2.52	1.417	50.21	2.417	3.95	3.42	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.583	2.88	1.583	13.37	2.583	3.56	3.58	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.750	3.38	1.750	8.29	2.750	3.25	3.75	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.917	4.18	1.917	6.30	2.917	3.01	3.92	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

Unit Hyd Qpeak (cms)= 1.157

PEAK FLOW (cms)= 0.029 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 3.019
TOTAL RAINFALL (mm)= 24.997
RUNOFF COEFFICIENT = 0.121

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

CALIB											
NASHYD (0015)	Area (ha)= 9.31	Curve Number (CN)= 72.2									
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00									
	U.H. Tp(hrs)= 0.11										

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	2.07	1.083	5.70	2.083	5.19	3.08	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.250	2.27	1.250	10.78	2.250	4.47	3.25	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.417	2.52	1.417	50.21	2.417	3.95	3.42	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.583	2.88	1.583	13.37	2.583	3.56	3.58	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.750	3.38	1.750	8.29	2.750	3.25	3.75	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.917	4.18	1.917	6.30	2.917	3.01	3.92	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

Unit Hyd Qpeak (cms)= 3.305

PEAK FLOW (cms)= 0.090 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 3.325
TOTAL RAINFALL (mm)= 24.997
RUNOFF COEFFICIENT = 0.133

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

DUHYD (0017)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
Inlet Cap.= 0.382					
#of Inlets= 1					
Total(cms)= 0.4	TOTAL HYD.(ID= 1):	9.31	0.09	1.58	3.33
	MAJOR SYS.(ID= 2):	0.00	0.00	0.00	0.00
	MINOR SYS.(ID= 3):	9.31	0.09	1.58	3.33

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0019)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------       (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           0.0000     0.0000   |   0.3715      0.0062
                           0.0000     0.0002   |   0.4883      0.0099
                           0.0000     0.0014   |   0.5821      0.0179
                           0.0000     0.0025   |   0.6627      0.0259

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0017)      0.000      0.000      0.00       0.00
   OUTFLOW: ID= 1 (  0019)      0.000      0.000      0.00       -Inf

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=   NaN
                  TIME SHIFT OF PEAK FLOW         (min)=  0.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0000
                  MAXIMUM  STORAGE   USED       (cu.m.)=  0.000000

    **** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
                   CHECK OUTFLOW/STORAGE TABLE  OR REDUCE DT.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0016)|   Area    (ha)=   1.29   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

        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    2.07 | 1.083    5.70 | 2.083    5.19 |  3.08    2.80
              0.167    2.07 | 1.167    5.70 | 2.167    5.19 |  3.17    2.80
              0.250    2.27 | 1.250   10.78 | 2.250    4.47 |  3.25    2.62
              0.333    2.27 | 1.333   10.78 | 2.333    4.47 |  3.33    2.62
              0.417    2.52 | 1.417   50.21 | 2.417    3.95 |  3.42    2.48
              0.500    2.52 | 1.500   50.21 | 2.500    3.95 |  3.50    2.48
              0.583    2.88 | 1.583   13.37 | 2.583    3.56 |  3.58    2.35
              0.667    2.88 | 1.667   13.37 | 2.667    3.56 |  3.67    2.35
              0.750    3.38 | 1.750    8.29 | 2.750    3.25 |  3.75    2.23
              0.833    3.38 | 1.833    8.29 | 2.833    3.25 |  3.83    2.23
              0.917    4.18 | 1.917    6.30 | 2.917    3.01 |  3.92    2.14
              1.000    4.18 | 2.000    6.30 | 3.000    3.01 |  4.00    2.14

     Unit Hyd Qpeak  (cms)=   0.445

     PEAK FLOW       (cms)=   0.013 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=   3.446
     TOTAL RAINFALL   (mm)=  24.997
     RUNOFF COEFFICIENT   =   0.138

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

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

--------------------
| ADD HYD  (  0020)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
*** W A R N I N G :  HYDROGRAPH   0019 <ID= 2> IS DRY.
*** W A R N I N G :  HYDROGRAPH   0003 = HYDROGRAPH 0001
       ID1= 1 (  0016):     1.29   0.013     1.58     3.45
     + ID2= 2 (  0019):     0.00   0.000     0.00     -Inf
       ================================================
       ID = 3 (  0020):     1.29   0.013     1.58     3.45

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

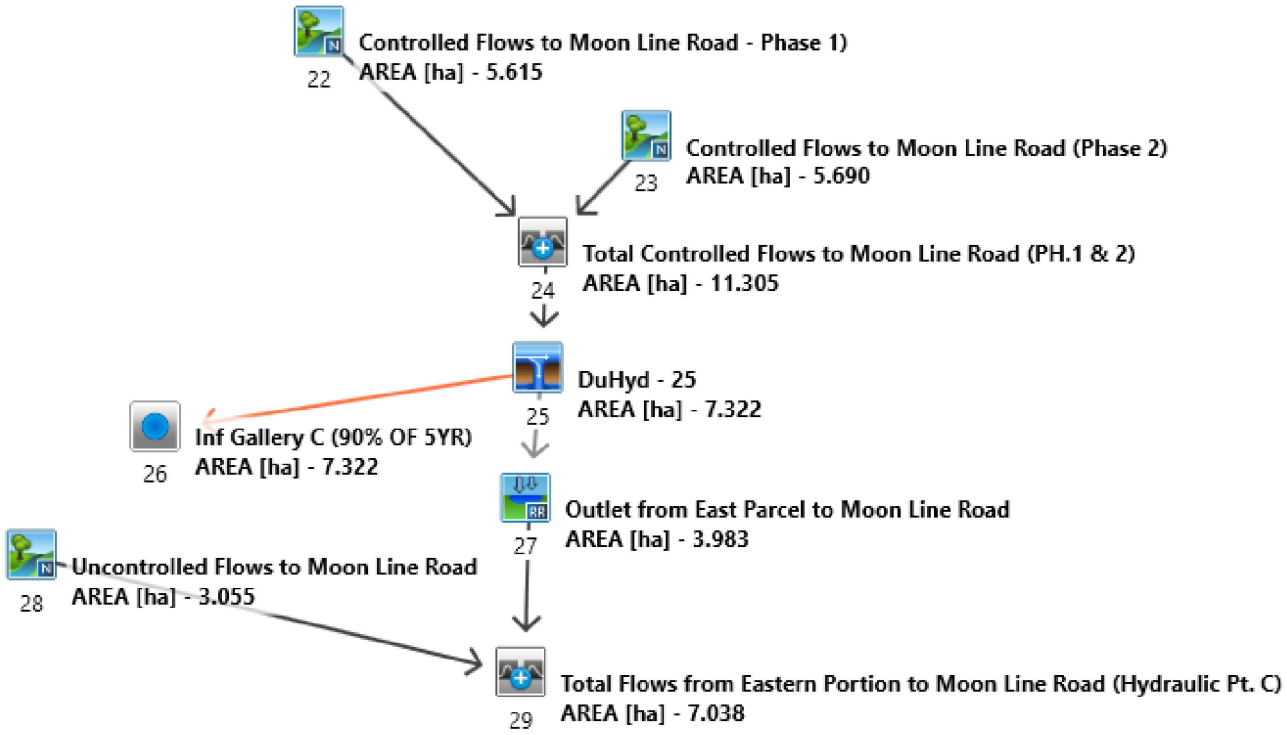
--------------------
| ADD HYD  (  0020)|
|   3 +  2 =  1    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0020):     1.29   0.013     1.58     3.45
     + ID2= 2 (  0008):     3.37   0.029     1.58     3.02
       ================================================
       ID = 1 (  0020):     4.66   0.042     1.58     3.14
```

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

  --------------------------
  | Junction Command(0018) |
  --------------------------

                           AREA     QPEAK   TPEAK     R.V.
                           (ha)     (cms)   (hrs)     (mm)
  INFLOW : ID= 9(  0017)    9.31     0.09    1.58     3.33
  OUTFLOW: ID= 2(  0018)    9.31     0.09    1.58     3.33

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



JEFFERY SUBDIVISION, BOBCAYGEON, ON

V.O. SCHEMATIC – POST-DEVELOPMENT FLOWS TO MOON LINE ROAD

D.G. BIDDLE & ASSOCIATES
CONSULTING ENGINEERS & PLANNERS
96 King Street East
Oshawa, Ontario, L1H 1B6
Phone: 905-576-8500
info@dgbiddle.com
dgbiddle.com

SCALE	N.T.S.
DRAWN	M.J.H.
DESIGN	M.J.H.
CHECKED	D.D.M.
DATE	MAR 2024

PROJECT 122169

DWG FIG 5

```
*********************************
** SIMULATION:1) CKL 2 Yr      **
*********************************
--------------------
| CALIB            |
| NASHYD   (  0023)|   Area    (ha)=   5.69   Curve Number   (CN)= 71.6
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.19

        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    2.15 | 1.083   20.33 | 2.083    5.50 |  3.08    2.59
  0.167    2.15 | 1.167   20.33 | 2.167    5.50 |  3.17    2.59
  0.250    2.49 | 1.250   84.39 | 2.250    4.60 |  3.25    2.39
  0.333    2.49 | 1.333   84.39 | 2.333    4.60 |  3.33    2.39
  0.417    2.98 | 1.417   26.99 | 2.417    3.97 |  3.42    2.23
  0.500    2.98 | 1.500   26.99 | 2.500    3.97 |  3.50    2.23
  0.583    3.73 | 1.583   13.71 | 2.583    3.49 |  3.58    2.08
  0.667    3.73 | 1.667   13.71 | 2.667    3.49 |  3.67    2.08
  0.750    5.04 | 1.750    9.12 | 2.750    3.13 |  3.75    1.95
  0.833    5.04 | 1.833    9.12 | 2.833    3.13 |  3.83    1.95
  0.917    7.98 | 1.917    6.85 | 2.917    2.83 |  3.92    1.84
  1.000    7.98 | 2.000    6.85 | 3.000    2.83 |  4.00    1.84

    Unit Hyd Qpeak  (cms)=   1.116

    PEAK FLOW       (cms)=   0.130 (i)
    TIME TO PEAK    (hrs)=   1.500
    RUNOFF VOLUME    (mm)=   7.726
    TOTAL RAINFALL   (mm)=  37.060
    RUNOFF COEFFICIENT   =   0.208

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0022)|   Area    (ha)=   5.62   Curve Number   (CN)= 72.9
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.24

        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    2.15 | 1.083   20.33 | 2.083    5.50 |  3.08    2.59
  0.167    2.15 | 1.167   20.33 | 2.167    5.50 |  3.17    2.59
  0.250    2.49 | 1.250   84.39 | 2.250    4.60 |  3.25    2.39
  0.333    2.49 | 1.333   84.39 | 2.333    4.60 |  3.33    2.39
  0.417    2.98 | 1.417   26.99 | 2.417    3.97 |  3.42    2.23
  0.500    2.98 | 1.500   26.99 | 2.500    3.97 |  3.50    2.23
  0.583    3.73 | 1.583   13.71 | 2.583    3.49 |  3.58    2.08
  0.667    3.73 | 1.667   13.71 | 2.667    3.49 |  3.67    2.08
  0.750    5.04 | 1.750    9.12 | 2.750    3.13 |  3.75    1.95
  0.833    5.04 | 1.833    9.12 | 2.833    3.13 |  3.83    1.95
  0.917    7.98 | 1.917    6.85 | 2.917    2.83 |  3.92    1.84
  1.000    7.98 | 2.000    6.85 | 3.000    2.83 |  4.00    1.84

    Unit Hyd Qpeak  (cms)=   0.877

    PEAK FLOW       (cms)=   0.120 (i)
    TIME TO PEAK    (hrs)=   1.583
    RUNOFF VOLUME    (mm)=   8.131
    TOTAL RAINFALL   (mm)=  37.060
    RUNOFF COEFFICIENT   =   0.219

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

--------------------------------------------------------------------------------
--------------------
| ADD HYD  (  0024)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0022):     5.62   0.120     1.58     8.13
     + ID2= 2 (  0023):     5.69   0.130     1.50     7.73
       ================================================
       ID = 3 (  0024):    11.30   0.247     1.58     7.93

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| DUHYD    (  0025)|
| Inlet Cap.= 0.344|
| #of Inlets=     1|
| Total(cms)=   0.3|      AREA     QPEAK     TPEAK     R.V.
--------------------      (ha)     (cms)     (hrs)     (mm)
    TOTAL HYD.(ID= 1):  11.30      0.25      1.58     7.93
    ================================================
    MAJOR SYS.(ID= 2):   0.00      0.00      0.00     0.00
    MINOR SYS.(ID= 3):  11.30      0.25      1.58     7.93

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0027)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.2356     0.0081
                          0.0978     0.0007   |   0.4205     0.0121
                          0.1578     0.0024   |   0.5293     0.0188
                          0.2005     0.0040   |   0.6141     0.0255

                               AREA     QPEAK     TPEAK        R.V.
                               (ha)     (cms)     (hrs)        (mm)
  INFLOW : ID= 2 (  0025)      0.000     0.000      0.00        0.00
  OUTFLOW: ID= 1 (  0027)      0.000     0.000      0.00         NaN

                PEAK   FLOW   REDUCTION [Qout/Qin](%)=   NaN
                TIME SHIFT OF PEAK FLOW          (min)=  0.00
                MAXIMUM  STORAGE   USED        (ha.m.)=  0.0000
                MAXIMUM  STORAGE   USED        (cu.m.)=  0.000000

    **** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
                   CHECK OUTFLOW/STORAGE TABLE  OR REDUCE DT.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0028)|   Area    (ha)=   3.06   Curve Number   (CN)= 69.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

        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    2.15 | 1.083   20.33 | 2.083    5.50 |  3.08    2.59
  0.167    2.15 | 1.167   20.33 | 2.167    5.50 |  3.17    2.59
  0.250    2.49 | 1.250   84.39 | 2.250    4.60 |  3.25    2.39
  0.333    2.49 | 1.333   84.39 | 2.333    4.60 |  3.33    2.39
  0.417    2.98 | 1.417   26.99 | 2.417    3.97 |  3.42    2.23
  0.500    2.98 | 1.500   26.99 | 2.500    3.97 |  3.50    2.23
  0.583    3.73 | 1.583   13.71 | 2.583    3.49 |  3.58    2.08
  0.667    3.73 | 1.667   13.71 | 2.667    3.49 |  3.67    2.08
  0.750    5.04 | 1.750    9.12 | 2.750    3.13 |  3.75    1.95
  0.833    5.04 | 1.833    9.12 | 2.833    3.13 |  3.83    1.95
  0.917    7.98 | 1.917    6.85 | 2.917    2.83 |  3.92    1.84
  1.000    7.98 | 2.000    6.85 | 3.000    2.83 |  4.00    1.84

    Unit Hyd Qpeak  (cms)=   1.050

    PEAK FLOW       (cms)=   0.080 (i)
    TIME TO PEAK    (hrs)=   1.417
    RUNOFF VOLUME    (mm)=   6.914
    TOTAL RAINFALL   (mm)=  37.060
    RUNOFF COEFFICIENT   =   0.187

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

--------------------------------------------------------------------------------
--------------------
| ADD HYD  (  0029)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
*** W A R N I N G :  HYDROGRAPH   0027 <ID= 1> IS DRY.
*** W A R N I N G :  HYDROGRAPH   0029 = HYDROGRAPH 0028
       ID1= 1 (  0027):     0.00   0.000     0.00      NaN
```

```
     + ID2= 2 (  0028):     3.06   0.080     1.42     6.91
       ================================================
       ID = 3 (  0029):     3.06   0.080     1.42     6.91

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

  --------------------------
  | Junction Command(0026) |
  --------------------------

                          AREA     QPEAK   TPEAK     R.V.
                          (ha)     (cms)    (hrs)    (mm)
  INFLOW : ID= 9(  0025)   11.30     0.25    1.58     7.93
  OUTFLOW: ID= 2(  0026)   11.30     0.25    1.58     7.93

  --------------------------------------------------------------------------------
*********************************
** SIMULATION:2) CKL 5 Yr     **
*********************************
--------------------
| CALIB            |
| NASHYD   (  0023)|   Area    (ha)=   5.69   Curve Number   (CN)= 71.6
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.19

        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    2.43 | 1.083   26.49 | 2.083    6.72 |  3.08    2.98
              0.167    2.43 | 1.167   26.49 | 2.167    6.72 |  3.17    2.98
              0.250    2.85 | 1.250  100.26 | 2.250    5.55 |  3.25    2.73
              0.333    2.85 | 1.333  100.26 | 2.333    5.55 |  3.33    2.73
              0.417    3.46 | 1.417   35.24 | 2.417    4.72 |  3.42    2.53
              0.500    3.46 | 1.500   35.24 | 2.500    4.72 |  3.50    2.53
              0.583    4.41 | 1.583   17.77 | 2.583    4.12 |  3.58    2.35
              0.667    4.41 | 1.667   17.77 | 2.667    4.12 |  3.67    2.35
              0.750    6.13 | 1.750   11.59 | 2.750    3.65 |  3.75    2.20
              0.833    6.13 | 1.833   11.59 | 2.833    3.65 |  3.83    2.20
              0.917   10.04 | 1.917    8.52 | 2.917    3.28 |  3.92    2.06
              1.000   10.04 | 2.000    8.52 | 3.000    3.28 |  4.00    2.06

    Unit Hyd Qpeak  (cms)=   1.116

    PEAK FLOW       (cms)=   0.201 (i)
    TIME TO PEAK    (hrs)=   1.500
    RUNOFF VOLUME    (mm)=  11.518
    TOTAL RAINFALL   (mm)=  45.348
    RUNOFF COEFFICIENT   =   0.254

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0022)|   Area    (ha)=   5.62   Curve Number   (CN)= 72.9
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.24

        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    2.43 | 1.083   26.49 | 2.083    6.72 |  3.08    2.98
              0.167    2.43 | 1.167   26.49 | 2.167    6.72 |  3.17    2.98
              0.250    2.85 | 1.250  100.26 | 2.250    5.55 |  3.25    2.73
              0.333    2.85 | 1.333  100.26 | 2.333    5.55 |  3.33    2.73
              0.417    3.46 | 1.417   35.24 | 2.417    4.72 |  3.42    2.53
              0.500    3.46 | 1.500   35.24 | 2.500    4.72 |  3.50    2.53
              0.583    4.41 | 1.583   17.77 | 2.583    4.12 |  3.58    2.35
              0.667    4.41 | 1.667   17.77 | 2.667    4.12 |  3.67    2.35
              0.750    6.13 | 1.750   11.59 | 2.750    3.65 |  3.75    2.20
              0.833    6.13 | 1.833   11.59 | 2.833    3.65 |  3.83    2.20
              0.917   10.04 | 1.917    8.52 | 2.917    3.28 |  3.92    2.06
              1.000   10.04 | 2.000    8.52 | 3.000    3.28 |  4.00    2.06

    Unit Hyd Qpeak  (cms)=   0.877

    PEAK FLOW       (cms)=   0.186 (i)

    TIME TO PEAK    (hrs)=   1.583
    RUNOFF VOLUME    (mm)=  12.086
    TOTAL RAINFALL   (mm)=  45.348
    RUNOFF COEFFICIENT   =   0.267

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

--------------------------------------------------------------------------------
--------------------
| ADD HYD  (  0024)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0022):     5.62   0.186     1.58    12.09
     + ID2= 2 (  0023):     5.69   0.201     1.50    11.52
       ================================================
       ID = 3 (  0024):    11.30   0.382     1.58    11.80

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| DUHYD    (  0025)|
| Inlet Cap.= 0.344|
| #of Inlets=    1|
| Total(cms)=   0.3|      AREA     QPEAK     TPEAK    R.V.
--------------------      (ha)     (cms)     (hrs)    (mm)
    TOTAL HYD.(ID= 1):  11.30      0.38      1.58   11.80
    ================================================
    MAJOR SYS.(ID= 2):   0.20      0.04      1.58   11.80
    MINOR SYS.(ID= 3):  11.10      0.34      1.50   11.80

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0027)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)    |   (cms)     (ha.m.)
                          0.0000     0.0000    |   0.2356     0.0081
                          0.0978     0.0007    |   0.4205     0.0121
                          0.1578     0.0024    |   0.5293     0.0188
                          0.2005     0.0040    |   0.6141     0.0255

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
  INFLOW : ID= 2 (  0025)      0.204     0.038      1.58      11.80
  OUTFLOW: ID= 1 (  0027)      0.204     0.039      1.58      11.84

                PEAK   FLOW   REDUCTION [Qout/Qin](%)=102.66
                TIME SHIFT OF PEAK FLOW          (min)=  0.00
                MAXIMUM  STORAGE   USED       (ha.m.)=  0.0003

    **** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
                   CHECK OUTFLOW/STORAGE TABLE  OR REDUCE DT.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0028)|   Area    (ha)=   3.06   Curve Number   (CN)= 69.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

        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    2.43 | 1.083   26.49 | 2.083    6.72 |  3.08    2.98
              0.167    2.43 | 1.167   26.49 | 2.167    6.72 |  3.17    2.98
              0.250    2.85 | 1.250  100.26 | 2.250    5.55 |  3.25    2.73
              0.333    2.85 | 1.333  100.26 | 2.333    5.55 |  3.33    2.73
              0.417    3.46 | 1.417   35.24 | 2.417    4.72 |  3.42    2.53
              0.500    3.46 | 1.500   35.24 | 2.500    4.72 |  3.50    2.53
              0.583    4.41 | 1.583   17.77 | 2.583    4.12 |  3.58    2.35
              0.667    4.41 | 1.667   17.77 | 2.667    4.12 |  3.67    2.35
              0.750    6.13 | 1.750   11.59 | 2.750    3.65 |  3.75    2.20
              0.833    6.13 | 1.833   11.59 | 2.833    3.65 |  3.83    2.20
              0.917   10.04 | 1.917    8.52 | 2.917    3.28 |  3.92    2.06
              1.000   10.04 | 2.000    8.52 | 3.000    3.28 |  4.00    2.06

    Unit Hyd Qpeak  (cms)=   1.050

    PEAK FLOW       (cms)=   0.123 (i)
```

```
     TIME TO PEAK    (hrs)=   1.417
     RUNOFF VOLUME    (mm)=  10.363
     TOTAL RAINFALL   (mm)=  45.348
     RUNOFF COEFFICIENT   =   0.229

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

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

--------------------
| ADD HYD  (  0029)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):      0.20   0.039     1.58    11.84
     + ID2= 2 (  0028):      3.06   0.123     1.42    10.36
       ================================================
       ID = 3 (  0029):      3.26   0.131     1.50    10.46

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

  --------------------------
  | Junction Command(0026) |
  --------------------------

                           AREA     QPEAK   TPEAK     R.V.
                           (ha)     (cms)    (hrs)    (mm)
  INFLOW : ID= 9(  0025)   11.10     0.34    1.50    11.80
  OUTFLOW: ID= 2(  0026)   11.10     0.34    1.50    11.80

  ------------------------------------------------------------------------------
********************************
** SIMULATION:3) CKL 10 Yr    **
********************************
--------------------
| CALIB            |
| NASHYD   (  0023)|   Area    (ha)=   5.69   Curve Number   (CN)= 71.6
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.19

         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    2.71 | 1.083   31.26 | 2.083    7.77 |  3.08    3.34
              0.167    2.71 | 1.167   31.26 | 2.167    7.77 |  3.17    3.34
              0.250    3.20 | 1.250  112.80 | 2.250    6.37 |  3.25    3.06
              0.333    3.20 | 1.333  112.80 | 2.333    6.37 |  3.33    3.06
              0.417    3.90 | 1.417   41.55 | 2.417    5.39 |  3.42    2.82
              0.500    3.90 | 1.500   41.55 | 2.500    5.39 |  3.50    2.82
              0.583    5.03 | 1.583   21.01 | 2.583    4.67 |  3.58    2.61
              0.667    5.03 | 1.667   21.01 | 2.667    4.67 |  3.67    2.61
              0.750    7.06 | 1.750   13.60 | 2.750    4.13 |  3.75    2.43
              0.833    7.06 | 1.833   13.60 | 2.833    4.13 |  3.83    2.43
              0.917   11.75 | 1.917    9.93 | 2.917    3.69 |  3.92    2.28
              1.000   11.75 | 2.000    9.93 | 3.000    3.69 |  4.00    2.28

     Unit Hyd Qpeak  (cms)=   1.116

     PEAK FLOW       (cms)=   0.265 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=  14.957
     TOTAL RAINFALL   (mm)=  52.060
     RUNOFF COEFFICIENT   =   0.287

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

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--------------------
| CALIB            |
| NASHYD   (  0022)|   Area    (ha)=   5.62   Curve Number   (CN)= 72.9
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.24

         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    2.71 | 1.083   31.26 | 2.083    7.77 |  3.08    3.34
              0.167    2.71 | 1.167   31.26 | 2.167    7.77 |  3.17    3.34
              0.250    3.20 | 1.250  112.80 | 2.250    6.37 |  3.25    3.06
              0.333    3.20 | 1.333  112.80 | 2.333    6.37 |  3.33    3.06
              0.417    3.90 | 1.417   41.55 | 2.417    5.39 |  3.42    2.82
              0.500    3.90 | 1.500   41.55 | 2.500    5.39 |  3.50    2.82
              0.583    5.03 | 1.583   21.01 | 2.583    4.67 |  3.58    2.61
              0.667    5.03 | 1.667   21.01 | 2.667    4.67 |  3.67    2.61
              0.750    7.06 | 1.750   13.60 | 2.750    4.13 |  3.75    2.43
              0.833    7.06 | 1.833   13.60 | 2.833    4.13 |  3.83    2.43
              0.917   11.75 | 1.917    9.93 | 2.917    3.69 |  3.92    2.28
              1.000   11.75 | 2.000    9.93 | 3.000    3.69 |  4.00    2.28

     Unit Hyd Qpeak  (cms)=   0.877

     PEAK FLOW       (cms)=   0.244 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  15.661
     TOTAL RAINFALL   (mm)=  52.060
     RUNOFF COEFFICIENT   =   0.301

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

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--------------------
| ADD HYD  (  0024)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0022):      5.62   0.244     1.58    15.66
     + ID2= 2 (  0023):      5.69   0.265     1.50    14.96
       ================================================
       ID = 3 (  0024):     11.30   0.502     1.58    15.31

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| DUHYD    (  0025)|
| Inlet Cap.= 0.344|
| #of Inlets=    1|
| Total(cms)=   0.3|          AREA     QPEAK     TPEAK     R.V.
--------------------          (ha)     (cms)     (hrs)     (mm)
     TOTAL HYD.(ID= 1):  11.30      0.50      1.58    15.31
     ================================================
     MAJOR SYS.(ID= 2):   1.13      0.16      1.58    15.31
     MINOR SYS.(ID= 3):  10.17      0.34      1.42    15.31

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0027)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.2356     0.0081
                          0.0978     0.0007   |   0.4205     0.0121
                          0.1578     0.0024   |   0.5293     0.0188
                          0.2005     0.0040   |   0.6141     0.0255

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0025)     1.133     0.158      1.58      15.31
   OUTFLOW: ID= 1 (  0027)     1.133     0.142      1.58      15.35

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 89.96
                  TIME SHIFT OF PEAK FLOW          (min)=  0.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0022

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--------------------
| CALIB            |
| NASHYD   (  0028)|   Area    (ha)=   3.06   Curve Number   (CN)= 69.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

         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    2.71 | 1.083   31.26 | 2.083    7.77 |  3.08    3.34
              0.167    2.71 | 1.167   31.26 | 2.167    7.77 |  3.17    3.34
              0.250    3.20 | 1.250  112.80 | 2.250    6.37 |  3.25    3.06
              0.333    3.20 | 1.333  112.80 | 2.333    6.37 |  3.33    3.06
```

0.417	3.90	1.417	41.55	2.417	5.39	3.42	2.82
0.500	3.90	1.500	41.55	2.500	5.39	3.50	2.82
0.583	5.03	1.583	21.01	2.583	4.67	3.58	2.61
0.667	5.03	1.667	21.01	2.667	4.67	3.67	2.61
0.750	7.06	1.750	13.60	2.750	4.13	3.75	2.43
0.833	7.06	1.833	13.60	2.833	4.13	3.83	2.43
0.917	11.75	1.917	9.93	2.917	3.69	3.92	2.28
1.000	11.75	2.000	9.93	3.000	3.69	4.00	2.28

Unit Hyd Qpeak (cms)= 1.050

PEAK FLOW (cms)= 0.161 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 13.510
TOTAL RAINFALL (mm)= 52.060
RUNOFF COEFFICIENT = 0.260

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

ADD HYD (0029)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0027):	1.13	0.142	1.58	15.35
	+ ID2= 2 (0028):	3.06	0.161	1.42	13.51
	ID = 3 (0029):	4.19	0.260	1.50	14.01

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

Junction Command(0026)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	INFLOW : ID= 9(0025)	10.17	0.34	1.42	15.31
	OUTFLOW: ID= 2(0026)	10.17	0.34	1.42	15.31

****
** SIMULATION:4) CKL 25 Yr **
****

CALIB					
NASHYD (0023)	Area (ha)= 5.69	Curve Number (CN)= 71.6			
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00			
	U.H. Tp(hrs)= 0.19				

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	3.09	1.083	38.05	2.083	9.28	3.08	3.85
0.167	3.09	1.167	38.05	2.167	9.28	3.17	3.85
0.250	3.67	1.250	130.09	2.250	7.55	3.25	3.50
0.333	3.67	1.333	130.09	2.333	7.55	3.33	3.50
0.417	4.53	1.417	50.47	2.417	6.34	3.42	3.22
0.500	4.53	1.500	50.47	2.500	6.34	3.50	3.22
0.583	5.90	1.583	25.68	2.583	5.46	3.58	2.97
0.667	5.90	1.667	25.68	2.667	5.46	3.67	2.97
0.750	8.40	1.750	16.52	2.750	4.80	3.75	2.76
0.833	8.40	1.833	16.52	2.833	4.80	3.83	2.76
0.917	14.22	1.917	11.95	2.917	4.27	3.92	2.58
1.000	14.22	2.000	11.95	3.000	4.27	4.00	2.58

Unit Hyd Qpeak (cms)= 1.116

PEAK FLOW (cms)= 0.364 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 20.279
TOTAL RAINFALL (mm)= 61.525
RUNOFF COEFFICIENT = 0.330

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

CALIB					
NASHYD (0022)	Area (ha)= 5.62	Curve Number (CN)= 72.9			
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00			
	U.H. Tp(hrs)= 0.24				

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	3.09	1.083	38.05	2.083	9.28	3.08	3.85
0.167	3.09	1.167	38.05	2.167	9.28	3.17	3.85
0.250	3.67	1.250	130.09	2.250	7.55	3.25	3.50
0.333	3.67	1.333	130.09	2.333	7.55	3.33	3.50
0.417	4.53	1.417	50.47	2.417	6.34	3.42	3.22
0.500	4.53	1.500	50.47	2.500	6.34	3.50	3.22
0.583	5.90	1.583	25.68	2.583	5.46	3.58	2.97
0.667	5.90	1.667	25.68	2.667	5.46	3.67	2.97
0.750	8.40	1.750	16.52	2.750	4.80	3.75	2.76
0.833	8.40	1.833	16.52	2.833	4.80	3.83	2.76
0.917	14.22	1.917	11.95	2.917	4.27	3.92	2.58
1.000	14.22	2.000	11.95	3.000	4.27	4.00	2.58

Unit Hyd Qpeak (cms)= 0.877

PEAK FLOW (cms)= 0.335 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 21.175
TOTAL RAINFALL (mm)= 61.525
RUNOFF COEFFICIENT = 0.344

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

ADD HYD (0024)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0022):	5.62	0.335	1.58	21.18
	+ ID2= 2 (0023):	5.69	0.364	1.50	20.28
	ID = 3 (0024):	11.30	0.689	1.58	20.72

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

DUHYD (0025)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
Inlet Cap.= 0.344					
#of Inlets= 1					
Total(cms)= 0.3	TOTAL HYD.(ID= 1):	11.30	0.69	1.58	20.72
	MAJOR SYS.(ID= 2):	2.40	0.34	1.58	20.72
	MINOR SYS.(ID= 3):	8.90	0.34	1.33	20.72

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0027)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.2356	0.0081
	0.0978	0.0007	0.4205	0.0121
	0.1578	0.0024	0.5293	0.0188
	0.2005	0.0040	0.6141	0.0255

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0025)	2.401	0.345	1.58	20.72
OUTFLOW: ID= 1 (0027)	2.401	0.308	1.67	20.97

PEAK FLOW REDUCTION [Qout/Qin](%)= 89.20
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.0098

CALIB					
NASHYD (0028)	Area (ha)= 3.06	Curve Number (CN)= 69.0			
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00			

-------------------- U.H. Tp(hrs)= 0.11

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	3.09	1.083	38.05	2.083	9.28	3.08	3.85
0.167	3.09	1.167	38.05	2.167	9.28	3.17	3.85
0.250	3.67	1.250	130.09	2.250	7.55	3.25	3.50
0.333	3.67	1.333	130.09	2.333	7.55	3.33	3.50
0.417	4.53	1.417	50.47	2.417	6.34	3.42	3.22
0.500	4.53	1.500	50.47	2.500	6.34	3.50	3.22
0.583	5.90	1.583	25.68	2.583	5.46	3.58	2.97
0.667	5.90	1.667	25.68	2.667	5.46	3.67	2.97
0.750	8.40	1.750	16.52	2.750	4.80	3.75	2.76
0.833	8.40	1.833	16.52	2.833	4.80	3.83	2.76
0.917	14.22	1.917	11.95	2.917	4.27	3.92	2.58
1.000	14.22	2.000	11.95	3.000	4.27	4.00	2.58

Unit Hyd Qpeak (cms)= 1.050

PEAK FLOW (cms)= 0.220 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 18.409
TOTAL RAINFALL (mm)= 61.525
RUNOFF COEFFICIENT = 0.299

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

ADD HYD (0029)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0027):	2.40	0.308	1.67	20.97
	+ ID2= 2 (0028):	3.06	0.220	1.42	18.41
	ID = 3 (0029):	5.46	0.430	1.67	19.54

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

Junction Command(0026)

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 9(0025)	8.90	0.34	1.33	20.72
OUTFLOW: ID= 2(0026)	8.90	0.34	1.33	20.72

****
** SIMULATION:5) CKL 50 Yr **
****

| CALIB |
| NASHYD (0023) | Area (ha)= 5.69 Curve Number (CN)= 71.6
|ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
-------------------- U.H. Tp(hrs)= 0.19

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	3.49	1.083	42.63	2.083	10.48	3.08	4.35
0.167	3.49	1.167	42.63	2.167	10.48	3.17	4.35
0.250	4.15	1.250	143.34	2.250	8.52	3.25	3.96
0.333	4.15	1.333	143.34	2.333	8.52	3.33	3.96
0.417	5.11	1.417	56.43	2.417	7.17	3.42	3.63
0.500	5.11	1.500	56.43	2.500	7.17	3.50	3.63
0.583	6.66	1.583	28.88	2.583	6.17	3.58	3.36
0.667	6.66	1.667	28.88	2.667	6.17	3.67	3.36
0.750	9.49	1.750	18.62	2.750	5.42	3.75	3.12
0.833	9.49	1.833	18.62	2.833	5.42	3.83	3.12
0.917	16.03	1.917	13.49	2.917	4.82	3.92	2.92
1.000	16.03	2.000	13.49	3.000	4.82	4.00	2.92

Unit Hyd Qpeak (cms)= 1.116

PEAK FLOW (cms)= 0.443 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 24.633
TOTAL RAINFALL (mm)= 68.705
RUNOFF COEFFICIENT = 0.359

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

| CALIB |
| NASHYD (0022) | Area (ha)= 5.62 Curve Number (CN)= 72.9
|ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
-------------------- U.H. Tp(hrs)= 0.24

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	3.49	1.083	42.63	2.083	10.48	3.08	4.35
0.167	3.49	1.167	42.63	2.167	10.48	3.17	4.35
0.250	4.15	1.250	143.34	2.250	8.52	3.25	3.96
0.333	4.15	1.333	143.34	2.333	8.52	3.33	3.96
0.417	5.11	1.417	56.43	2.417	7.17	3.42	3.63
0.500	5.11	1.500	56.43	2.500	7.17	3.50	3.63
0.583	6.66	1.583	28.88	2.583	6.17	3.58	3.36
0.667	6.66	1.667	28.88	2.667	6.17	3.67	3.36
0.750	9.49	1.750	18.62	2.750	5.42	3.75	3.12
0.833	9.49	1.833	18.62	2.833	5.42	3.83	3.12
0.917	16.03	1.917	13.49	2.917	4.82	3.92	2.92
1.000	16.03	2.000	13.49	3.000	4.82	4.00	2.92

Unit Hyd Qpeak (cms)= 0.877

PEAK FLOW (cms)= 0.407 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 25.673
TOTAL RAINFALL (mm)= 68.705
RUNOFF COEFFICIENT = 0.374

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

ADD HYD (0024)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0022):	5.62	0.407	1.58	25.67
	+ ID2= 2 (0023):	5.69	0.443	1.50	24.63
	ID = 3 (0024):	11.30	0.837	1.58	25.15

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| DUHYD (0025) |
| Inlet Cap.= 0.344 |
| #of Inlets= 1 |
| Total(cms)= 0.3 |

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	11.30	0.84	1.58	25.15
MAJOR SYS.(ID= 2):	3.21	0.49	1.58	25.15
MINOR SYS.(ID= 3):	8.10	0.34	1.33	25.15

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| RESERVOIR(0027) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min |

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.2356	0.0081
0.0978	0.0007	0.4205	0.0121
0.1578	0.0024	0.5293	0.0188
0.2005	0.0040	0.6141	0.0255

AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)

```
   INFLOW : ID= 2 (  0025)      3.209      0.493      1.58      25.15
   OUTFLOW: ID= 1 (  0027)      3.209      0.446      1.67      25.35

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 90.47
                  TIME SHIFT OF PEAK FLOW         (min)=  5.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0139

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0028)|   Area     (ha)=   3.06   Curve Number   (CN)= 69.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

        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    3.49 | 1.083   42.63 | 2.083   10.48 |  3.08    4.35
             0.167    3.49 | 1.167   42.63 | 2.167   10.48 |  3.17    4.35
             0.250    4.15 | 1.250  143.34 | 2.250    8.52 |  3.25    3.96
             0.333    4.15 | 1.333  143.34 | 2.333    8.52 |  3.33    3.96
             0.417    5.11 | 1.417   56.43 | 2.417    7.17 |  3.42    3.63
             0.500    5.11 | 1.500   56.43 | 2.500    7.17 |  3.50    3.63
             0.583    6.66 | 1.583   28.88 | 2.583    6.17 |  3.58    3.36
             0.667    6.66 | 1.667   28.88 | 2.667    6.17 |  3.67    3.36
             0.750    9.49 | 1.750   18.62 | 2.750    5.42 |  3.75    3.12
             0.833    9.49 | 1.833   18.62 | 2.833    5.42 |  3.83    3.12
             0.917   16.03 | 1.917   13.49 | 2.917    4.82 |  3.92    2.92
             1.000   16.03 | 2.000   13.49 | 3.000    4.82 |  4.00    2.92

     Unit Hyd Qpeak  (cms)=   1.050

     PEAK FLOW       (cms)=   0.269 (i)
     TIME TO PEAK    (hrs)=   1.417
     RUNOFF VOLUME    (mm)=  22.438
     TOTAL RAINFALL   (mm)=  68.705
     RUNOFF COEFFICIENT   =   0.327

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

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--------------------
| ADD HYD  (  0029)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     3.21   0.446     1.67     25.35
     + ID2= 2 (  0028):     3.06   0.269     1.42     22.44
       ==================================================
       ID = 3 (  0029):     6.26   0.622     1.58     23.93

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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   --------------------------
   | Junction Command(0026) |
   --------------------------

                          AREA     QPEAK    TPEAK     R.V.
                          (ha)     (cms)    (hrs)     (mm)
   INFLOW : ID= 9(  0025)    8.10     0.34     1.33     25.15
   OUTFLOW: ID= 2(  0026)    8.10     0.34     1.33     25.15

   ------------------------------------------------------------------------------
*********************************
** SIMULATION:6) CKL 100 Yr   **
*********************************
--------------------
| CALIB            |
| NASHYD   (  0023)|   Area     (ha)=   5.69   Curve Number   (CN)= 71.6
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.19

        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    3.74 | 1.083   48.41 | 2.083   11.70 |  3.08    4.70
             0.167    3.74 | 1.167   48.41 | 2.167   11.70 |  3.17    4.70
             0.250    4.47 | 1.250  157.29 | 2.250    9.45 |  3.25    4.26
             0.333    4.47 | 1.333  157.29 | 2.333    9.45 |  3.33    4.26
             0.417    5.56 | 1.417   64.01 | 2.417    7.90 |  3.42    3.90
             0.500    5.56 | 1.500   64.01 | 2.500    7.90 |  3.50    3.90
             0.583    7.32 | 1.583   32.88 | 2.583    6.77 |  3.58    3.59
             0.667    7.32 | 1.667   32.88 | 2.667    6.77 |  3.67    3.59
             0.750   10.56 | 1.750   21.09 | 2.750    5.91 |  3.75    3.33
             0.833   10.56 | 1.833   21.09 | 2.833    5.91 |  3.83    3.33
             0.917   18.10 | 1.917   15.17 | 2.917    5.24 |  3.92    3.10
             1.000   18.10 | 2.000   15.17 | 3.000    5.24 |  4.00    3.10

     Unit Hyd Qpeak  (cms)=   1.116

     PEAK FLOW       (cms)=   0.537 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=  29.563
     TOTAL RAINFALL   (mm)=  76.405
     RUNOFF COEFFICIENT   =   0.387

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

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--------------------
| CALIB            |
| NASHYD   (  0022)|   Area     (ha)=   5.62   Curve Number   (CN)= 72.9
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.24

        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    3.74 | 1.083   48.41 | 2.083   11.70 |  3.08    4.70
             0.167    3.74 | 1.167   48.41 | 2.167   11.70 |  3.17    4.70
             0.250    4.47 | 1.250  157.29 | 2.250    9.45 |  3.25    4.26
             0.333    4.47 | 1.333  157.29 | 2.333    9.45 |  3.33    4.26
             0.417    5.56 | 1.417   64.01 | 2.417    7.90 |  3.42    3.90
             0.500    5.56 | 1.500   64.01 | 2.500    7.90 |  3.50    3.90
             0.583    7.32 | 1.583   32.88 | 2.583    6.77 |  3.58    3.59
             0.667    7.32 | 1.667   32.88 | 2.667    6.77 |  3.67    3.59
             0.750   10.56 | 1.750   21.09 | 2.750    5.91 |  3.75    3.33
             0.833   10.56 | 1.833   21.09 | 2.833    5.91 |  3.83    3.33
             0.917   18.10 | 1.917   15.17 | 2.917    5.24 |  3.92    3.10
             1.000   18.10 | 2.000   15.17 | 3.000    5.24 |  4.00    3.10

     Unit Hyd Qpeak  (cms)=   0.877

     PEAK FLOW       (cms)=   0.493 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=  30.756
     TOTAL RAINFALL   (mm)=  76.405
     RUNOFF COEFFICIENT   =   0.403

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

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--------------------
| ADD HYD  (  0024)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0022):     5.62   0.493     1.58     30.76
     + ID2= 2 (  0023):     5.69   0.537     1.50     29.56
       ==================================================
       ID = 3 (  0024):    11.30   1.013     1.58     30.16

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| DUHYD    (  0025)|
| Inlet Cap.= 0.344|
| #of Inlets=    1|
| Total(cms)=   0.3|      AREA     QPEAK     TPEAK     R.V.
--------------------      (ha)     (cms)     (hrs)     (mm)
     TOTAL HYD.(ID= 1):  11.30      1.01      1.58    30.16
     ==================================================
     MAJOR SYS.(ID= 2):   3.98      0.67      1.58    30.16
     MINOR SYS.(ID= 3):   7.32      0.34      1.33    30.16

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| RESERVOIR(  0027)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)    |   (cms)     (ha.m.)
                          0.0000     0.0000    |   0.2356     0.0081
                          0.0978     0.0007    |   0.4205     0.0121
                          0.1578     0.0024    |   0.5293     0.0188
                          0.2005     0.0040    |   0.6141     0.0255

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0025)     3.983     0.670      1.58      30.16
   OUTFLOW: ID= 1 (  0027)     3.983     0.568      1.67      30.22

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 84.84
                  TIME SHIFT OF PEAK FLOW         (min)=  5.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0223

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--------------------
| CALIB            |
| NASHYD   (  0028)|   Area    (ha)=   3.06   Curve Number   (CN)= 69.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

        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    3.74 | 1.083   48.41 | 2.083   11.70 |  3.08    4.70
   0.167    3.74 | 1.167   48.41 | 2.167   11.70 |  3.17    4.70
   0.250    4.47 | 1.250  157.29 | 2.250    9.45 |  3.25    4.26
   0.333    4.47 | 1.333  157.29 | 2.333    9.45 |  3.33    4.26
   0.417    5.56 | 1.417   64.01 | 2.417    7.90 |  3.42    3.90
   0.500    5.56 | 1.500   64.01 | 2.500    7.90 |  3.50    3.90
   0.583    7.32 | 1.583   32.88 | 2.583    6.77 |  3.58    3.59
   0.667    7.32 | 1.667   32.88 | 2.667    6.77 |  3.67    3.59
   0.750   10.56 | 1.750   21.09 | 2.750    5.91 |  3.75    3.33
   0.833   10.56 | 1.833   21.09 | 2.833    5.91 |  3.83    3.33
   0.917   18.10 | 1.917   15.17 | 2.917    5.24 |  3.92    3.10
   1.000   18.10 | 2.000   15.17 | 3.000    5.24 |  4.00    3.10

    Unit Hyd Qpeak  (cms)=   1.050

    PEAK FLOW       (cms)=   0.325 (i)
    TIME TO PEAK    (hrs)=   1.417
    RUNOFF VOLUME    (mm)=  27.019
    TOTAL RAINFALL   (mm)=  76.405
    RUNOFF COEFFICIENT   =   0.354

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

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--------------------
| ADD HYD  (  0029)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0027):     3.98   0.568     1.67    30.22
     + ID2= 2 (  0028):     3.06   0.325     1.42    27.02
       ================================================
       ID = 3 (  0029):     7.04   0.765     1.58    28.83

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

  --------------------------
  | Junction Command(0026) |
  --------------------------

                           AREA     QPEAK   TPEAK     R.V.
                           (ha)     (cms)    (hrs)    (mm)
  INFLOW : ID= 9(  0025)    7.32     0.34    1.33    30.16
  OUTFLOW: ID= 2(  0026)    7.32     0.34    1.33    30.16

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**********
** SIMULATION:7) 25mm Event   **
**********
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| CALIB            |
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| NASHYD   (  0023)|   Area    (ha)=   5.69   Curve Number   (CN)= 71.6
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.19

        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    2.07 | 1.083    5.70 | 2.083    5.19 |  3.08    2.80
   0.167    2.07 | 1.167    5.70 | 2.167    5.19 |  3.17    2.80
   0.250    2.27 | 1.250   10.78 | 2.250    4.47 |  3.25    2.62
   0.333    2.27 | 1.333   10.78 | 2.333    4.47 |  3.33    2.62
   0.417    2.52 | 1.417   50.21 | 2.417    3.95 |  3.42    2.48
   0.500    2.52 | 1.500   50.21 | 2.500    3.95 |  3.50    2.48
   0.583    2.88 | 1.583   13.37 | 2.583    3.56 |  3.58    2.35
   0.667    2.88 | 1.667   13.37 | 2.667    3.56 |  3.67    2.35
   0.750    3.38 | 1.750    8.29 | 2.750    3.25 |  3.75    2.23
   0.833    3.38 | 1.833    8.29 | 2.833    3.25 |  3.83    2.23
   0.917    4.18 | 1.917    6.30 | 2.917    3.01 |  3.92    2.14
   1.000    4.18 | 2.000    6.30 | 3.000    3.01 |  4.00    2.14

    Unit Hyd Qpeak  (cms)=   1.116

    PEAK FLOW       (cms)=   0.041 (i)
    TIME TO PEAK    (hrs)=   1.667
    RUNOFF VOLUME    (mm)=   3.306
    TOTAL RAINFALL   (mm)=  24.997
    RUNOFF COEFFICIENT   =   0.132

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0022)|   Area    (ha)=   5.62   Curve Number   (CN)= 72.9
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.24

        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    2.07 | 1.083    5.70 | 2.083    5.19 |  3.08    2.80
   0.167    2.07 | 1.167    5.70 | 2.167    5.19 |  3.17    2.80
   0.250    2.27 | 1.250   10.78 | 2.250    4.47 |  3.25    2.62
   0.333    2.27 | 1.333   10.78 | 2.333    4.47 |  3.33    2.62
   0.417    2.52 | 1.417   50.21 | 2.417    3.95 |  3.42    2.48
   0.500    2.52 | 1.500   50.21 | 2.500    3.95 |  3.50    2.48
   0.583    2.88 | 1.583   13.37 | 2.583    3.56 |  3.58    2.35
   0.667    2.88 | 1.667   13.37 | 2.667    3.56 |  3.67    2.35
   0.750    3.38 | 1.750    8.29 | 2.750    3.25 |  3.75    2.23
   0.833    3.38 | 1.833    8.29 | 2.833    3.25 |  3.83    2.23
   0.917    4.18 | 1.917    6.30 | 2.917    3.01 |  3.92    2.14
   1.000    4.18 | 2.000    6.30 | 3.000    3.01 |  4.00    2.14

    Unit Hyd Qpeak  (cms)=   0.877

    PEAK FLOW       (cms)=   0.038 (i)
    TIME TO PEAK    (hrs)=   1.750
    RUNOFF VOLUME    (mm)=   3.498
    TOTAL RAINFALL   (mm)=  24.997
    RUNOFF COEFFICIENT   =   0.140

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

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--------------------
| ADD HYD  (  0024)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0022):     5.62   0.038     1.75     3.50
     + ID2= 2 (  0023):     5.69   0.041     1.67     3.31
       ================================================
       ID = 3 (  0024):    11.30   0.078     1.75     3.40

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| DUHYD    (  0025)|
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```
| Inlet Cap.= 0.344|
| #of Inlets=     1|
| Total(cms)=   0.3|      AREA     QPEAK     TPEAK    R.V.
-------------------      (ha)     (cms)     (hrs)    (mm)
     TOTAL HYD.(ID= 1):  11.30      0.08      1.75    3.40
     ==========================================================
     MAJOR SYS.(ID= 2):   0.00      0.00      0.00    0.00
     MINOR SYS.(ID= 3):  11.30      0.08      1.75    3.40

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0027)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   0.2356     0.0081
                         0.0978     0.0007   |   0.4205     0.0121
                         0.1578     0.0024   |   0.5293     0.0188
                         0.2005     0.0040   |   0.6141     0.0255

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0025)   0.000     0.000      0.00       0.00
   OUTFLOW: ID= 1 (  0027)   0.000     0.000      0.00        NaN

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=   NaN
                  TIME SHIFT OF PEAK FLOW         (min)=  0.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0000
                  MAXIMUM  STORAGE   USED       (cu.m.)=  0.000000

     **** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
                    CHECK OUTFLOW/STORAGE TABLE  OR REDUCE DT.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0028)|   Area    (ha)=   3.06   Curve Number   (CN)= 69.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.11

         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    2.07 | 1.083    5.70 | 2.083    5.19 |  3.08    2.80
              0.167    2.07 | 1.167    5.70 | 2.167    5.19 |  3.17    2.80
              0.250    2.27 | 1.250   10.78 | 2.250    4.47 |  3.25    2.62
              0.333    2.27 | 1.333   10.78 | 2.333    4.47 |  3.33    2.62
              0.417    2.52 | 1.417   50.21 | 2.417    3.95 |  3.42    2.48
              0.500    2.52 | 1.500   50.21 | 2.500    3.95 |  3.50    2.48
              0.583    2.88 | 1.583   13.37 | 2.583    3.56 |  3.58    2.35
              0.667    2.88 | 1.667   13.37 | 2.667    3.56 |  3.67    2.35
              0.750    3.38 | 1.750    8.29 | 2.750    3.25 |  3.75    2.23
              0.833    3.38 | 1.833    8.29 | 2.833    3.25 |  3.83    2.23
              0.917    4.18 | 1.917    6.30 | 2.917    3.01 |  3.92    2.14
              1.000    4.18 | 2.000    6.30 | 3.000    3.01 |  4.00    2.14

     Unit Hyd Qpeak  (cms)=   1.050

     PEAK FLOW       (cms)=   0.026 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=   2.932
     TOTAL RAINFALL   (mm)=  24.997
     RUNOFF COEFFICIENT   =   0.117

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

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--------------------
| ADD HYD  (  0029)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
------------------          (ha)    (cms)    (hrs)     (mm)
*** W A R N I N G :  HYDROGRAPH   0027 <ID= 1> IS DRY.
*** W A R N I N G :  HYDROGRAPH   0029 = HYDROGRAPH 0028
       ID1= 1 (  0027):     0.00   0.000     0.00      NaN
     + ID2= 2 (  0028):     3.06   0.026     1.58     2.93
       ================================================
       ID = 3 (  0029):     3.06   0.026     1.58     2.93

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

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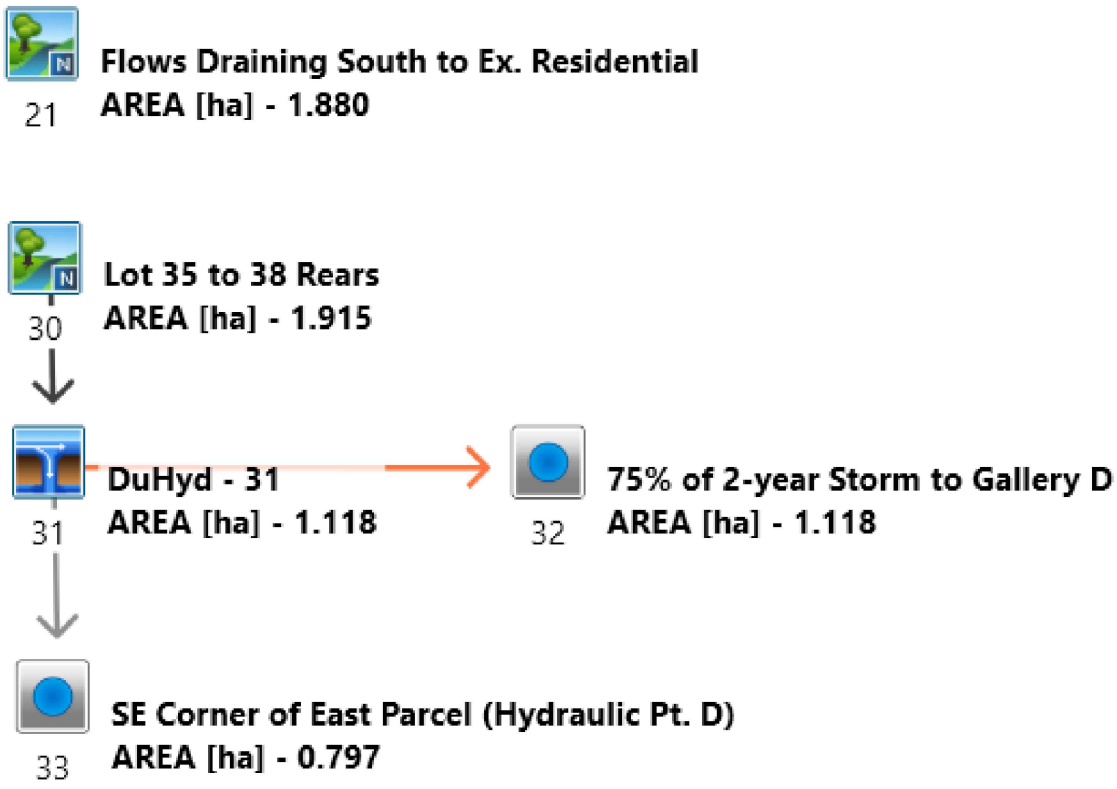
  --------------------------
  | Junction Command(0026) |
  --------------------------

                             AREA     QPEAK   TPEAK     R.V.
                             (ha)     (cms)   (hrs)     (mm)
  INFLOW : ID= 9(  0025)    11.30     0.08    1.75      3.40
  OUTFLOW: ID= 2(  0026)    11.30     0.08    1.75      3.40

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



JEFFERY SUBDIVISION, BOBCAYGEON, ON

V.O. SCHEMATIC – POST-DEVELOPMENT FLOWS TO EXISTING RESIDENTIAL SUBDIVISION

D.G. BIDDLE & ASSOCIATES
CONSULTING ENGINEERS & PLANNERS
96 King Street East
Oshawa, Ontario, L1H 1B6
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info@dgbiddle.com
dgbiddle.com

SCALE	N.T.S.
DRAWN	M.J.H.
DESIGN	M.J.H.
CHECKED	D.D.M.
DATE	MAR 2024

PROJECT 122169

DWG FIG 6

```
*********************************
** SIMULATION:1) CKL 2 Yr      **
*********************************
--------------------
| CALIB            |
| NASHYD   (  0021)|   Area    (ha)=   1.88   Curve Number   (CN)= 69.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

        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    2.15 | 1.083   20.33 | 2.083    5.50 |  3.08    2.59
0.167    2.15 | 1.167   20.33 | 2.167    5.50 |  3.17    2.59
0.250    2.49 | 1.250   84.39 | 2.250    4.60 |  3.25    2.39
0.333    2.49 | 1.333   84.39 | 2.333    4.60 |  3.33    2.39
0.417    2.98 | 1.417   26.99 | 2.417    3.97 |  3.42    2.23
0.500    2.98 | 1.500   26.99 | 2.500    3.97 |  3.50    2.23
0.583    3.73 | 1.583   13.71 | 2.583    3.49 |  3.58    2.08
0.667    3.73 | 1.667   13.71 | 2.667    3.49 |  3.67    2.08
0.750    5.04 | 1.750    9.12 | 2.750    3.13 |  3.75    1.95
0.833    5.04 | 1.833    9.12 | 2.833    3.13 |  3.83    1.95
0.917    7.98 | 1.917    6.85 | 2.917    2.83 |  3.92    1.84
1.000    7.98 | 2.000    6.85 | 3.000    2.83 |  4.00    1.84

    Unit Hyd Qpeak  (cms)=   0.646

    PEAK FLOW       (cms)=   0.050 (i)
    TIME TO PEAK    (hrs)=   1.417
    RUNOFF VOLUME    (mm)=   7.026
    TOTAL RAINFALL   (mm)=  37.060
    RUNOFF COEFFICIENT   =   0.190

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0030)|   Area    (ha)=   1.91   Curve Number   (CN)= 68.6
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

        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    2.15 | 1.083   20.33 | 2.083    5.50 |  3.08    2.59
0.167    2.15 | 1.167   20.33 | 2.167    5.50 |  3.17    2.59
0.250    2.49 | 1.250   84.39 | 2.250    4.60 |  3.25    2.39
0.333    2.49 | 1.333   84.39 | 2.333    4.60 |  3.33    2.39
0.417    2.98 | 1.417   26.99 | 2.417    3.97 |  3.42    2.23
0.500    2.98 | 1.500   26.99 | 2.500    3.97 |  3.50    2.23
0.583    3.73 | 1.583   13.71 | 2.583    3.49 |  3.58    2.08
0.667    3.73 | 1.667   13.71 | 2.667    3.49 |  3.67    2.08
0.750    5.04 | 1.750    9.12 | 2.750    3.13 |  3.75    1.95
0.833    5.04 | 1.833    9.12 | 2.833    3.13 |  3.83    1.95
0.917    7.98 | 1.917    6.85 | 2.917    2.83 |  3.92    1.84
1.000    7.98 | 2.000    6.85 | 3.000    2.83 |  4.00    1.84

    Unit Hyd Qpeak  (cms)=   0.658

    PEAK FLOW       (cms)=   0.049 (i)
    TIME TO PEAK    (hrs)=   1.417
    RUNOFF VOLUME    (mm)=   6.812
    TOTAL RAINFALL   (mm)=  37.060
    RUNOFF COEFFICIENT   =   0.184

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

--------------------------------------------------------------------------------
--------------------
| DUHYD    (  0031)|
| Inlet Cap.= 0.048|
| #of Inlets=     1|
| Total(cms)=   0.0|      AREA     QPEAK     TPEAK    R.V.
--------------------      (ha)     (cms)     (hrs)    (mm)
    TOTAL HYD.(ID= 1):   1.91      0.05      1.42    6.81
    ================================================
    MAJOR SYS.(ID= 2):   0.01      0.00      1.42    6.81
    MINOR SYS.(ID= 3):   1.91      0.05      1.42    6.81

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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  --------------------------
  | Junction Command(0032) |
  --------------------------

                           AREA     QPEAK   TPEAK     R.V.
                           (ha)     (cms)    (hrs)    (mm)
  INFLOW : ID= 9(  0031)    1.91     0.05    1.42     6.81
  OUTFLOW: ID= 2(  0032)    1.91     0.05    1.42     6.81

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

  --------------------------
  | Junction Command(0033) |
  --------------------------

                           AREA     QPEAK   TPEAK     R.V.
                           (ha)     (cms)    (hrs)    (mm)
  INFLOW : ID= 8(  0031)    0.01     0.00    1.42     6.81
  OUTFLOW: ID= 2(  0033)    0.01     0.00    1.42     6.81

  --------------------------------------------------------------------------------
*********************************
** SIMULATION:2) CKL 5 Yr      **
*********************************
--------------------
| CALIB            |
| NASHYD   (  0021)|   Area    (ha)=   1.88   Curve Number   (CN)= 69.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

        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    2.43 | 1.083   26.49 | 2.083    6.72 |  3.08    2.98
0.167    2.43 | 1.167   26.49 | 2.167    6.72 |  3.17    2.98
0.250    2.85 | 1.250  100.26 | 2.250    5.55 |  3.25    2.73
0.333    2.85 | 1.333  100.26 | 2.333    5.55 |  3.33    2.73
0.417    3.46 | 1.417   35.24 | 2.417    4.72 |  3.42    2.53
0.500    3.46 | 1.500   35.24 | 2.500    4.72 |  3.50    2.53
0.583    4.41 | 1.583   17.77 | 2.583    4.12 |  3.58    2.35
0.667    4.41 | 1.667   17.77 | 2.667    4.12 |  3.67    2.35
0.750    6.13 | 1.750   11.59 | 2.750    3.65 |  3.75    2.20
0.833    6.13 | 1.833   11.59 | 2.833    3.65 |  3.83    2.20
0.917   10.04 | 1.917    8.52 | 2.917    3.28 |  3.92    2.06
1.000   10.04 | 2.000    8.52 | 3.000    3.28 |  4.00    2.06

    Unit Hyd Qpeak  (cms)=   0.646

    PEAK FLOW       (cms)=   0.077 (i)
    TIME TO PEAK    (hrs)=   1.417
    RUNOFF VOLUME    (mm)=  10.522
    TOTAL RAINFALL   (mm)=  45.348
    RUNOFF COEFFICIENT   =   0.232

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0030)|   Area    (ha)=   1.91   Curve Number   (CN)= 68.6
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

        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    2.43 | 1.083   26.49 | 2.083    6.72 |  3.08    2.98
0.167    2.43 | 1.167   26.49 | 2.167    6.72 |  3.17    2.98
0.250    2.85 | 1.250  100.26 | 2.250    5.55 |  3.25    2.73
0.333    2.85 | 1.333  100.26 | 2.333    5.55 |  3.33    2.73
0.417    3.46 | 1.417   35.24 | 2.417    4.72 |  3.42    2.53
0.500    3.46 | 1.500   35.24 | 2.500    4.72 |  3.50    2.53
```

0.583	4.41	1.583	17.77	2.583	4.12	3.58	2.35
0.667	4.41	1.667	17.77	2.667	4.12	3.67	2.35
0.750	6.13	1.750	11.59	2.750	3.65	3.75	2.20
0.833	6.13	1.833	11.59	2.833	3.65	3.83	2.20
0.917	10.04	1.917	8.52	2.917	3.28	3.92	2.06
1.000	10.04	2.000	8.52	3.000	3.28	4.00	2.06

Unit Hyd Qpeak (cms)= 0.658

PEAK FLOW (cms)= 0.076 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 10.218
TOTAL RAINFALL (mm)= 45.348
RUNOFF COEFFICIENT = 0.225

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

DUHYD (0031) Inlet Cap.= 0.048 #of Inlets= 1 Total(cms)= 0.0	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	1.91	0.08	1.42	10.22
MAJOR SYS.(ID= 2):	0.22	0.03	1.42	10.22
MINOR SYS.(ID= 3):	1.69	0.05	1.33	10.22

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

Junction Command(0032)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 9(0031)	1.69	0.05	1.33	10.22
OUTFLOW: ID= 2(0032)	1.69	0.05	1.33	10.22

Junction Command(0033)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 8(0031)	0.22	0.03	1.42	10.22
OUTFLOW: ID= 2(0033)	0.22	0.03	1.42	10.22

****
** SIMULATION:3) CKL 10 Yr **
****

CALIB NASHYD (0021) ID= 1 DT= 5.0 min	Area (ha)= 1.88	Curve Number (CN)= 69.5 Ia (mm)= 5.00	# of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.11

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	2.71	1.083	31.26	2.083	7.77	3.08	3.34
0.167	2.71	1.167	31.26	2.167	7.77	3.17	3.34
0.250	3.20	1.250	112.80	2.250	6.37	3.25	3.06
0.333	3.20	1.333	112.80	2.333	6.37	3.33	3.06
0.417	3.90	1.417	41.55	2.417	5.39	3.42	2.82
0.500	3.90	1.500	41.55	2.500	5.39	3.50	2.82
0.583	5.03	1.583	21.01	2.583	4.67	3.58	2.61
0.667	5.03	1.667	21.01	2.667	4.67	3.67	2.61
0.750	7.06	1.750	13.60	2.750	4.13	3.75	2.43
0.833	7.06	1.833	13.60	2.833	4.13	3.83	2.43
0.917	11.75	1.917	9.93	2.917	3.69	3.92	2.28
1.000	11.75	2.000	9.93	3.000	3.69	4.00	2.28

Unit Hyd Qpeak (cms)= 0.646

PEAK FLOW (cms)= 0.101 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 13.709
TOTAL RAINFALL (mm)= 52.060
RUNOFF COEFFICIENT = 0.263

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

CALIB NASHYD (0030) ID= 1 DT= 5.0 min	Area (ha)= 1.91	Curve Number (CN)= 68.6 Ia (mm)= 5.00	# of Linear Res.(N)= 3.00 U.H. Tp(hrs)= 0.11

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	2.71	1.083	31.26	2.083	7.77	3.08	3.34
0.167	2.71	1.167	31.26	2.167	7.77	3.17	3.34
0.250	3.20	1.250	112.80	2.250	6.37	3.25	3.06
0.333	3.20	1.333	112.80	2.333	6.37	3.33	3.06
0.417	3.90	1.417	41.55	2.417	5.39	3.42	2.82
0.500	3.90	1.500	41.55	2.500	5.39	3.50	2.82
0.583	5.03	1.583	21.01	2.583	4.67	3.58	2.61
0.667	5.03	1.667	21.01	2.667	4.67	3.67	2.61
0.750	7.06	1.750	13.60	2.750	4.13	3.75	2.43
0.833	7.06	1.833	13.60	2.833	4.13	3.83	2.43
0.917	11.75	1.917	9.93	2.917	3.69	3.92	2.28
1.000	11.75	2.000	9.93	3.000	3.69	4.00	2.28

Unit Hyd Qpeak (cms)= 0.658

PEAK FLOW (cms)= 0.099 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 13.328
TOTAL RAINFALL (mm)= 52.060
RUNOFF COEFFICIENT = 0.256

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

DUHYD (0031) Inlet Cap.= 0.048 #of Inlets= 1 Total(cms)= 0.0	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	1.91	0.10	1.42	13.33
MAJOR SYS.(ID= 2):	0.38	0.05	1.42	13.33
MINOR SYS.(ID= 3):	1.54	0.05	1.33	13.33

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

Junction Command(0032)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 9(0031)	1.54	0.05	1.33	13.33
OUTFLOW: ID= 2(0032)	1.54	0.05	1.33	13.33

Junction Command(0033)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 8(0031)	0.38	0.05	1.42	13.33
OUTFLOW: ID= 2(0033)	0.38	0.05	1.42	13.33

****
** SIMULATION:4) CKL 25 Yr **
****

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--------------------
| CALIB            |
| NASHYD   (  0021)|   Area    (ha)=   1.88   Curve Number   (CN)= 69.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

        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    3.09 | 1.083   38.05 | 2.083    9.28 |  3.08    3.85
 0.167    3.09 | 1.167   38.05 | 2.167    9.28 |  3.17    3.85
 0.250    3.67 | 1.250  130.09 | 2.250    7.55 |  3.25    3.50
 0.333    3.67 | 1.333  130.09 | 2.333    7.55 |  3.33    3.50
 0.417    4.53 | 1.417   50.47 | 2.417    6.34 |  3.42    3.22
 0.500    4.53 | 1.500   50.47 | 2.500    6.34 |  3.50    3.22
 0.583    5.90 | 1.583   25.68 | 2.583    5.46 |  3.58    2.97
 0.667    5.90 | 1.667   25.68 | 2.667    5.46 |  3.67    2.97
 0.750    8.40 | 1.750   16.52 | 2.750    4.80 |  3.75    2.76
 0.833    8.40 | 1.833   16.52 | 2.833    4.80 |  3.83    2.76
 0.917   14.22 | 1.917   11.95 | 2.917    4.27 |  3.92    2.58
 1.000   14.22 | 2.000   11.95 | 3.000    4.27 |  4.00    2.58

    Unit Hyd Qpeak  (cms)=   0.646

    PEAK FLOW       (cms)=   0.138 (i)
    TIME TO PEAK    (hrs)=   1.417
    RUNOFF VOLUME    (mm)=  18.664
    TOTAL RAINFALL   (mm)=  61.525
    RUNOFF COEFFICIENT   =   0.303

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0030)|   Area    (ha)=   1.91   Curve Number   (CN)= 68.6
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

        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    3.09 | 1.083   38.05 | 2.083    9.28 |  3.08    3.85
 0.167    3.09 | 1.167   38.05 | 2.167    9.28 |  3.17    3.85
 0.250    3.67 | 1.250  130.09 | 2.250    7.55 |  3.25    3.50
 0.333    3.67 | 1.333  130.09 | 2.333    7.55 |  3.33    3.50
 0.417    4.53 | 1.417   50.47 | 2.417    6.34 |  3.42    3.22
 0.500    4.53 | 1.500   50.47 | 2.500    6.34 |  3.50    3.22
 0.583    5.90 | 1.583   25.68 | 2.583    5.46 |  3.58    2.97
 0.667    5.90 | 1.667   25.68 | 2.667    5.46 |  3.67    2.97
 0.750    8.40 | 1.750   16.52 | 2.750    4.80 |  3.75    2.76
 0.833    8.40 | 1.833   16.52 | 2.833    4.80 |  3.83    2.76
 0.917   14.22 | 1.917   11.95 | 2.917    4.27 |  3.92    2.58
 1.000   14.22 | 2.000   11.95 | 3.000    4.27 |  4.00    2.58

    Unit Hyd Qpeak  (cms)=   0.658

    PEAK FLOW       (cms)=   0.136 (i)
    TIME TO PEAK    (hrs)=   1.417
    RUNOFF VOLUME    (mm)=  18.175
    TOTAL RAINFALL   (mm)=  61.525
    RUNOFF COEFFICIENT   =   0.295

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

--------------------------------------------------------------------------------
--------------------
| DUHYD    (  0031)|
| Inlet Cap.= 0.048|
| #of Inlets=     1|
| Total(cms)=   0.0|      AREA     QPEAK     TPEAK     R.V.
--------------------      (ha)     (cms)     (hrs)     (mm)
    TOTAL HYD.(ID= 1):   1.91      0.14      1.42    18.17
    ==========================================================
    MAJOR SYS.(ID= 2):   0.57      0.09      1.42    18.17
    MINOR SYS.(ID= 3):   1.35      0.05      1.25    18.17

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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  --------------------------
  | Junction Command(0032) |
  --------------------------

                            AREA     QPEAK   TPEAK     R.V.
                            (ha)     (cms)    (hrs)    (mm)
  INFLOW : ID= 9(  0031)    1.35      0.05    1.25    18.17
  OUTFLOW: ID= 2(  0032)    1.35      0.05    1.25    18.17

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

  --------------------------
  | Junction Command(0033) |
  --------------------------

                            AREA     QPEAK   TPEAK     R.V.
                            (ha)     (cms)    (hrs)    (mm)
  INFLOW : ID= 8(  0031)    0.57      0.09    1.42    18.17
  OUTFLOW: ID= 2(  0033)    0.57      0.09    1.42    18.17

  --------------------------------------------------------------------------------
**********************************
** SIMULATION:5) CKL 50 Yr    **
**********************************
--------------------
| CALIB            |
| NASHYD   (  0021)|   Area    (ha)=   1.88   Curve Number   (CN)= 69.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

        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    3.49 | 1.083   42.63 | 2.083   10.48 |  3.08    4.35
 0.167    3.49 | 1.167   42.63 | 2.167   10.48 |  3.17    4.35
 0.250    4.15 | 1.250  143.34 | 2.250    8.52 |  3.25    3.96
 0.333    4.15 | 1.333  143.34 | 2.333    8.52 |  3.33    3.96
 0.417    5.11 | 1.417   56.43 | 2.417    7.17 |  3.42    3.63
 0.500    5.11 | 1.500   56.43 | 2.500    7.17 |  3.50    3.63
 0.583    6.66 | 1.583   28.88 | 2.583    6.17 |  3.58    3.36
 0.667    6.66 | 1.667   28.88 | 2.667    6.17 |  3.67    3.36
 0.750    9.49 | 1.750   18.62 | 2.750    5.42 |  3.75    3.12
 0.833    9.49 | 1.833   18.62 | 2.833    5.42 |  3.83    3.12
 0.917   16.03 | 1.917   13.49 | 2.917    4.82 |  3.92    2.92
 1.000   16.03 | 2.000   13.49 | 3.000    4.82 |  4.00    2.92

    Unit Hyd Qpeak  (cms)=   0.646

    PEAK FLOW       (cms)=   0.168 (i)
    TIME TO PEAK    (hrs)=   1.417
    RUNOFF VOLUME    (mm)=  22.736
    TOTAL RAINFALL   (mm)=  68.705
    RUNOFF COEFFICIENT   =   0.331

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

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| CALIB            |
| NASHYD   (  0030)|   Area    (ha)=   1.91   Curve Number   (CN)= 68.6
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

        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    3.49 | 1.083   42.63 | 2.083   10.48 |  3.08    4.35
 0.167    3.49 | 1.167   42.63 | 2.167   10.48 |  3.17    4.35
 0.250    4.15 | 1.250  143.34 | 2.250    8.52 |  3.25    3.96
 0.333    4.15 | 1.333  143.34 | 2.333    8.52 |  3.33    3.96
 0.417    5.11 | 1.417   56.43 | 2.417    7.17 |  3.42    3.63
 0.500    5.11 | 1.500   56.43 | 2.500    7.17 |  3.50    3.63
 0.583    6.66 | 1.583   28.88 | 2.583    6.17 |  3.58    3.36
 0.667    6.66 | 1.667   28.88 | 2.667    6.17 |  3.67    3.36
 0.750    9.49 | 1.750   18.62 | 2.750    5.42 |  3.75    3.12
```

0.833	9.49	1.833	18.62	2.833	5.42	3.83	3.12
0.917	16.03	1.917	13.49	2.917	4.82	3.92	2.92
1.000	16.03	2.000	13.49	3.000	4.82	4.00	2.92

Unit Hyd Qpeak (cms)= 0.658

PEAK FLOW (cms)= 0.166 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 22.163
TOTAL RAINFALL (mm)= 68.705
RUNOFF COEFFICIENT = 0.323

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

DUHYD (0031)
Inlet Cap.= 0.048
#of Inlets= 1
Total(cms)= 0.0

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	1.91	0.17	1.42	22.16
MAJOR SYS.(ID= 2):	0.68	0.12	1.42	22.16
MINOR SYS.(ID= 3):	1.23	0.05	1.25	22.16

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

Junction Command(0032)

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 9(0031)	1.23	0.05	1.25	22.16
OUTFLOW: ID= 2(0032)	1.23	0.05	1.25	22.16

Junction Command(0033)

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 8(0031)	0.68	0.12	1.42	22.16
OUTFLOW: ID= 2(0033)	0.68	0.12	1.42	22.16

****
** SIMULATION:6) CKL 100 Yr **
****

CALIB
NASHYD (0021)| Area (ha)= 1.88 Curve Number (CN)= 69.5
ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.11

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	3.74	1.083	48.41	2.083	11.70	3.08	4.70
0.167	3.74	1.167	48.41	2.167	11.70	3.17	4.70
0.250	4.47	1.250	157.29	2.250	9.45	3.25	4.26
0.333	4.47	1.333	157.29	2.333	9.45	3.33	4.26
0.417	5.56	1.417	64.01	2.417	7.90	3.42	3.90
0.500	5.56	1.500	64.01	2.500	7.90	3.50	3.90
0.583	7.32	1.583	32.88	2.583	6.77	3.58	3.59
0.667	7.32	1.667	32.88	2.667	6.77	3.67	3.59
0.750	10.56	1.750	21.09	2.750	5.91	3.75	3.33
0.833	10.56	1.833	21.09	2.833	5.91	3.83	3.33
0.917	18.10	1.917	15.17	2.917	5.24	3.92	3.10
1.000	18.10	2.000	15.17	3.000	5.24	4.00	3.10

Unit Hyd Qpeak (cms)= 0.646

PEAK FLOW (cms)= 0.203 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 27.363
TOTAL RAINFALL (mm)= 76.405
RUNOFF COEFFICIENT = 0.358

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

CALIB
NASHYD (0030)| Area (ha)= 1.91 Curve Number (CN)= 68.6
ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.11

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	3.74	1.083	48.41	2.083	11.70	3.08	4.70
0.167	3.74	1.167	48.41	2.167	11.70	3.17	4.70
0.250	4.47	1.250	157.29	2.250	9.45	3.25	4.26
0.333	4.47	1.333	157.29	2.333	9.45	3.33	4.26
0.417	5.56	1.417	64.01	2.417	7.90	3.42	3.90
0.500	5.56	1.500	64.01	2.500	7.90	3.50	3.90
0.583	7.32	1.583	32.88	2.583	6.77	3.58	3.59
0.667	7.32	1.667	32.88	2.667	6.77	3.67	3.59
0.750	10.56	1.750	21.09	2.750	5.91	3.75	3.33
0.833	10.56	1.833	21.09	2.833	5.91	3.83	3.33
0.917	18.10	1.917	15.17	2.917	5.24	3.92	3.10
1.000	18.10	2.000	15.17	3.000	5.24	4.00	3.10

Unit Hyd Qpeak (cms)= 0.658

PEAK FLOW (cms)= 0.201 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 26.702
TOTAL RAINFALL (mm)= 76.405
RUNOFF COEFFICIENT = 0.349

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

DUHYD (0031)
Inlet Cap.= 0.048
#of Inlets= 1
Total(cms)= 0.0

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	1.91	0.20	1.42	26.70
MAJOR SYS.(ID= 2):	0.80	0.15	1.42	26.70
MINOR SYS.(ID= 3):	1.12	0.05	1.25	26.70

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

Junction Command(0032)

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 9(0031)	1.12	0.05	1.25	26.70
OUTFLOW: ID= 2(0032)	1.12	0.05	1.25	26.70

Junction Command(0033)

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 8(0031)	0.80	0.15	1.42	26.70
OUTFLOW: ID= 2(0033)	0.80	0.15	1.42	26.70

****
** SIMULATION:7) 25mm Event **
****

CALIB
NASHYD (0021)| Area (ha)= 1.88 Curve Number (CN)= 69.5

ID= 1 DT= 5.0 min	Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.11

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	2.07	1.083	5.70	2.083	5.19	3.08	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.250	2.27	1.250	10.78	2.250	4.47	3.25	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.417	2.52	1.417	50.21	2.417	3.95	3.42	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.583	2.88	1.583	13.37	2.583	3.56	3.58	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.750	3.38	1.750	8.29	2.750	3.25	3.75	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.917	4.18	1.917	6.30	2.917	3.01	3.92	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

Unit Hyd Qpeak (cms)= 0.646

PEAK FLOW (cms)= 0.016 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 2.984
TOTAL RAINFALL (mm)= 24.997
RUNOFF COEFFICIENT = 0.119

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

CALIB	
NASHYD (0030)	Area (ha)= 1.91 Curve Number (CN)= 68.6
ID= 1 DT= 5.0 min	Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.11

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	2.07	1.083	5.70	2.083	5.19	3.08	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.250	2.27	1.250	10.78	2.250	4.47	3.25	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.417	2.52	1.417	50.21	2.417	3.95	3.42	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.583	2.88	1.583	13.37	2.583	3.56	3.58	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.750	3.38	1.750	8.29	2.750	3.25	3.75	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.917	4.18	1.917	6.30	2.917	3.01	3.92	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

Unit Hyd Qpeak (cms)= 0.658

PEAK FLOW (cms)= 0.016 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 2.885
TOTAL RAINFALL (mm)= 24.997
RUNOFF COEFFICIENT = 0.115

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

DUHYD (0031)	
Inlet Cap.= 0.048	
#of Inlets= 1	
Total(cms)= 0.0	

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
TOTAL HYD.(ID= 1):	1.91	0.02	1.58	2.88
MAJOR SYS.(ID= 2):	0.00	0.00	0.00	0.00
MINOR SYS.(ID= 3):	1.91	0.02	1.58	2.88

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

Junction Command(0032)

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 9(0031)	1.91	0.02	1.58	2.88
OUTFLOW: ID= 2(0032)	1.91	0.02	1.58	2.88

Junction Command(0033)

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 8(0031)	0.00	0.00	0.00	0.00
OUTFLOW: ID= 2(0033)	0.00	0.00	0.00	0.00
