

Project Description

File Name 10 year pre-existing.SPF

Project Options

Flow Units CFS
Elevation Type Elevation
Hydrology Method Modified Rational
Time of Concentration (TOC) Method SCS TR-55
Link Routing Method Steady Flow
Enable Overflow Ponding at Nodes YES
Skip Steady State Analysis Time Periods NO

Analysis Options

Start Analysis On Sep 13, 2012 00:00:00
End Analysis On Sep 14, 2012 00:00:00
Start Reporting On Sep 13, 2012 00:00:00
Antecedent Dry Days 0 days
Runoff (Dry Weather) Time Step 0 01:00:00 days hh:mm:ss
Runoff (Wet Weather) Time Step 0 00:05:00 days hh:mm:ss
Reporting Time Step 0 00:05:00 days hh:mm:ss
Routing Time Step 30 seconds

Number of Elements

Qty
Rain Gages 0
Subbasins..... 1
Nodes..... 2
 Junctions 0
 Outfalls 1
 Flow Diversions 0
 Inlets 1
 Storage Nodes 0
Links..... 1
 Channels 0
 Pipes 1
 Pumps 0
 Orifices 0
 Weirs 0
 Outlets 0
Pollutants 0
Land Uses 0

Rainfall Details

Return Period..... 10 year(s)

Subbasin Summary

SN	Subbasin ID	Area	Weighted Runoff Coefficient	Total Rainfall	Total Runoff	Total Runoff Volume	Peak Runoff	Time of Concentration
		(ft²)		(in)	(in)	(ac-in)	(cfs)	(days hh:mm:ss)
1	Sub-01	38759.99	0.8100	0.90	0.73	0.65	3.91	0 00:10:00

Node Summary

SN	Element ID	Element Type	Invert Elevation	Ground/Rim (Max) Elevation	Initial Water Elevation	Surcharge Elevation	Ponded Area	Peak Inflow	Max HGL Elevation Attained	Max Surcharge Depth Attained	Min Freeboard Attained	Time of Peak Flooding Occurrence	Total Flooded Volume	Total Time Flooded
			(ft)	(ft)	(ft)	(ft)	(ft²)	(cfs)	(ft)	(ft)	(ft)	(days hh:mm)	(ac-in)	(min)
1	Out-01	Outfall	72.51					10.55	73.07					

Link Summary

SN	Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Reported Surcharged	Condition
					(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
1	Link-01	Pipe	exist.inlet(t/g80.45)	Out-01	28.00	74.05	72.51	5.5000	27.000	0.0120	10.55	78.68	0.13	13.78	0.56	0.25	0.00	Calculated

Inlet Summary

SN	Element ID	Inlet Manufacturer	Manufacturer Part Number	Inlet Location	Number of Inlets	Catchbasin Invert Elevation	Max (Rim) Elevation	Initial Water Elevation	Ponded Area	Peak Flow	Peak Flow Intercepted by Inlet	Peak Flow Bypassing Inlet	Inlet Efficiency during Peak Flow	Allowable Spread	Maximum Spread
						(ft)	(ft)	(ft)	(ft²)	(cfs)	(cfs)	(cfs)	(%)	(ft)	(ft)
1	exist.inlet(t/g80.45)	FHWA HEC-22	GENERIC	N/A	On Sag	1	74.05	80.45	0.00	10.00	3.91	N/A	N/A	N/A	7.00

Subbasin Hydrology

Subbasin : Sub-01

Input Data

Area (ft²) 38759.99
Weighted Runoff Coefficient 0.8100

Runoff Coefficient

Soil/Surface Description	Area (ft²)	Soil Group	Runoff Coeff.
-	38759.99	-	0.98
-	14806.00	-	0.35
Composite Area & Weighted Runoff Coeff.	53565.99		0.81

Time of Concentration

TOC Method : SCS TR-55

Sheet Flow Equation :

$$T_c = (0.007 * ((n * L_f)^{0.8})) / ((P^{0.5}) * (S_f^{0.4}))$$

Where :

Tc = Time of Concentration (hr)
n = Manning's roughness
Lf = Flow Length (ft)
P = 2 yr, 24 hr Rainfall (inches)
Sf = Slope (ft/ft)

Shallow Concentrated Flow Equation :

V = 16.1345 * (Sf^{0.5}) (unpaved surface)
V = 20.3282 * (Sf^{0.5}) (paved surface)
V = 15.0 * (Sf^{0.5}) (grassed waterway surface)
V = 10.0 * (Sf^{0.5}) (nearly bare & untilled surface)
V = 9.0 * (Sf^{0.5}) (cultivated straight rows surface)
V = 7.0 * (Sf^{0.5}) (short grass pasture surface)
V = 5.0 * (Sf^{0.5}) (woodland surface)
V = 2.5 * (Sf^{0.5}) (forest w/heavy litter surface)
Tc = (Lf / V) / (3600 sec/hr)

Where:

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)

Channel Flow Equation :

V = (1.49 * (R^{2/3}) * (Sf^{0.5})) / n
R = Aq / Wp
Tc = (Lf / V) / (3600 sec/hr)

Where :

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
R = Hydraulic Radius (ft)
Aq = Flow Area (ft²)
Wp = Wetted Perimeter (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)
n = Manning's roughness

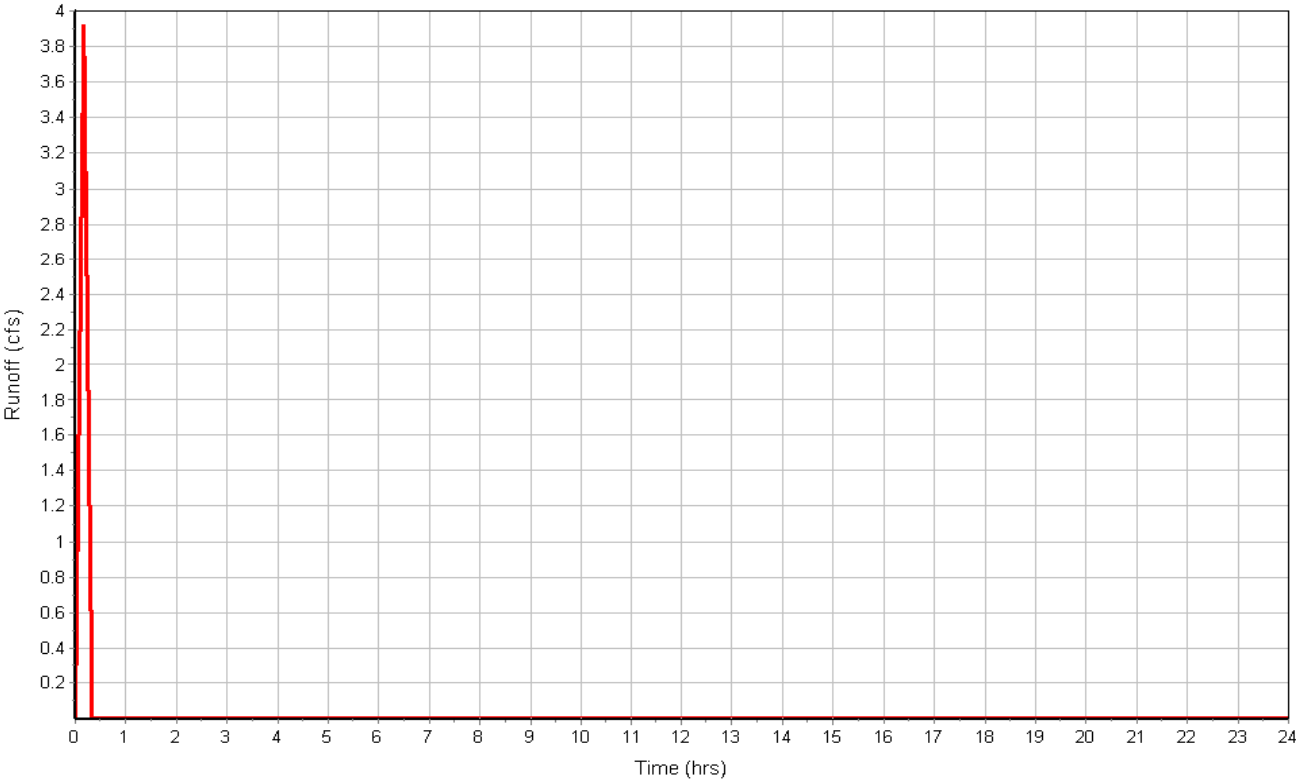
User-Defined TOC override (minutes): 10

Subbasin Runoff Results

Total Rainfall (in) 0.90
Total Runoff (in) 0.73
Peak Runoff (cfs) 3.91
Rainfall Intensity 5.427
Weighted Runoff Coefficient 0.8100
Time of Concentration (days hh:mm:ss) 0 00:10:00

Subbasin : Sub-01

Runoff Hydrograph



Pipe Input

SN	Element ID	Length	Inlet Invert Elevation	Inlet Invert Offset	Outlet Invert Elevation	Outlet Invert Offset	Total Drop	Average Slope	Pipe Shape	Pipe Diameter or Height	Pipe Width	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow	Flap Gate	No. of Barrels
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(%)		(in)	(in)					(cfs)		
1	Link-01	28.00	74.05	0.00	72.51	0.00	1.54	5.5000	CIRCULAR	27.000	27.000	0.0120	0.5000	0.5000	0.0000	0.00	No	1

Pipe Results

SN	Element ID	Peak Flow	Time of Peak Flow Occurrence	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Travel Time	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	Froude Number	Reported Condition
		(cfs)	(days hh:mm)	(cfs)		(ft/sec)	(min)	(ft)		(min)		
1	Link-01	10.55	0 00:15	78.68	0.13	13.78	0.03	0.56	0.25	0.00		Calculated

Inlet Input

SN Element ID	Inlet Manufacturer	Manufacturer Part Number	Inlet Location	Number of Inlets	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Inlet Depth (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Ponded Area (ft²)	Grate Clogging Factor (%)	
1 exist.inlet(t/g80.45)	FHWA HEC-22	GENERIC	N/A	On Sag	1	74.05	80.45	6.40	0.00	0.00	10.00	0.00

Roadway & Gutter Input

SN Element ID	Roadway Longitudinal Slope (ft/ft)	Roadway Cross Slope (ft/ft)	Roadway Manning's Roughness	Gutter Cross Slope (ft/ft)	Gutter Width (ft)	Gutter Depression (in)	Allowable Spread (ft)
1 exist.inlet(t/g80.45)	N/A	0.0200	0.0160	0.0620	2.00	0.0656	7.00

Inlet Results

SN Element ID	Peak Flow	Peak Lateral Inflow	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Inlet Efficiency during Peak Flow (%)	Max Gutter Spread during Peak Flow (ft)	Max Gutter Water Elev. during Peak Flow (ft)	Max Gutter Water Depth during Peak Flow (ft)	Time of Max Depth Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1 exist.inlet(t/g80.45)	3.91	3.91	N/A	N/A	N/A	11.02	81.39	0.94	0 00:15	0.00	0.00