# DRAINAGE REPORT

## Splash Carwash

***Date:*** **05-11-2022**

***Located in:*** **Bryant, Arkansas**

***Prepared for:***
**City of Bryant, Arkansas**

***Prepared by:***

PHILLIP LEWIS ENGINEERING

Structural + Civil Consultants

23620 Interstate 30 | Bryant, AR
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PHILLIP LEWIS ENGINEERING, INC.
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23620 Interstate 30 N
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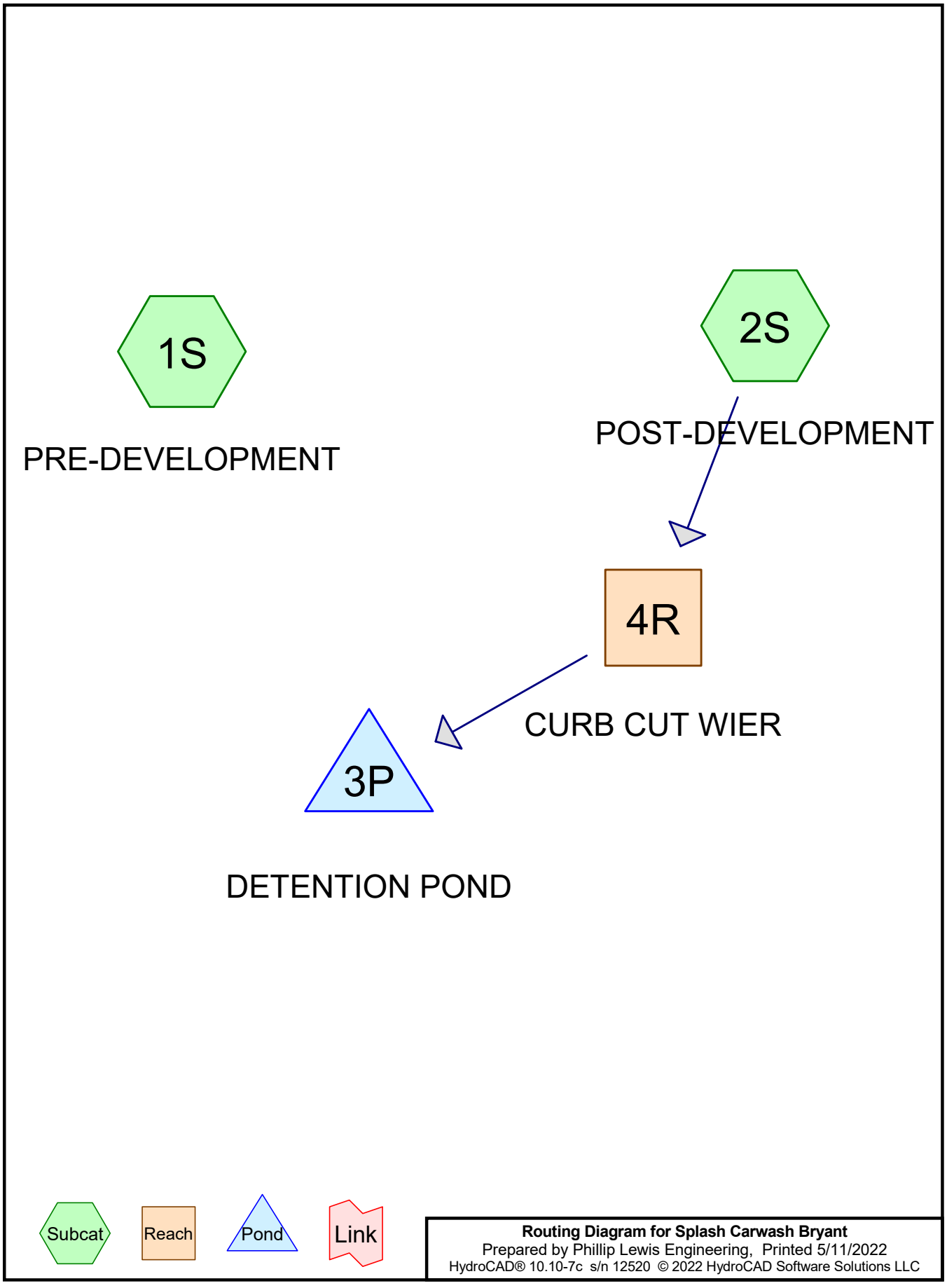
## Description of Project

The proposed project is for development of Splash Carwash facility located at 2116 Reynolds Rood in Bryant, Arkansas. The 1.09 acres is located at the intersection of Reynolds Road and Evans loop (old filling station site).

The scope of the project includes the construction of a drive thru tunnel carwash with self service vacuum bays and a covered pay kiosk. In addition to the vacuum bays, new interior landscape islands will be added around the vacuum bays as well as new landscape areas at the South and West side of the property.

Post-development runoff conditions will be reduced from Pre-development runoff conditions after completion of the devlopement with a detention pond constructed in the North East Corner of the property. Post-development site conditions will have an increase in pervious areas. Detention is calculated and sized for the 100 year storm.

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**Routing Diagram for Splash Carwash Bryant**
Prepared by Phillip Lewis Engineering, Printed 5/11/2022
HydroCAD® 10.10-7c s/n 12520 © 2022 HydroCAD Software Solutions LLC

## Area Listing (all nodes)

| Area (acres) | C | Description (subcatchment-numbers) |
|---|---|---|
| 0.516 | 0.95 | ASPHALT SURFACE (2S) |
| 0.390 | 0.46 | GRASS LANDSCAPING (2S) |
| 0.712 | 0.65 | GRAVEL PARKING (1S) |
| 0.152 | 0.97 | ROOF TOP (2S) |
| 0.345 | 0.77 | SHRUB POOR CONDITION BRUSH (1S) |
| **2.115** | **0.73** | **TOTAL AREA** |

## Pipe Listing (all nodes)

| Line# | Node Number | In-Invert (feet) | Out-Invert (feet) | Length (feet) | Slope (ft/ft) | n | Width (inches) | Diam/Height (inches) | Inside-Fill (inches) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 3P | 384.50 | 384.00 | 10.0 | 0.0500 | 0.011 | 0.0 | 12.0 | 0.0 |

Time span=0.00-12.00 hrs, dt=0.01 hrs, 1201 points
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: PRE-DEVELOPMENT** Runoff Area=46,055 sf 0.00% Impervious Runoff Depth=0.63"
Flow Length=270' Slope=0.0250 '/' Tc=15.5 min C=0.69 Runoff=2.53 cfs 0.056 af

**Subcatchment 2S: POST-DEVELOPMENT** Runoff Area=46,055 sf 63.15% Impervious Runoff Depth=0.71"
Flow Length=360' Slope=0.0150 '/' Tc=8.8 min C=0.77 Runoff=2.82 cfs 0.062 af

**Reach 4R: CURB CUT WIER** Avg. Flow Depth=0.19' Max Vel=4.94 fps Inflow=2.82 cfs 0.062 af
n=0.013 L=4.0' S=0.0200 '/' Capacity=12.61 cfs Outflow=2.83 cfs 0.062 af

**Pond 3P: DETENTION POND** Peak Elev=385.57' Storage=1,038 cf Inflow=2.83 cfs 0.062 af
12.0" Round Culvert n=0.011 L=10.0' S=0.0500 '/' Outflow=2.26 cfs 0.062 af

**Total Runoff Area = 2.115 ac Runoff Volume = 0.118 af Average Runoff Depth = 0.67"**
**68.43% Pervious = 1.447 ac 31.57% Impervious = 0.668 ac**

## Summary for Subcatchment 1S: PRE-DEVELOPMENT

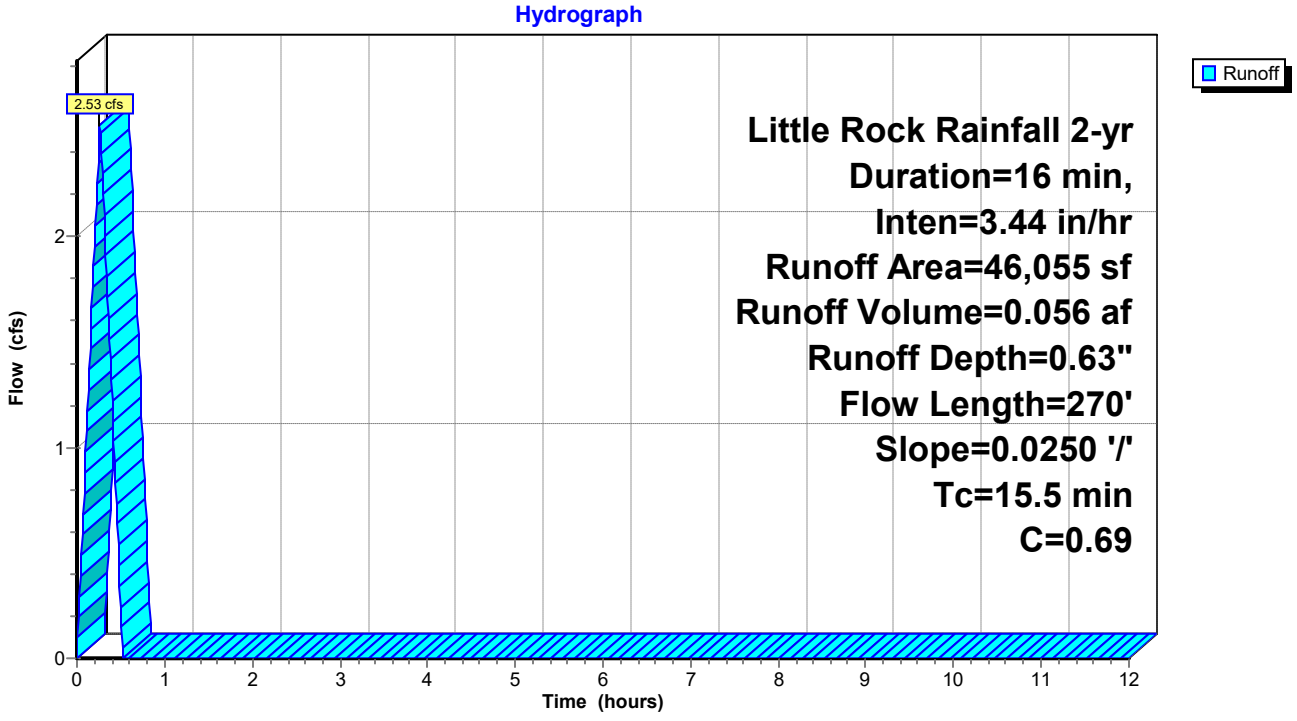
Runoff = 2.53 cfs @ 0.26 hrs, Volume= 0.056 af, Depth= 0.63"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-12.00 hrs, dt= 0.01 hrs
Little Rock Rainfall 2-yr Duration=16 min, Inten=3.44 in/hr

| Area (sf) | C | Description |
|---|---|---|
| 31,035 | 0.65 | GRAVEL PARKING |
| 15,020 | 0.77 | SHRUB POOR CONDITION BRUSH |
| 46,055 | 0.69 | Weighted Average |
| 46,055 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 15.5 | 270 | 0.0250 | 0.29 | | **Sheet Flow, SHEET FLOW SURFACE** Range n= 0.130 P2= 4.19" |

## Subcatchment 1S: PRE-DEVELOPMENT



## Hydrograph for Subcatchment 1S: PRE-DEVELOPMENT

| Time (hours) | Runoff (cfs) | Time (hours) | Runoff (cfs) | Time (hours) | Runoff (cfs) |
|---|---|---|---|---|---|
| 0.00 | 0.00 | 5.10 | 0.00 | 10.20 | 0.00 |
| 0.10 | 0.98 | 5.20 | 0.00 | 10.30 | 0.00 |
| 0.20 | **1.96** | 5.30 | 0.00 | 10.40 | 0.00 |
| 0.30 | **2.20** | 5.40 | 0.00 | 10.50 | 0.00 |
| 0.40 | 1.22 | 5.50 | 0.00 | 10.60 | 0.00 |
| 0.50 | 0.24 | 5.60 | 0.00 | 10.70 | 0.00 |
| 0.60 | 0.00 | 5.70 | 0.00 | 10.80 | 0.00 |
| 0.70 | 0.00 | 5.80 | 0.00 | 10.90 | 0.00 |
| 0.80 | 0.00 | 5.90 | 0.00 | 11.00 | 0.00 |
| 0.90 | 0.00 | 6.00 | 0.00 | 11.10 | 0.00 |
| 1.00 | 0.00 | 6.10 | 0.00 | 11.20 | 0.00 |
| 1.10 | 0.00 | 6.20 | 0.00 | 11.30 | 0.00 |
| 1.20 | 0.00 | 6.30 | 0.00 | 11.40 | 0.00 |
| 1.30 | 0.00 | 6.40 | 0.00 | 11.50 | 0.00 |
| 1.40 | 0.00 | 6.50 | 0.00 | 11.60 | 0.00 |
| 1.50 | 0.00 | 6.60 | 0.00 | 11.70 | 0.00 |
| 1.60 | 0.00 | 6.70 | 0.00 | 11.80 | 0.00 |
| 1.70 | 0.00 | 6.80 | 0.00 | 11.90 | 0.00 |
| 1.80 | 0.00 | 6.90 | 0.00 | 12.00 | 0.00 |
| 1.90 | 0.00 | 7.00 | 0.00 | | |
| 2.00 | 0.00 | 7.10 | 0.00 | | |
| 2.10 | 0.00 | 7.20 | 0.00 | | |
| 2.20 | 0.00 | 7.30 | 0.00 | | |
| 2.30 | 0.00 | 7.40 | 0.00 | | |
| 2.40 | 0.00 | 7.50 | 0.00 | | |
| 2.50 | 0.00 | 7.60 | 0.00 | | |
| 2.60 | 0.00 | 7.70 | 0.00 | | |
| 2.70 | 0.00 | 7.80 | 0.00 | | |
| 2.80 | 0.00 | 7.90 | 0.00 | | |
| 2.90 | 0.00 | 8.00 | 0.00 | | |
| 3.00 | 0.00 | 8.10 | 0.00 | | |
| 3.10 | 0.00 | 8.20 | 0.00 | | |
| 3.20 | 0.00 | 8.30 | 0.00 | | |
| 3.30 | 0.00 | 8.40 | 0.00 | | |
| 3.40 | 0.00 | 8.50 | 0.00 | | |
| 3.50 | 0.00 | 8.60 | 0.00 | | |
| 3.60 | 0.00 | 8.70 | 0.00 | | |
| 3.70 | 0.00 | 8.80 | 0.00 | | |
| 3.80 | 0.00 | 8.90 | 0.00 | | |
| 3.90 | 0.00 | 9.00 | 0.00 | | |
| 4.00 | 0.00 | 9.10 | 0.00 | | |
| 4.10 | 0.00 | 9.20 | 0.00 | | |
| 4.20 | 0.00 | 9.30 | 0.00 | | |
| 4.30 | 0.00 | 9.40 | 0.00 | | |
| 4.40 | 0.00 | 9.50 | 0.00 | | |
| 4.50 | 0.00 | 9.60 | 0.00 | | |
| 4.60 | 0.00 | 9.70 | 0.00 | | |
| 4.70 | 0.00 | 9.80 | 0.00 | | |
| 4.80 | 0.00 | 9.90 | 0.00 | | |
| 4.90 | 0.00 | 10.00 | 0.00 | | |
| 5.00 | 0.00 | 10.10 | 0.00 | | |

## Summary for Subcatchment 2S: POST-DEVELOPMENT

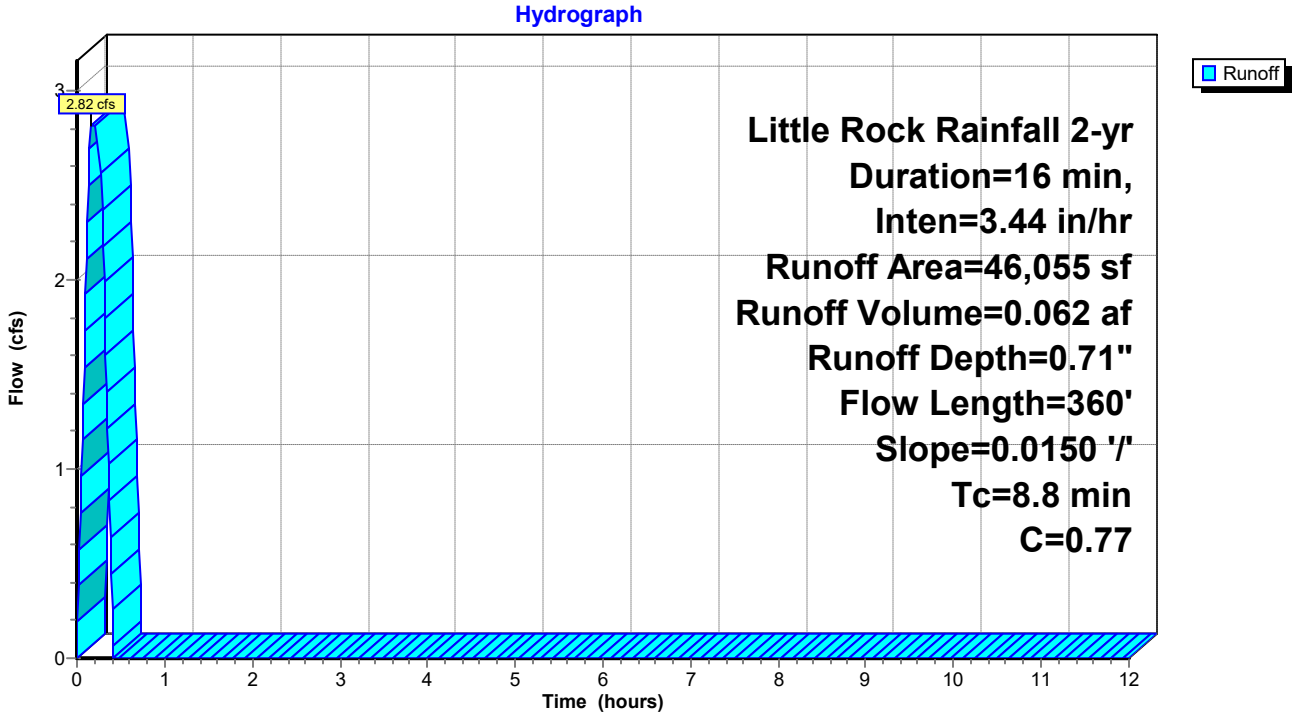
Runoff = 2.82 cfs @ 0.15 hrs, Volume= 0.062 af, Depth= 0.71"
Routed to Reach 4R : CURB CUT WIER

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-12.00 hrs, dt= 0.01 hrs
Little Rock Rainfall 2-yr Duration=16 min, Inten=3.44 in/hr

| Area (sf) | C | Description |
|---|---|---|
| 22,479 | 0.95 | ASPHALT SURFACE |
| 6,603 | 0.97 | ROOF TOP |
| 16,973 | 0.46 | GRASS LANDSCAPING |
| 46,055 | 0.77 | Weighted Average |
| 16,973 | | 36.85% Pervious Area |
| 29,082 | | 63.15% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.7 | 40 | 0.0150 | 0.10 | | **Sheet Flow, GRASS** Grass: Dense n= 0.240 P2= 4.19" |
| 2.1 | 320 | 0.0150 | 2.49 | | **Shallow Concentrated Flow, PAVEMENT** Paved Kv= 20.3 fps |
| 8.8 | 360 | Total | | | |

## Subcatchment 2S: POST-DEVELOPMENT



## Hydrograph for Subcatchment 2S: POST-DEVELOPMENT

| Time (hours) | Runoff (cfs) | Time (hours) | Runoff (cfs) | Time (hours) | Runoff (cfs) |
|---|---|---|---|---|---|
| 0.00 | 0.00 | 5.10 | 0.00 | 10.20 | 0.00 |
| 0.10 | **1.92** | 5.20 | 0.00 | 10.30 | 0.00 |
| 0.20 | **2.82** | 5.30 | 0.00 | 10.40 | 0.00 |
| 0.30 | 2.18 | 5.40 | 0.00 | 10.50 | 0.00 |
| 0.40 | 0.26 | 5.50 | 0.00 | 10.60 | 0.00 |
| 0.50 | 0.00 | 5.60 | 0.00 | 10.70 | 0.00 |
| 0.60 | 0.00 | 5.70 | 0.00 | 10.80 | 0.00 |
| 0.70 | 0.00 | 5.80 | 0.00 | 10.90 | 0.00 |
| 0.80 | 0.00 | 5.90 | 0.00 | 11.00 | 0.00 |
| 0.90 | 0.00 | 6.00 | 0.00 | 11.10 | 0.00 |
| 1.00 | 0.00 | 6.10 | 0.00 | 11.20 | 0.00 |
| 1.10 | 0.00 | 6.20 | 0.00 | 11.30 | 0.00 |
| 1.20 | 0.00 | 6.30 | 0.00 | 11.40 | 0.00 |
| 1.30 | 0.00 | 6.40 | 0.00 | 11.50 | 0.00 |
| 1.40 | 0.00 | 6.50 | 0.00 | 11.60 | 0.00 |
| 1.50 | 0.00 | 6.60 | 0.00 | 11.70 | 0.00 |
| 1.60 | 0.00 | 6.70 | 0.00 | 11.80 | 0.00 |
| 1.70 | 0.00 | 6.80 | 0.00 | 11.90 | 0.00 |
| 1.80 | 0.00 | 6.90 | 0.00 | 12.00 | 0.00 |
| 1.90 | 0.00 | 7.00 | 0.00 | | |
| 2.00 | 0.00 | 7.10 | 0.00 | | |
| 2.10 | 0.00 | 7.20 | 0.00 | | |
| 2.20 | 0.00 | 7.30 | 0.00 | | |
| 2.30 | 0.00 | 7.40 | 0.00 | | |
| 2.40 | 0.00 | 7.50 | 0.00 | | |
| 2.50 | 0.00 | 7.60 | 0.00 | | |
| 2.60 | 0.00 | 7.70 | 0.00 | | |
| 2.70 | 0.00 | 7.80 | 0.00 | | |
| 2.80 | 0.00 | 7.90 | 0.00 | | |
| 2.90 | 0.00 | 8.00 | 0.00 | | |
| 3.00 | 0.00 | 8.10 | 0.00 | | |
| 3.10 | 0.00 | 8.20 | 0.00 | | |
| 3.20 | 0.00 | 8.30 | 0.00 | | |
| 3.30 | 0.00 | 8.40 | 0.00 | | |
| 3.40 | 0.00 | 8.50 | 0.00 | | |
| 3.50 | 0.00 | 8.60 | 0.00 | | |
| 3.60 | 0.00 | 8.70 | 0.00 | | |
| 3.70 | 0.00 | 8.80 | 0.00 | | |
| 3.80 | 0.00 | 8.90 | 0.00 | | |
| 3.90 | 0.00 | 9.00 | 0.00 | | |
| 4.00 | 0.00 | 9.10 | 0.00 | | |
| 4.10 | 0.00 | 9.20 | 0.00 | | |
| 4.20 | 0.00 | 9.30 | 0.00 | | |
| 4.30 | 0.00 | 9.40 | 0.00 | | |
| 4.40 | 0.00 | 9.50 | 0.00 | | |
| 4.50 | 0.00 | 9.60 | 0.00 | | |
| 4.60 | 0.00 | 9.70 | 0.00 | | |
| 4.70 | 0.00 | 9.80 | 0.00 | | |
| 4.80 | 0.00 | 9.90 | 0.00 | | |
| 4.90 | 0.00 | 10.00 | 0.00 | | |
| 5.00 | 0.00 | 10.10 | 0.00 | | |

## Summary for Reach 4R: CURB CUT WIER

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 1.057 ac, 63.15% Impervious, Inflow Depth = 0.71" for 2-yr event
Inflow = 2.82 cfs @ 0.15 hrs, Volume= 0.062 af
Outflow = 2.83 cfs @ 0.16 hrs, Volume= 0.062 af, Atten= 0%, Lag= 0.6 min
Routed to Pond 3P : DETENTION POND

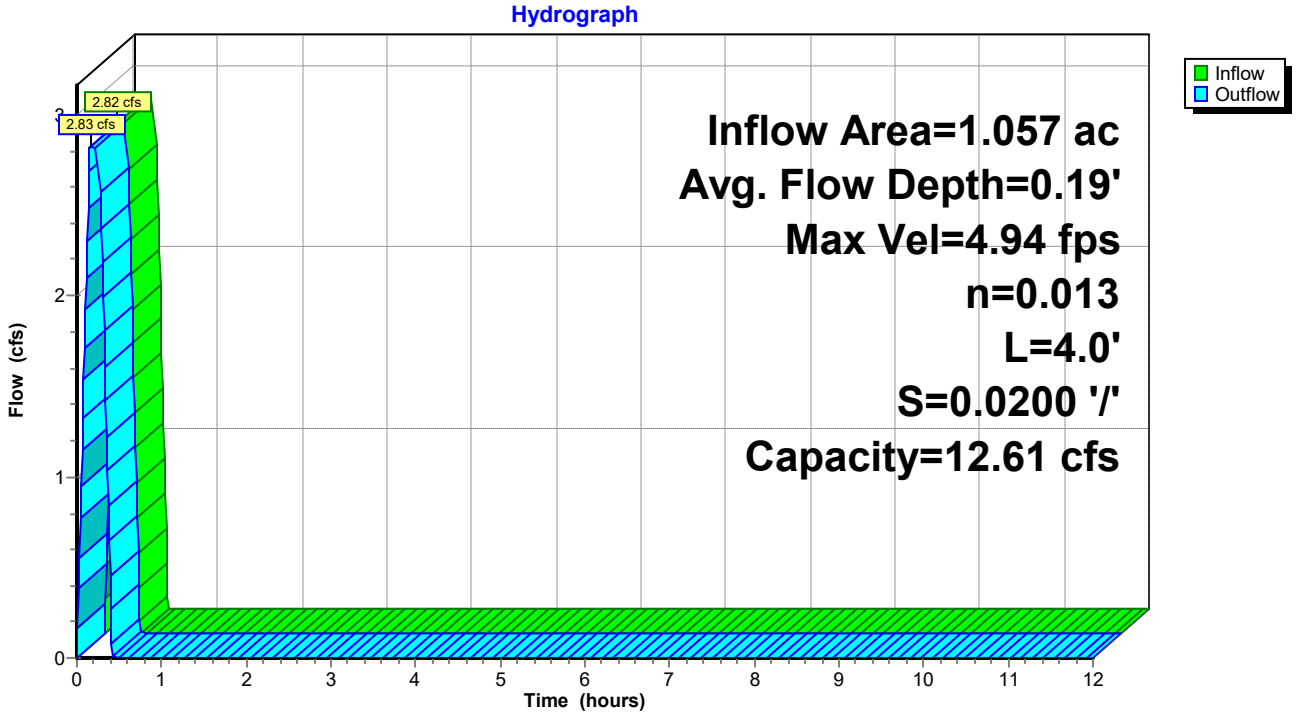
Routing by Stor-Ind+Trans method, Time Span= 0.00-12.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.94 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.92 fps, Avg. Travel Time= 0.0 min

Peak Storage= 2 cf @ 0.16 hrs
Average Depth at Peak Storage= 0.19' , Surface Width= 3.00'
Bank-Full Depth= 0.50' Flow Area= 1.5 sf, Capacity= 12.61 cfs

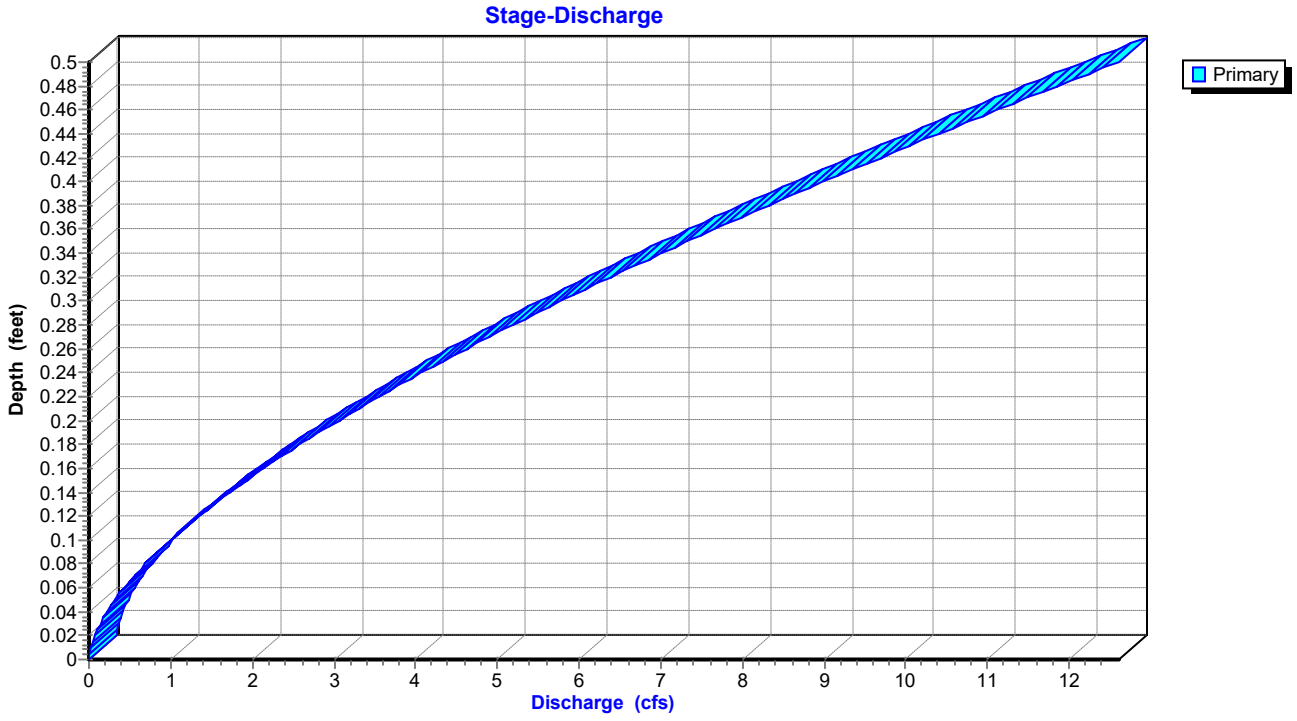
3.00' x 0.50' deep channel, n= 0.013 Concrete, trowel finish
Length= 4.0' Slope= 0.0200 '/'
Inlet Invert= 387.25', Outlet Invert= 387.17'



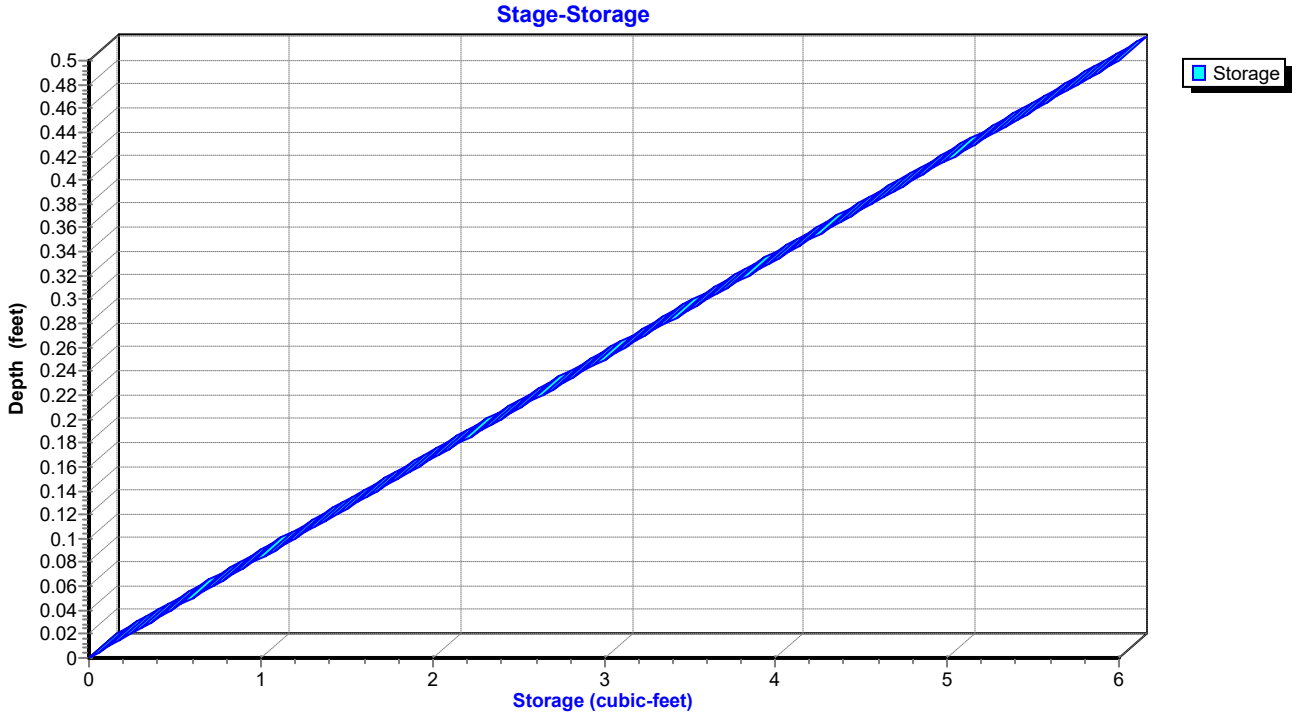
## Reach 4R: CURB CUT WIER




## Reach 4R: CURB CUT WIER



## Reach 4R: CURB CUT WIER



## Hydrograph for Reach 4R: CURB CUT WIER

| Time (hours) | Inflow (cfs) | Storage (cubic-feet) | Elevation (feet) | Outflow (cfs) |
|---|---|---|---|---|
| 0.00 | **0.00** | **0** | **387.25** | **0.00** |
| 0.50 | **0.00** | **0** | **387.25** | **0.00** |
| 1.00 | 0.00 | 0 | 387.25 | 0.00 |
| 1.50 | 0.00 | 0 | 387.25 | 0.00 |
| 2.00 | 0.00 | 0 | 387.25 | 0.00 |
| 2.50 | 0.00 | 0 | 387.25 | 0.00 |
| 3.00 | 0.00 | 0 | 387.25 | 0.00 |
| 3.50 | 0.00 | 0 | 387.25 | 0.00 |
| 4.00 | 0.00 | 0 | 387.25 | 0.00 |
| 4.50 | 0.00 | 0 | 387.25 | 0.00 |
| 5.00 | 0.00 | 0 | 387.25 | 0.00 |
| 5.50 | 0.00 | 0 | 387.25 | 0.00 |
| 6.00 | 0.00 | 0 | 387.25 | 0.00 |
| 6.50 | 0.00 | 0 | 387.25 | 0.00 |
| 7.00 | 0.00 | 0 | 387.25 | 0.00 |
| 7.50 | 0.00 | 0 | 387.25 | 0.00 |
| 8.00 | 0.00 | 0 | 387.25 | 0.00 |
| 8.50 | 0.00 | 0 | 387.25 | 0.00 |
| 9.00 | 0.00 | 0 | 387.25 | 0.00 |
| 9.50 | 0.00 | 0 | 387.25 | 0.00 |
| 10.00 | 0.00 | 0 | 387.25 | 0.00 |
| 10.50 | 0.00 | 0 | 387.25 | 0.00 |
| 11.00 | 0.00 | 0 | 387.25 | 0.00 |
| 11.50 | 0.00 | 0 | 387.25 | 0.00 |
| 12.00 | 0.00 | 0 | 387.25 | 0.00 |

## Stage-Discharge for Reach 4R: CURB CUT WIER

| Elevation (feet) | Velocity (ft/sec) | Discharge (cfs) |
|---|---|---|
| 387.25 | 0.00 | 0.00 |
| 387.26 | 0.75 | 0.02 |
| 387.27 | 1.18 | 0.07 |
| 387.28 | 1.54 | 0.14 |
| 387.29 | 1.86 | 0.22 |
| 387.30 | 2.15 | 0.32 |
| 387.31 | 2.41 | 0.43 |
| 387.32 | 2.66 | 0.56 |
| 387.33 | 2.90 | 0.70 |
| 387.34 | 3.12 | 0.84 |
| 387.35 | 3.34 | 1.00 |
| 387.36 | 3.54 | 1.17 |
| 387.37 | 3.74 | 1.35 |
| 387.38 | 3.92 | 1.53 |
| 387.39 | 4.11 | 1.72 |
| 387.40 | 4.28 | 1.93 |
| 387.41 | 4.45 | 2.14 |
| 387.42 | 4.62 | 2.36 |
| 387.43 | 4.78 | 2.58 |
| 387.44 | 4.93 | 2.81 |
| 387.45 | 5.09 | 3.05 |
| 387.46 | 5.23 | 3.30 |
| 387.47 | 5.38 | 3.55 |
| 387.48 | 5.52 | 3.81 |
| 387.49 | 5.65 | 4.07 |
| 387.50 | 5.79 | 4.34 |
| 387.51 | 5.92 | 4.62 |
| 387.52 | 6.05 | 4.90 |
| 387.53 | 6.17 | 5.19 |
| 387.54 | 6.30 | 5.48 |
| 387.55 | 6.42 | 5.77 |
| 387.56 | 6.53 | 6.08 |
| 387.57 | 6.65 | 6.38 |
| 387.58 | 6.76 | 6.69 |
| 387.59 | 6.87 | 7.01 |
| 387.60 | 6.98 | 7.33 |
| 387.61 | 7.09 | 7.65 |
| 387.62 | 7.19 | 7.98 |
| 387.63 | 7.30 | 8.32 |
| 387.64 | 7.40 | 8.65 |
| 387.65 | 7.50 | 9.00 |
| 387.66 | 7.59 | 9.34 |
| 387.67 | 7.69 | 9.69 |
| 387.68 | 7.79 | 10.04 |
| 387.69 | 7.88 | 10.40 |
| 387.70 | 7.97 | 10.76 |
| 387.71 | 8.06 | 11.12 |
| 387.72 | 8.15 | 11.49 |
| 387.73 | 8.24 | 11.86 |
| 387.74 | 8.32 | 12.23 |
| 387.75 | **8.41** | **12.61** |

## Stage-Area-Storage for Reach 4R: CURB CUT WIER

| Elevation (feet) | End-Area (sq-ft) | Storage (cubic-feet) |
|---|---|---|
| 387.25 | 0.0 | 0 |
| 387.26 | 0.0 | 0 |
| 387.27 | 0.1 | 0 |
| 387.28 | 0.1 | 0 |
| 387.29 | 0.1 | 0 |
| 387.30 | 0.2 | 1 |
| 387.31 | 0.2 | 1 |
| 387.32 | 0.2 | 1 |
| 387.33 | 0.2 | 1 |
| 387.34 | 0.3 | 1 |
| 387.35 | 0.3 | 1 |
| 387.36 | 0.3 | 1 |
| 387.37 | 0.4 | 1 |
| 387.38 | 0.4 | 2 |
| 387.39 | 0.4 | 2 |
| 387.40 | 0.4 | 2 |
| 387.41 | 0.5 | 2 |
| 387.42 | 0.5 | 2 |
| 387.43 | 0.5 | 2 |
| 387.44 | 0.6 | 2 |
| 387.45 | 0.6 | 2 |
| 387.46 | 0.6 | 3 |
| 387.47 | 0.7 | 3 |
| 387.48 | 0.7 | 3 |
| 387.49 | 0.7 | 3 |
| 387.50 | 0.8 | 3 |
| 387.51 | 0.8 | 3 |
| 387.52 | 0.8 | 3 |
| 387.53 | 0.8 | 3 |
| 387.54 | 0.9 | 3 |
| 387.55 | 0.9 | 4 |
| 387.56 | 0.9 | 4 |
| 387.57 | 1.0 | 4 |
| 387.58 | 1.0 | 4 |
| 387.59 | 1.0 | 4 |
| 387.60 | 1.1 | 4 |
| 387.61 | 1.1 | 4 |
| 387.62 | 1.1 | 4 |
| 387.63 | 1.1 | 5 |
| 387.64 | 1.2 | 5 |
| 387.65 | 1.2 | 5 |
| 387.66 | 1.2 | 5 |
| 387.67 | 1.3 | 5 |
| 387.68 | 1.3 | 5 |
| 387.69 | 1.3 | 5 |
| 387.70 | 1.4 | 5 |
| 387.71 | 1.4 | 6 |
| 387.72 | 1.4 | 6 |
| 387.73 | 1.4 | 6 |
| 387.74 | 1.5 | 6 |
| 387.75 | **1.5** | **6** |

## Summary for Pond 3P: DETENTION POND

Inflow Area = 1.057 ac, 63.15% Impervious, Inflow Depth = 0.71" for 2-yr event
Inflow = 2.83 cfs @ 0.16 hrs, Volume= 0.062 af
Outflow = 2.26 cfs @ 0.30 hrs, Volume= 0.062 af, Atten= 20%, Lag= 8.2 min
Primary = 2.26 cfs @ 0.30 hrs, Volume= 0.062 af

Routing by Stor-Ind method, Time Span= 0.00-12.00 hrs, dt= 0.01 hrs
Peak Elev= 385.57' @ 0.30 hrs Surf.Area= 1,150 sf Storage= 1,038 cf

Plug-Flow detention time= 10.9 min calculated for 0.062 af (100% of inflow)
Center-of-Mass det. time= 10.8 min ( 23.3 - 12.4 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 384.50' | 2,986 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

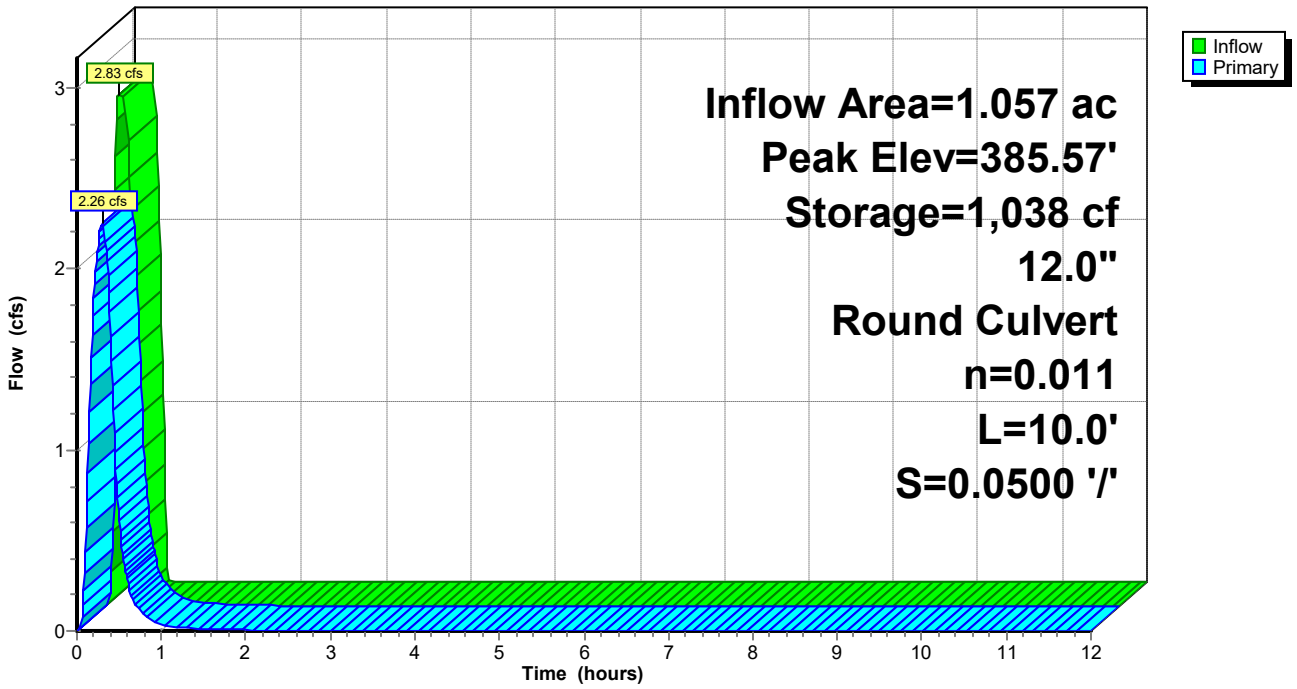
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 384.50 | 724 | 0 | 0 |
| 385.00 | 986 | 428 | 428 |
| 386.00 | 1,273 | 1,130 | 1,557 |
| 387.00 | 1,585 | 1,429 | 2,986 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 384.50' | **12.0" Round 12" RCP**<br>L= 10.0' CMP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 384.50' / 384.00' S= 0.0500 '/' Cc= 0.900<br>n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf |

**Primary OutFlow** Max=2.26 cfs @ 0.30 hrs HW=385.57' (Free Discharge)
↑**1=12" RCP** (Inlet Controls 2.26 cfs @ 2.87 fps)

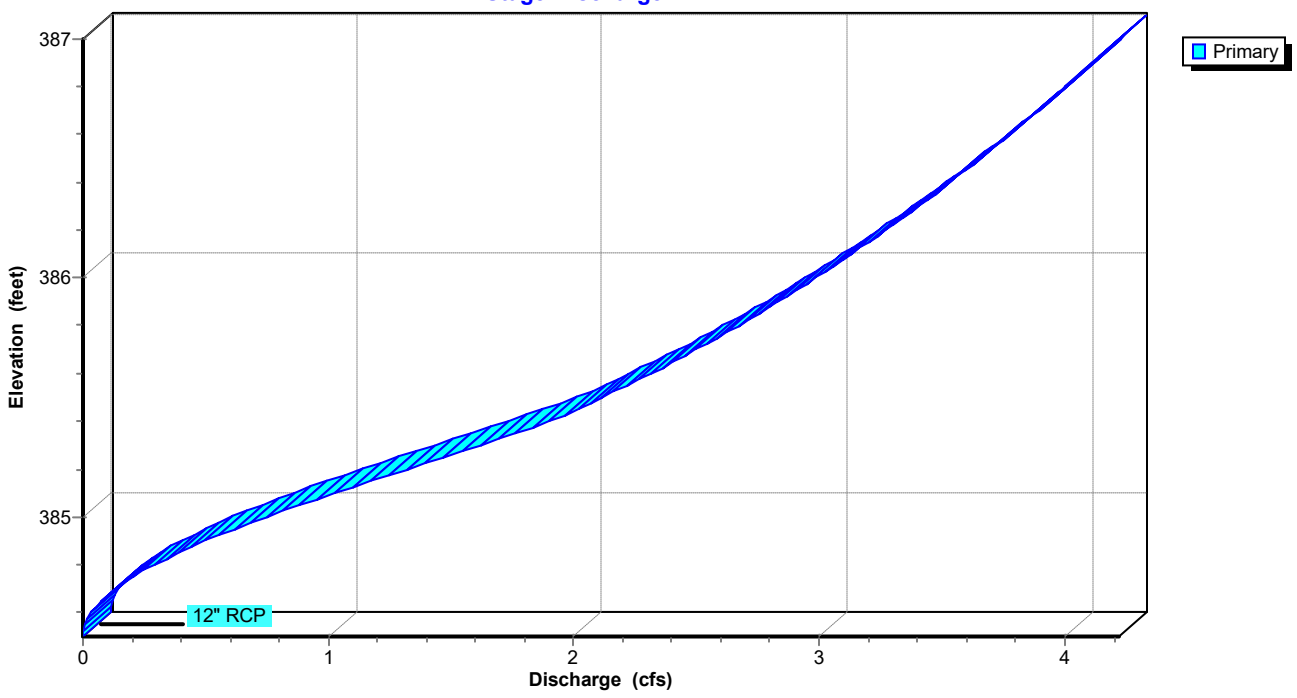
## Pond 3P: DETENTION POND

Hydrograph

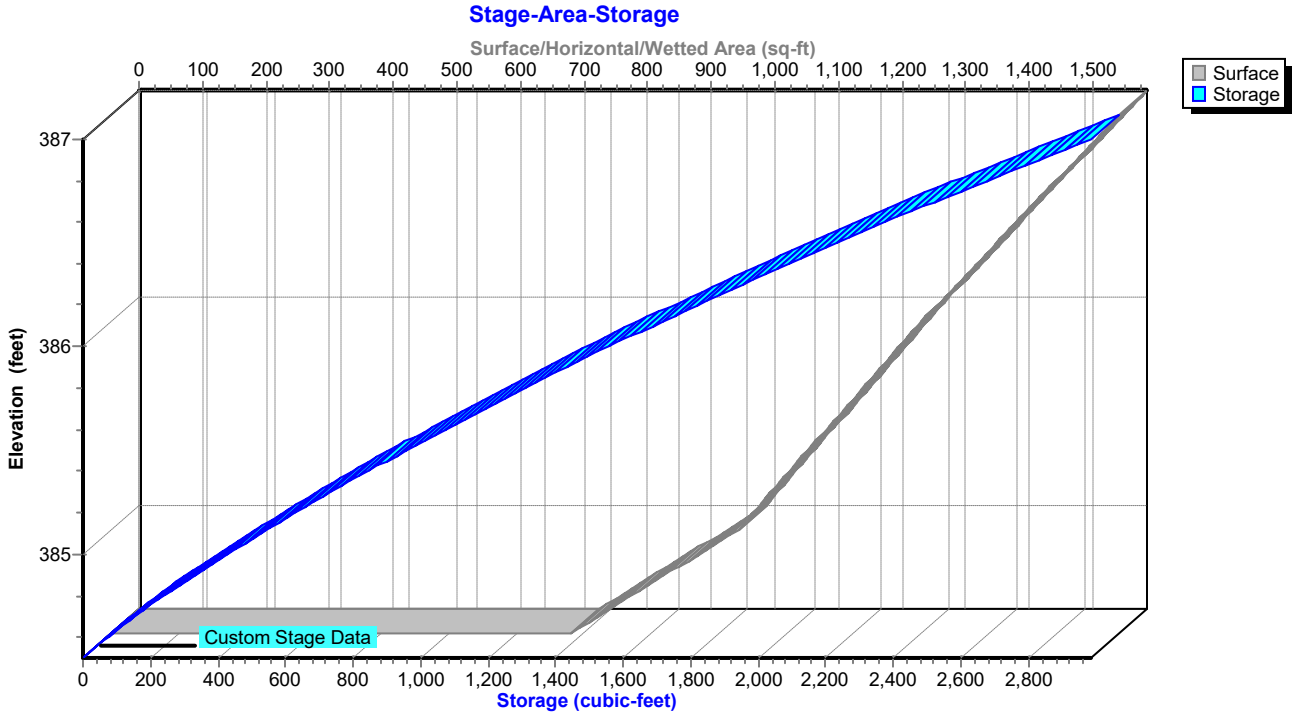



## Pond 3P: DETENTION POND

Stage-Discharge



## Pond 3P: DETENTION POND



## Hydrograph for Pond 3P: DETENTION POND

| Time (hours) | Inflow (cfs) | Storage (cubic-feet) | Elevation (feet) | Primary (cfs) |
|---|---|---|---|---|
| 0.00 | **0.00** | **0** | **384.50** | **0.00** |
| 0.50 | **0.00** | **375** | **384.95** | **0.61** |
| 1.00 | 0.00 | 79 | 384.60 | 0.04 |
| 1.50 | 0.00 | 41 | 384.56 | 0.01 |
| 2.00 | 0.00 | 27 | 384.54 | 0.01 |
| 2.50 | 0.00 | 20 | 384.53 | 0.00 |
| 3.00 | 0.00 | 16 | 384.52 | 0.00 |
| 3.50 | 0.00 | 13 | 384.52 | 0.00 |
| 4.00 | 0.00 | 10 | 384.51 | 0.00 |
| 4.50 | 0.00 | 8 | 384.51 | 0.00 |
| 5.00 | 0.00 | 7 | 384.51 | 0.00 |
| 5.50 | 0.00 | 5 | 384.51 | 0.00 |
| 6.00 | 0.00 | 4 | 384.51 | 0.00 |
| 6.50 | 0.00 | 3 | 384.50 | 0.00 |
| 7.00 | 0.00 | 3 | 384.50 | 0.00 |
| 7.50 | 0.00 | 2 | 384.50 | 0.00 |
| 8.00 | 0.00 | 2 | 384.50 | 0.00 |
| 8.50 | 0.00 | 1 | 384.50 | 0.00 |
| 9.00 | 0.00 | 1 | 384.50 | 0.00 |
| 9.50 | 0.00 | 1 | 384.50 | 0.00 |
| 10.00 | 0.00 | 1 | 384.50 | 0.00 |
| 10.50 | 0.00 | 1 | 384.50 | 0.00 |
| 11.00 | 0.00 | 0 | 384.50 | 0.00 |
| 11.50 | 0.00 | 0 | 384.50 | 0.00 |
| 12.00 | 0.00 | 0 | 384.50 | 0.00 |

## Stage-Discharge for Pond 3P: DETENTION POND

| Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) |
|---|---|---|---|---|---|
| 384.50 | 0.00 | 385.52 | 2.15 | 386.54 | 3.70 |
| 384.52 | 0.00 | 385.54 | 2.19 | 386.56 | 3.73 |
| 384.54 | 0.01 | 385.56 | 2.23 | 386.58 | 3.75 |
| 384.56 | 0.01 | 385.58 | 2.27 | 386.60 | 3.78 |
| 384.58 | 0.02 | 385.60 | 2.31 | 386.62 | 3.80 |
| 384.60 | 0.03 | 385.62 | 2.35 | 386.64 | 3.82 |
| 384.62 | 0.05 | 385.64 | 2.39 | 386.66 | 3.85 |
| 384.64 | 0.07 | 385.66 | 2.43 | 386.68 | 3.87 |
| 384.66 | 0.09 | 385.68 | 2.46 | 386.70 | 3.89 |
| 384.68 | 0.11 | 385.70 | 2.50 | 386.72 | 3.92 |
| 384.70 | 0.13 | 385.72 | 2.53 | 386.74 | 3.94 |
| 384.72 | 0.16 | 385.74 | 2.57 | 386.76 | 3.96 |
| 384.74 | 0.19 | 385.76 | 2.60 | 386.78 | 3.98 |
| 384.76 | 0.22 | 385.78 | 2.64 | 386.80 | 4.01 |
| 384.78 | 0.26 | 385.80 | 2.67 | 386.82 | 4.03 |
| 384.80 | 0.29 | 385.82 | 2.70 | 386.84 | 4.05 |
| 384.82 | 0.33 | 385.84 | 2.74 | 386.86 | 4.07 |
| 384.84 | 0.37 | 385.86 | 2.77 | 386.88 | 4.09 |
| 384.86 | 0.41 | 385.88 | 2.80 | 386.90 | 4.12 |
| 384.88 | 0.45 | 385.90 | 2.83 | 386.92 | 4.14 |
| 384.90 | 0.50 | 385.92 | 2.86 | 386.94 | 4.16 |
| 384.92 | 0.55 | 385.94 | 2.89 | 386.96 | 4.18 |
| 384.94 | 0.59 | 385.96 | 2.93 | 386.98 | 4.20 |
| 384.96 | 0.64 | 385.98 | 2.96 | 387.00 | **4.22** |
| 384.98 | 0.69 | 386.00 | 2.99 | | |
| 385.00 | 0.75 | 386.02 | 3.02 | | |
| 385.02 | 0.80 | 386.04 | 3.04 | | |
| 385.04 | 0.85 | 386.06 | 3.07 | | |
| 385.06 | 0.91 | 386.08 | 3.10 | | |
| 385.08 | 0.97 | 386.10 | 3.13 | | |
| 385.10 | 1.02 | 386.12 | 3.16 | | |
| 385.12 | 1.08 | 386.14 | 3.19 | | |
| 385.14 | 1.14 | 386.16 | 3.22 | | |
| 385.16 | 1.20 | 386.18 | 3.24 | | |
| 385.18 | 1.26 | 386.20 | 3.27 | | |
| 385.20 | 1.32 | 386.22 | 3.30 | | |
| 385.22 | 1.38 | 386.24 | 3.32 | | |
| 385.24 | 1.44 | 386.26 | 3.35 | | |
| 385.26 | 1.50 | 386.28 | 3.38 | | |
| 385.28 | 1.56 | 386.30 | 3.40 | | |
| 385.30 | 1.62 | 386.32 | 3.43 | | |
| 385.32 | 1.68 | 386.34 | 3.46 | | |
| 385.34 | 1.74 | 386.36 | 3.48 | | |
| 385.36 | 1.79 | 386.38 | 3.51 | | |
| 385.38 | 1.85 | 386.40 | 3.53 | | |
| 385.40 | 1.90 | 386.42 | 3.56 | | |
| 385.42 | 1.95 | 386.44 | 3.58 | | |
| 385.44 | 2.00 | 386.46 | 3.61 | | |
| 385.46 | 2.04 | 386.48 | 3.63 | | |
| 385.48 | 2.08 | 386.50 | 3.66 | | |
| 385.50 | 2.11 | 386.52 | 3.68 | | |

## Stage-Area-Storage for Pond 3P: DETENTION POND

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---|---|---|
| 384.50 | 724 | 0 |
| 384.55 | 750 | 37 |
| 384.60 | 776 | 75 |
| 384.65 | 803 | 114 |
| 384.70 | 829 | 155 |
| 384.75 | 855 | 197 |
| 384.80 | 881 | 241 |
| 384.85 | 907 | 285 |
| 384.90 | 934 | 332 |
| 384.95 | 960 | 379 |
| 385.00 | 986 | 428 |
| 385.05 | 1,000 | 477 |
| 385.10 | 1,015 | 528 |
| 385.15 | 1,029 | 579 |
| 385.20 | 1,043 | 630 |
| 385.25 | 1,058 | 683 |
| 385.30 | 1,072 | 736 |
| 385.35 | 1,086 | 790 |
| 385.40 | 1,101 | 845 |
| 385.45 | 1,115 | 900 |
| 385.50 | 1,130 | 956 |
| 385.55 | 1,144 | 1,013 |
| 385.60 | 1,158 | 1,071 |
| 385.65 | 1,173 | 1,129 |
| 385.70 | 1,187 | 1,188 |
| 385.75 | 1,201 | 1,248 |
| 385.80 | 1,216 | 1,308 |
| 385.85 | 1,230 | 1,369 |
| 385.90 | 1,244 | 1,431 |
| 385.95 | 1,259 | 1,494 |
| 386.00 | 1,273 | 1,557 |
| 386.05 | 1,289 | 1,621 |
| 386.10 | 1,304 | 1,686 |
| 386.15 | 1,320 | 1,751 |
| 386.20 | 1,335 | 1,818 |
| 386.25 | 1,351 | 1,885 |
| 386.30 | 1,367 | 1,953 |
| 386.35 | 1,382 | 2,022 |
| 386.40 | 1,398 | 2,091 |
| 386.45 | 1,413 | 2,161 |
| 386.50 | 1,429 | 2,233 |
| 386.55 | 1,445 | 2,304 |
| 386.60 | 1,460 | 2,377 |
| 386.65 | 1,476 | 2,450 |
| 386.70 | 1,491 | 2,525 |
| 386.75 | 1,507 | 2,600 |
| 386.80 | 1,523 | 2,675 |
| 386.85 | 1,538 | 2,752 |
| 386.90 | 1,554 | 2,829 |
| 386.95 | 1,569 | 2,907 |
| 387.00 | **1,585** | **2,986** |

Time span=0.00-12.00 hrs, dt=0.01 hrs, 1201 points
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: PRE-DEVELOPMENT** Runoff Area=46,055 sf 0.00% Impervious Runoff Depth=0.75"
Flow Length=270' Slope=0.0250 '/' Tc=15.5 min C=0.69 Runoff=3.01 cfs 0.066 af

**Subcatchment 2S: POST-DEVELOPMENT** Runoff Area=46,055 sf 63.15% Impervious Runoff Depth=0.84"
Flow Length=360' Slope=0.0150 '/' Tc=8.8 min C=0.77 Runoff=3.36 cfs 0.074 af

**Reach 4R: CURB CUT WIER** Avg. Flow Depth=0.21' Max Vel=5.27 fps Inflow=3.36 cfs 0.074 af
n=0.013 L=4.0' S=0.0200 '/' Capacity=12.61 cfs Outflow=3.36 cfs 0.074 af

**Pond 3P: DETENTION POND** Peak Elev=385.75' Storage=1,253 cf Inflow=3.36 cfs 0.074 af
12.0" Round Culvert n=0.011 L=10.0' S=0.0500 '/' Outflow=2.59 cfs 0.074 af

**Total Runoff Area = 2.115 ac Runoff Volume = 0.140 af Average Runoff Depth = 0.80"**
**68.43% Pervious = 1.447 ac 31.57% Impervious = 0.668 ac**

## Summary for Subcatchment 1S: PRE-DEVELOPMENT

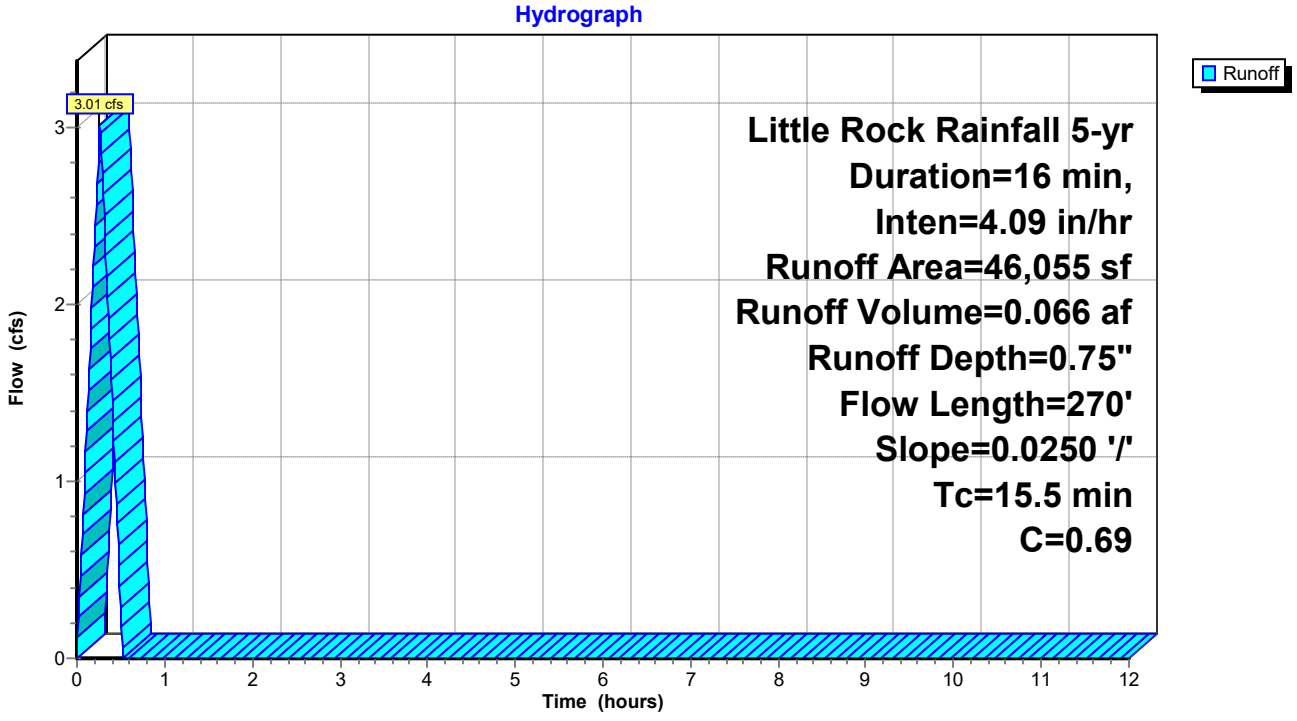
Runoff = 3.01 cfs @ 0.26 hrs, Volume= 0.066 af, Depth= 0.75"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-12.00 hrs, dt= 0.01 hrs
Little Rock Rainfall 5-yr Duration=16 min, Inten=4.09 in/hr

| Area (sf) | C | Description |
|---|---|---|
| 31,035 | 0.65 | GRAVEL PARKING |
| 15,020 | 0.77 | SHRUB POOR CONDITION BRUSH |
| 46,055 | 0.69 | Weighted Average |
| 46,055 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 15.5 | 270 | 0.0250 | 0.29 | | **Sheet Flow, SHEET FLOW SURFACE** Range n= 0.130 P2= 4.19" |

## Subcatchment 1S: PRE-DEVELOPMENT



## Hydrograph for Subcatchment 1S: PRE-DEVELOPMENT

| Time (hours) | Runoff (cfs) | Time (hours) | Runoff (cfs) | Time (hours) | Runoff (cfs) |
|---|---|---|---|---|---|
| 0.00 | 0.00 | 5.10 | 0.00 | 10.20 | 0.00 |
| 0.10 | 1.16 | 5.20 | 0.00 | 10.30 | 0.00 |
| 0.20 | **2.33** | 5.30 | 0.00 | 10.40 | 0.00 |
| 0.30 | **2.62** | 5.40 | 0.00 | 10.50 | 0.00 |
| 0.40 | 1.46 | 5.50 | 0.00 | 10.60 | 0.00 |
| 0.50 | 0.29 | 5.60 | 0.00 | 10.70 | 0.00 |
| 0.60 | 0.00 | 5.70 | 0.00 | 10.80 | 0.00 |
| 0.70 | 0.00 | 5.80 | 0.00 | 10.90 | 0.00 |
| 0.80 | 0.00 | 5.90 | 0.00 | 11.00 | 0.00 |
| 0.90 | 0.00 | 6.00 | 0.00 | 11.10 | 0.00 |
| 1.00 | 0.00 | 6.10 | 0.00 | 11.20 | 0.00 |
| 1.10 | 0.00 | 6.20 | 0.00 | 11.30 | 0.00 |
| 1.20 | 0.00 | 6.30 | 0.00 | 11.40 | 0.00 |
| 1.30 | 0.00 | 6.40 | 0.00 | 11.50 | 0.00 |
| 1.40 | 0.00 | 6.50 | 0.00 | 11.60 | 0.00 |
| 1.50 | 0.00 | 6.60 | 0.00 | 11.70 | 0.00 |
| 1.60 | 0.00 | 6.70 | 0.00 | 11.80 | 0.00 |
| 1.70 | 0.00 | 6.80 | 0.00 | 11.90 | 0.00 |
| 1.80 | 0.00 | 6.90 | 0.00 | 12.00 | 0.00 |
| 1.90 | 0.00 | 7.00 | 0.00 | | |
| 2.00 | 0.00 | 7.10 | 0.00 | | |
| 2.10 | 0.00 | 7.20 | 0.00 | | |
| 2.20 | 0.00 | 7.30 | 0.00 | | |
| 2.30 | 0.00 | 7.40 | 0.00 | | |
| 2.40 | 0.00 | 7.50 | 0.00 | | |
| 2.50 | 0.00 | 7.60 | 0.00 | | |
| 2.60 | 0.00 | 7.70 | 0.00 | | |
| 2.70 | 0.00 | 7.80 | 0.00 | | |
| 2.80 | 0.00 | 7.90 | 0.00 | | |
| 2.90 | 0.00 | 8.00 | 0.00 | | |
| 3.00 | 0.00 | 8.10 | 0.00 | | |
| 3.10 | 0.00 | 8.20 | 0.00 | | |
| 3.20 | 0.00 | 8.30 | 0.00 | | |
| 3.30 | 0.00 | 8.40 | 0.00 | | |
| 3.40 | 0.00 | 8.50 | 0.00 | | |
| 3.50 | 0.00 | 8.60 | 0.00 | | |
| 3.60 | 0.00 | 8.70 | 0.00 | | |
| 3.70 | 0.00 | 8.80 | 0.00 | | |
| 3.80 | 0.00 | 8.90 | 0.00 | | |
| 3.90 | 0.00 | 9.00 | 0.00 | | |
| 4.00 | 0.00 | 9.10 | 0.00 | | |
| 4.10 | 0.00 | 9.20 | 0.00 | | |
| 4.20 | 0.00 | 9.30 | 0.00 | | |
| 4.30 | 0.00 | 9.40 | 0.00 | | |
| 4.40 | 0.00 | 9.50 | 0.00 | | |
| 4.50 | 0.00 | 9.60 | 0.00 | | |
| 4.60 | 0.00 | 9.70 | 0.00 | | |
| 4.70 | 0.00 | 9.80 | 0.00 | | |
| 4.80 | 0.00 | 9.90 | 0.00 | | |
| 4.90 | 0.00 | 10.00 | 0.00 | | |
| 5.00 | 0.00 | 10.10 | 0.00 | | |

## Summary for Subcatchment 2S: POST-DEVELOPMENT

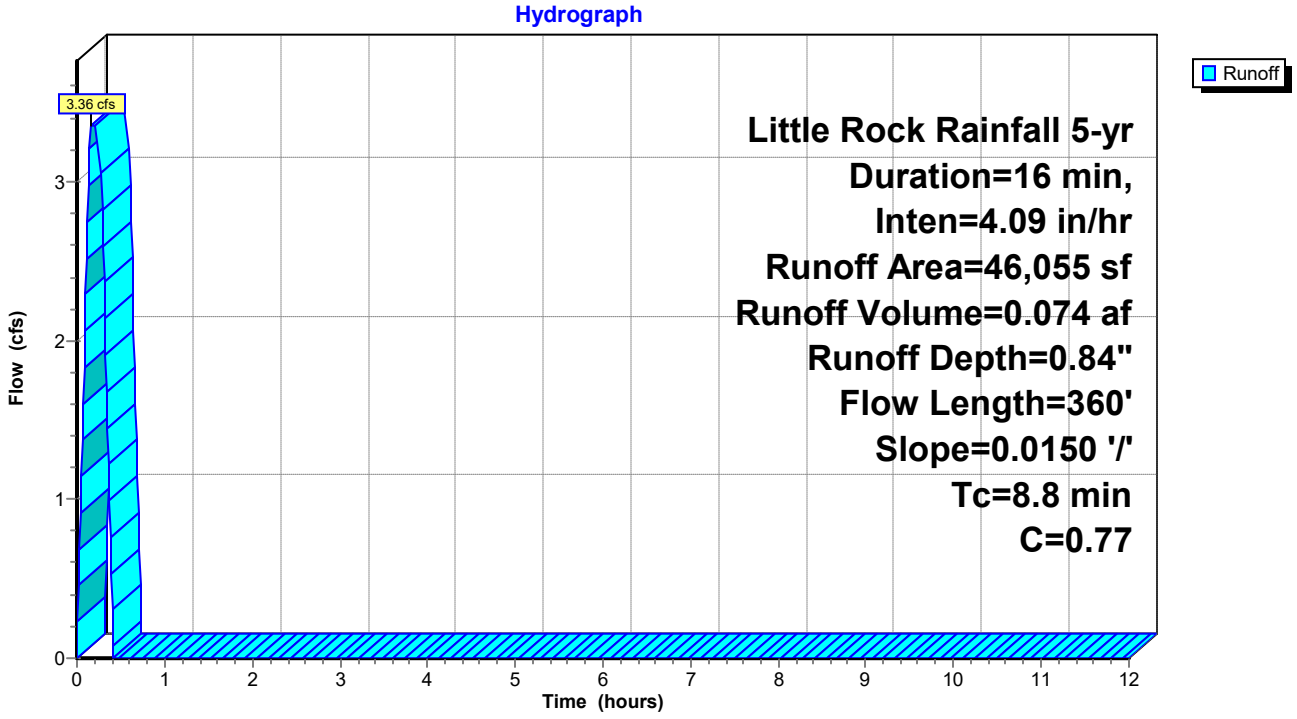
Runoff = 3.36 cfs @ 0.15 hrs, Volume= 0.074 af, Depth= 0.84"
Routed to Reach 4R : CURB CUT WIER

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-12.00 hrs, dt= 0.01 hrs
Little Rock Rainfall 5-yr Duration=16 min, Inten=4.09 in/hr

| Area (sf) | C | Description |
|---|---|---|
| 22,479 | 0.95 | ASPHALT SURFACE |
| 6,603 | 0.97 | ROOF TOP |
| 16,973 | 0.46 | GRASS LANDSCAPING |
| 46,055 | 0.77 | Weighted Average |
| 16,973 | | 36.85% Pervious Area |
| 29,082 | | 63.15% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.7 | 40 | 0.0150 | 0.10 | | **Sheet Flow, GRASS** Grass: Dense n= 0.240 P2= 4.19" |
| 2.1 | 320 | 0.0150 | 2.49 | | **Shallow Concentrated Flow, PAVEMENT** Paved Kv= 20.3 fps |
| 8.8 | 360 | Total | | | |

## Subcatchment 2S: POST-DEVELOPMENT



## Hydrograph for Subcatchment 2S: POST-DEVELOPMENT

| Time (hours) | Runoff (cfs) | Time (hours) | Runoff (cfs) | Time (hours) | Runoff (cfs) |
|---|---|---|---|---|---|
| 0.00 | 0.00 | 5.10 | 0.00 | 10.20 | 0.00 |
| 0.10 | **2.29** | 5.20 | 0.00 | 10.30 | 0.00 |
| 0.20 | **3.36** | 5.30 | 0.00 | 10.40 | 0.00 |
| 0.30 | 2.59 | 5.40 | 0.00 | 10.50 | 0.00 |
| 0.40 | 0.31 | 5.50 | 0.00 | 10.60 | 0.00 |
| 0.50 | 0.00 | 5.60 | 0.00 | 10.70 | 0.00 |
| 0.60 | 0.00 | 5.70 | 0.00 | 10.80 | 0.00 |
| 0.70 | 0.00 | 5.80 | 0.00 | 10.90 | 0.00 |
| 0.80 | 0.00 | 5.90 | 0.00 | 11.00 | 0.00 |
| 0.90 | 0.00 | 6.00 | 0.00 | 11.10 | 0.00 |
| 1.00 | 0.00 | 6.10 | 0.00 | 11.20 | 0.00 |
| 1.10 | 0.00 | 6.20 | 0.00 | 11.30 | 0.00 |
| 1.20 | 0.00 | 6.30 | 0.00 | 11.40 | 0.00 |
| 1.30 | 0.00 | 6.40 | 0.00 | 11.50 | 0.00 |
| 1.40 | 0.00 | 6.50 | 0.00 | 11.60 | 0.00 |
| 1.50 | 0.00 | 6.60 | 0.00 | 11.70 | 0.00 |
| 1.60 | 0.00 | 6.70 | 0.00 | 11.80 | 0.00 |
| 1.70 | 0.00 | 6.80 | 0.00 | 11.90 | 0.00 |
| 1.80 | 0.00 | 6.90 | 0.00 | 12.00 | 0.00 |
| 1.90 | 0.00 | 7.00 | 0.00 | | |
| 2.00 | 0.00 | 7.10 | 0.00 | | |
| 2.10 | 0.00 | 7.20 | 0.00 | | |
| 2.20 | 0.00 | 7.30 | 0.00 | | |
| 2.30 | 0.00 | 7.40 | 0.00 | | |
| 2.40 | 0.00 | 7.50 | 0.00 | | |
| 2.50 | 0.00 | 7.60 | 0.00 | | |
| 2.60 | 0.00 | 7.70 | 0.00 | | |
| 2.70 | 0.00 | 7.80 | 0.00 | | |
| 2.80 | 0.00 | 7.90 | 0.00 | | |
| 2.90 | 0.00 | 8.00 | 0.00 | | |
| 3.00 | 0.00 | 8.10 | 0.00 | | |
| 3.10 | 0.00 | 8.20 | 0.00 | | |
| 3.20 | 0.00 | 8.30 | 0.00 | | |
| 3.30 | 0.00 | 8.40 | 0.00 | | |
| 3.40 | 0.00 | 8.50 | 0.00 | | |
| 3.50 | 0.00 | 8.60 | 0.00 | | |
| 3.60 | 0.00 | 8.70 | 0.00 | | |
| 3.70 | 0.00 | 8.80 | 0.00 | | |
| 3.80 | 0.00 | 8.90 | 0.00 | | |
| 3.90 | 0.00 | 9.00 | 0.00 | | |
| 4.00 | 0.00 | 9.10 | 0.00 | | |
| 4.10 | 0.00 | 9.20 | 0.00 | | |
| 4.20 | 0.00 | 9.30 | 0.00 | | |
| 4.30 | 0.00 | 9.40 | 0.00 | | |
| 4.40 | 0.00 | 9.50 | 0.00 | | |
| 4.50 | 0.00 | 9.60 | 0.00 | | |
| 4.60 | 0.00 | 9.70 | 0.00 | | |
| 4.70 | 0.00 | 9.80 | 0.00 | | |
| 4.80 | 0.00 | 9.90 | 0.00 | | |
| 4.90 | 0.00 | 10.00 | 0.00 | | |
| 5.00 | 0.00 | 10.10 | 0.00 | | |

## Summary for Reach 4R: CURB CUT WIER

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 1.057 ac, 63.15% Impervious, Inflow Depth = 0.84" for 5-yr event
Inflow = 3.36 cfs @ 0.15 hrs, Volume= 0.074 af
Outflow = 3.36 cfs @ 0.16 hrs, Volume= 0.074 af, Atten= 0%, Lag= 0.6 min
Routed to Pond 3P : DETENTION POND

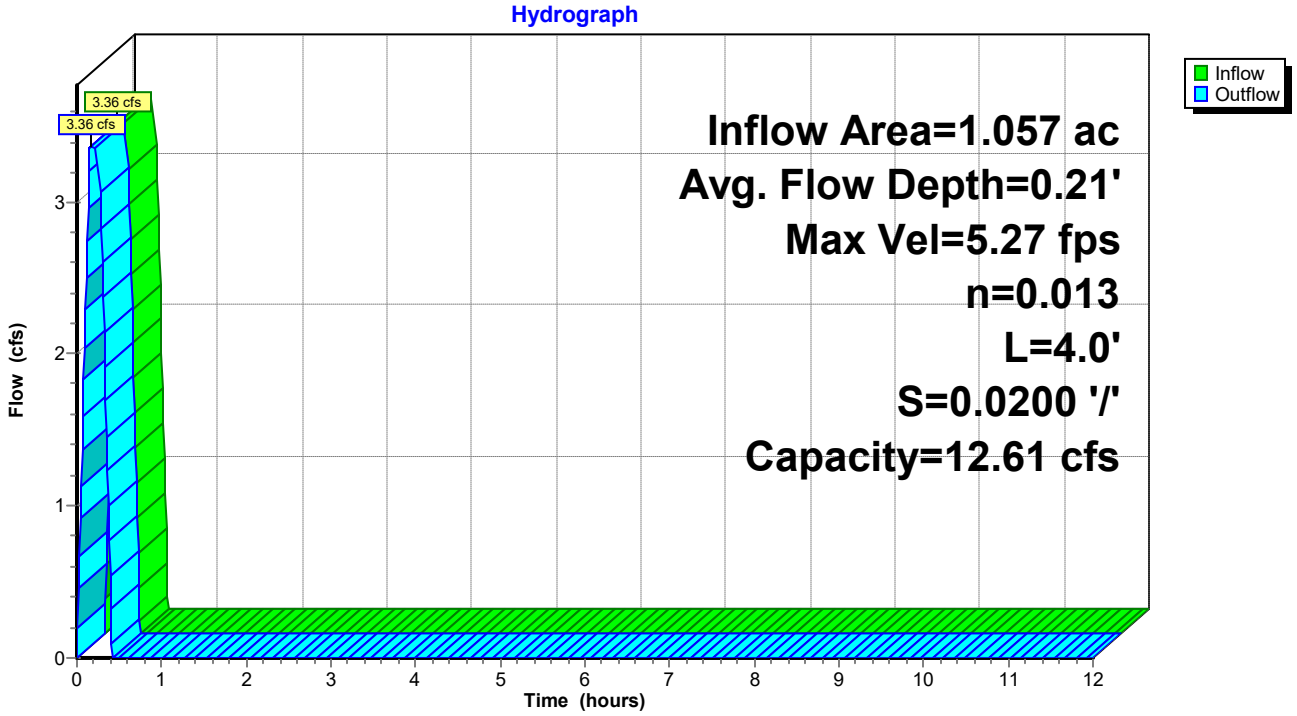
Routing by Stor-Ind+Trans method, Time Span= 0.00-12.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.27 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 4.18 fps, Avg. Travel Time= 0.0 min

Peak Storage= 3 cf @ 0.16 hrs
Average Depth at Peak Storage= 0.21' , Surface Width= 3.00'
Bank-Full Depth= 0.50' Flow Area= 1.5 sf, Capacity= 12.61 cfs

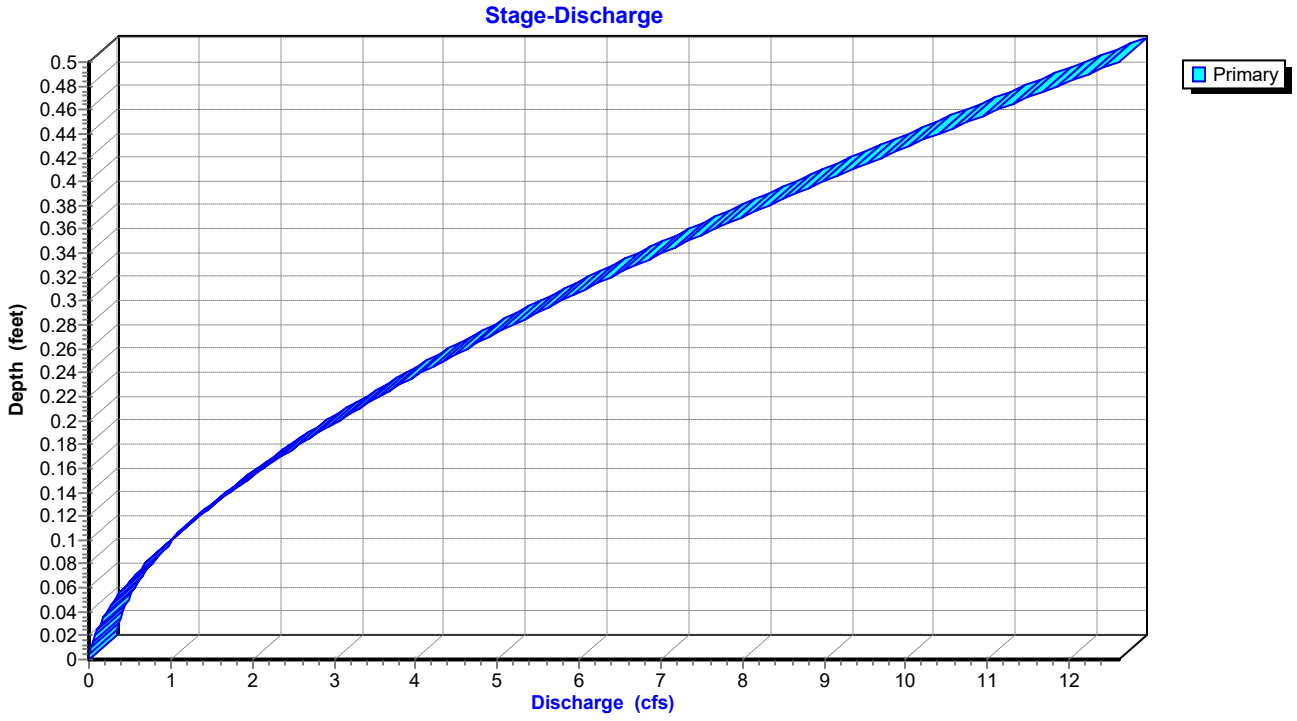
3.00' x 0.50' deep channel, n= 0.013 Concrete, trowel finish
Length= 4.0' Slope= 0.0200 '/'
Inlet Invert= 387.25', Outlet Invert= 387.17'



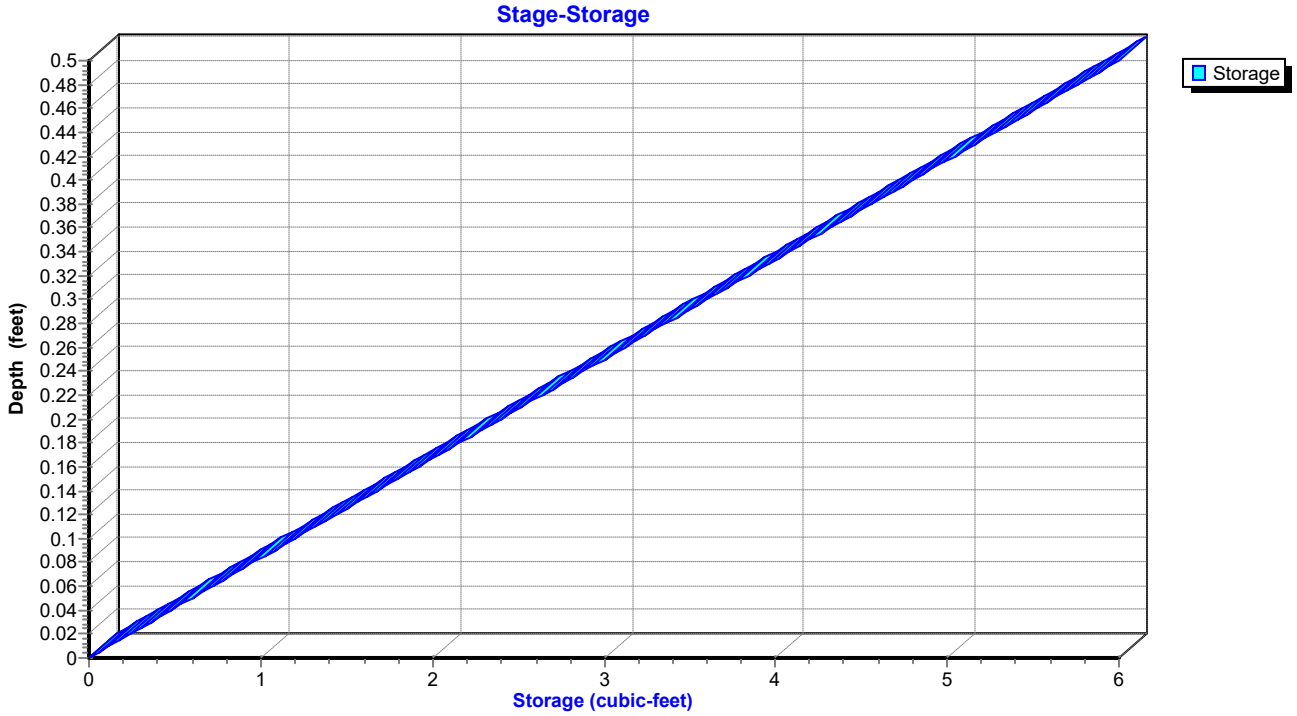
## Reach 4R: CURB CUT WIER




## Reach 4R: CURB CUT WIER



## Reach 4R: CURB CUT WIER



## Hydrograph for Reach 4R: CURB CUT WIER

| Time (hours) | Inflow (cfs) | Storage (cubic-feet) | Elevation (feet) | Outflow (cfs) |
|---|---|---|---|---|
| 0.00 | **0.00** | **0** | **387.25** | **0.00** |
| 0.50 | **0.00** | **0** | **387.25** | **0.00** |
| 1.00 | 0.00 | 0 | 387.25 | 0.00 |
| 1.50 | 0.00 | 0 | 387.25 | 0.00 |
| 2.00 | 0.00 | 0 | 387.25 | 0.00 |
| 2.50 | 0.00 | 0 | 387.25 | 0.00 |
| 3.00 | 0.00 | 0 | 387.25 | 0.00 |
| 3.50 | 0.00 | 0 | 387.25 | 0.00 |
| 4.00 | 0.00 | 0 | 387.25 | 0.00 |
| 4.50 | 0.00 | 0 | 387.25 | 0.00 |
| 5.00 | 0.00 | 0 | 387.25 | 0.00 |
| 5.50 | 0.00 | 0 | 387.25 | 0.00 |
| 6.00 | 0.00 | 0 | 387.25 | 0.00 |
| 6.50 | 0.00 | 0 | 387.25 | 0.00 |
| 7.00 | 0.00 | 0 | 387.25 | 0.00 |
| 7.50 | 0.00 | 0 | 387.25 | 0.00 |
| 8.00 | 0.00 | 0 | 387.25 | 0.00 |
| 8.50 | 0.00 | 0 | 387.25 | 0.00 |
| 9.00 | 0.00 | 0 | 387.25 | 0.00 |
| 9.50 | 0.00 | 0 | 387.25 | 0.00 |
| 10.00 | 0.00 | 0 | 387.25 | 0.00 |
| 10.50 | 0.00 | 0 | 387.25 | 0.00 |
| 11.00 | 0.00 | 0 | 387.25 | 0.00 |
| 11.50 | 0.00 | 0 | 387.25 | 0.00 |
| 12.00 | 0.00 | 0 | 387.25 | 0.00 |

## Stage-Discharge for Reach 4R: CURB CUT WIER

| Elevation (feet) | Velocity (ft/sec) | Discharge (cfs) |
|---|---|---|
| 387.25 | 0.00 | 0.00 |
| 387.26 | 0.75 | 0.02 |
| 387.27 | 1.18 | 0.07 |
| 387.28 | 1.54 | 0.14 |
| 387.29 | 1.86 | 0.22 |
| 387.30 | 2.15 | 0.32 |
| 387.31 | 2.41 | 0.43 |
| 387.32 | 2.66 | 0.56 |
| 387.33 | 2.90 | 0.70 |
| 387.34 | 3.12 | 0.84 |
| 387.35 | 3.34 | 1.00 |
| 387.36 | 3.54 | 1.17 |
| 387.37 | 3.74 | 1.35 |
| 387.38 | 3.92 | 1.53 |
| 387.39 | 4.11 | 1.72 |
| 387.40 | 4.28 | 1.93 |
| 387.41 | 4.45 | 2.14 |
| 387.42 | 4.62 | 2.36 |
| 387.43 | 4.78 | 2.58 |
| 387.44 | 4.93 | 2.81 |
| 387.45 | 5.09 | 3.05 |
| 387.46 | 5.23 | 3.30 |
| 387.47 | 5.38 | 3.55 |
| 387.48 | 5.52 | 3.81 |
| 387.49 | 5.65 | 4.07 |
| 387.50 | 5.79 | 4.34 |
| 387.51 | 5.92 | 4.62 |
| 387.52 | 6.05 | 4.90 |
| 387.53 | 6.17 | 5.19 |
| 387.54 | 6.30 | 5.48 |
| 387.55 | 6.42 | 5.77 |
| 387.56 | 6.53 | 6.08 |
| 387.57 | 6.65 | 6.38 |
| 387.58 | 6.76 | 6.69 |
| 387.59 | 6.87 | 7.01 |
| 387.60 | 6.98 | 7.33 |
| 387.61 | 7.09 | 7.65 |
| 387.62 | 7.19 | 7.98 |
| 387.63 | 7.30 | 8.32 |
| 387.64 | 7.40 | 8.65 |
| 387.65 | 7.50 | 9.00 |
| 387.66 | 7.59 | 9.34 |
| 387.67 | 7.69 | 9.69 |
| 387.68 | 7.79 | 10.04 |
| 387.69 | 7.88 | 10.40 |
| 387.70 | 7.97 | 10.76 |
| 387.71 | 8.06 | 11.12 |
| 387.72 | 8.15 | 11.49 |
| 387.73 | 8.24 | 11.86 |
| 387.74 | 8.32 | 12.23 |
| 387.75 | **8.41** | **12.61** |

## Stage-Area-Storage for Reach 4R: CURB CUT WIER

| Elevation (feet) | End-Area (sq-ft) | Storage (cubic-feet) |
|---|---|---|
| 387.25 | 0.0 | 0 |
| 387.26 | 0.0 | 0 |
| 387.27 | 0.1 | 0 |
| 387.28 | 0.1 | 0 |
| 387.29 | 0.1 | 0 |
| 387.30 | 0.2 | 1 |
| 387.31 | 0.2 | 1 |
| 387.32 | 0.2 | 1 |
| 387.33 | 0.2 | 1 |
| 387.34 | 0.3 | 1 |
| 387.35 | 0.3 | 1 |
| 387.36 | 0.3 | 1 |
| 387.37 | 0.4 | 1 |
| 387.38 | 0.4 | 2 |
| 387.39 | 0.4 | 2 |
| 387.40 | 0.4 | 2 |
| 387.41 | 0.5 | 2 |
| 387.42 | 0.5 | 2 |
| 387.43 | 0.5 | 2 |
| 387.44 | 0.6 | 2 |
| 387.45 | 0.6 | 2 |
| 387.46 | 0.6 | 3 |
| 387.47 | 0.7 | 3 |
| 387.48 | 0.7 | 3 |
| 387.49 | 0.7 | 3 |
| 387.50 | 0.8 | 3 |
| 387.51 | 0.8 | 3 |
| 387.52 | 0.8 | 3 |
| 387.53 | 0.8 | 3 |
| 387.54 | 0.9 | 3 |
| 387.55 | 0.9 | 4 |
| 387.56 | 0.9 | 4 |
| 387.57 | 1.0 | 4 |
| 387.58 | 1.0 | 4 |
| 387.59 | 1.0 | 4 |
| 387.60 | 1.1 | 4 |
| 387.61 | 1.1 | 4 |
| 387.62 | 1.1 | 4 |
| 387.63 | 1.1 | 5 |
| 387.64 | 1.2 | 5 |
| 387.65 | 1.2 | 5 |
| 387.66 | 1.2 | 5 |
| 387.67 | 1.3 | 5 |
| 387.68 | 1.3 | 5 |
| 387.69 | 1.3 | 5 |
| 387.70 | 1.4 | 5 |
| 387.71 | 1.4 | 6 |
| 387.72 | 1.4 | 6 |
| 387.73 | 1.4 | 6 |
| 387.74 | 1.5 | 6 |
| 387.75 | **1.5** | **6** |

## Summary for Pond 3P: DETENTION POND

Inflow Area = 1.057 ac, 63.15% Impervious, Inflow Depth = 0.84" for 5-yr event
Inflow = 3.36 cfs @ 0.16 hrs, Volume= 0.074 af
Outflow = 2.59 cfs @ 0.30 hrs, Volume= 0.074 af, Atten= 23%, Lag= 8.4 min
Primary = 2.59 cfs @ 0.30 hrs, Volume= 0.074 af

Routing by Stor-Ind method, Time Span= 0.00-12.00 hrs, dt= 0.01 hrs
Peak Elev= 385.75' @ 0.30 hrs Surf.Area= 1,202 sf Storage= 1,253 cf

Plug-Flow detention time= 10.0 min calculated for 0.074 af (100% of inflow)
Center-of-Mass det. time= 10.4 min ( 22.9 - 12.4 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 384.50' | 2,986 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

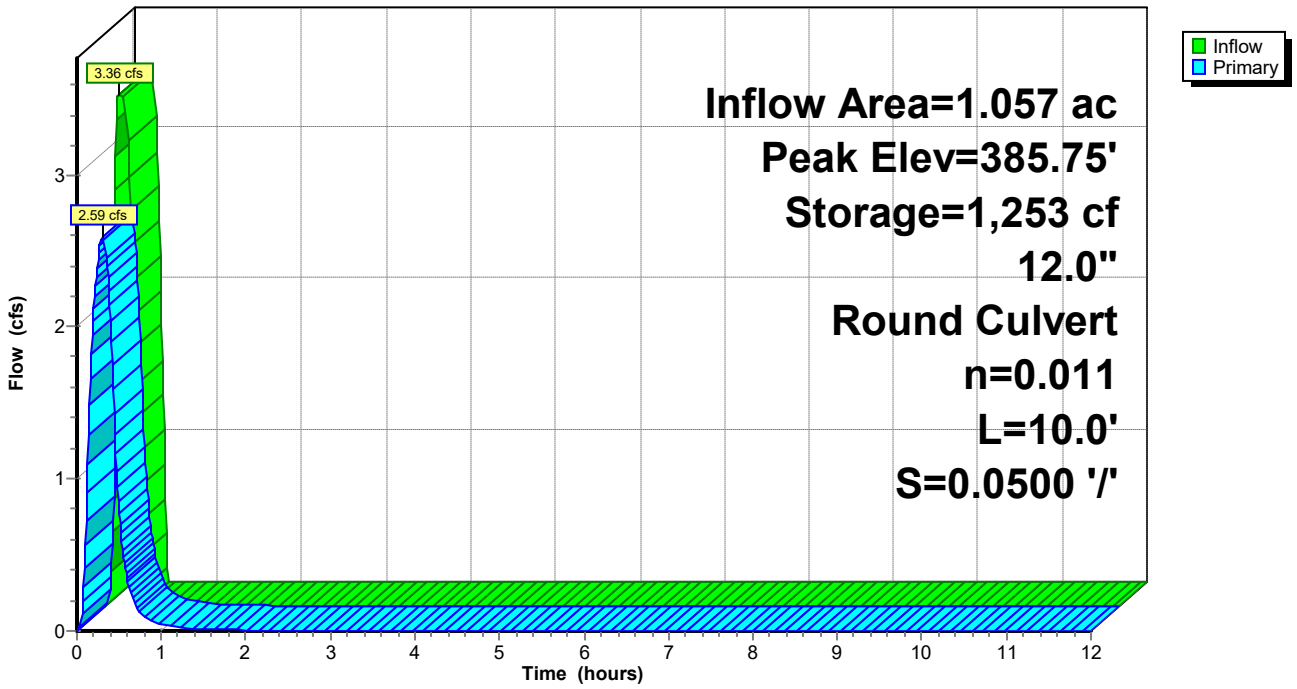
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 384.50 | 724 | 0 | 0 |
| 385.00 | 986 | 428 | 428 |
| 386.00 | 1,273 | 1,130 | 1,557 |
| 387.00 | 1,585 | 1,429 | 2,986 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 384.50' | **12.0" Round 12" RCP**<br>L= 10.0' CMP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 384.50' / 384.00' S= 0.0500 '/' Cc= 0.900<br>n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf |

**Primary OutFlow** Max=2.59 cfs @ 0.30 hrs HW=385.75' (Free Discharge)
↑**1=12" RCP** (Inlet Controls 2.59 cfs @ 3.30 fps)

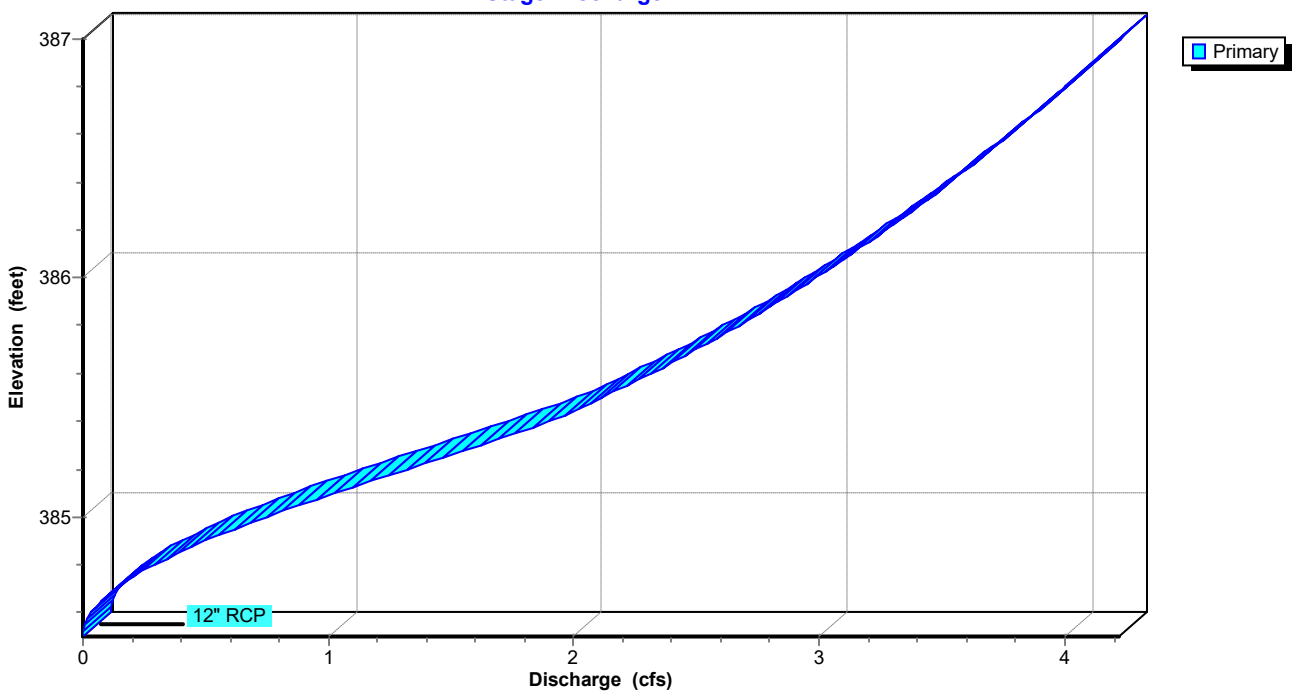
## Pond 3P: DETENTION POND

Hydrograph

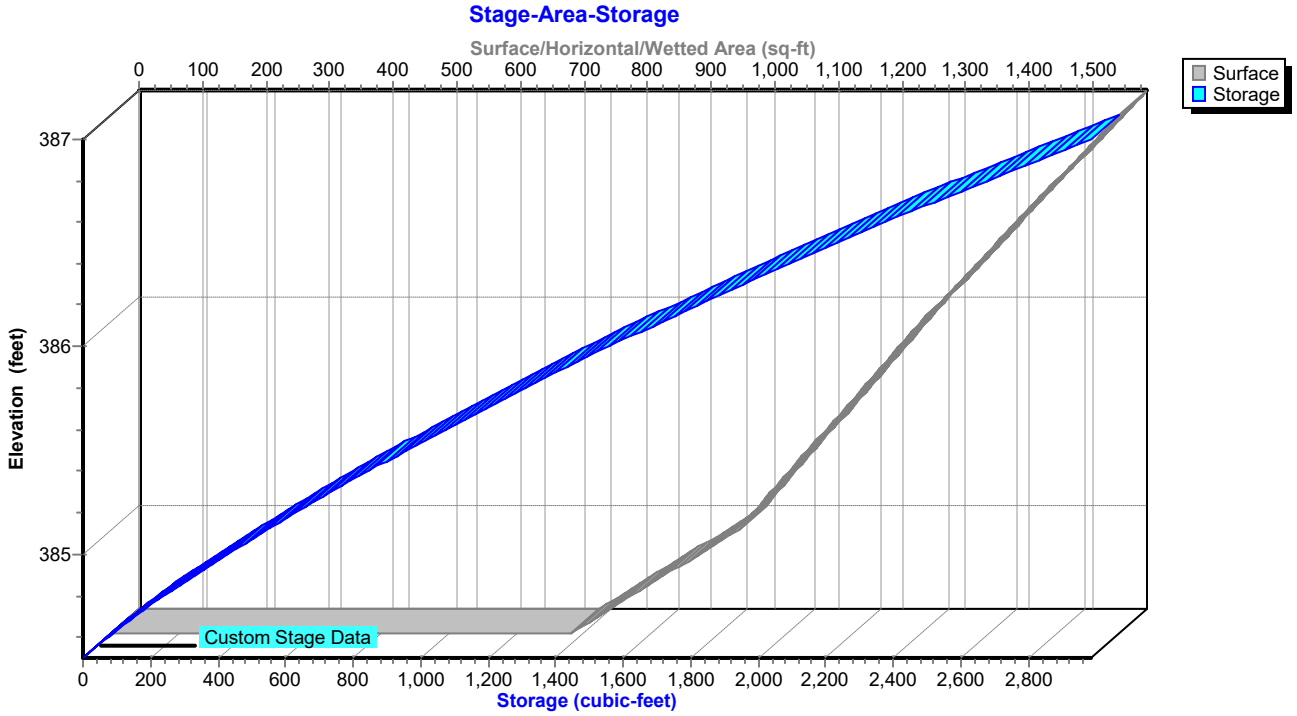



## Pond 3P: DETENTION POND

Stage-Discharge



## Pond 3P: DETENTION POND



## Hydrograph for Pond 3P: DETENTION POND

| Time (hours) | Inflow (cfs) | Storage (cubic-feet) | Elevation (feet) | Primary (cfs) |
|---|---|---|---|---|
| 0.00 | **0.00** | **0** | **384.50** | **0.00** |
| 0.50 | **0.00** | **439** | **385.01** | **0.78** |
| 1.00 | 0.00 | 82 | 384.61 | 0.04 |
| 1.50 | 0.00 | 42 | 384.56 | 0.01 |
| 2.00 | 0.00 | 28 | 384.54 | 0.01 |
| 2.50 | 0.00 | 20 | 384.53 | 0.00 |
| 3.00 | 0.00 | 16 | 384.52 | 0.00 |
| 3.50 | 0.00 | 13 | 384.52 | 0.00 |
| 4.00 | 0.00 | 10 | 384.51 | 0.00 |
| 4.50 | 0.00 | 8 | 384.51 | 0.00 |
| 5.00 | 0.00 | 7 | 384.51 | 0.00 |
| 5.50 | 0.00 | 5 | 384.51 | 0.00 |
| 6.00 | 0.00 | 4 | 384.51 | 0.00 |
| 6.50 | 0.00 | 3 | 384.50 | 0.00 |
| 7.00 | 0.00 | 3 | 384.50 | 0.00 |
| 7.50 | 0.00 | 2 | 384.50 | 0.00 |
| 8.00 | 0.00 | 2 | 384.50 | 0.00 |
| 8.50 | 0.00 | 1 | 384.50 | 0.00 |
| 9.00 | 0.00 | 1 | 384.50 | 0.00 |
| 9.50 | 0.00 | 1 | 384.50 | 0.00 |
| 10.00 | 0.00 | 1 | 384.50 | 0.00 |
| 10.50 | 0.00 | 1 | 384.50 | 0.00 |
| 11.00 | 0.00 | 0 | 384.50 | 0.00 |
| 11.50 | 0.00 | 0 | 384.50 | 0.00 |
| 12.00 | 0.00 | 0 | 384.50 | 0.00 |

## Stage-Discharge for Pond 3P: DETENTION POND

| Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) |
|---|---|---|---|---|---|
| 384.50 | 0.00 | 385.52 | 2.15 | 386.54 | 3.70 |
| 384.52 | 0.00 | 385.54 | 2.19 | 386.56 | 3.73 |
| 384.54 | 0.01 | 385.56 | 2.23 | 386.58 | 3.75 |
| 384.56 | 0.01 | 385.58 | 2.27 | 386.60 | 3.78 |
| 384.58 | 0.02 | 385.60 | 2.31 | 386.62 | 3.80 |
| 384.60 | 0.03 | 385.62 | 2.35 | 386.64 | 3.82 |
| 384.62 | 0.05 | 385.64 | 2.39 | 386.66 | 3.85 |
| 384.64 | 0.07 | 385.66 | 2.43 | 386.68 | 3.87 |
| 384.66 | 0.09 | 385.68 | 2.46 | 386.70 | 3.89 |
| 384.68 | 0.11 | 385.70 | 2.50 | 386.72 | 3.92 |
| 384.70 | 0.13 | 385.72 | 2.53 | 386.74 | 3.94 |
| 384.72 | 0.16 | 385.74 | 2.57 | 386.76 | 3.96 |
| 384.74 | 0.19 | 385.76 | 2.60 | 386.78 | 3.98 |
| 384.76 | 0.22 | 385.78 | 2.64 | 386.80 | 4.01 |
| 384.78 | 0.26 | 385.80 | 2.67 | 386.82 | 4.03 |
| 384.80 | 0.29 | 385.82 | 2.70 | 386.84 | 4.05 |
| 384.82 | 0.33 | 385.84 | 2.74 | 386.86 | 4.07 |
| 384.84 | 0.37 | 385.86 | 2.77 | 386.88 | 4.09 |
| 384.86 | 0.41 | 385.88 | 2.80 | 386.90 | 4.12 |
| 384.88 | 0.45 | 385.90 | 2.83 | 386.92 | 4.14 |
| 384.90 | 0.50 | 385.92 | 2.86 | 386.94 | 4.16 |
| 384.92 | 0.55 | 385.94 | 2.89 | 386.96 | 4.18 |
| 384.94 | 0.59 | 385.96 | 2.93 | 386.98 | 4.20 |
| 384.96 | 0.64 | 385.98 | 2.96 | 387.00 | **4.22** |
| 384.98 | 0.69 | 386.00 | 2.99 | | |
| 385.00 | 0.75 | 386.02 | 3.02 | | |
| 385.02 | 0.80 | 386.04 | 3.04 | | |
| 385.04 | 0.85 | 386.06 | 3.07 | | |
| 385.06 | 0.91 | 386.08 | 3.10 | | |
| 385.08 | 0.97 | 386.10 | 3.13 | | |
| 385.10 | 1.02 | 386.12 | 3.16 | | |
| 385.12 | 1.08 | 386.14 | 3.19 | | |
| 385.14 | 1.14 | 386.16 | 3.22 | | |
| 385.16 | 1.20 | 386.18 | 3.24 | | |
| 385.18 | 1.26 | 386.20 | 3.27 | | |
| 385.20 | 1.32 | 386.22 | 3.30 | | |
| 385.22 | 1.38 | 386.24 | 3.32 | | |
| 385.24 | 1.44 | 386.26 | 3.35 | | |
| 385.26 | 1.50 | 386.28 | 3.38 | | |
| 385.28 | 1.56 | 386.30 | 3.40 | | |
| 385.30 | 1.62 | 386.32 | 3.43 | | |
| 385.32 | 1.68 | 386.34 | 3.46 | | |
| 385.34 | 1.74 | 386.36 | 3.48 | | |
| 385.36 | 1.79 | 386.38 | 3.51 | | |
| 385.38 | 1.85 | 386.40 | 3.53 | | |
| 385.40 | 1.90 | 386.42 | 3.56 | | |
| 385.42 | 1.95 | 386.44 | 3.58 | | |
| 385.44 | 2.00 | 386.46 | 3.61 | | |
| 385.46 | 2.04 | 386.48 | 3.63 | | |
| 385.48 | 2.08 | 386.50 | 3.66 | | |
| 385.50 | 2.11 | 386.52 | 3.68 | | |

## Stage-Area-Storage for Pond 3P: DETENTION POND

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---|---|---|
| 384.50 | 724 | 0 |
| 384.55 | 750 | 37 |
| 384.60 | 776 | 75 |
| 384.65 | 803 | 114 |
| 384.70 | 829 | 155 |
| 384.75 | 855 | 197 |
| 384.80 | 881 | 241 |
| 384.85 | 907 | 285 |
| 384.90 | 934 | 332 |
| 384.95 | 960 | 379 |
| 385.00 | 986 | 428 |
| 385.05 | 1,000 | 477 |
| 385.10 | 1,015 | 528 |
| 385.15 | 1,029 | 579 |
| 385.20 | 1,043 | 630 |
| 385.25 | 1,058 | 683 |
| 385.30 | 1,072 | 736 |
| 385.35 | 1,086 | 790 |
| 385.40 | 1,101 | 845 |
| 385.45 | 1,115 | 900 |
| 385.50 | 1,130 | 956 |
| 385.55 | 1,144 | 1,013 |
| 385.60 | 1,158 | 1,071 |
| 385.65 | 1,173 | 1,129 |
| 385.70 | 1,187 | 1,188 |
| 385.75 | 1,201 | 1,248 |
| 385.80 | 1,216 | 1,308 |
| 385.85 | 1,230 | 1,369 |
| 385.90 | 1,244 | 1,431 |
| 385.95 | 1,259 | 1,494 |
| 386.00 | 1,273 | 1,557 |
| 386.05 | 1,289 | 1,621 |
| 386.10 | 1,304 | 1,686 |
| 386.15 | 1,320 | 1,751 |
| 386.20 | 1,335 | 1,818 |
| 386.25 | 1,351 | 1,885 |
| 386.30 | 1,367 | 1,953 |
| 386.35 | 1,382 | 2,022 |
| 386.40 | 1,398 | 2,091 |
| 386.45 | 1,413 | 2,161 |
| 386.50 | 1,429 | 2,233 |
| 386.55 | 1,445 | 2,304 |
| 386.60 | 1,460 | 2,377 |
| 386.65 | 1,476 | 2,450 |
| 386.70 | 1,491 | 2,525 |
| 386.75 | 1,507 | 2,600 |
| 386.80 | 1,523 | 2,675 |
| 386.85 | 1,538 | 2,752 |
| 386.90 | 1,554 | 2,829 |
| 386.95 | 1,569 | 2,907 |
| 387.00 | **1,585** | **2,986** |

Time span=0.00-12.00 hrs, dt=0.01 hrs, 1201 points
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: PRE-DEVELOPMENT** Runoff Area=46,055 sf 0.00% Impervious Runoff Depth=0.85"
Flow Length=270' Slope=0.0250 '/' Tc=15.5 min C=0.69 Runoff=3.39 cfs 0.075 af

**Subcatchment 2S: POST-DEVELOPMENT** Runoff Area=46,055 sf 63.15% Impervious Runoff Depth=0.94"
Flow Length=360' Slope=0.0150 '/' Tc=8.8 min C=0.77 Runoff=3.77 cfs 0.083 af

**Reach 4R: CURB CUT WIER** Avg. Flow Depth=0.23' Max Vel=5.50 fps Inflow=3.77 cfs 0.083 af
n=0.013 L=4.0' S=0.0200 '/' Capacity=12.61 cfs Outflow=3.78 cfs 0.083 af

**Pond 3P: DETENTION POND** Peak Elev=385.90' Storage=1,433 cf Inflow=3.78 cfs 0.083 af
12.0" Round Culvert n=0.011 L=10.0' S=0.0500 '/' Outflow=2.83 cfs 0.083 af

**Total Runoff Area = 2.115 ac Runoff Volume = 0.158 af Average Runoff Depth = 0.89"**
**68.43% Pervious = 1.447 ac 31.57% Impervious = 0.668 ac**

## Summary for Subcatchment 1S: PRE-DEVELOPMENT

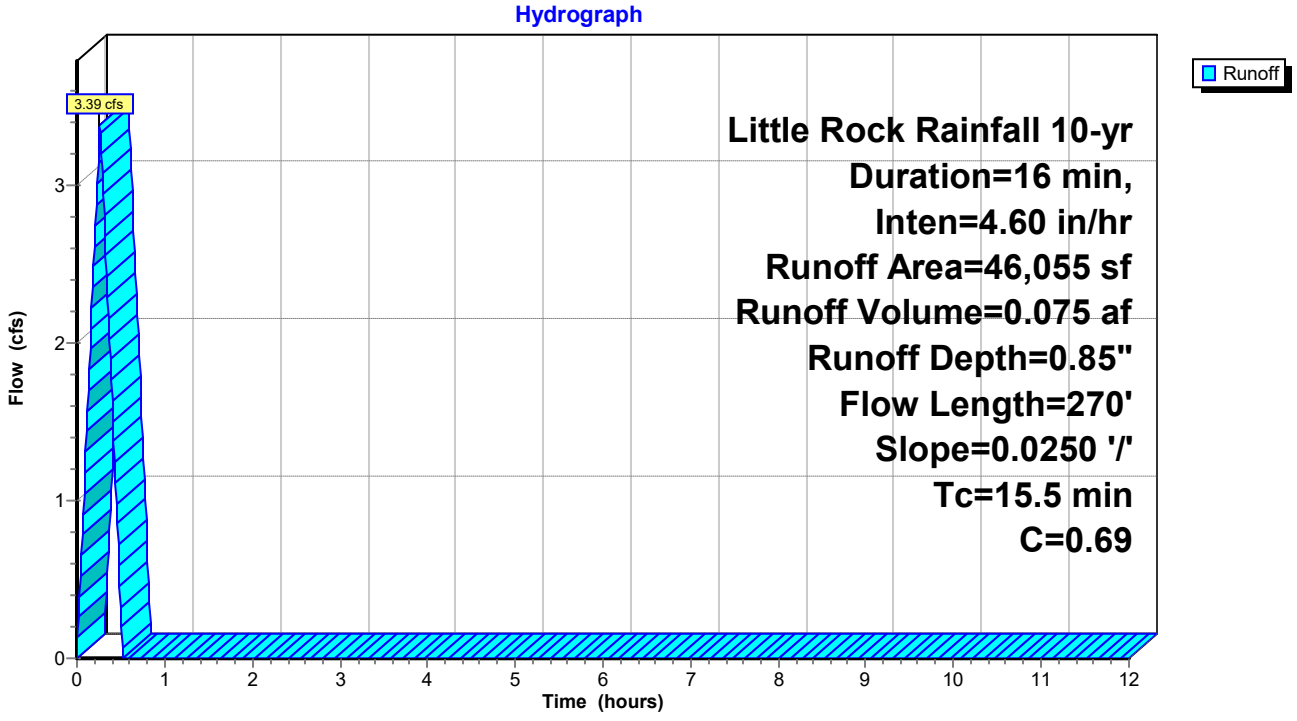
Runoff = 3.39 cfs @ 0.26 hrs, Volume= 0.075 af, Depth= 0.85"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-12.00 hrs, dt= 0.01 hrs
Little Rock Rainfall 10-yr Duration=16 min, Inten=4.60 in/hr

| Area (sf) | C | Description |
|---|---|---|
| 31,035 | 0.65 | GRAVEL PARKING |
| 15,020 | 0.77 | SHRUB POOR CONDITION BRUSH |
| 46,055 | 0.69 | Weighted Average |
| 46,055 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 15.5 | 270 | 0.0250 | 0.29 | | **Sheet Flow, SHEET FLOW SURFACE** Range n= 0.130 P2= 4.19" |

## Subcatchment 1S: PRE-DEVELOPMENT



## Hydrograph for Subcatchment 1S: PRE-DEVELOPMENT

| Time (hours) | Runoff (cfs) | Time (hours) | Runoff (cfs) | Time (hours) | Runoff (cfs) |
|---|---|---|---|---|---|
| 0.00 | 0.00 | 5.10 | 0.00 | 10.20 | 0.00 |
| 0.10 | 1.31 | 5.20 | 0.00 | 10.30 | 0.00 |
| 0.20 | **2.62** | 5.30 | 0.00 | 10.40 | 0.00 |
| 0.30 | **2.95** | 5.40 | 0.00 | 10.50 | 0.00 |
| 0.40 | 1.64 | 5.50 | 0.00 | 10.60 | 0.00 |
| 0.50 | 0.33 | 5.60 | 0.00 | 10.70 | 0.00 |
| 0.60 | 0.00 | 5.70 | 0.00 | 10.80 | 0.00 |
| 0.70 | 0.00 | 5.80 | 0.00 | 10.90 | 0.00 |
| 0.80 | 0.00 | 5.90 | 0.00 | 11.00 | 0.00 |
| 0.90 | 0.00 | 6.00 | 0.00 | 11.10 | 0.00 |
| 1.00 | 0.00 | 6.10 | 0.00 | 11.20 | 0.00 |
| 1.10 | 0.00 | 6.20 | 0.00 | 11.30 | 0.00 |
| 1.20 | 0.00 | 6.30 | 0.00 | 11.40 | 0.00 |
| 1.30 | 0.00 | 6.40 | 0.00 | 11.50 | 0.00 |
| 1.40 | 0.00 | 6.50 | 0.00 | 11.60 | 0.00 |
| 1.50 | 0.00 | 6.60 | 0.00 | 11.70 | 0.00 |
| 1.60 | 0.00 | 6.70 | 0.00 | 11.80 | 0.00 |
| 1.70 | 0.00 | 6.80 | 0.00 | 11.90 | 0.00 |
| 1.80 | 0.00 | 6.90 | 0.00 | 12.00 | 0.00 |
| 1.90 | 0.00 | 7.00 | 0.00 | | |
| 2.00 | 0.00 | 7.10 | 0.00 | | |
| 2.10 | 0.00 | 7.20 | 0.00 | | |
| 2.20 | 0.00 | 7.30 | 0.00 | | |
| 2.30 | 0.00 | 7.40 | 0.00 | | |
| 2.40 | 0.00 | 7.50 | 0.00 | | |
| 2.50 | 0.00 | 7.60 | 0.00 | | |
| 2.60 | 0.00 | 7.70 | 0.00 | | |
| 2.70 | 0.00 | 7.80 | 0.00 | | |
| 2.80 | 0.00 | 7.90 | 0.00 | | |
| 2.90 | 0.00 | 8.00 | 0.00 | | |
| 3.00 | 0.00 | 8.10 | 0.00 | | |
| 3.10 | 0.00 | 8.20 | 0.00 | | |
| 3.20 | 0.00 | 8.30 | 0.00 | | |
| 3.30 | 0.00 | 8.40 | 0.00 | | |
| 3.40 | 0.00 | 8.50 | 0.00 | | |
| 3.50 | 0.00 | 8.60 | 0.00 | | |
| 3.60 | 0.00 | 8.70 | 0.00 | | |
| 3.70 | 0.00 | 8.80 | 0.00 | | |
| 3.80 | 0.00 | 8.90 | 0.00 | | |
| 3.90 | 0.00 | 9.00 | 0.00 | | |
| 4.00 | 0.00 | 9.10 | 0.00 | | |
| 4.10 | 0.00 | 9.20 | 0.00 | | |
| 4.20 | 0.00 | 9.30 | 0.00 | | |
| 4.30 | 0.00 | 9.40 | 0.00 | | |
| 4.40 | 0.00 | 9.50 | 0.00 | | |
| 4.50 | 0.00 | 9.60 | 0.00 | | |
| 4.60 | 0.00 | 9.70 | 0.00 | | |
| 4.70 | 0.00 | 9.80 | 0.00 | | |
| 4.80 | 0.00 | 9.90 | 0.00 | | |
| 4.90 | 0.00 | 10.00 | 0.00 | | |
| 5.00 | 0.00 | 10.10 | 0.00 | | |

## Summary for Subcatchment 2S: POST-DEVELOPMENT

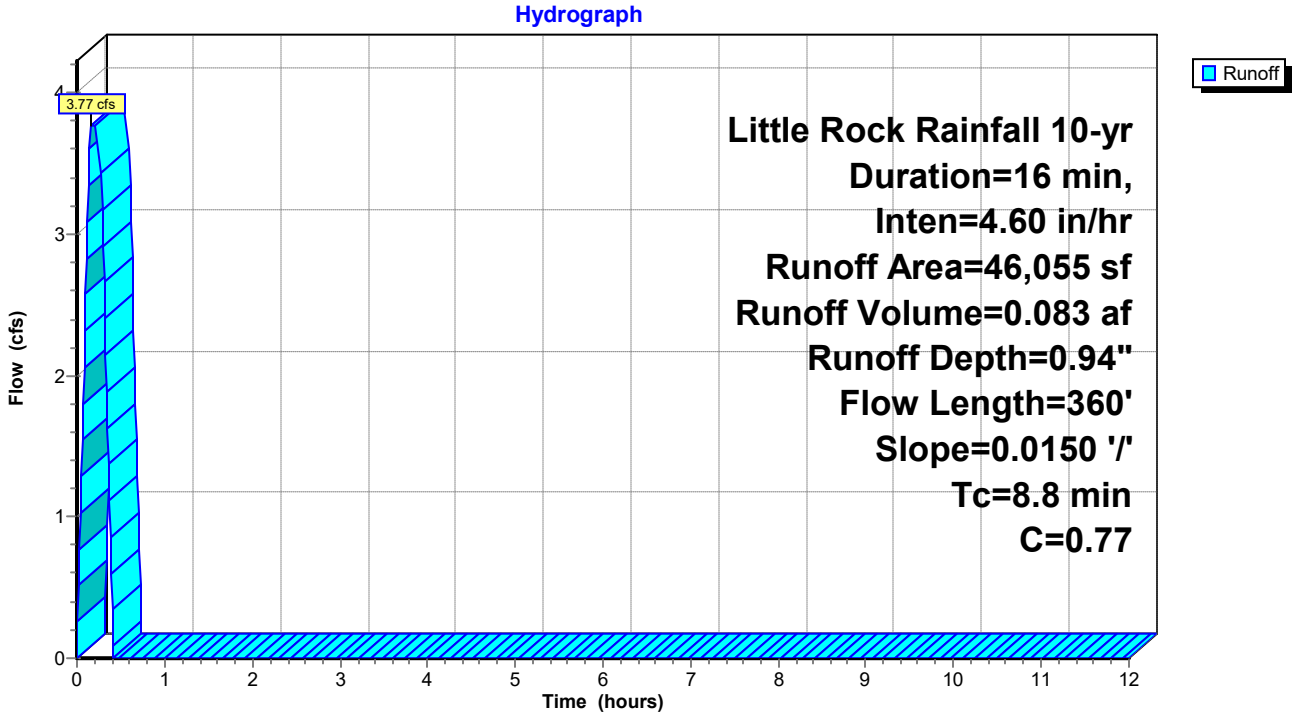
Runoff = 3.77 cfs @ 0.15 hrs, Volume= 0.083 af, Depth= 0.94"
Routed to Reach 4R : CURB CUT WIER

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-12.00 hrs, dt= 0.01 hrs
Little Rock Rainfall 10-yr Duration=16 min, Inten=4.60 in/hr

| Area (sf) | C | Description |
|---|---|---|
| 22,479 | 0.95 | ASPHALT SURFACE |
| 6,603 | 0.97 | ROOF TOP |
| 16,973 | 0.46 | GRASS LANDSCAPING |
| 46,055 | 0.77 | Weighted Average |
| 16,973 | | 36.85% Pervious Area |
| 29,082 | | 63.15% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.7 | 40 | 0.0150 | 0.10 | | **Sheet Flow, GRASS** Grass: Dense n= 0.240 P2= 4.19" |
| 2.1 | 320 | 0.0150 | 2.49 | | **Shallow Concentrated Flow, PAVEMENT** Paved Kv= 20.3 fps |
| 8.8 | 360 | Total | | | |

## Subcatchment 2S: POST-DEVELOPMENT



## Hydrograph for Subcatchment 2S: POST-DEVELOPMENT

| Time (hours) | Runoff (cfs) | Time (hours) | Runoff (cfs) | Time (hours) | Runoff (cfs) |
|---|---|---|---|---|---|
| 0.00 | 0.00 | 5.10 | 0.00 | 10.20 | 0.00 |
| 0.10 | **2.57** | 5.20 | 0.00 | 10.30 | 0.00 |
| 0.20 | **3.77** | 5.30 | 0.00 | 10.40 | 0.00 |
| 0.30 | 2.92 | 5.40 | 0.00 | 10.50 | 0.00 |
| 0.40 | 0.34 | 5.50 | 0.00 | 10.60 | 0.00 |
| 0.50 | 0.00 | 5.60 | 0.00 | 10.70 | 0.00 |
| 0.60 | 0.00 | 5.70 | 0.00 | 10.80 | 0.00 |
| 0.70 | 0.00 | 5.80 | 0.00 | 10.90 | 0.00 |
| 0.80 | 0.00 | 5.90 | 0.00 | 11.00 | 0.00 |
| 0.90 | 0.00 | 6.00 | 0.00 | 11.10 | 0.00 |
| 1.00 | 0.00 | 6.10 | 0.00 | 11.20 | 0.00 |
| 1.10 | 0.00 | 6.20 | 0.00 | 11.30 | 0.00 |
| 1.20 | 0.00 | 6.30 | 0.00 | 11.40 | 0.00 |
| 1.30 | 0.00 | 6.40 | 0.00 | 11.50 | 0.00 |
| 1.40 | 0.00 | 6.50 | 0.00 | 11.60 | 0.00 |
| 1.50 | 0.00 | 6.60 | 0.00 | 11.70 | 0.00 |
| 1.60 | 0.00 | 6.70 | 0.00 | 11.80 | 0.00 |
| 1.70 | 0.00 | 6.80 | 0.00 | 11.90 | 0.00 |
| 1.80 | 0.00 | 6.90 | 0.00 | 12.00 | 0.00 |
| 1.90 | 0.00 | 7.00 | 0.00 | | |
| 2.00 | 0.00 | 7.10 | 0.00 | | |
| 2.10 | 0.00 | 7.20 | 0.00 | | |
| 2.20 | 0.00 | 7.30 | 0.00 | | |
| 2.30 | 0.00 | 7.40 | 0.00 | | |
| 2.40 | 0.00 | 7.50 | 0.00 | | |
| 2.50 | 0.00 | 7.60 | 0.00 | | |
| 2.60 | 0.00 | 7.70 | 0.00 | | |
| 2.70 | 0.00 | 7.80 | 0.00 | | |
| 2.80 | 0.00 | 7.90 | 0.00 | | |
| 2.90 | 0.00 | 8.00 | 0.00 | | |
| 3.00 | 0.00 | 8.10 | 0.00 | | |
| 3.10 | 0.00 | 8.20 | 0.00 | | |
| 3.20 | 0.00 | 8.30 | 0.00 | | |
| 3.30 | 0.00 | 8.40 | 0.00 | | |
| 3.40 | 0.00 | 8.50 | 0.00 | | |
| 3.50 | 0.00 | 8.60 | 0.00 | | |
| 3.60 | 0.00 | 8.70 | 0.00 | | |
| 3.70 | 0.00 | 8.80 | 0.00 | | |
| 3.80 | 0.00 | 8.90 | 0.00 | | |
| 3.90 | 0.00 | 9.00 | 0.00 | | |
| 4.00 | 0.00 | 9.10 | 0.00 | | |
| 4.10 | 0.00 | 9.20 | 0.00 | | |
| 4.20 | 0.00 | 9.30 | 0.00 | | |
| 4.30 | 0.00 | 9.40 | 0.00 | | |
| 4.40 | 0.00 | 9.50 | 0.00 | | |
| 4.50 | 0.00 | 9.60 | 0.00 | | |
| 4.60 | 0.00 | 9.70 | 0.00 | | |
| 4.70 | 0.00 | 9.80 | 0.00 | | |
| 4.80 | 0.00 | 9.90 | 0.00 | | |
| 4.90 | 0.00 | 10.00 | 0.00 | | |
| 5.00 | 0.00 | 10.10 | 0.00 | | |

## Summary for Reach 4R: CURB CUT WIER

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 1.057 ac, 63.15% Impervious, Inflow Depth = 0.94" for 10-yr event
Inflow = 3.77 cfs @ 0.15 hrs, Volume= 0.083 af
Outflow = 3.78 cfs @ 0.16 hrs, Volume= 0.083 af, Atten= 0%, Lag= 0.6 min
Routed to Pond 3P : DETENTION POND

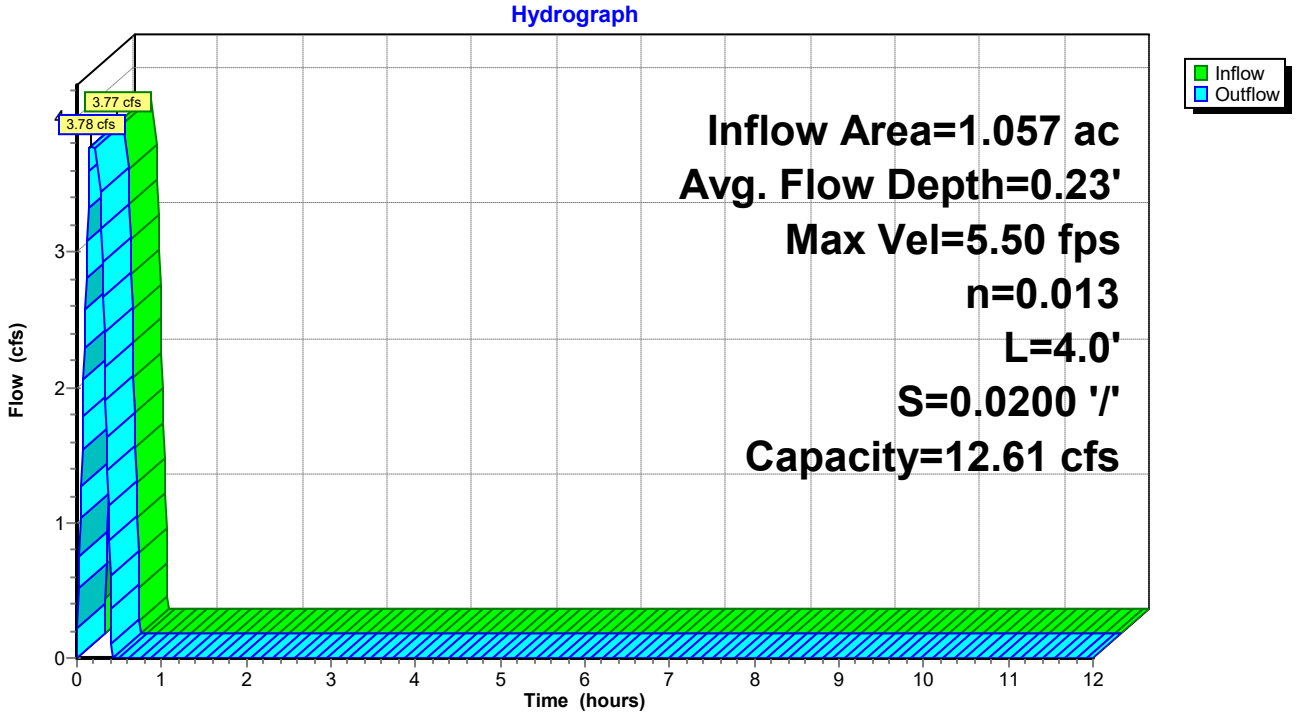
Routing by Stor-Ind+Trans method, Time Span= 0.00-12.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.50 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 4.37 fps, Avg. Travel Time= 0.0 min

Peak Storage= 3 cf @ 0.16 hrs
Average Depth at Peak Storage= 0.23' , Surface Width= 3.00'
Bank-Full Depth= 0.50' Flow Area= 1.5 sf, Capacity= 12.61 cfs

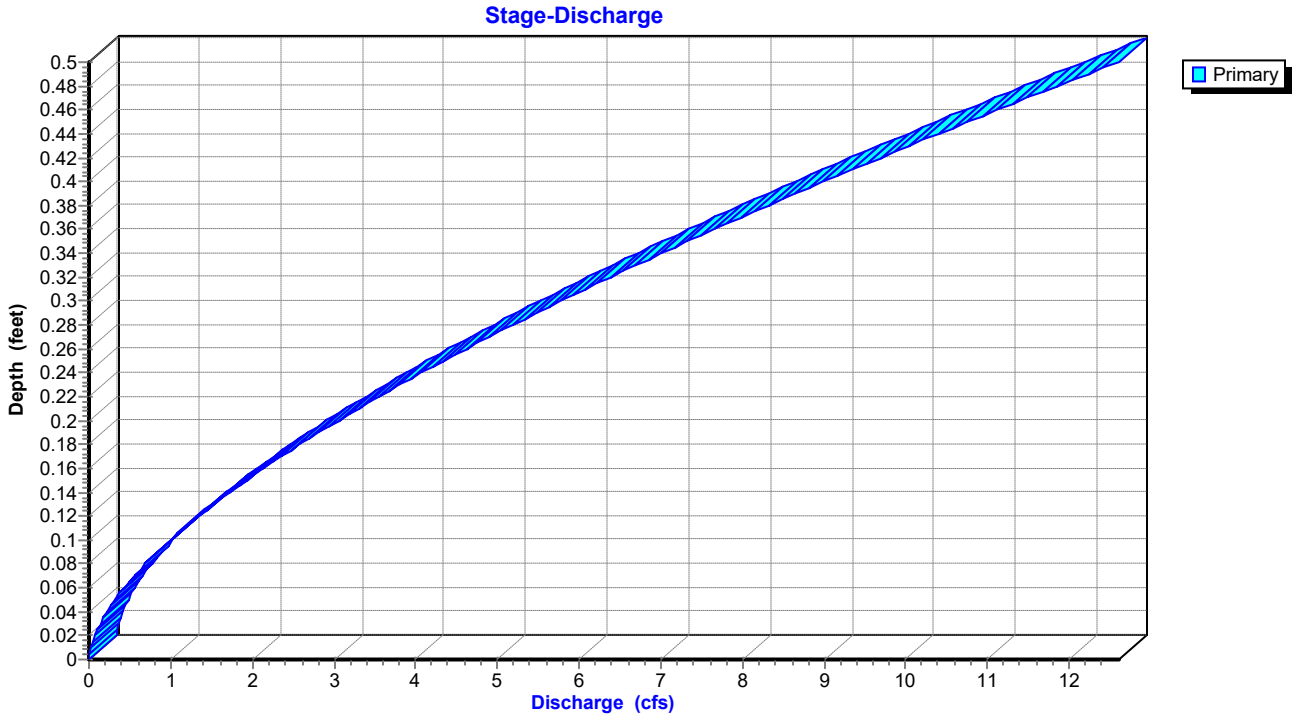
3.00' x 0.50' deep channel, n= 0.013 Concrete, trowel finish
Length= 4.0' Slope= 0.0200 '/'
Inlet Invert= 387.25', Outlet Invert= 387.17'



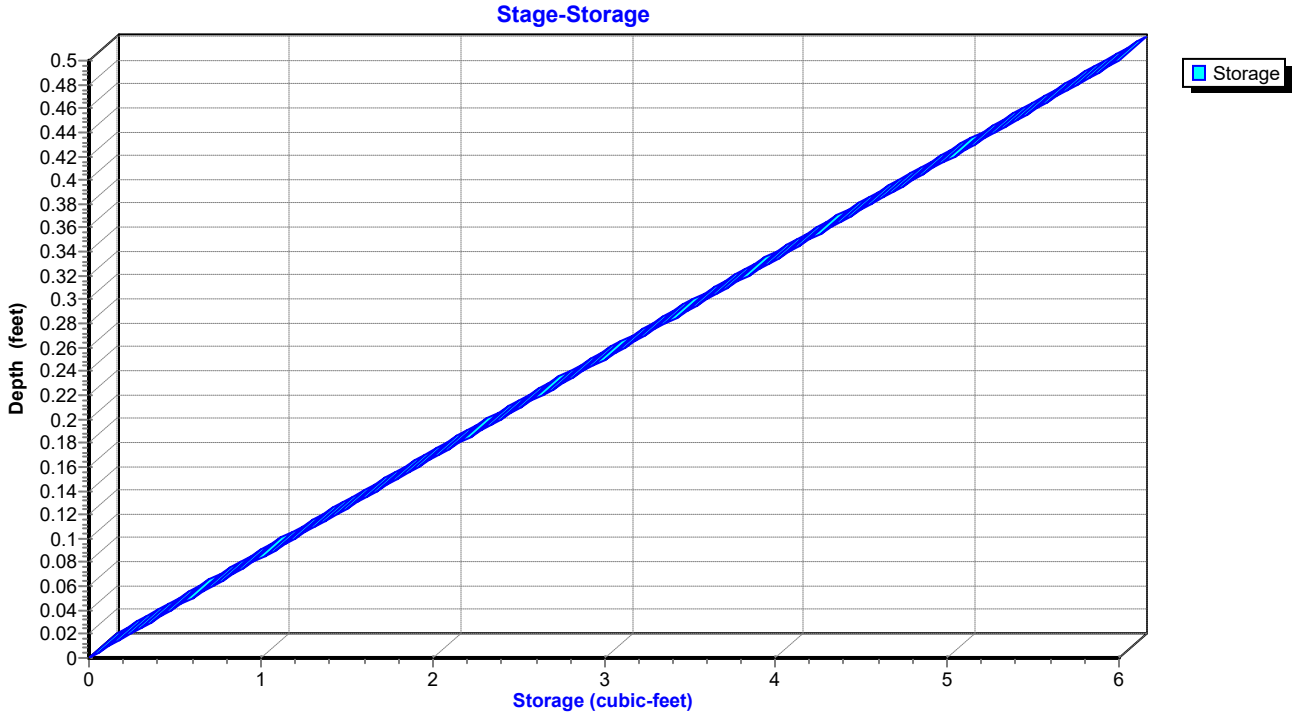
## Reach 4R: CURB CUT WIER




## Reach 4R: CURB CUT WIER



## Reach 4R: CURB CUT WIER



## Hydrograph for Reach 4R: CURB CUT WIER

| Time (hours) | Inflow (cfs) | Storage (cubic-feet) | Elevation (feet) | Outflow (cfs) |
|---|---|---|---|---|
| 0.00 | **0.00** | **0** | **387.25** | **0.00** |
| 0.50 | **0.00** | **0** | **387.25** | **0.00** |
| 1.00 | 0.00 | 0 | 387.25 | 0.00 |
| 1.50 | 0.00 | 0 | 387.25 | 0.00 |
| 2.00 | 0.00 | 0 | 387.25 | 0.00 |
| 2.50 | 0.00 | 0 | 387.25 | 0.00 |
| 3.00 | 0.00 | 0 | 387.25 | 0.00 |
| 3.50 | 0.00 | 0 | 387.25 | 0.00 |
| 4.00 | 0.00 | 0 | 387.25 | 0.00 |
| 4.50 | 0.00 | 0 | 387.25 | 0.00 |
| 5.00 | 0.00 | 0 | 387.25 | 0.00 |
| 5.50 | 0.00 | 0 | 387.25 | 0.00 |
| 6.00 | 0.00 | 0 | 387.25 | 0.00 |
| 6.50 | 0.00 | 0 | 387.25 | 0.00 |
| 7.00 | 0.00 | 0 | 387.25 | 0.00 |
| 7.50 | 0.00 | 0 | 387.25 | 0.00 |
| 8.00 | 0.00 | 0 | 387.25 | 0.00 |
| 8.50 | 0.00 | 0 | 387.25 | 0.00 |
| 9.00 | 0.00 | 0 | 387.25 | 0.00 |
| 9.50 | 0.00 | 0 | 387.25 | 0.00 |
| 10.00 | 0.00 | 0 | 387.25 | 0.00 |
| 10.50 | 0.00 | 0 | 387.25 | 0.00 |
| 11.00 | 0.00 | 0 | 387.25 | 0.00 |
| 11.50 | 0.00 | 0 | 387.25 | 0.00 |
| 12.00 | 0.00 | 0 | 387.25 | 0.00 |

## Stage-Discharge for Reach 4R: CURB CUT WIER

| Elevation (feet) | Velocity (ft/sec) | Discharge (cfs) |
|---|---|---|
| 387.25 | 0.00 | 0.00 |
| 387.26 | 0.75 | 0.02 |
| 387.27 | 1.18 | 0.07 |
| 387.28 | 1.54 | 0.14 |
| 387.29 | 1.86 | 0.22 |
| 387.30 | 2.15 | 0.32 |
| 387.31 | 2.41 | 0.43 |
| 387.32 | 2.66 | 0.56 |
| 387.33 | 2.90 | 0.70 |
| 387.34 | 3.12 | 0.84 |
| 387.35 | 3.34 | 1.00 |
| 387.36 | 3.54 | 1.17 |
| 387.37 | 3.74 | 1.35 |
| 387.38 | 3.92 | 1.53 |
| 387.39 | 4.11 | 1.72 |
| 387.40 | 4.28 | 1.93 |
| 387.41 | 4.45 | 2.14 |
| 387.42 | 4.62 | 2.36 |
| 387.43 | 4.78 | 2.58 |
| 387.44 | 4.93 | 2.81 |
| 387.45 | 5.09 | 3.05 |
| 387.46 | 5.23 | 3.30 |
| 387.47 | 5.38 | 3.55 |
| 387.48 | 5.52 | 3.81 |
| 387.49 | 5.65 | 4.07 |
| 387.50 | 5.79 | 4.34 |
| 387.51 | 5.92 | 4.62 |
| 387.52 | 6.05 | 4.90 |
| 387.53 | 6.17 | 5.19 |
| 387.54 | 6.30 | 5.48 |
| 387.55 | 6.42 | 5.77 |
| 387.56 | 6.53 | 6.08 |
| 387.57 | 6.65 | 6.38 |
| 387.58 | 6.76 | 6.69 |
| 387.59 | 6.87 | 7.01 |
| 387.60 | 6.98 | 7.33 |
| 387.61 | 7.09 | 7.65 |
| 387.62 | 7.19 | 7.98 |
| 387.63 | 7.30 | 8.32 |
| 387.64 | 7.40 | 8.65 |
| 387.65 | 7.50 | 9.00 |
| 387.66 | 7.59 | 9.34 |
| 387.67 | 7.69 | 9.69 |
| 387.68 | 7.79 | 10.04 |
| 387.69 | 7.88 | 10.40 |
| 387.70 | 7.97 | 10.76 |
| 387.71 | 8.06 | 11.12 |
| 387.72 | 8.15 | 11.49 |
| 387.73 | 8.24 | 11.86 |
| 387.74 | 8.32 | 12.23 |
| 387.75 | **8.41** | **12.61** |

## Stage-Area-Storage for Reach 4R: CURB CUT WIER

| Elevation (feet) | End-Area (sq-ft) | Storage (cubic-feet) |
|---|---|---|
| 387.25 | 0.0 | 0 |
| 387.26 | 0.0 | 0 |
| 387.27 | 0.1 | 0 |
| 387.28 | 0.1 | 0 |
| 387.29 | 0.1 | 0 |
| 387.30 | 0.2 | 1 |
| 387.31 | 0.2 | 1 |
| 387.32 | 0.2 | 1 |
| 387.33 | 0.2 | 1 |
| 387.34 | 0.3 | 1 |
| 387.35 | 0.3 | 1 |
| 387.36 | 0.3 | 1 |
| 387.37 | 0.4 | 1 |
| 387.38 | 0.4 | 2 |
| 387.39 | 0.4 | 2 |
| 387.40 | 0.4 | 2 |
| 387.41 | 0.5 | 2 |
| 387.42 | 0.5 | 2 |
| 387.43 | 0.5 | 2 |
| 387.44 | 0.6 | 2 |
| 387.45 | 0.6 | 2 |
| 387.46 | 0.6 | 3 |
| 387.47 | 0.7 | 3 |
| 387.48 | 0.7 | 3 |
| 387.49 | 0.7 | 3 |
| 387.50 | 0.8 | 3 |
| 387.51 | 0.8 | 3 |
| 387.52 | 0.8 | 3 |
| 387.53 | 0.8 | 3 |
| 387.54 | 0.9 | 3 |
| 387.55 | 0.9 | 4 |
| 387.56 | 0.9 | 4 |
| 387.57 | 1.0 | 4 |
| 387.58 | 1.0 | 4 |
| 387.59 | 1.0 | 4 |
| 387.60 | 1.1 | 4 |
| 387.61 | 1.1 | 4 |
| 387.62 | 1.1 | 4 |
| 387.63 | 1.1 | 5 |
| 387.64 | 1.2 | 5 |
| 387.65 | 1.2 | 5 |
| 387.66 | 1.2 | 5 |
| 387.67 | 1.3 | 5 |
| 387.68 | 1.3 | 5 |
| 387.69 | 1.3 | 5 |
| 387.70 | 1.4 | 5 |
| 387.71 | 1.4 | 6 |
| 387.72 | 1.4 | 6 |
| 387.73 | 1.4 | 6 |
| 387.74 | 1.5 | 6 |
| 387.75 | **1.5** | **6** |

## Summary for Pond 3P: DETENTION POND

Inflow Area = 1.057 ac, 63.15% Impervious, Inflow Depth = 0.94" for 10-yr event
Inflow = 3.78 cfs @ 0.16 hrs, Volume= 0.083 af
Outflow = 2.83 cfs @ 0.30 hrs, Volume= 0.083 af, Atten= 25%, Lag= 8.6 min
Primary = 2.83 cfs @ 0.30 hrs, Volume= 0.083 af

Routing by Stor-Ind method, Time Span= 0.00-12.00 hrs, dt= 0.01 hrs
Peak Elev= 385.90' @ 0.30 hrs Surf.Area= 1,245 sf Storage= 1,433 cf

Plug-Flow detention time= 9.9 min calculated for 0.083 af (100% of inflow)
Center-of-Mass det. time= 10.3 min ( 22.7 - 12.4 )

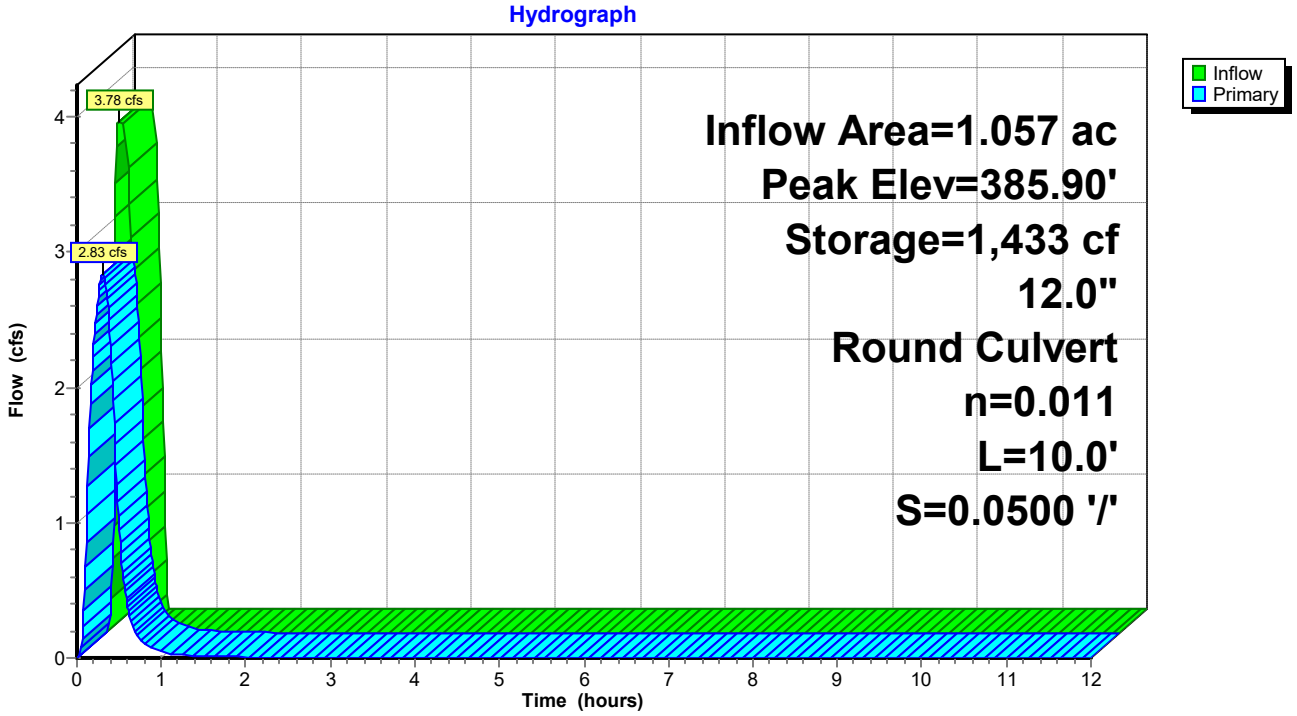
| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 384.50' | 2,986 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 384.50 | 724 | 0 | 0 |
| 385.00 | 986 | 428 | 428 |
| 386.00 | 1,273 | 1,130 | 1,557 |
| 387.00 | 1,585 | 1,429 | 2,986 |

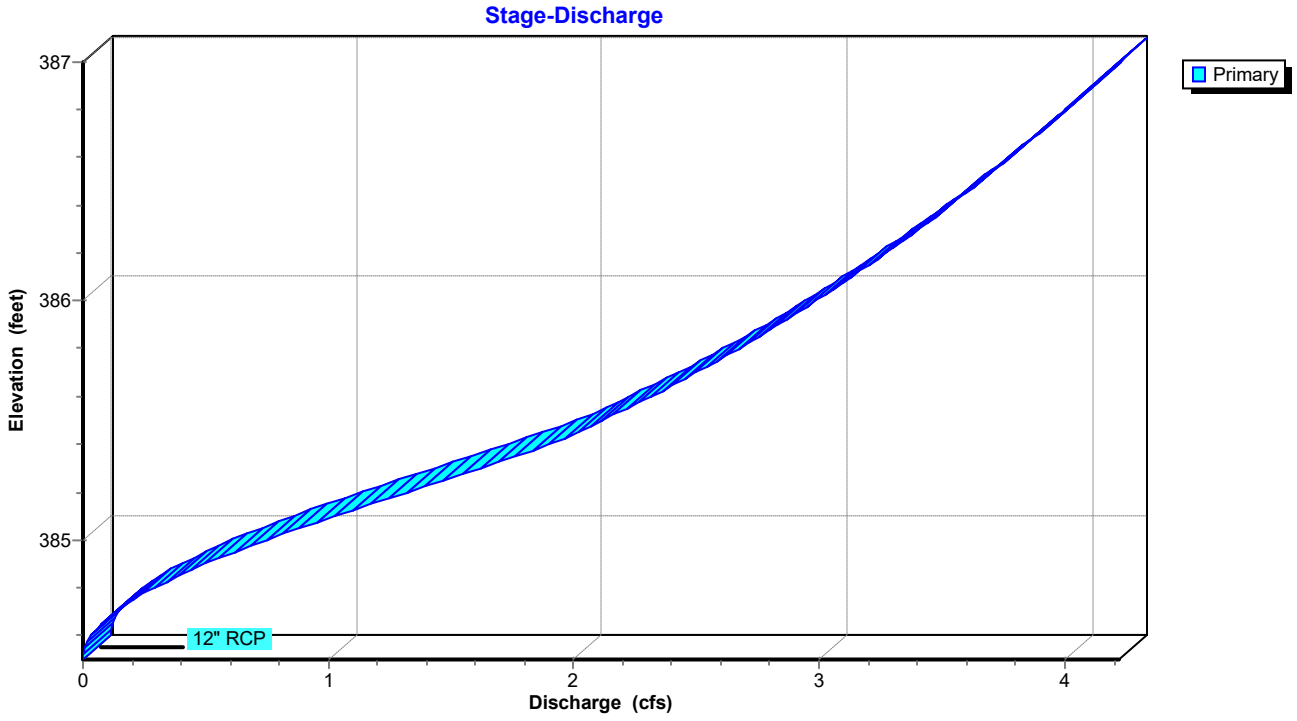
| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 384.50' | **12.0" Round 12" RCP**<br>L= 10.0' CMP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 384.50' / 384.00' S= 0.0500 '/' Cc= 0.900<br>n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf |

**Primary OutFlow** Max=2.83 cfs @ 0.30 hrs HW=385.90' (Free Discharge)
↑**1=12" RCP** (Inlet Controls 2.83 cfs @ 3.61 fps)

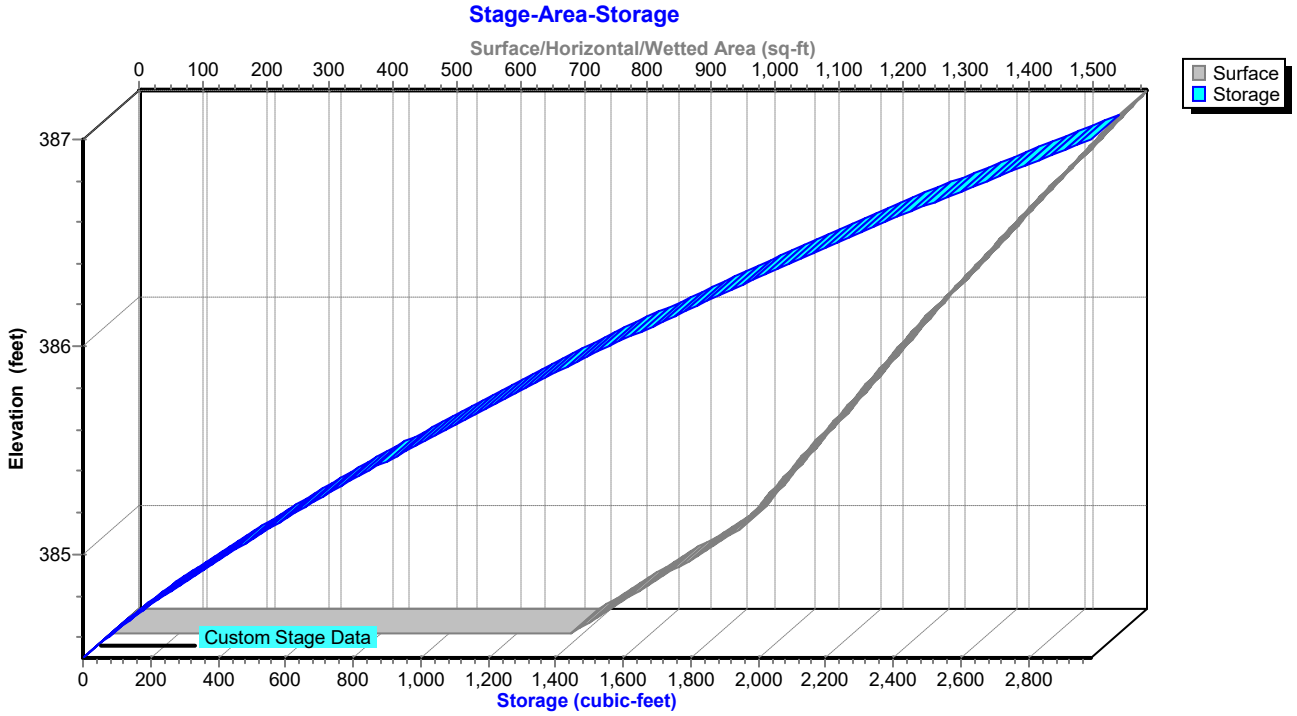
## Pond 3P: DETENTION POND




## Pond 3P: DETENTION POND



## Pond 3P: DETENTION POND



## Hydrograph for Pond 3P: DETENTION POND

| Time (hours) | Inflow (cfs) | Storage (cubic-feet) | Elevation (feet) | Primary (cfs) |
|---|---|---|---|---|
| 0.00 | **0.00** | **0** | **384.50** | **0.00** |
| 0.50 | **0.00** | **499** | **385.07** | **0.94** |
| 1.00 | 0.00 | 85 | 384.61 | 0.04 |
| 1.50 | 0.00 | 43 | 384.56 | 0.01 |
| 2.00 | 0.00 | 28 | 384.54 | 0.01 |
| 2.50 | 0.00 | 21 | 384.53 | 0.00 |
| 3.00 | 0.00 | 16 | 384.52 | 0.00 |
| 3.50 | 0.00 | 13 | 384.52 | 0.00 |
| 4.00 | 0.00 | 11 | 384.51 | 0.00 |
| 4.50 | 0.00 | 8 | 384.51 | 0.00 |
| 5.00 | 0.00 | 7 | 384.51 | 0.00 |
| 5.50 | 0.00 | 5 | 384.51 | 0.00 |
| 6.00 | 0.00 | 4 | 384.51 | 0.00 |
| 6.50 | 0.00 | 4 | 384.50 | 0.00 |
| 7.00 | 0.00 | 3 | 384.50 | 0.00 |
| 7.50 | 0.00 | 2 | 384.50 | 0.00 |
| 8.00 | 0.00 | 2 | 384.50 | 0.00 |
| 8.50 | 0.00 | 1 | 384.50 | 0.00 |
| 9.00 | 0.00 | 1 | 384.50 | 0.00 |
| 9.50 | 0.00 | 1 | 384.50 | 0.00 |
| 10.00 | 0.00 | 1 | 384.50 | 0.00 |
| 10.50 | 0.00 | 1 | 384.50 | 0.00 |
| 11.00 | 0.00 | 0 | 384.50 | 0.00 |
| 11.50 | 0.00 | 0 | 384.50 | 0.00 |
| 12.00 | 0.00 | 0 | 384.50 | 0.00 |

## Stage-Discharge for Pond 3P: DETENTION POND

| Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) |
|---|---|---|---|---|---|
| 384.50 | 0.00 | 385.52 | 2.15 | 386.54 | 3.70 |
| 384.52 | 0.00 | 385.54 | 2.19 | 386.56 | 3.73 |
| 384.54 | 0.01 | 385.56 | 2.23 | 386.58 | 3.75 |
| 384.56 | 0.01 | 385.58 | 2.27 | 386.60 | 3.78 |
| 384.58 | 0.02 | 385.60 | 2.31 | 386.62 | 3.80 |
| 384.60 | 0.03 | 385.62 | 2.35 | 386.64 | 3.82 |
| 384.62 | 0.05 | 385.64 | 2.39 | 386.66 | 3.85 |
| 384.64 | 0.07 | 385.66 | 2.43 | 386.68 | 3.87 |
| 384.66 | 0.09 | 385.68 | 2.46 | 386.70 | 3.89 |
| 384.68 | 0.11 | 385.70 | 2.50 | 386.72 | 3.92 |
| 384.70 | 0.13 | 385.72 | 2.53 | 386.74 | 3.94 |
| 384.72 | 0.16 | 385.74 | 2.57 | 386.76 | 3.96 |
| 384.74 | 0.19 | 385.76 | 2.60 | 386.78 | 3.98 |
| 384.76 | 0.22 | 385.78 | 2.64 | 386.80 | 4.01 |
| 384.78 | 0.26 | 385.80 | 2.67 | 386.82 | 4.03 |
| 384.80 | 0.29 | 385.82 | 2.70 | 386.84 | 4.05 |
| 384.82 | 0.33 | 385.84 | 2.74 | 386.86 | 4.07 |
| 384.84 | 0.37 | 385.86 | 2.77 | 386.88 | 4.09 |
| 384.86 | 0.41 | 385.88 | 2.80 | 386.90 | 4.12 |
| 384.88 | 0.45 | 385.90 | 2.83 | 386.92 | 4.14 |
| 384.90 | 0.50 | 385.92 | 2.86 | 386.94 | 4.16 |
| 384.92 | 0.55 | 385.94 | 2.89 | 386.96 | 4.18 |
| 384.94 | 0.59 | 385.96 | 2.93 | 386.98 | 4.20 |
| 384.96 | 0.64 | 385.98 | 2.96 | 387.00 | **4.22** |
| 384.98 | 0.69 | 386.00 | 2.99 | | |
| 385.00 | 0.75 | 386.02 | 3.02 | | |
| 385.02 | 0.80 | 386.04 | 3.04 | | |
| 385.04 | 0.85 | 386.06 | 3.07 | | |
| 385.06 | 0.91 | 386.08 | 3.10 | | |
| 385.08 | 0.97 | 386.10 | 3.13 | | |
| 385.10 | 1.02 | 386.12 | 3.16 | | |
| 385.12 | 1.08 | 386.14 | 3.19 | | |
| 385.14 | 1.14 | 386.16 | 3.22 | | |
| 385.16 | 1.20 | 386.18 | 3.24 | | |
| 385.18 | 1.26 | 386.20 | 3.27 | | |
| 385.20 | 1.32 | 386.22 | 3.30 | | |
| 385.22 | 1.38 | 386.24 | 3.32 | | |
| 385.24 | 1.44 | 386.26 | 3.35 | | |
| 385.26 | 1.50 | 386.28 | 3.38 | | |
| 385.28 | 1.56 | 386.30 | 3.40 | | |
| 385.30 | 1.62 | 386.32 | 3.43 | | |
| 385.32 | 1.68 | 386.34 | 3.46 | | |
| 385.34 | 1.74 | 386.36 | 3.48 | | |
| 385.36 | 1.79 | 386.38 | 3.51 | | |
| 385.38 | 1.85 | 386.40 | 3.53 | | |
| 385.40 | 1.90 | 386.42 | 3.56 | | |
| 385.42 | 1.95 | 386.44 | 3.58 | | |
| 385.44 | 2.00 | 386.46 | 3.61 | | |
| 385.46 | 2.04 | 386.48 | 3.63 | | |
| 385.48 | 2.08 | 386.50 | 3.66 | | |
| 385.50 | 2.11 | 386.52 | 3.68 | | |

## Stage-Area-Storage for Pond 3P: DETENTION POND

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---|---|---|
| 384.50 | 724 | 0 |
| 384.55 | 750 | 37 |
| 384.60 | 776 | 75 |
| 384.65 | 803 | 114 |
| 384.70 | 829 | 155 |
| 384.75 | 855 | 197 |
| 384.80 | 881 | 241 |
| 384.85 | 907 | 285 |
| 384.90 | 934 | 332 |
| 384.95 | 960 | 379 |
| 385.00 | 986 | 428 |
| 385.05 | 1,000 | 477 |
| 385.10 | 1,015 | 528 |
| 385.15 | 1,029 | 579 |
| 385.20 | 1,043 | 630 |
| 385.25 | 1,058 | 683 |
| 385.30 | 1,072 | 736 |
| 385.35 | 1,086 | 790 |
| 385.40 | 1,101 | 845 |
| 385.45 | 1,115 | 900 |
| 385.50 | 1,130 | 956 |
| 385.55 | 1,144 | 1,013 |
| 385.60 | 1,158 | 1,071 |
| 385.65 | 1,173 | 1,129 |
| 385.70 | 1,187 | 1,188 |
| 385.75 | 1,201 | 1,248 |
| 385.80 | 1,216 | 1,308 |
| 385.85 | 1,230 | 1,369 |
| 385.90 | 1,244 | 1,431 |
| 385.95 | 1,259 | 1,494 |
| 386.00 | 1,273 | 1,557 |
| 386.05 | 1,289 | 1,621 |
| 386.10 | 1,304 | 1,686 |
| 386.15 | 1,320 | 1,751 |
| 386.20 | 1,335 | 1,818 |
| 386.25 | 1,351 | 1,885 |
| 386.30 | 1,367 | 1,953 |
| 386.35 | 1,382 | 2,022 |
| 386.40 | 1,398 | 2,091 |
| 386.45 | 1,413 | 2,161 |
| 386.50 | 1,429 | 2,233 |
| 386.55 | 1,445 | 2,304 |
| 386.60 | 1,460 | 2,377 |
| 386.65 | 1,476 | 2,450 |
| 386.70 | 1,491 | 2,525 |
| 386.75 | 1,507 | 2,600 |
| 386.80 | 1,523 | 2,675 |
| 386.85 | 1,538 | 2,752 |
| 386.90 | 1,554 | 2,829 |
| 386.95 | 1,569 | 2,907 |
| 387.00 | **1,585** | **2,986** |

Time span=0.00-12.00 hrs, dt=0.01 hrs, 1201 points
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: PRE-DEVELOPMENT** Runoff Area=46,055 sf 0.00% Impervious Runoff Depth=0.97"
Flow Length=270' Slope=0.0250 '/' Tc=15.5 min C=0.69 Runoff=3.90 cfs 0.086 af

**Subcatchment 2S: POST-DEVELOPMENT** Runoff Area=46,055 sf 63.15% Impervious Runoff Depth=1.09"
Flow Length=360' Slope=0.0150 '/' Tc=8.8 min C=0.77 Runoff=4.35 cfs 0.096 af

**Reach 4R: CURB CUT WIER** Avg. Flow Depth=0.25' Max Vel=5.80 fps Inflow=4.35 cfs 0.096 af
n=0.013 L=4.0' S=0.0200 '/' Capacity=12.61 cfs Outflow=4.36 cfs 0.096 af

**Pond 3P: DETENTION POND** Peak Elev=386.11' Storage=1,698 cf Inflow=4.36 cfs 0.096 af
12.0" Round Culvert n=0.011 L=10.0' S=0.0500 '/' Outflow=3.14 cfs 0.096 af

**Total Runoff Area = 2.115 ac Runoff Volume = 0.182 af Average Runoff Depth = 1.03"**
**68.43% Pervious = 1.447 ac 31.57% Impervious = 0.668 ac**

## Summary for Subcatchment 1S: PRE-DEVELOPMENT

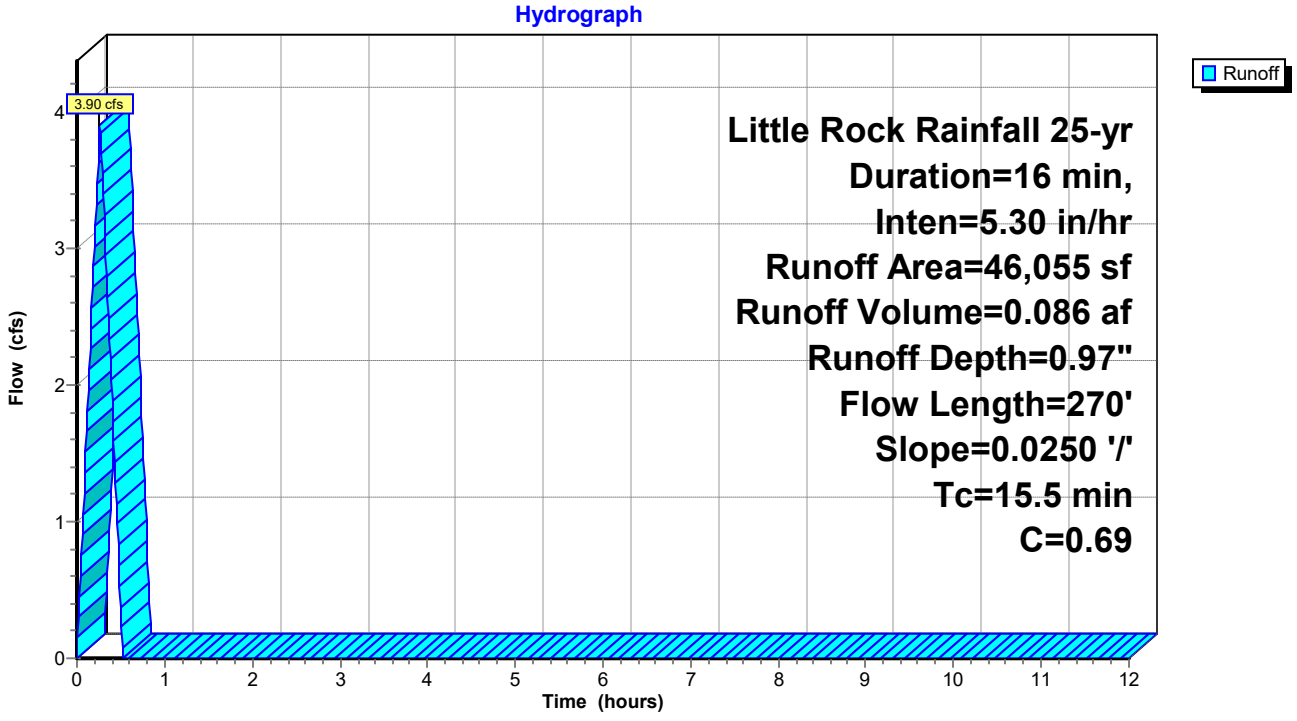
Runoff = 3.90 cfs @ 0.26 hrs, Volume= 0.086 af, Depth= 0.97"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-12.00 hrs, dt= 0.01 hrs
Little Rock Rainfall 25-yr Duration=16 min, Inten=5.30 in/hr

| Area (sf) | C | Description |
|---|---|---|
| 31,035 | 0.65 | GRAVEL PARKING |
| 15,020 | 0.77 | SHRUB POOR CONDITION BRUSH |
| 46,055 | 0.69 | Weighted Average |
| 46,055 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 15.5 | 270 | 0.0250 | 0.29 | | **Sheet Flow, SHEET FLOW SURFACE** Range n= 0.130 P2= 4.19" |

## Subcatchment 1S: PRE-DEVELOPMENT



## Hydrograph for Subcatchment 1S: PRE-DEVELOPMENT

| Time (hours) | Runoff (cfs) | Time (hours) | Runoff (cfs) | Time (hours) | Runoff (cfs) |
|---|---|---|---|---|---|
| 0.00 | 0.00 | 5.10 | 0.00 | 10.20 | 0.00 |
| 0.10 | 1.51 | 5.20 | 0.00 | 10.30 | 0.00 |
| 0.20 | **3.02** | 5.30 | 0.00 | 10.40 | 0.00 |
| 0.30 | **3.39** | 5.40 | 0.00 | 10.50 | 0.00 |
| 0.40 | 1.89 | 5.50 | 0.00 | 10.60 | 0.00 |
| 0.50 | 0.38 | 5.60 | 0.00 | 10.70 | 0.00 |
| 0.60 | 0.00 | 5.70 | 0.00 | 10.80 | 0.00 |
| 0.70 | 0.00 | 5.80 | 0.00 | 10.90 | 0.00 |
| 0.80 | 0.00 | 5.90 | 0.00 | 11.00 | 0.00 |
| 0.90 | 0.00 | 6.00 | 0.00 | 11.10 | 0.00 |
| 1.00 | 0.00 | 6.10 | 0.00 | 11.20 | 0.00 |
| 1.10 | 0.00 | 6.20 | 0.00 | 11.30 | 0.00 |
| 1.20 | 0.00 | 6.30 | 0.00 | 11.40 | 0.00 |
| 1.30 | 0.00 | 6.40 | 0.00 | 11.50 | 0.00 |
| 1.40 | 0.00 | 6.50 | 0.00 | 11.60 | 0.00 |
| 1.50 | 0.00 | 6.60 | 0.00 | 11.70 | 0.00 |
| 1.60 | 0.00 | 6.70 | 0.00 | 11.80 | 0.00 |
| 1.70 | 0.00 | 6.80 | 0.00 | 11.90 | 0.00 |
| 1.80 | 0.00 | 6.90 | 0.00 | 12.00 | 0.00 |
| 1.90 | 0.00 | 7.00 | 0.00 | | |
| 2.00 | 0.00 | 7.10 | 0.00 | | |
| 2.10 | 0.00 | 7.20 | 0.00 | | |
| 2.20 | 0.00 | 7.30 | 0.00 | | |
| 2.30 | 0.00 | 7.40 | 0.00 | | |
| 2.40 | 0.00 | 7.50 | 0.00 | | |
| 2.50 | 0.00 | 7.60 | 0.00 | | |
| 2.60 | 0.00 | 7.70 | 0.00 | | |
| 2.70 | 0.00 | 7.80 | 0.00 | | |
| 2.80 | 0.00 | 7.90 | 0.00 | | |
| 2.90 | 0.00 | 8.00 | 0.00 | | |
| 3.00 | 0.00 | 8.10 | 0.00 | | |
| 3.10 | 0.00 | 8.20 | 0.00 | | |
| 3.20 | 0.00 | 8.30 | 0.00 | | |
| 3.30 | 0.00 | 8.40 | 0.00 | | |
| 3.40 | 0.00 | 8.50 | 0.00 | | |
| 3.50 | 0.00 | 8.60 | 0.00 | | |
| 3.60 | 0.00 | 8.70 | 0.00 | | |
| 3.70 | 0.00 | 8.80 | 0.00 | | |
| 3.80 | 0.00 | 8.90 | 0.00 | | |
| 3.90 | 0.00 | 9.00 | 0.00 | | |
| 4.00 | 0.00 | 9.10 | 0.00 | | |
| 4.10 | 0.00 | 9.20 | 0.00 | | |
| 4.20 | 0.00 | 9.30 | 0.00 | | |
| 4.30 | 0.00 | 9.40 | 0.00 | | |
| 4.40 | 0.00 | 9.50 | 0.00 | | |
| 4.50 | 0.00 | 9.60 | 0.00 | | |
| 4.60 | 0.00 | 9.70 | 0.00 | | |
| 4.70 | 0.00 | 9.80 | 0.00 | | |
| 4.80 | 0.00 | 9.90 | 0.00 | | |
| 4.90 | 0.00 | 10.00 | 0.00 | | |
| 5.00 | 0.00 | 10.10 | 0.00 | | |

## Summary for Subcatchment 2S: POST-DEVELOPMENT

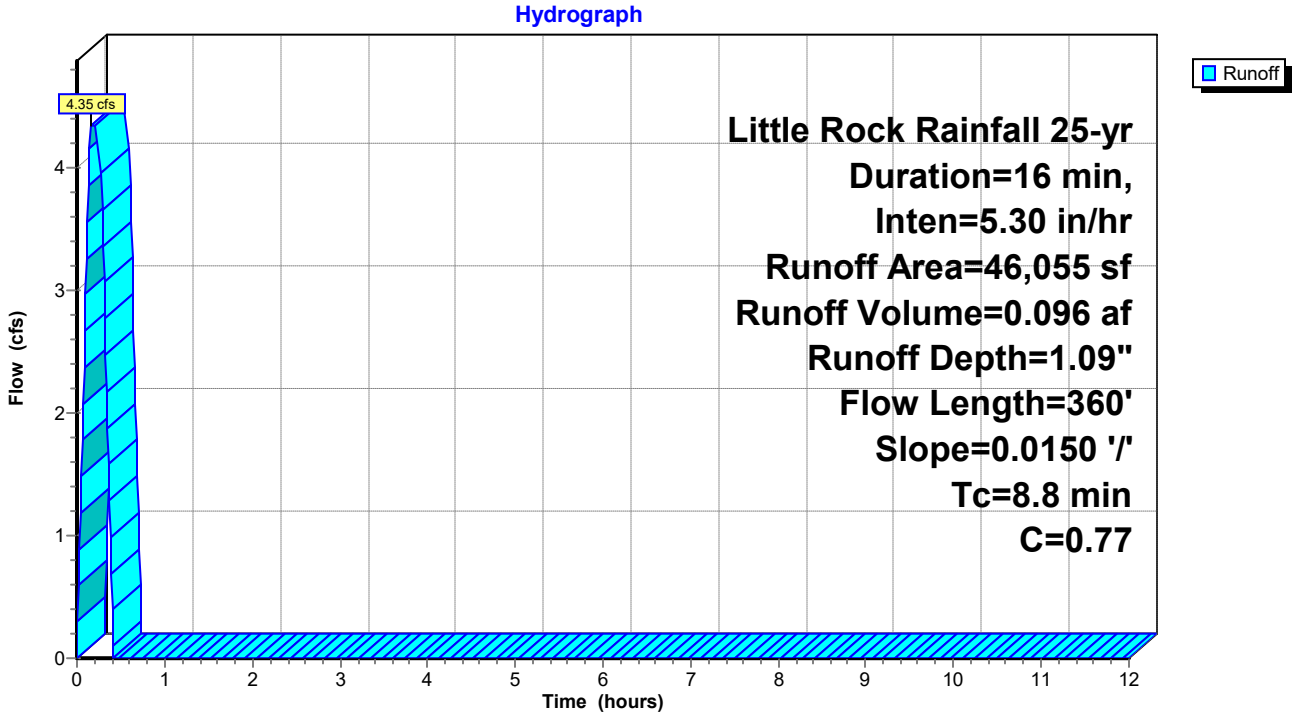
Runoff = 4.35 cfs @ 0.15 hrs, Volume= 0.096 af, Depth= 1.09"
Routed to Reach 4R : CURB CUT WIER

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-12.00 hrs, dt= 0.01 hrs
Little Rock Rainfall 25-yr Duration=16 min, Inten=5.30 in/hr

| Area (sf) | C | Description |
|---|---|---|
| 22,479 | 0.95 | ASPHALT SURFACE |
| 6,603 | 0.97 | ROOF TOP |
| 16,973 | 0.46 | GRASS LANDSCAPING |
| 46,055 | 0.77 | Weighted Average |
| 16,973 | | 36.85% Pervious Area |
| 29,082 | | 63.15% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.7 | 40 | 0.0150 | 0.10 | | **Sheet Flow, GRASS** Grass: Dense n= 0.240 P2= 4.19" |
| 2.1 | 320 | 0.0150 | 2.49 | | **Shallow Concentrated Flow, PAVEMENT** Paved Kv= 20.3 fps |
| 8.8 | 360 | Total | | | |

## Subcatchment 2S: POST-DEVELOPMENT



## Hydrograph for Subcatchment 2S: POST-DEVELOPMENT

| Time (hours) | Runoff (cfs) | Time (hours) | Runoff (cfs) | Time (hours) | Runoff (cfs) |
|---|---|---|---|---|---|
| 0.00 | 0.00 | 5.10 | 0.00 | 10.20 | 0.00 |
| 0.10 | **2.97** | 5.20 | 0.00 | 10.30 | 0.00 |
| 0.20 | **4.35** | 5.30 | 0.00 | 10.40 | 0.00 |
| 0.30 | 3.36 | 5.40 | 0.00 | 10.50 | 0.00 |
| 0.40 | 0.40 | 5.50 | 0.00 | 10.60 | 0.00 |
| 0.50 | 0.00 | 5.60 | 0.00 | 10.70 | 0.00 |
| 0.60 | 0.00 | 5.70 | 0.00 | 10.80 | 0.00 |
| 0.70 | 0.00 | 5.80 | 0.00 | 10.90 | 0.00 |
| 0.80 | 0.00 | 5.90 | 0.00 | 11.00 | 0.00 |
| 0.90 | 0.00 | 6.00 | 0.00 | 11.10 | 0.00 |
| 1.00 | 0.00 | 6.10 | 0.00 | 11.20 | 0.00 |
| 1.10 | 0.00 | 6.20 | 0.00 | 11.30 | 0.00 |
| 1.20 | 0.00 | 6.30 | 0.00 | 11.40 | 0.00 |
| 1.30 | 0.00 | 6.40 | 0.00 | 11.50 | 0.00 |
| 1.40 | 0.00 | 6.50 | 0.00 | 11.60 | 0.00 |
| 1.50 | 0.00 | 6.60 | 0.00 | 11.70 | 0.00 |
| 1.60 | 0.00 | 6.70 | 0.00 | 11.80 | 0.00 |
| 1.70 | 0.00 | 6.80 | 0.00 | 11.90 | 0.00 |
| 1.80 | 0.00 | 6.90 | 0.00 | 12.00 | 0.00 |
| 1.90 | 0.00 | 7.00 | 0.00 | | |
| 2.00 | 0.00 | 7.10 | 0.00 | | |
| 2.10 | 0.00 | 7.20 | 0.00 | | |
| 2.20 | 0.00 | 7.30 | 0.00 | | |
| 2.30 | 0.00 | 7.40 | 0.00 | | |
| 2.40 | 0.00 | 7.50 | 0.00 | | |
| 2.50 | 0.00 | 7.60 | 0.00 | | |
| 2.60 | 0.00 | 7.70 | 0.00 | | |
| 2.70 | 0.00 | 7.80 | 0.00 | | |
| 2.80 | 0.00 | 7.90 | 0.00 | | |
| 2.90 | 0.00 | 8.00 | 0.00 | | |
| 3.00 | 0.00 | 8.10 | 0.00 | | |
| 3.10 | 0.00 | 8.20 | 0.00 | | |
| 3.20 | 0.00 | 8.30 | 0.00 | | |
| 3.30 | 0.00 | 8.40 | 0.00 | | |
| 3.40 | 0.00 | 8.50 | 0.00 | | |
| 3.50 | 0.00 | 8.60 | 0.00 | | |
| 3.60 | 0.00 | 8.70 | 0.00 | | |
| 3.70 | 0.00 | 8.80 | 0.00 | | |
| 3.80 | 0.00 | 8.90 | 0.00 | | |
| 3.90 | 0.00 | 9.00 | 0.00 | | |
| 4.00 | 0.00 | 9.10 | 0.00 | | |
| 4.10 | 0.00 | 9.20 | 0.00 | | |
| 4.20 | 0.00 | 9.30 | 0.00 | | |
| 4.30 | 0.00 | 9.40 | 0.00 | | |
| 4.40 | 0.00 | 9.50 | 0.00 | | |
| 4.50 | 0.00 | 9.60 | 0.00 | | |
| 4.60 | 0.00 | 9.70 | 0.00 | | |
| 4.70 | 0.00 | 9.80 | 0.00 | | |
| 4.80 | 0.00 | 9.90 | 0.00 | | |
| 4.90 | 0.00 | 10.00 | 0.00 | | |
| 5.00 | 0.00 | 10.10 | 0.00 | | |

## Summary for Reach 4R: CURB CUT WIER

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 1.057 ac, 63.15% Impervious, Inflow Depth = 1.09" for 25-yr event
Inflow = 4.35 cfs @ 0.15 hrs, Volume= 0.096 af
Outflow = 4.36 cfs @ 0.16 hrs, Volume= 0.096 af, Atten= 0%, Lag= 0.6 min
Routed to Pond 3P : DETENTION POND

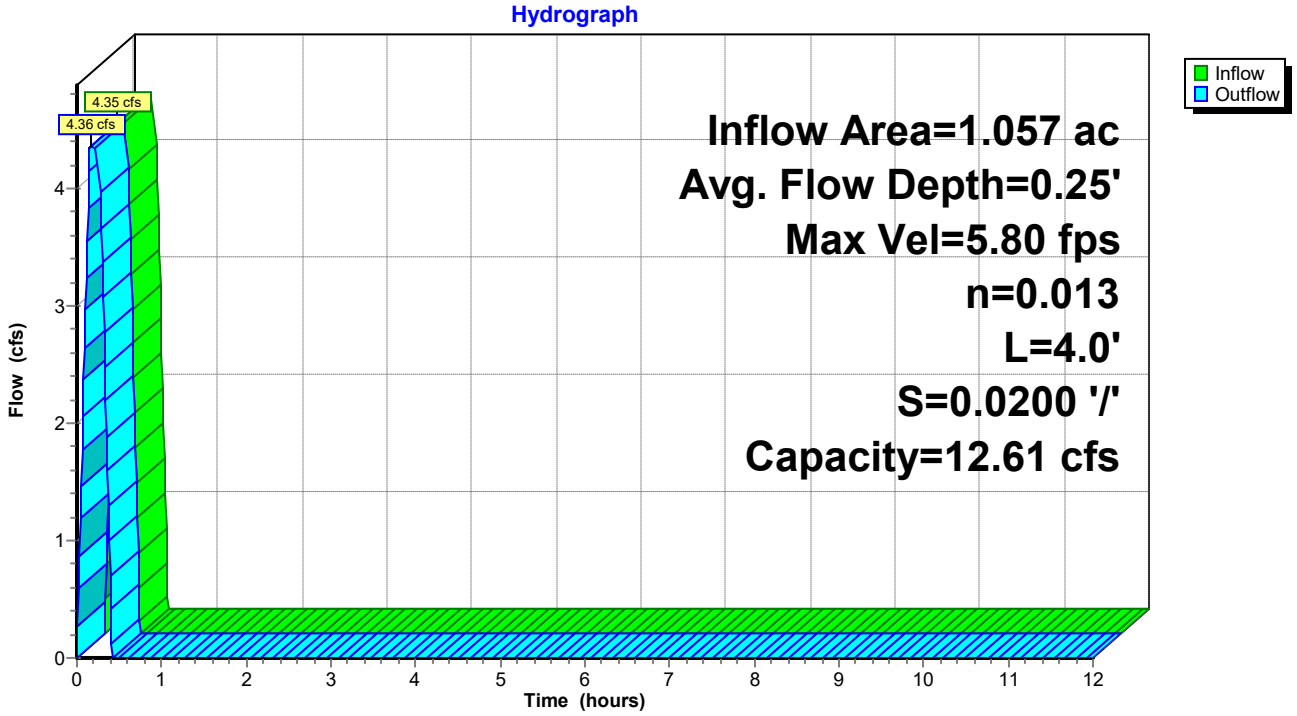
Routing by Stor-Ind+Trans method, Time Span= 0.00-12.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.80 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 4.60 fps, Avg. Travel Time= 0.0 min

Peak Storage= 3 cf @ 0.16 hrs
Average Depth at Peak Storage= 0.25' , Surface Width= 3.00'
Bank-Full Depth= 0.50' Flow Area= 1.5 sf, Capacity= 12.61 cfs

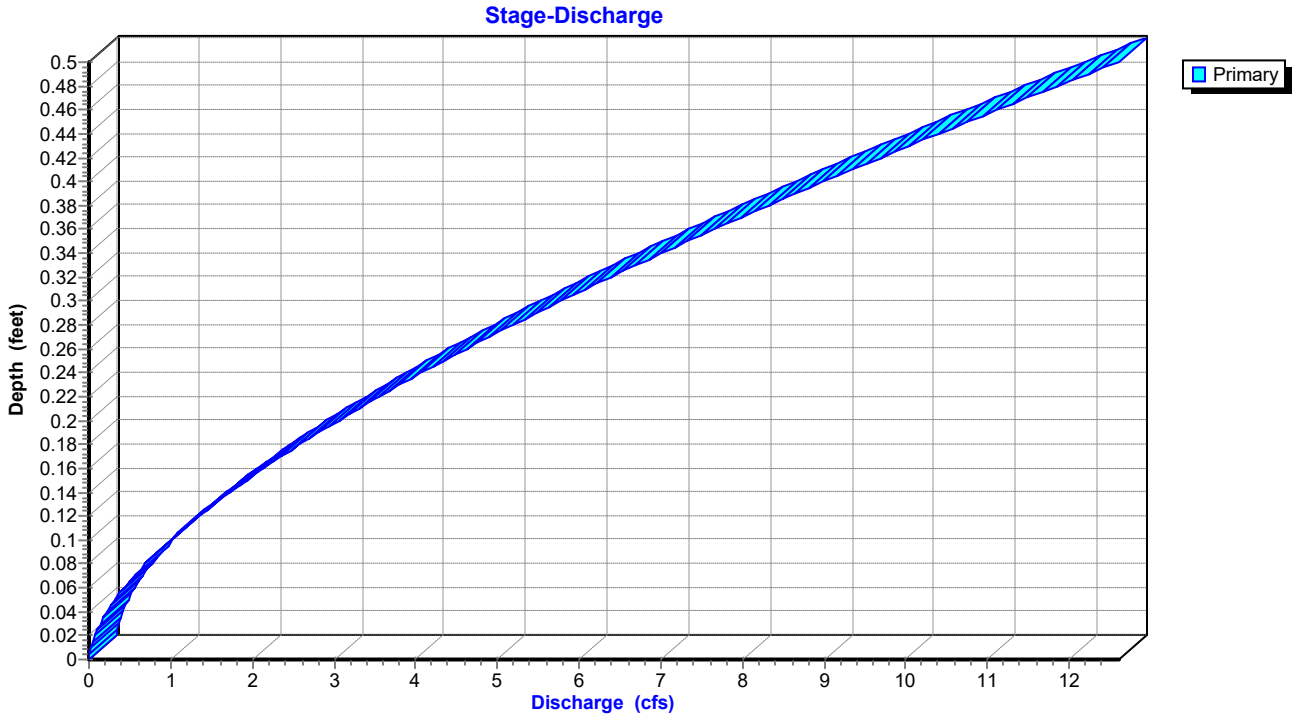
3.00' x 0.50' deep channel, n= 0.013 Concrete, trowel finish
Length= 4.0' Slope= 0.0200 '/'
Inlet Invert= 387.25', Outlet Invert= 387.17'



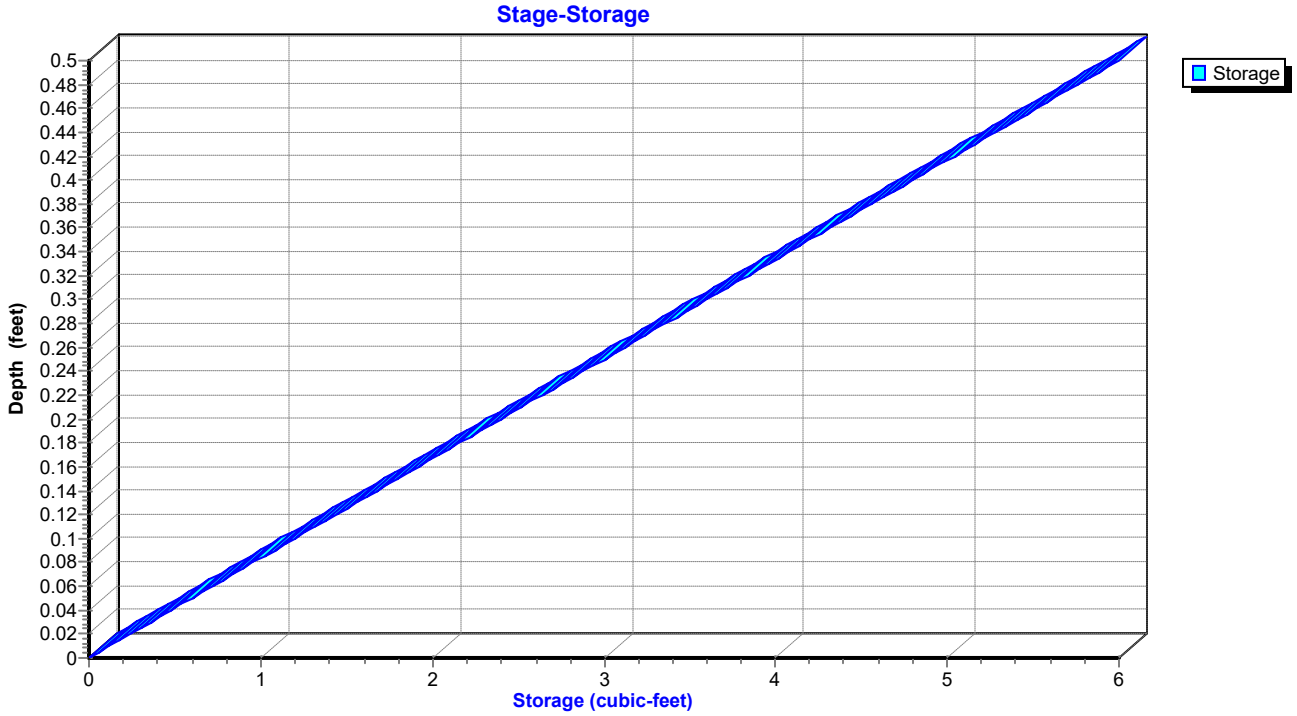
## Reach 4R: CURB CUT WIER




## Reach 4R: CURB CUT WIER



## Reach 4R: CURB CUT WIER



## Hydrograph for Reach 4R: CURB CUT WIER

| Time (hours) | Inflow (cfs) | Storage (cubic-feet) | Elevation (feet) | Outflow (cfs) |
|---|---|---|---|---|
| 0.00 | **0.00** | **0** | **387.25** | **0.00** |
| 0.50 | **0.00** | **0** | **387.25** | **0.00** |
| 1.00 | 0.00 | 0 | 387.25 | 0.00 |
| 1.50 | 0.00 | 0 | 387.25 | 0.00 |
| 2.00 | 0.00 | 0 | 387.25 | 0.00 |
| 2.50 | 0.00 | 0 | 387.25 | 0.00 |
| 3.00 | 0.00 | 0 | 387.25 | 0.00 |
| 3.50 | 0.00 | 0 | 387.25 | 0.00 |
| 4.00 | 0.00 | 0 | 387.25 | 0.00 |
| 4.50 | 0.00 | 0 | 387.25 | 0.00 |
| 5.00 | 0.00 | 0 | 387.25 | 0.00 |
| 5.50 | 0.00 | 0 | 387.25 | 0.00 |
| 6.00 | 0.00 | 0 | 387.25 | 0.00 |
| 6.50 | 0.00 | 0 | 387.25 | 0.00 |
| 7.00 | 0.00 | 0 | 387.25 | 0.00 |
| 7.50 | 0.00 | 0 | 387.25 | 0.00 |
| 8.00 | 0.00 | 0 | 387.25 | 0.00 |
| 8.50 | 0.00 | 0 | 387.25 | 0.00 |
| 9.00 | 0.00 | 0 | 387.25 | 0.00 |
| 9.50 | 0.00 | 0 | 387.25 | 0.00 |
| 10.00 | 0.00 | 0 | 387.25 | 0.00 |
| 10.50 | 0.00 | 0 | 387.25 | 0.00 |
| 11.00 | 0.00 | 0 | 387.25 | 0.00 |
| 11.50 | 0.00 | 0 | 387.25 | 0.00 |
| 12.00 | 0.00 | 0 | 387.25 | 0.00 |

## Stage-Discharge for Reach 4R: CURB CUT WIER

| Elevation (feet) | Velocity (ft/sec) | Discharge (cfs) |
|---|---|---|
| 387.25 | 0.00 | 0.00 |
| 387.26 | 0.75 | 0.02 |
| 387.27 | 1.18 | 0.07 |
| 387.28 | 1.54 | 0.14 |
| 387.29 | 1.86 | 0.22 |
| 387.30 | 2.15 | 0.32 |
| 387.31 | 2.41 | 0.43 |
| 387.32 | 2.66 | 0.56 |
| 387.33 | 2.90 | 0.70 |
| 387.34 | 3.12 | 0.84 |
| 387.35 | 3.34 | 1.00 |
| 387.36 | 3.54 | 1.17 |
| 387.37 | 3.74 | 1.35 |
| 387.38 | 3.92 | 1.53 |
| 387.39 | 4.11 | 1.72 |
| 387.40 | 4.28 | 1.93 |
| 387.41 | 4.45 | 2.14 |
| 387.42 | 4.62 | 2.36 |
| 387.43 | 4.78 | 2.58 |
| 387.44 | 4.93 | 2.81 |
| 387.45 | 5.09 | 3.05 |
| 387.46 | 5.23 | 3.30 |
| 387.47 | 5.38 | 3.55 |
| 387.48 | 5.52 | 3.81 |
| 387.49 | 5.65 | 4.07 |
| 387.50 | 5.79 | 4.34 |
| 387.51 | 5.92 | 4.62 |
| 387.52 | 6.05 | 4.90 |
| 387.53 | 6.17 | 5.19 |
| 387.54 | 6.30 | 5.48 |
| 387.55 | 6.42 | 5.77 |
| 387.56 | 6.53 | 6.08 |
| 387.57 | 6.65 | 6.38 |
| 387.58 | 6.76 | 6.69 |
| 387.59 | 6.87 | 7.01 |
| 387.60 | 6.98 | 7.33 |
| 387.61 | 7.09 | 7.65 |
| 387.62 | 7.19 | 7.98 |
| 387.63 | 7.30 | 8.32 |
| 387.64 | 7.40 | 8.65 |
| 387.65 | 7.50 | 9.00 |
| 387.66 | 7.59 | 9.34 |
| 387.67 | 7.69 | 9.69 |
| 387.68 | 7.79 | 10.04 |
| 387.69 | 7.88 | 10.40 |
| 387.70 | 7.97 | 10.76 |
| 387.71 | 8.06 | 11.12 |
| 387.72 | 8.15 | 11.49 |
| 387.73 | 8.24 | 11.86 |
| 387.74 | 8.32 | 12.23 |
| 387.75 | **8.41** | **12.61** |

## Stage-Area-Storage for Reach 4R: CURB CUT WIER

| Elevation (feet) | End-Area (sq-ft) | Storage (cubic-feet) |
|---|---|---|
| 387.25 | 0.0 | 0 |
| 387.26 | 0.0 | 0 |
| 387.27 | 0.1 | 0 |
| 387.28 | 0.1 | 0 |
| 387.29 | 0.1 | 0 |
| 387.30 | 0.2 | 1 |
| 387.31 | 0.2 | 1 |
| 387.32 | 0.2 | 1 |
| 387.33 | 0.2 | 1 |
| 387.34 | 0.3 | 1 |
| 387.35 | 0.3 | 1 |
| 387.36 | 0.3 | 1 |
| 387.37 | 0.4 | 1 |
| 387.38 | 0.4 | 2 |
| 387.39 | 0.4 | 2 |
| 387.40 | 0.4 | 2 |
| 387.41 | 0.5 | 2 |
| 387.42 | 0.5 | 2 |
| 387.43 | 0.5 | 2 |
| 387.44 | 0.6 | 2 |
| 387.45 | 0.6 | 2 |
| 387.46 | 0.6 | 3 |
| 387.47 | 0.7 | 3 |
| 387.48 | 0.7 | 3 |
| 387.49 | 0.7 | 3 |
| 387.50 | 0.8 | 3 |
| 387.51 | 0.8 | 3 |
| 387.52 | 0.8 | 3 |
| 387.53 | 0.8 | 3 |
| 387.54 | 0.9 | 3 |
| 387.55 | 0.9 | 4 |
| 387.56 | 0.9 | 4 |
| 387.57 | 1.0 | 4 |
| 387.58 | 1.0 | 4 |
| 387.59 | 1.0 | 4 |
| 387.60 | 1.1 | 4 |
| 387.61 | 1.1 | 4 |
| 387.62 | 1.1 | 4 |
| 387.63 | 1.1 | 5 |
| 387.64 | 1.2 | 5 |
| 387.65 | 1.2 | 5 |
| 387.66 | 1.2 | 5 |
| 387.67 | 1.3 | 5 |
| 387.68 | 1.3 | 5 |
| 387.69 | 1.3 | 5 |
| 387.70 | 1.4 | 5 |
| 387.71 | 1.4 | 6 |
| 387.72 | 1.4 | 6 |
| 387.73 | 1.4 | 6 |
| 387.74 | 1.5 | 6 |
| 387.75 | **1.5** | **6** |

## Summary for Pond 3P: DETENTION POND

Inflow Area = 1.057 ac, 63.15% Impervious, Inflow Depth = 1.09" for 25-yr event
Inflow = 4.36 cfs @ 0.16 hrs, Volume= 0.096 af
Outflow = 3.14 cfs @ 0.31 hrs, Volume= 0.096 af, Atten= 28%, Lag= 8.9 min
Primary = 3.14 cfs @ 0.31 hrs, Volume= 0.096 af

Routing by Stor-Ind method, Time Span= 0.00-12.00 hrs, dt= 0.01 hrs
Peak Elev= 386.11' @ 0.31 hrs Surf.Area= 1,307 sf Storage= 1,698 cf

Plug-Flow detention time= 9.9 min calculated for 0.096 af (100% of inflow)
Center-of-Mass det. time= 10.2 min ( 22.7 - 12.4 )

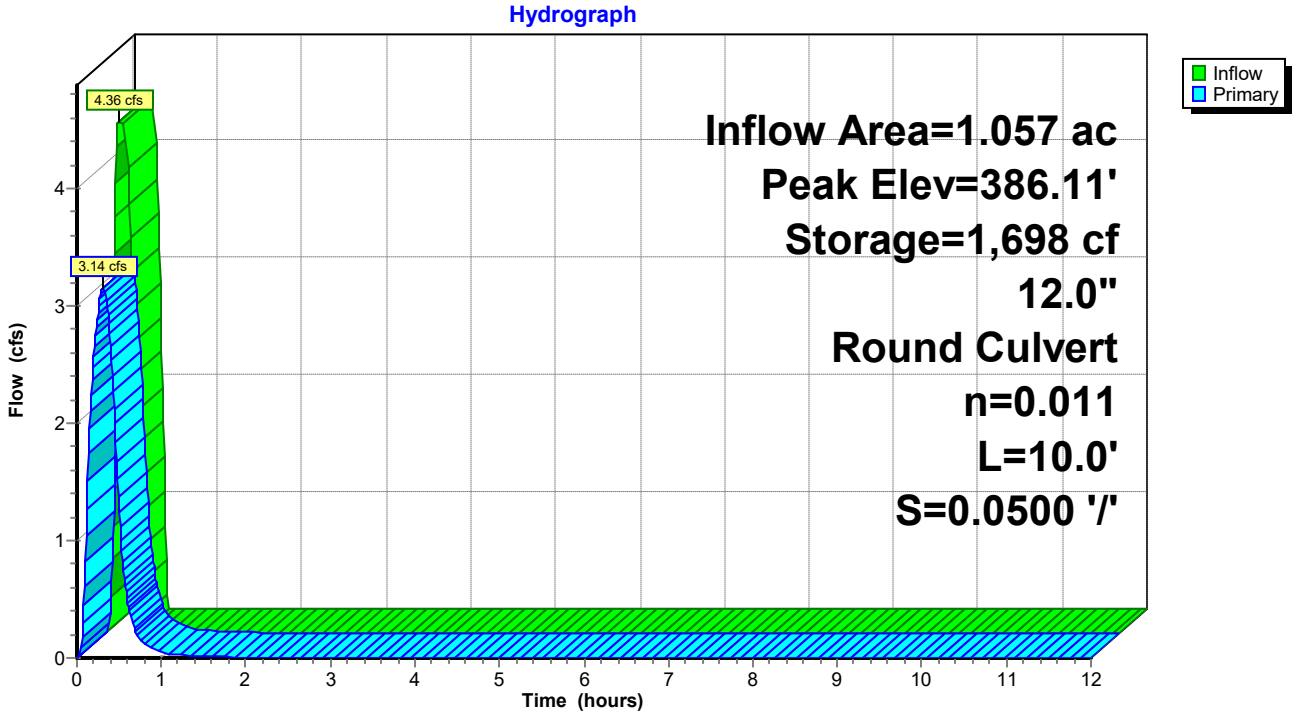
| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 384.50' | 2,986 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 384.50 | 724 | 0 | 0 |
| 385.00 | 986 | 428 | 428 |
| 386.00 | 1,273 | 1,130 | 1,557 |
| 387.00 | 1,585 | 1,429 | 2,986 |

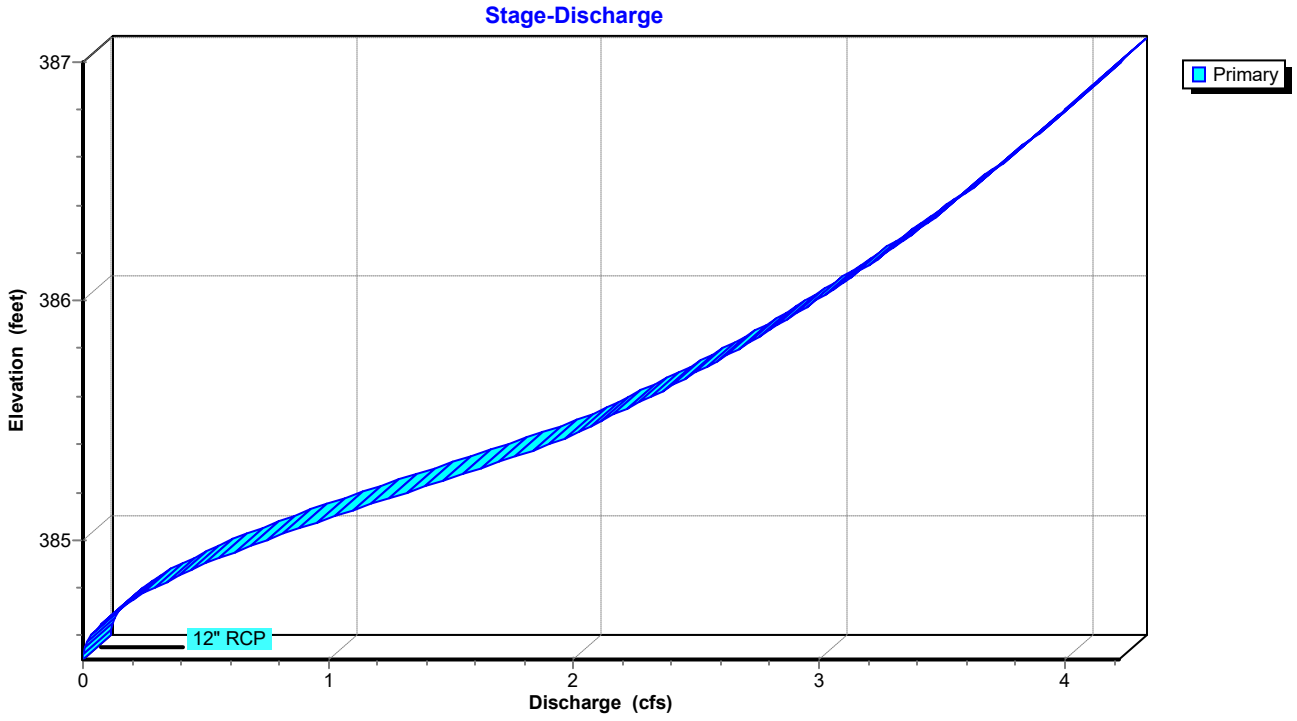
| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 384.50' | **12.0" Round 12" RCP**<br>L= 10.0' CMP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 384.50' / 384.00' S= 0.0500 '/' Cc= 0.900<br>n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf |

**Primary OutFlow** Max=3.14 cfs @ 0.31 hrs HW=386.11' (Free Discharge)
↑**1=12" RCP** (Inlet Controls 3.14 cfs @ 4.00 fps)

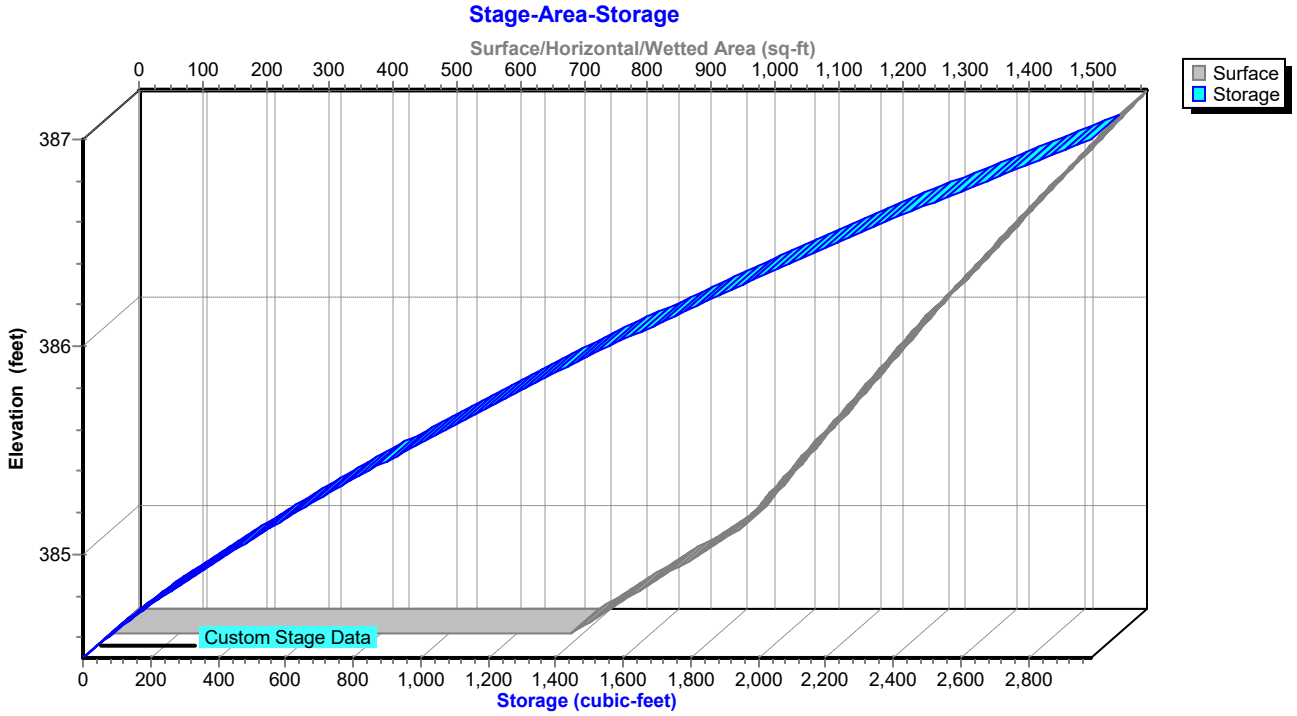
## Pond 3P: DETENTION POND




## Pond 3P: DETENTION POND



## Pond 3P: DETENTION POND



## Hydrograph for Pond 3P: DETENTION POND

| Time (hours) | Inflow (cfs) | Storage (cubic-feet) | Elevation (feet) | Primary (cfs) |
|---|---|---|---|---|
| 0.00 | **0.00** | **0** | **384.50** | **0.00** |
| 0.50 | **0.00** | **600** | **385.17** | **1.23** |
| 1.00 | 0.00 | 90 | 384.62 | 0.05 |
| 1.50 | 0.00 | 44 | 384.56 | 0.01 |
| 2.00 | 0.00 | 29 | 384.54 | 0.01 |
| 2.50 | 0.00 | 21 | 384.53 | 0.00 |
| 3.00 | 0.00 | 16 | 384.52 | 0.00 |
| 3.50 | 0.00 | 13 | 384.52 | 0.00 |
| 4.00 | 0.00 | 11 | 384.51 | 0.00 |
| 4.50 | 0.00 | 9 | 384.51 | 0.00 |
| 5.00 | 0.00 | 7 | 384.51 | 0.00 |
| 5.50 | 0.00 | 6 | 384.51 | 0.00 |
| 6.00 | 0.00 | 4 | 384.51 | 0.00 |
| 6.50 | 0.00 | 4 | 384.50 | 0.00 |
| 7.00 | 0.00 | 3 | 384.50 | 0.00 |
| 7.50 | 0.00 | 2 | 384.50 | 0.00 |
| 8.00 | 0.00 | 2 | 384.50 | 0.00 |
| 8.50 | 0.00 | 1 | 384.50 | 0.00 |
| 9.00 | 0.00 | 1 | 384.50 | 0.00 |
| 9.50 | 0.00 | 1 | 384.50 | 0.00 |
| 10.00 | 0.00 | 1 | 384.50 | 0.00 |
| 10.50 | 0.00 | 1 | 384.50 | 0.00 |
| 11.00 | 0.00 | 0 | 384.50 | 0.00 |
| 11.50 | 0.00 | 0 | 384.50 | 0.00 |
| 12.00 | 0.00 | 0 | 384.50 | 0.00 |

## Stage-Discharge for Pond 3P: DETENTION POND

| Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) |
|---|---|---|---|---|---|
| 384.50 | 0.00 | 385.52 | 2.15 | 386.54 | 3.70 |
| 384.52 | 0.00 | 385.54 | 2.19 | 386.56 | 3.73 |
| 384.54 | 0.01 | 385.56 | 2.23 | 386.58 | 3.75 |
| 384.56 | 0.01 | 385.58 | 2.27 | 386.60 | 3.78 |
| 384.58 | 0.02 | 385.60 | 2.31 | 386.62 | 3.80 |
| 384.60 | 0.03 | 385.62 | 2.35 | 386.64 | 3.82 |
| 384.62 | 0.05 | 385.64 | 2.39 | 386.66 | 3.85 |
| 384.64 | 0.07 | 385.66 | 2.43 | 386.68 | 3.87 |
| 384.66 | 0.09 | 385.68 | 2.46 | 386.70 | 3.89 |
| 384.68 | 0.11 | 385.70 | 2.50 | 386.72 | 3.92 |
| 384.70 | 0.13 | 385.72 | 2.53 | 386.74 | 3.94 |
| 384.72 | 0.16 | 385.74 | 2.57 | 386.76 | 3.96 |
| 384.74 | 0.19 | 385.76 | 2.60 | 386.78 | 3.98 |
| 384.76 | 0.22 | 385.78 | 2.64 | 386.80 | 4.01 |
| 384.78 | 0.26 | 385.80 | 2.67 | 386.82 | 4.03 |
| 384.80 | 0.29 | 385.82 | 2.70 | 386.84 | 4.05 |
| 384.82 | 0.33 | 385.84 | 2.74 | 386.86 | 4.07 |
| 384.84 | 0.37 | 385.86 | 2.77 | 386.88 | 4.09 |
| 384.86 | 0.41 | 385.88 | 2.80 | 386.90 | 4.12 |
| 384.88 | 0.45 | 385.90 | 2.83 | 386.92 | 4.14 |
| 384.90 | 0.50 | 385.92 | 2.86 | 386.94 | 4.16 |
| 384.92 | 0.55 | 385.94 | 2.89 | 386.96 | 4.18 |
| 384.94 | 0.59 | 385.96 | 2.93 | 386.98 | 4.20 |
| 384.96 | 0.64 | 385.98 | 2.96 | 387.00 | **4.22** |
| 384.98 | 0.69 | 386.00 | 2.99 | | |
| 385.00 | 0.75 | 386.02 | 3.02 | | |
| 385.02 | 0.80 | 386.04 | 3.04 | | |
| 385.04 | 0.85 | 386.06 | 3.07 | | |
| 385.06 | 0.91 | 386.08 | 3.10 | | |
| 385.08 | 0.97 | 386.10 | 3.13 | | |
| 385.10 | 1.02 | 386.12 | 3.16 | | |
| 385.12 | 1.08 | 386.14 | 3.19 | | |
| 385.14 | 1.14 | 386.16 | 3.22 | | |
| 385.16 | 1.20 | 386.18 | 3.24 | | |
| 385.18 | 1.26 | 386.20 | 3.27 | | |
| 385.20 | 1.32 | 386.22 | 3.30 | | |
| 385.22 | 1.38 | 386.24 | 3.32 | | |
| 385.24 | 1.44 | 386.26 | 3.35 | | |
| 385.26 | 1.50 | 386.28 | 3.38 | | |
| 385.28 | 1.56 | 386.30 | 3.40 | | |
| 385.30 | 1.62 | 386.32 | 3.43 | | |
| 385.32 | 1.68 | 386.34 | 3.46 | | |
| 385.34 | 1.74 | 386.36 | 3.48 | | |
| 385.36 | 1.79 | 386.38 | 3.51 | | |
| 385.38 | 1.85 | 386.40 | 3.53 | | |
| 385.40 | 1.90 | 386.42 | 3.56 | | |
| 385.42 | 1.95 | 386.44 | 3.58 | | |
| 385.44 | 2.00 | 386.46 | 3.61 | | |
| 385.46 | 2.04 | 386.48 | 3.63 | | |
| 385.48 | 2.08 | 386.50 | 3.66 | | |
| 385.50 | 2.11 | 386.52 | 3.68 | | |

## Stage-Area-Storage for Pond 3P: DETENTION POND

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---|---|---|
| 384.50 | 724 | 0 |
| 384.55 | 750 | 37 |
| 384.60 | 776 | 75 |
| 384.65 | 803 | 114 |
| 384.70 | 829 | 155 |
| 384.75 | 855 | 197 |
| 384.80 | 881 | 241 |
| 384.85 | 907 | 285 |
| 384.90 | 934 | 332 |
| 384.95 | 960 | 379 |
| 385.00 | 986 | 428 |
| 385.05 | 1,000 | 477 |
| 385.10 | 1,015 | 528 |
| 385.15 | 1,029 | 579 |
| 385.20 | 1,043 | 630 |
| 385.25 | 1,058 | 683 |
| 385.30 | 1,072 | 736 |
| 385.35 | 1,086 | 790 |
| 385.40 | 1,101 | 845 |
| 385.45 | 1,115 | 900 |
| 385.50 | 1,130 | 956 |
| 385.55 | 1,144 | 1,013 |
| 385.60 | 1,158 | 1,071 |
| 385.65 | 1,173 | 1,129 |
| 385.70 | 1,187 | 1,188 |
| 385.75 | 1,201 | 1,248 |
| 385.80 | 1,216 | 1,308 |
| 385.85 | 1,230 | 1,369 |
| 385.90 | 1,244 | 1,431 |
| 385.95 | 1,259 | 1,494 |
| 386.00 | 1,273 | 1,557 |
| 386.05 | 1,289 | 1,621 |
| 386.10 | 1,304 | 1,686 |
| 386.15 | 1,320 | 1,751 |
| 386.20 | 1,335 | 1,818 |
| 386.25 | 1,351 | 1,885 |
| 386.30 | 1,367 | 1,953 |
| 386.35 | 1,382 | 2,022 |
| 386.40 | 1,398 | 2,091 |
| 386.45 | 1,413 | 2,161 |
| 386.50 | 1,429 | 2,233 |
| 386.55 | 1,445 | 2,304 |
| 386.60 | 1,460 | 2,377 |
| 386.65 | 1,476 | 2,450 |
| 386.70 | 1,491 | 2,525 |
| 386.75 | 1,507 | 2,600 |
| 386.80 | 1,523 | 2,675 |
| 386.85 | 1,538 | 2,752 |
| 386.90 | 1,554 | 2,829 |
| 386.95 | 1,569 | 2,907 |
| 387.00 | **1,585** | **2,986** |

Time span=0.00-12.00 hrs, dt=0.01 hrs, 1201 points
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: PRE-DEVELOPMENT** Runoff Area=46,055 sf 0.00% Impervious Runoff Depth=1.07"
Flow Length=270' Slope=0.0250 '/' Tc=15.5 min C=0.69 Runoff=4.30 cfs 0.095 af

**Subcatchment 2S: POST-DEVELOPMENT** Runoff Area=46,055 sf 63.15% Impervious Runoff Depth=1.20"
Flow Length=360' Slope=0.0150 '/' Tc=8.8 min C=0.77 Runoff=4.79 cfs 0.106 af

**Reach 4R: CURB CUT WIER** Avg. Flow Depth=0.27' Max Vel=6.00 fps Inflow=4.79 cfs 0.106 af
n=0.013 L=4.0' S=0.0200 '/' Capacity=12.61 cfs Outflow=4.80 cfs 0.106 af

**Pond 3P: DETENTION POND** Peak Elev=386.27' Storage=1,914 cf Inflow=4.80 cfs 0.106 af
12.0" Round Culvert n=0.011 L=10.0' S=0.0500 '/' Outflow=3.37 cfs 0.106 af

**Total Runoff Area = 2.115 ac Runoff Volume = 0.200 af Average Runoff Depth = 1.14"**
**68.43% Pervious = 1.447 ac 31.57% Impervious = 0.668 ac**

## Summary for Subcatchment 1S: PRE-DEVELOPMENT

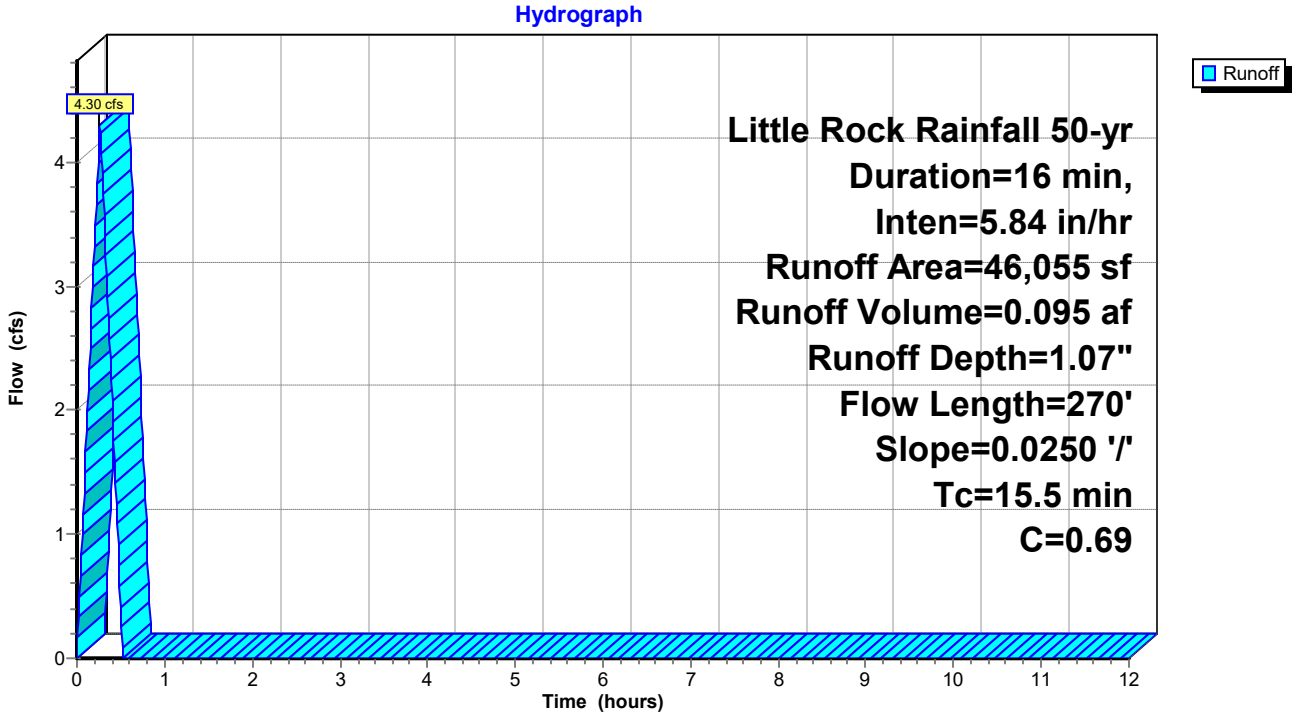
Runoff = 4.30 cfs @ 0.26 hrs, Volume= 0.095 af, Depth= 1.07"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-12.00 hrs, dt= 0.01 hrs
Little Rock Rainfall 50-yr Duration=16 min, Inten=5.84 in/hr

| Area (sf) | C | Description |
|---|---|---|
| 31,035 | 0.65 | GRAVEL PARKING |
| 15,020 | 0.77 | SHRUB POOR CONDITION BRUSH |
| 46,055 | 0.69 | Weighted Average |
| 46,055 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 15.5 | 270 | 0.0250 | 0.29 | | **Sheet Flow, SHEET FLOW SURFACE** Range n= 0.130 P2= 4.19" |

## Subcatchment 1S: PRE-DEVELOPMENT



## Hydrograph for Subcatchment 1S: PRE-DEVELOPMENT

| Time (hours) | Runoff (cfs) | Time (hours) | Runoff (cfs) | Time (hours) | Runoff (cfs) |
|---|---|---|---|---|---|
| 0.00 | 0.00 | 5.10 | 0.00 | 10.20 | 0.00 |
| 0.10 | 1.66 | 5.20 | 0.00 | 10.30 | 0.00 |
| 0.20 | **3.33** | 5.30 | 0.00 | 10.40 | 0.00 |
| 0.30 | **3.74** | 5.40 | 0.00 | 10.50 | 0.00 |
| 0.40 | 2.08 | 5.50 | 0.00 | 10.60 | 0.00 |
| 0.50 | 0.42 | 5.60 | 0.00 | 10.70 | 0.00 |
| 0.60 | 0.00 | 5.70 | 0.00 | 10.80 | 0.00 |
| 0.70 | 0.00 | 5.80 | 0.00 | 10.90 | 0.00 |
| 0.80 | 0.00 | 5.90 | 0.00 | 11.00 | 0.00 |
| 0.90 | 0.00 | 6.00 | 0.00 | 11.10 | 0.00 |
| 1.00 | 0.00 | 6.10 | 0.00 | 11.20 | 0.00 |
| 1.10 | 0.00 | 6.20 | 0.00 | 11.30 | 0.00 |
| 1.20 | 0.00 | 6.30 | 0.00 | 11.40 | 0.00 |
| 1.30 | 0.00 | 6.40 | 0.00 | 11.50 | 0.00 |
| 1.40 | 0.00 | 6.50 | 0.00 | 11.60 | 0.00 |
| 1.50 | 0.00 | 6.60 | 0.00 | 11.70 | 0.00 |
| 1.60 | 0.00 | 6.70 | 0.00 | 11.80 | 0.00 |
| 1.70 | 0.00 | 6.80 | 0.00 | 11.90 | 0.00 |
| 1.80 | 0.00 | 6.90 | 0.00 | 12.00 | 0.00 |
| 1.90 | 0.00 | 7.00 | 0.00 | | |
| 2.00 | 0.00 | 7.10 | 0.00 | | |
| 2.10 | 0.00 | 7.20 | 0.00 | | |
| 2.20 | 0.00 | 7.30 | 0.00 | | |
| 2.30 | 0.00 | 7.40 | 0.00 | | |
| 2.40 | 0.00 | 7.50 | 0.00 | | |
| 2.50 | 0.00 | 7.60 | 0.00 | | |
| 2.60 | 0.00 | 7.70 | 0.00 | | |
| 2.70 | 0.00 | 7.80 | 0.00 | | |
| 2.80 | 0.00 | 7.90 | 0.00 | | |
| 2.90 | 0.00 | 8.00 | 0.00 | | |
| 3.00 | 0.00 | 8.10 | 0.00 | | |
| 3.10 | 0.00 | 8.20 | 0.00 | | |
| 3.20 | 0.00 | 8.30 | 0.00 | | |
| 3.30 | 0.00 | 8.40 | 0.00 | | |
| 3.40 | 0.00 | 8.50 | 0.00 | | |
| 3.50 | 0.00 | 8.60 | 0.00 | | |
| 3.60 | 0.00 | 8.70 | 0.00 | | |
| 3.70 | 0.00 | 8.80 | 0.00 | | |
| 3.80 | 0.00 | 8.90 | 0.00 | | |
| 3.90 | 0.00 | 9.00 | 0.00 | | |
| 4.00 | 0.00 | 9.10 | 0.00 | | |
| 4.10 | 0.00 | 9.20 | 0.00 | | |
| 4.20 | 0.00 | 9.30 | 0.00 | | |
| 4.30 | 0.00 | 9.40 | 0.00 | | |
| 4.40 | 0.00 | 9.50 | 0.00 | | |
| 4.50 | 0.00 | 9.60 | 0.00 | | |
| 4.60 | 0.00 | 9.70 | 0.00 | | |
| 4.70 | 0.00 | 9.80 | 0.00 | | |
| 4.80 | 0.00 | 9.90 | 0.00 | | |
| 4.90 | 0.00 | 10.00 | 0.00 | | |
| 5.00 | 0.00 | 10.10 | 0.00 | | |

## Summary for Subcatchment 2S: POST-DEVELOPMENT

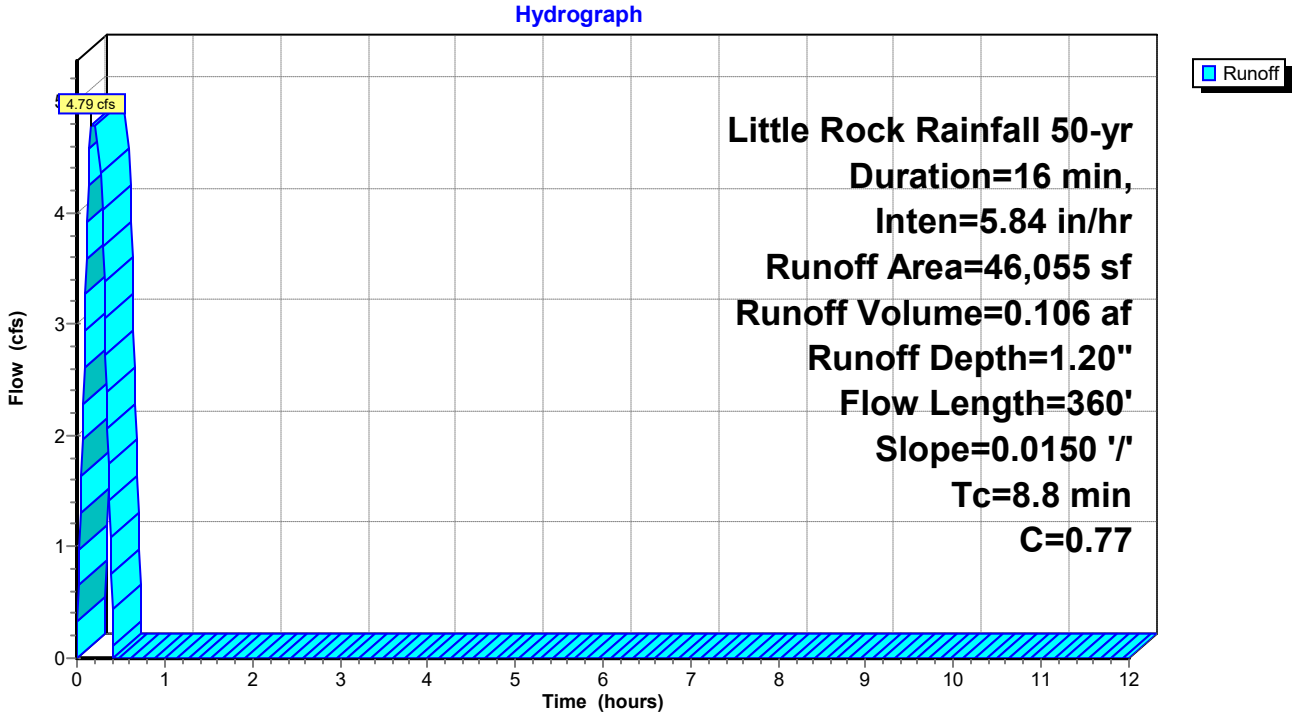
Runoff = 4.79 cfs @ 0.15 hrs, Volume= 0.106 af, Depth= 1.20"
Routed to Reach 4R : CURB CUT WIER

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-12.00 hrs, dt= 0.01 hrs
Little Rock Rainfall 50-yr Duration=16 min, Inten=5.84 in/hr

| Area (sf) | C | Description |
|---|---|---|
| 22,479 | 0.95 | ASPHALT SURFACE |
| 6,603 | 0.97 | ROOF TOP |
| 16,973 | 0.46 | GRASS LANDSCAPING |
| 46,055 | 0.77 | Weighted Average |
| 16,973 | | 36.85% Pervious Area |
| 29,082 | | 63.15% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.7 | 40 | 0.0150 | 0.10 | | **Sheet Flow, GRASS** Grass: Dense n= 0.240 P2= 4.19" |
| 2.1 | 320 | 0.0150 | 2.49 | | **Shallow Concentrated Flow, PAVEMENT** Paved Kv= 20.3 fps |
| 8.8 | 360 | Total | | | |

## Subcatchment 2S: POST-DEVELOPMENT



## Hydrograph for Subcatchment 2S: POST-DEVELOPMENT

| Time (hours) | Runoff (cfs) | Time (hours) | Runoff (cfs) | Time (hours) | Runoff (cfs) |
|---|---|---|---|---|---|
| 0.00 | 0.00 | 5.10 | 0.00 | 10.20 | 0.00 |
| 0.10 | **3.27** | 5.20 | 0.00 | 10.30 | 0.00 |
| 0.20 | **4.79** | 5.30 | 0.00 | 10.40 | 0.00 |
| 0.30 | 3.70 | 5.40 | 0.00 | 10.50 | 0.00 |
| 0.40 | 0.44 | 5.50 | 0.00 | 10.60 | 0.00 |
| 0.50 | 0.00 | 5.60 | 0.00 | 10.70 | 0.00 |
| 0.60 | 0.00 | 5.70 | 0.00 | 10.80 | 0.00 |
| 0.70 | 0.00 | 5.80 | 0.00 | 10.90 | 0.00 |
| 0.80 | 0.00 | 5.90 | 0.00 | 11.00 | 0.00 |
| 0.90 | 0.00 | 6.00 | 0.00 | 11.10 | 0.00 |
| 1.00 | 0.00 | 6.10 | 0.00 | 11.20 | 0.00 |
| 1.10 | 0.00 | 6.20 | 0.00 | 11.30 | 0.00 |
| 1.20 | 0.00 | 6.30 | 0.00 | 11.40 | 0.00 |
| 1.30 | 0.00 | 6.40 | 0.00 | 11.50 | 0.00 |
| 1.40 | 0.00 | 6.50 | 0.00 | 11.60 | 0.00 |
| 1.50 | 0.00 | 6.60 | 0.00 | 11.70 | 0.00 |
| 1.60 | 0.00 | 6.70 | 0.00 | 11.80 | 0.00 |
| 1.70 | 0.00 | 6.80 | 0.00 | 11.90 | 0.00 |
| 1.80 | 0.00 | 6.90 | 0.00 | 12.00 | 0.00 |
| 1.90 | 0.00 | 7.00 | 0.00 | | |
| 2.00 | 0.00 | 7.10 | 0.00 | | |
| 2.10 | 0.00 | 7.20 | 0.00 | | |
| 2.20 | 0.00 | 7.30 | 0.00 | | |
| 2.30 | 0.00 | 7.40 | 0.00 | | |
| 2.40 | 0.00 | 7.50 | 0.00 | | |
| 2.50 | 0.00 | 7.60 | 0.00 | | |
| 2.60 | 0.00 | 7.70 | 0.00 | | |
| 2.70 | 0.00 | 7.80 | 0.00 | | |
| 2.80 | 0.00 | 7.90 | 0.00 | | |
| 2.90 | 0.00 | 8.00 | 0.00 | | |
| 3.00 | 0.00 | 8.10 | 0.00 | | |
| 3.10 | 0.00 | 8.20 | 0.00 | | |
| 3.20 | 0.00 | 8.30 | 0.00 | | |
| 3.30 | 0.00 | 8.40 | 0.00 | | |
| 3.40 | 0.00 | 8.50 | 0.00 | | |
| 3.50 | 0.00 | 8.60 | 0.00 | | |
| 3.60 | 0.00 | 8.70 | 0.00 | | |
| 3.70 | 0.00 | 8.80 | 0.00 | | |
| 3.80 | 0.00 | 8.90 | 0.00 | | |
| 3.90 | 0.00 | 9.00 | 0.00 | | |
| 4.00 | 0.00 | 9.10 | 0.00 | | |
| 4.10 | 0.00 | 9.20 | 0.00 | | |
| 4.20 | 0.00 | 9.30 | 0.00 | | |
| 4.30 | 0.00 | 9.40 | 0.00 | | |
| 4.40 | 0.00 | 9.50 | 0.00 | | |
| 4.50 | 0.00 | 9.60 | 0.00 | | |
| 4.60 | 0.00 | 9.70 | 0.00 | | |
| 4.70 | 0.00 | 9.80 | 0.00 | | |
| 4.80 | 0.00 | 9.90 | 0.00 | | |
| 4.90 | 0.00 | 10.00 | 0.00 | | |
| 5.00 | 0.00 | 10.10 | 0.00 | | |

## Summary for Reach 4R: CURB CUT WIER

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 1.057 ac, 63.15% Impervious, Inflow Depth = 1.20" for 50-yr event
Inflow = 4.79 cfs @ 0.15 hrs, Volume= 0.106 af
Outflow = 4.80 cfs @ 0.16 hrs, Volume= 0.106 af, Atten= 0%, Lag= 0.6 min
Routed to Pond 3P : DETENTION POND

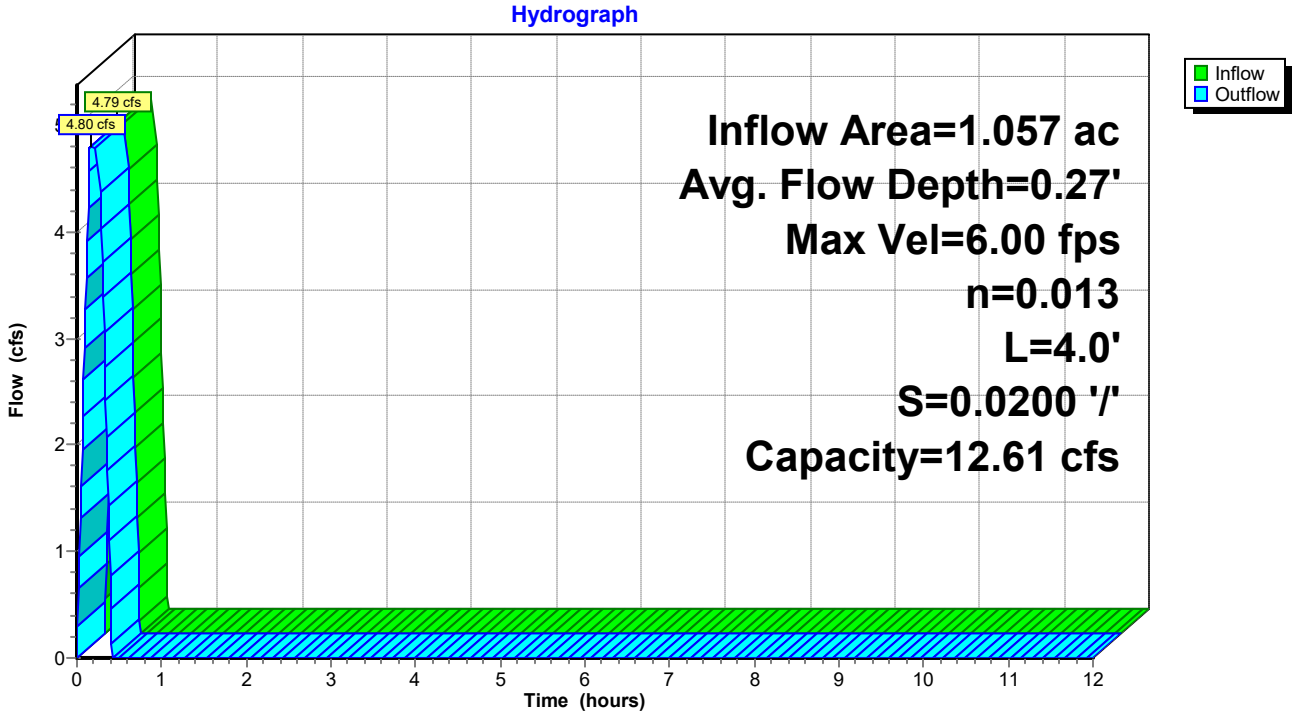
Routing by Stor-Ind+Trans method, Time Span= 0.00-12.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 4.77 fps, Avg. Travel Time= 0.0 min

Peak Storage= 3 cf @ 0.16 hrs
Average Depth at Peak Storage= 0.27' , Surface Width= 3.00'
Bank-Full Depth= 0.50' Flow Area= 1.5 sf, Capacity= 12.61 cfs

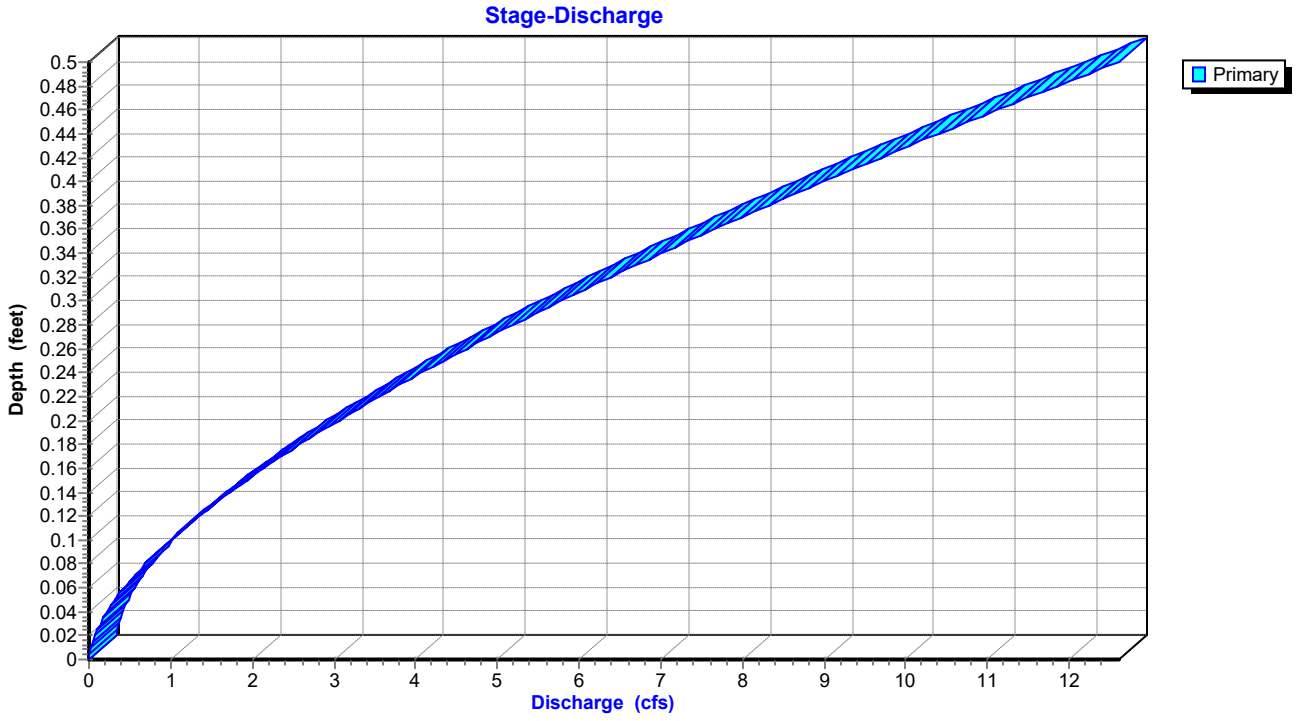
3.00' x 0.50' deep channel, n= 0.013 Concrete, trowel finish
Length= 4.0' Slope= 0.0200 '/'
Inlet Invert= 387.25', Outlet Invert= 387.17'



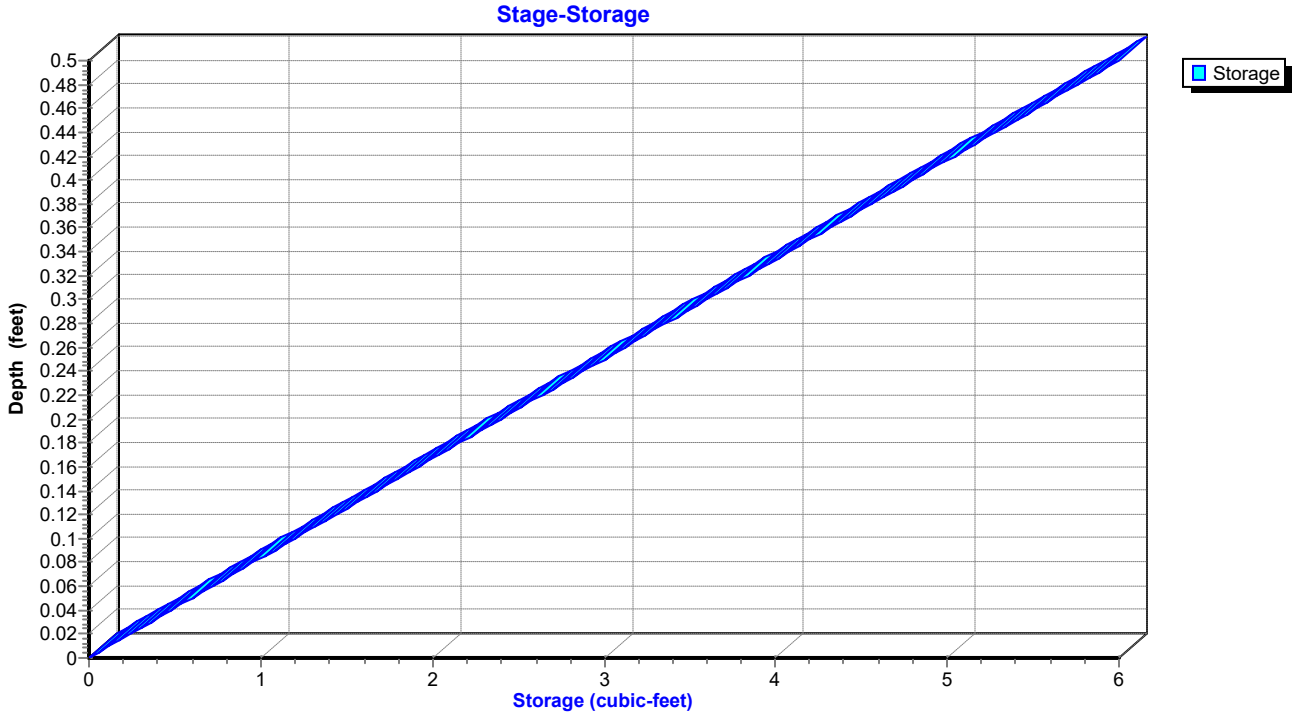
## Reach 4R: CURB CUT WIER




## Reach 4R: CURB CUT WIER



## Reach 4R: CURB CUT WIER



## Hydrograph for Reach 4R: CURB CUT WIER

| Time (hours) | Inflow (cfs) | Storage (cubic-feet) | Elevation (feet) | Outflow (cfs) |
|---|---|---|---|---|
| 0.00 | **0.00** | **0** | **387.25** | **0.00** |
| 0.50 | **0.00** | **0** | **387.25** | **0.00** |
| 1.00 | 0.00 | 0 | 387.25 | 0.00 |
| 1.50 | 0.00 | 0 | 387.25 | 0.00 |
| 2.00 | 0.00 | 0 | 387.25 | 0.00 |
| 2.50 | 0.00 | 0 | 387.25 | 0.00 |
| 3.00 | 0.00 | 0 | 387.25 | 0.00 |
| 3.50 | 0.00 | 0 | 387.25 | 0.00 |
| 4.00 | 0.00 | 0 | 387.25 | 0.00 |
| 4.50 | 0.00 | 0 | 387.25 | 0.00 |
| 5.00 | 0.00 | 0 | 387.25 | 0.00 |
| 5.50 | 0.00 | 0 | 387.25 | 0.00 |
| 6.00 | 0.00 | 0 | 387.25 | 0.00 |
| 6.50 | 0.00 | 0 | 387.25 | 0.00 |
| 7.00 | 0.00 | 0 | 387.25 | 0.00 |
| 7.50 | 0.00 | 0 | 387.25 | 0.00 |
| 8.00 | 0.00 | 0 | 387.25 | 0.00 |
| 8.50 | 0.00 | 0 | 387.25 | 0.00 |
| 9.00 | 0.00 | 0 | 387.25 | 0.00 |
| 9.50 | 0.00 | 0 | 387.25 | 0.00 |
| 10.00 | 0.00 | 0 | 387.25 | 0.00 |
| 10.50 | 0.00 | 0 | 387.25 | 0.00 |
| 11.00 | 0.00 | 0 | 387.25 | 0.00 |
| 11.50 | 0.00 | 0 | 387.25 | 0.00 |
| 12.00 | 0.00 | 0 | 387.25 | 0.00 |

## Stage-Discharge for Reach 4R: CURB CUT WIER

| Elevation (feet) | Velocity (ft/sec) | Discharge (cfs) |
|---|---|---|
| 387.25 | 0.00 | 0.00 |
| 387.26 | 0.75 | 0.02 |
| 387.27 | 1.18 | 0.07 |
| 387.28 | 1.54 | 0.14 |
| 387.29 | 1.86 | 0.22 |
| 387.30 | 2.15 | 0.32 |
| 387.31 | 2.41 | 0.43 |
| 387.32 | 2.66 | 0.56 |
| 387.33 | 2.90 | 0.70 |
| 387.34 | 3.12 | 0.84 |
| 387.35 | 3.34 | 1.00 |
| 387.36 | 3.54 | 1.17 |
| 387.37 | 3.74 | 1.35 |
| 387.38 | 3.92 | 1.53 |
| 387.39 | 4.11 | 1.72 |
| 387.40 | 4.28 | 1.93 |
| 387.41 | 4.45 | 2.14 |
| 387.42 | 4.62 | 2.36 |
| 387.43 | 4.78 | 2.58 |
| 387.44 | 4.93 | 2.81 |
| 387.45 | 5.09 | 3.05 |
| 387.46 | 5.23 | 3.30 |
| 387.47 | 5.38 | 3.55 |
| 387.48 | 5.52 | 3.81 |
| 387.49 | 5.65 | 4.07 |
| 387.50 | 5.79 | 4.34 |
| 387.51 | 5.92 | 4.62 |
| 387.52 | 6.05 | 4.90 |
| 387.53 | 6.17 | 5.19 |
| 387.54 | 6.30 | 5.48 |
| 387.55 | 6.42 | 5.77 |
| 387.56 | 6.53 | 6.08 |
| 387.57 | 6.65 | 6.38 |
| 387.58 | 6.76 | 6.69 |
| 387.59 | 6.87 | 7.01 |
| 387.60 | 6.98 | 7.33 |
| 387.61 | 7.09 | 7.65 |
| 387.62 | 7.19 | 7.98 |
| 387.63 | 7.30 | 8.32 |
| 387.64 | 7.40 | 8.65 |
| 387.65 | 7.50 | 9.00 |
| 387.66 | 7.59 | 9.34 |
| 387.67 | 7.69 | 9.69 |
| 387.68 | 7.79 | 10.04 |
| 387.69 | 7.88 | 10.40 |
| 387.70 | 7.97 | 10.76 |
| 387.71 | 8.06 | 11.12 |
| 387.72 | 8.15 | 11.49 |
| 387.73 | 8.24 | 11.86 |
| 387.74 | 8.32 | 12.23 |
| 387.75 | **8.41** | **12.61** |

## Stage-Area-Storage for Reach 4R: CURB CUT WIER

| Elevation (feet) | End-Area (sq-ft) | Storage (cubic-feet) |
|---|---|---|
| 387.25 | 0.0 | 0 |
| 387.26 | 0.0 | 0 |
| 387.27 | 0.1 | 0 |
| 387.28 | 0.1 | 0 |
| 387.29 | 0.1 | 0 |
| 387.30 | 0.2 | 1 |
| 387.31 | 0.2 | 1 |
| 387.32 | 0.2 | 1 |
| 387.33 | 0.2 | 1 |
| 387.34 | 0.3 | 1 |
| 387.35 | 0.3 | 1 |
| 387.36 | 0.3 | 1 |
| 387.37 | 0.4 | 1 |
| 387.38 | 0.4 | 2 |
| 387.39 | 0.4 | 2 |
| 387.40 | 0.4 | 2 |
| 387.41 | 0.5 | 2 |
| 387.42 | 0.5 | 2 |
| 387.43 | 0.5 | 2 |
| 387.44 | 0.6 | 2 |
| 387.45 | 0.6 | 2 |
| 387.46 | 0.6 | 3 |
| 387.47 | 0.7 | 3 |
| 387.48 | 0.7 | 3 |
| 387.49 | 0.7 | 3 |
| 387.50 | 0.8 | 3 |
| 387.51 | 0.8 | 3 |
| 387.52 | 0.8 | 3 |
| 387.53 | 0.8 | 3 |
| 387.54 | 0.9 | 3 |
| 387.55 | 0.9 | 4 |
| 387.56 | 0.9 | 4 |
| 387.57 | 1.0 | 4 |
| 387.58 | 1.0 | 4 |
| 387.59 | 1.0 | 4 |
| 387.60 | 1.1 | 4 |
| 387.61 | 1.1 | 4 |
| 387.62 | 1.1 | 4 |
| 387.63 | 1.1 | 5 |
| 387.64 | 1.2 | 5 |
| 387.65 | 1.2 | 5 |
| 387.66 | 1.2 | 5 |
| 387.67 | 1.3 | 5 |
| 387.68 | 1.3 | 5 |
| 387.69 | 1.3 | 5 |
| 387.70 | 1.4 | 5 |
| 387.71 | 1.4 | 6 |
| 387.72 | 1.4 | 6 |
| 387.73 | 1.4 | 6 |
| 387.74 | 1.5 | 6 |
| 387.75 | **1.5** | **6** |

## Summary for Pond 3P: DETENTION POND

Inflow Area = 1.057 ac, 63.15% Impervious, Inflow Depth = 1.20" for 50-yr event
Inflow = 4.80 cfs @ 0.16 hrs, Volume= 0.106 af
Outflow = 3.37 cfs @ 0.31 hrs, Volume= 0.106 af, Atten= 30%, Lag= 9.0 min
Primary = 3.37 cfs @ 0.31 hrs, Volume= 0.106 af

Routing by Stor-Ind method, Time Span= 0.00-12.00 hrs, dt= 0.01 hrs
Peak Elev= 386.27' @ 0.31 hrs Surf.Area= 1,358 sf Storage= 1,914 cf

Plug-Flow detention time= 9.9 min calculated for 0.106 af (100% of inflow)
Center-of-Mass det. time= 10.3 min ( 22.7 - 12.4 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 384.50' | 2,986 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

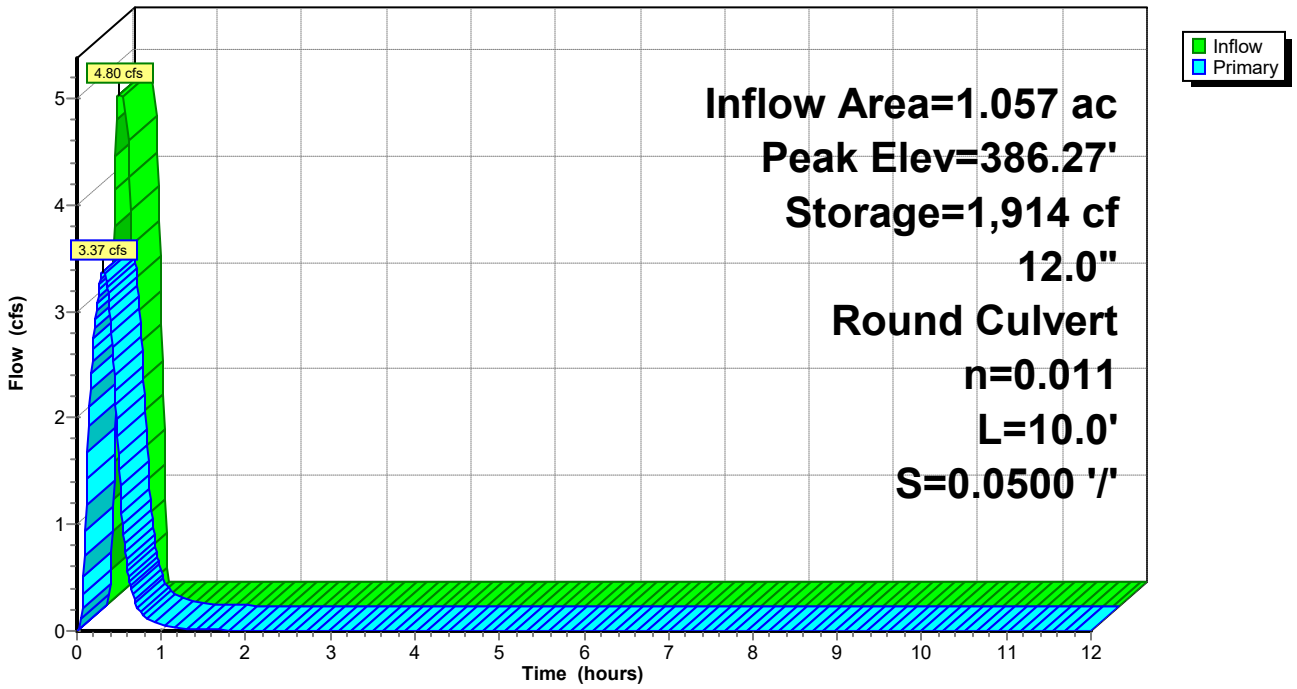
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 384.50 | 724 | 0 | 0 |
| 385.00 | 986 | 428 | 428 |
| 386.00 | 1,273 | 1,130 | 1,557 |
| 387.00 | 1,585 | 1,429 | 2,986 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 384.50' | **12.0" Round 12" RCP**<br>L= 10.0' CMP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 384.50' / 384.00' S= 0.0500 '/' Cc= 0.900<br>n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf |

**Primary OutFlow** Max=3.37 cfs @ 0.31 hrs HW=386.27' (Free Discharge)
↑**1=12" RCP** (Inlet Controls 3.37 cfs @ 4.29 fps)

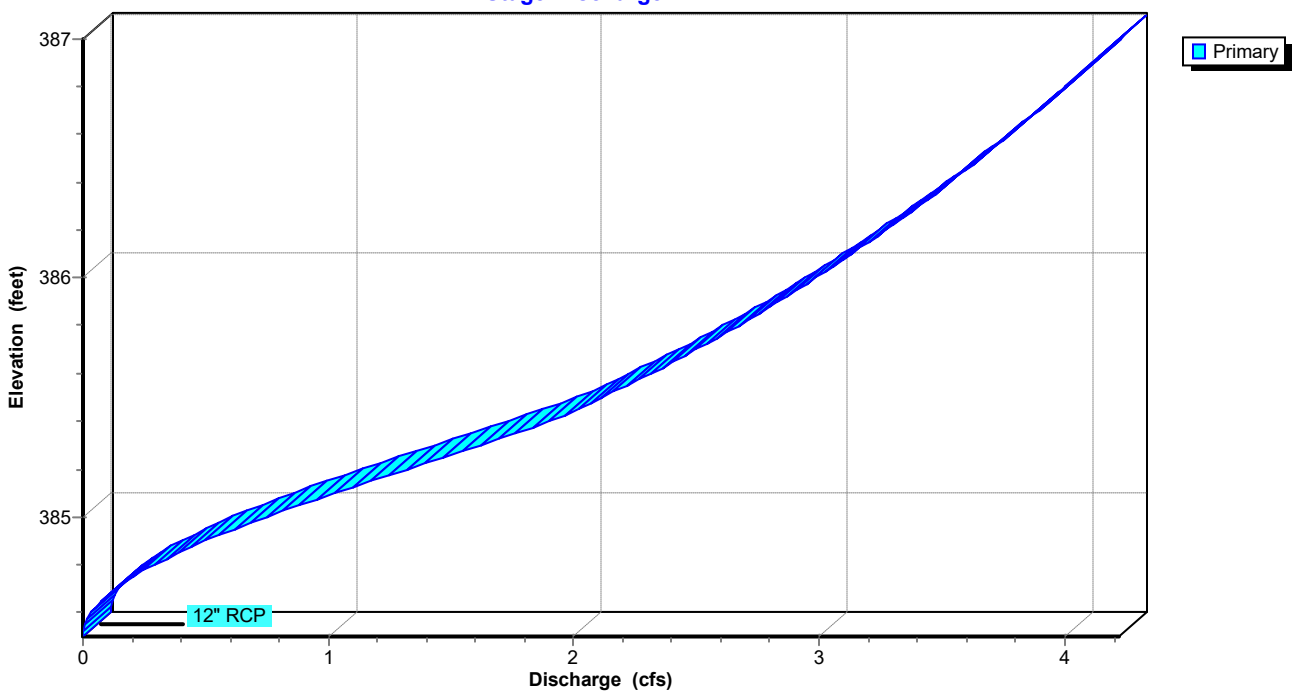
## Pond 3P: DETENTION POND

Hydrograph

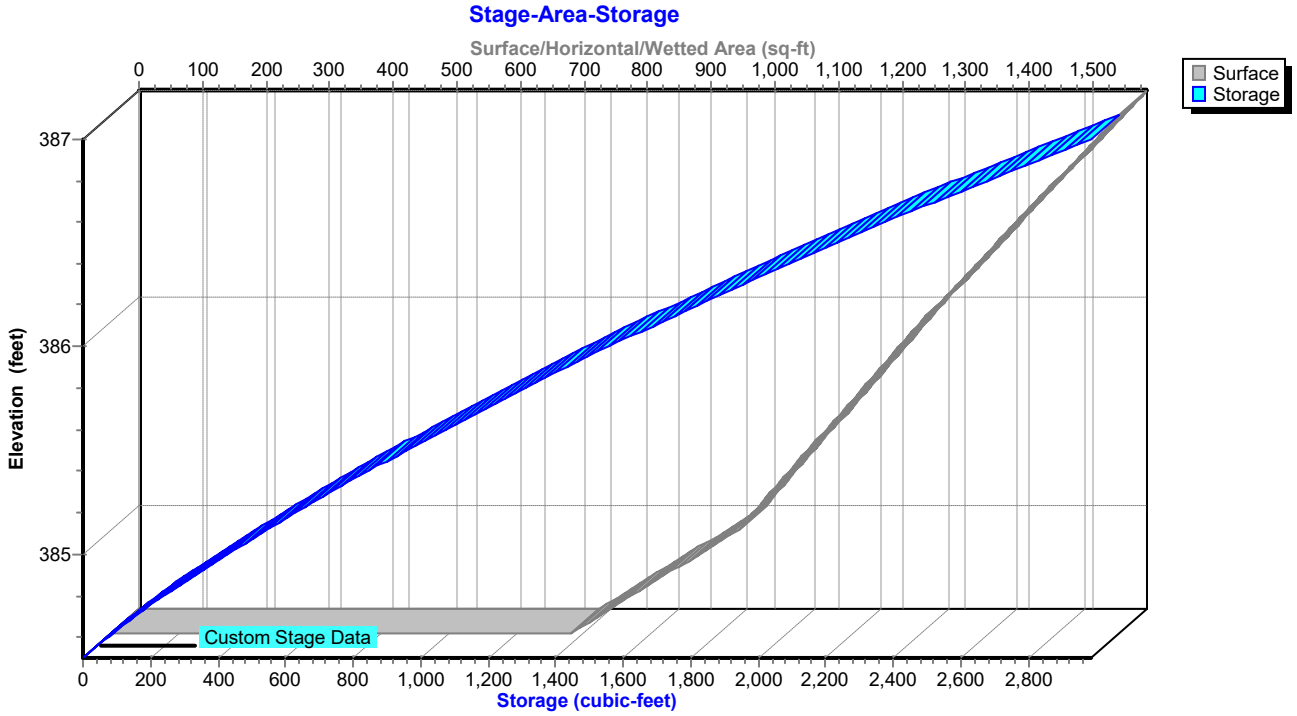



## Pond 3P: DETENTION POND

Stage-Discharge



## Pond 3P: DETENTION POND



## Hydrograph for Pond 3P: DETENTION POND

| Time (hours) | Inflow (cfs) | Storage (cubic-feet) | Elevation (feet) | Primary (cfs) |
|---|---|---|---|---|
| 0.00 | **0.00** | **0** | **384.50** | **0.00** |
| 0.50 | **0.00** | **697** | **385.26** | **1.51** |
| 1.00 | 0.00 | 93 | 384.62 | 0.05 |
| 1.50 | 0.00 | 45 | 384.56 | 0.01 |
| 2.00 | 0.00 | 29 | 384.54 | 0.01 |
| 2.50 | 0.00 | 21 | 384.53 | 0.00 |
| 3.00 | 0.00 | 17 | 384.52 | 0.00 |
| 3.50 | 0.00 | 13 | 384.52 | 0.00 |
| 4.00 | 0.00 | 11 | 384.51 | 0.00 |
| 4.50 | 0.00 | 9 | 384.51 | 0.00 |
| 5.00 | 0.00 | 7 | 384.51 | 0.00 |
| 5.50 | 0.00 | 6 | 384.51 | 0.00 |
| 6.00 | 0.00 | 4 | 384.51 | 0.00 |
| 6.50 | 0.00 | 4 | 384.50 | 0.00 |
| 7.00 | 0.00 | 3 | 384.50 | 0.00 |
| 7.50 | 0.00 | 2 | 384.50 | 0.00 |
| 8.00 | 0.00 | 2 | 384.50 | 0.00 |
| 8.50 | 0.00 | 1 | 384.50 | 0.00 |
| 9.00 | 0.00 | 1 | 384.50 | 0.00 |
| 9.50 | 0.00 | 1 | 384.50 | 0.00 |
| 10.00 | 0.00 | 1 | 384.50 | 0.00 |
| 10.50 | 0.00 | 1 | 384.50 | 0.00 |
| 11.00 | 0.00 | 0 | 384.50 | 0.00 |
| 11.50 | 0.00 | 0 | 384.50 | 0.00 |
| 12.00 | 0.00 | 0 | 384.50 | 0.00 |

## Stage-Discharge for Pond 3P: DETENTION POND

| Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) |
|---|---|---|---|---|---|
| 384.50 | 0.00 | 385.52 | 2.15 | 386.54 | 3.70 |
| 384.52 | 0.00 | 385.54 | 2.19 | 386.56 | 3.73 |
| 384.54 | 0.01 | 385.56 | 2.23 | 386.58 | 3.75 |
| 384.56 | 0.01 | 385.58 | 2.27 | 386.60 | 3.78 |
| 384.58 | 0.02 | 385.60 | 2.31 | 386.62 | 3.80 |
| 384.60 | 0.03 | 385.62 | 2.35 | 386.64 | 3.82 |
| 384.62 | 0.05 | 385.64 | 2.39 | 386.66 | 3.85 |
| 384.64 | 0.07 | 385.66 | 2.43 | 386.68 | 3.87 |
| 384.66 | 0.09 | 385.68 | 2.46 | 386.70 | 3.89 |
| 384.68 | 0.11 | 385.70 | 2.50 | 386.72 | 3.92 |
| 384.70 | 0.13 | 385.72 | 2.53 | 386.74 | 3.94 |
| 384.72 | 0.16 | 385.74 | 2.57 | 386.76 | 3.96 |
| 384.74 | 0.19 | 385.76 | 2.60 | 386.78 | 3.98 |
| 384.76 | 0.22 | 385.78 | 2.64 | 386.80 | 4.01 |
| 384.78 | 0.26 | 385.80 | 2.67 | 386.82 | 4.03 |
| 384.80 | 0.29 | 385.82 | 2.70 | 386.84 | 4.05 |
| 384.82 | 0.33 | 385.84 | 2.74 | 386.86 | 4.07 |
| 384.84 | 0.37 | 385.86 | 2.77 | 386.88 | 4.09 |
| 384.86 | 0.41 | 385.88 | 2.80 | 386.90 | 4.12 |
| 384.88 | 0.45 | 385.90 | 2.83 | 386.92 | 4.14 |
| 384.90 | 0.50 | 385.92 | 2.86 | 386.94 | 4.16 |
| 384.92 | 0.55 | 385.94 | 2.89 | 386.96 | 4.18 |
| 384.94 | 0.59 | 385.96 | 2.93 | 386.98 | 4.20 |
| 384.96 | 0.64 | 385.98 | 2.96 | 387.00 | **4.22** |
| 384.98 | 0.69 | 386.00 | 2.99 | | |
| 385.00 | 0.75 | 386.02 | 3.02 | | |
| 385.02 | 0.80 | 386.04 | 3.04 | | |
| 385.04 | 0.85 | 386.06 | 3.07 | | |
| 385.06 | 0.91 | 386.08 | 3.10 | | |
| 385.08 | 0.97 | 386.10 | 3.13 | | |
| 385.10 | 1.02 | 386.12 | 3.16 | | |
| 385.12 | 1.08 | 386.14 | 3.19 | | |
| 385.14 | 1.14 | 386.16 | 3.22 | | |
| 385.16 | 1.20 | 386.18 | 3.24 | | |
| 385.18 | 1.26 | 386.20 | 3.27 | | |
| 385.20 | 1.32 | 386.22 | 3.30 | | |
| 385.22 | 1.38 | 386.24 | 3.32 | | |
| 385.24 | 1.44 | 386.26 | 3.35 | | |
| 385.26 | 1.50 | 386.28 | 3.38 | | |
| 385.28 | 1.56 | 386.30 | 3.40 | | |
| 385.30 | 1.62 | 386.32 | 3.43 | | |
| 385.32 | 1.68 | 386.34 | 3.46 | | |
| 385.34 | 1.74 | 386.36 | 3.48 | | |
| 385.36 | 1.79 | 386.38 | 3.51 | | |
| 385.38 | 1.85 | 386.40 | 3.53 | | |
| 385.40 | 1.90 | 386.42 | 3.56 | | |
| 385.42 | 1.95 | 386.44 | 3.58 | | |
| 385.44 | 2.00 | 386.46 | 3.61 | | |
| 385.46 | 2.04 | 386.48 | 3.63 | | |
| 385.48 | 2.08 | 386.50 | 3.66 | | |
| 385.50 | 2.11 | 386.52 | 3.68 | | |

## Stage-Area-Storage for Pond 3P: DETENTION POND

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---|---|---|
| 384.50 | 724 | 0 |
| 384.55 | 750 | 37 |
| 384.60 | 776 | 75 |
| 384.65 | 803 | 114 |
| 384.70 | 829 | 155 |
| 384.75 | 855 | 197 |
| 384.80 | 881 | 241 |
| 384.85 | 907 | 285 |
| 384.90 | 934 | 332 |
| 384.95 | 960 | 379 |
| 385.00 | 986 | 428 |
| 385.05 | 1,000 | 477 |
| 385.10 | 1,015 | 528 |
| 385.15 | 1,029 | 579 |
| 385.20 | 1,043 | 630 |
| 385.25 | 1,058 | 683 |
| 385.30 | 1,072 | 736 |
| 385.35 | 1,086 | 790 |
| 385.40 | 1,101 | 845 |
| 385.45 | 1,115 | 900 |
| 385.50 | 1,130 | 956 |
| 385.55 | 1,144 | 1,013 |
| 385.60 | 1,158 | 1,071 |
| 385.65 | 1,173 | 1,129 |
| 385.70 | 1,187 | 1,188 |
| 385.75 | 1,201 | 1,248 |
| 385.80 | 1,216 | 1,308 |
| 385.85 | 1,230 | 1,369 |
| 385.90 | 1,244 | 1,431 |
| 385.95 | 1,259 | 1,494 |
| 386.00 | 1,273 | 1,557 |
| 386.05 | 1,289 | 1,621 |
| 386.10 | 1,304 | 1,686 |
| 386.15 | 1,320 | 1,751 |
| 386.20 | 1,335 | 1,818 |
| 386.25 | 1,351 | 1,885 |
| 386.30 | 1,367 | 1,953 |
| 386.35 | 1,382 | 2,022 |
| 386.40 | 1,398 | 2,091 |
| 386.45 | 1,413 | 2,161 |
| 386.50 | 1,429 | 2,233 |
| 386.55 | 1,445 | 2,304 |
| 386.60 | 1,460 | 2,377 |
| 386.65 | 1,476 | 2,450 |
| 386.70 | 1,491 | 2,525 |
| 386.75 | 1,507 | 2,600 |
| 386.80 | 1,523 | 2,675 |
| 386.85 | 1,538 | 2,752 |
| 386.90 | 1,554 | 2,829 |
| 386.95 | 1,569 | 2,907 |
| 387.00 | **1,585** | **2,986** |

Time span=0.00-12.00 hrs, dt=0.01 hrs, 1201 points
Runoff by Rational method, Rise/Fall=1.0/1.0 xTc
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: PRE-DEVELOPMENT** Runoff Area=46,055 sf 0.00% Impervious Runoff Depth=1.16"
Flow Length=270' Slope=0.0250 '/' Tc=15.5 min C=0.69 Runoff=4.65 cfs 0.102 af

**Subcatchment 2S: POST-DEVELOPMENT** Runoff Area=46,055 sf 63.15% Impervious Runoff Depth=1.30"
Flow Length=360' Slope=0.0150 '/' Tc=8.8 min C=0.77 Runoff=5.18 cfs 0.114 af

**Reach 4R: CURB CUT WIER** Avg. Flow Depth=0.28' Max Vel=6.18 fps Inflow=5.18 cfs 0.114 af
n=0.013 L=4.0' S=0.0200 '/' Capacity=12.61 cfs Outflow=5.19 cfs 0.114 af

**Pond 3P: DETENTION POND** Peak Elev=386.41' Storage=2,110 cf Inflow=5.19 cfs 0.114 af
12.0" Round Culvert n=0.011 L=10.0' S=0.0500 '/' Outflow=3.55 cfs 0.114 af

**Total Runoff Area = 2.115 ac Runoff Volume = 0.216 af Average Runoff Depth = 1.23"**
**68.43% Pervious = 1.447 ac 31.57% Impervious = 0.668 ac**

## Summary for Subcatchment 1S: PRE-DEVELOPMENT

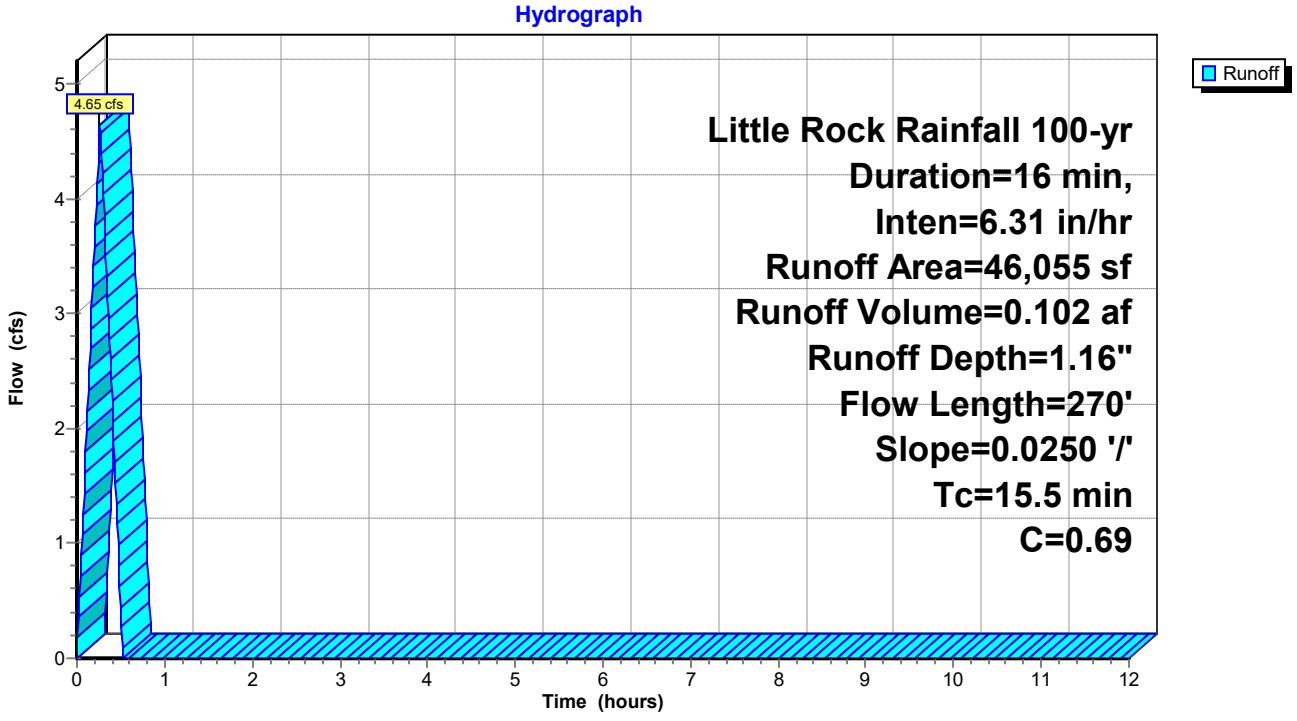
Runoff = 4.65 cfs @ 0.26 hrs, Volume= 0.102 af, Depth= 1.16"

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-12.00 hrs, dt= 0.01 hrs
Little Rock Rainfall 100-yr Duration=16 min, Inten=6.31 in/hr

| Area (sf) | C | Description |
|---|---|---|
| 31,035 | 0.65 | GRAVEL PARKING |
| 15,020 | 0.77 | SHRUB POOR CONDITION BRUSH |
| 46,055 | 0.69 | Weighted Average |
| 46,055 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 15.5 | 270 | 0.0250 | 0.29 | | **Sheet Flow, SHEET FLOW SURFACE** Range n= 0.130 P2= 4.19" |

## Subcatchment 1S: PRE-DEVELOPMENT



## Hydrograph for Subcatchment 1S: PRE-DEVELOPMENT

| Time (hours) | Runoff (cfs) | Time (hours) | Runoff (cfs) | Time (hours) | Runoff (cfs) |
|---|---|---|---|---|---|
| 0.00 | 0.00 | 5.10 | 0.00 | 10.20 | 0.00 |
| 0.10 | 1.80 | 5.20 | 0.00 | 10.30 | 0.00 |
| 0.20 | **3.59** | 5.30 | 0.00 | 10.40 | 0.00 |
| 0.30 | **4.04** | 5.40 | 0.00 | 10.50 | 0.00 |
| 0.40 | 2.25 | 5.50 | 0.00 | 10.60 | 0.00 |
| 0.50 | 0.45 | 5.60 | 0.00 | 10.70 | 0.00 |
| 0.60 | 0.00 | 5.70 | 0.00 | 10.80 | 0.00 |
| 0.70 | 0.00 | 5.80 | 0.00 | 10.90 | 0.00 |
| 0.80 | 0.00 | 5.90 | 0.00 | 11.00 | 0.00 |
| 0.90 | 0.00 | 6.00 | 0.00 | 11.10 | 0.00 |
| 1.00 | 0.00 | 6.10 | 0.00 | 11.20 | 0.00 |
| 1.10 | 0.00 | 6.20 | 0.00 | 11.30 | 0.00 |
| 1.20 | 0.00 | 6.30 | 0.00 | 11.40 | 0.00 |
| 1.30 | 0.00 | 6.40 | 0.00 | 11.50 | 0.00 |
| 1.40 | 0.00 | 6.50 | 0.00 | 11.60 | 0.00 |
| 1.50 | 0.00 | 6.60 | 0.00 | 11.70 | 0.00 |
| 1.60 | 0.00 | 6.70 | 0.00 | 11.80 | 0.00 |
| 1.70 | 0.00 | 6.80 | 0.00 | 11.90 | 0.00 |
| 1.80 | 0.00 | 6.90 | 0.00 | 12.00 | 0.00 |
| 1.90 | 0.00 | 7.00 | 0.00 | | |
| 2.00 | 0.00 | 7.10 | 0.00 | | |
| 2.10 | 0.00 | 7.20 | 0.00 | | |
| 2.20 | 0.00 | 7.30 | 0.00 | | |
| 2.30 | 0.00 | 7.40 | 0.00 | | |
| 2.40 | 0.00 | 7.50 | 0.00 | | |
| 2.50 | 0.00 | 7.60 | 0.00 | | |
| 2.60 | 0.00 | 7.70 | 0.00 | | |
| 2.70 | 0.00 | 7.80 | 0.00 | | |
| 2.80 | 0.00 | 7.90 | 0.00 | | |
| 2.90 | 0.00 | 8.00 | 0.00 | | |
| 3.00 | 0.00 | 8.10 | 0.00 | | |
| 3.10 | 0.00 | 8.20 | 0.00 | | |
| 3.20 | 0.00 | 8.30 | 0.00 | | |
| 3.30 | 0.00 | 8.40 | 0.00 | | |
| 3.40 | 0.00 | 8.50 | 0.00 | | |
| 3.50 | 0.00 | 8.60 | 0.00 | | |
| 3.60 | 0.00 | 8.70 | 0.00 | | |
| 3.70 | 0.00 | 8.80 | 0.00 | | |
| 3.80 | 0.00 | 8.90 | 0.00 | | |
| 3.90 | 0.00 | 9.00 | 0.00 | | |
| 4.00 | 0.00 | 9.10 | 0.00 | | |
| 4.10 | 0.00 | 9.20 | 0.00 | | |
| 4.20 | 0.00 | 9.30 | 0.00 | | |
| 4.30 | 0.00 | 9.40 | 0.00 | | |
| 4.40 | 0.00 | 9.50 | 0.00 | | |
| 4.50 | 0.00 | 9.60 | 0.00 | | |
| 4.60 | 0.00 | 9.70 | 0.00 | | |
| 4.70 | 0.00 | 9.80 | 0.00 | | |
| 4.80 | 0.00 | 9.90 | 0.00 | | |
| 4.90 | 0.00 | 10.00 | 0.00 | | |
| 5.00 | 0.00 | 10.10 | 0.00 | | |

## Summary for Subcatchment 2S: POST-DEVELOPMENT

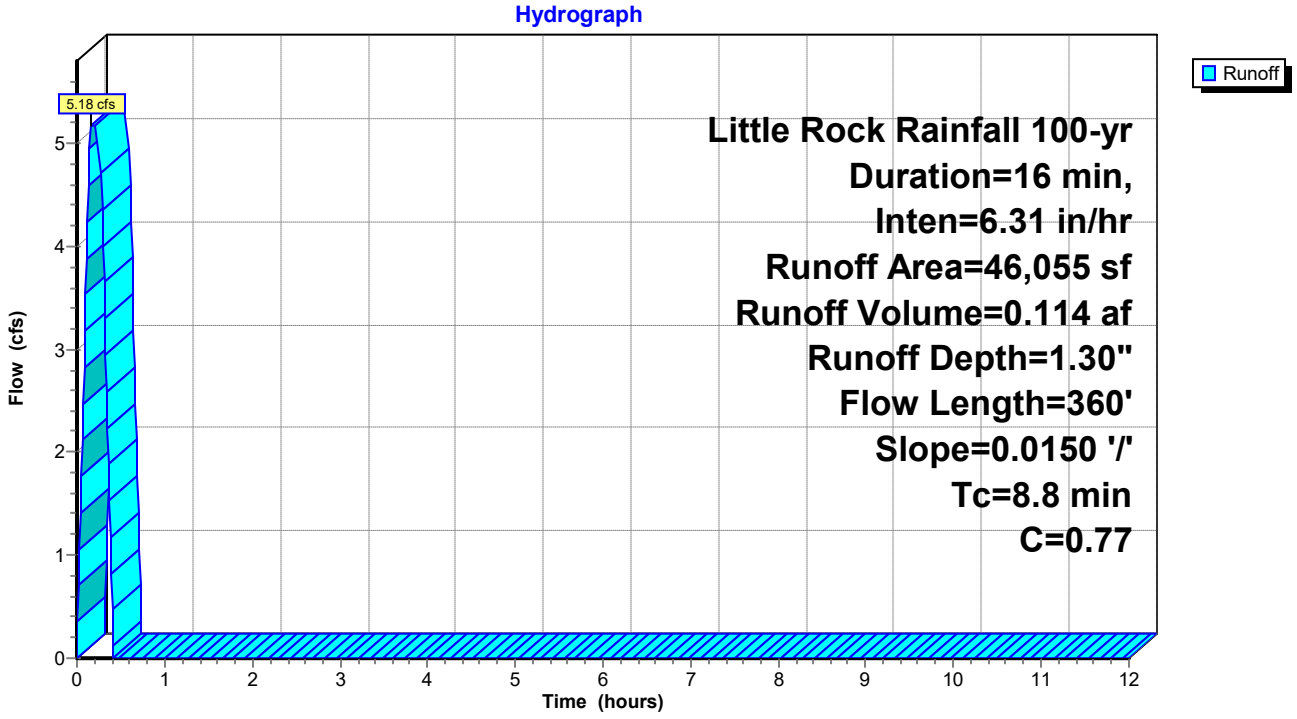
Runoff = 5.18 cfs @ 0.15 hrs, Volume= 0.114 af, Depth= 1.30"
Routed to Reach 4R : CURB CUT WIER

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-12.00 hrs, dt= 0.01 hrs
Little Rock Rainfall 100-yr Duration=16 min, Inten=6.31 in/hr

| Area (sf) | C | Description |
|---|---|---|
| 22,479 | 0.95 | ASPHALT SURFACE |
| 6,603 | 0.97 | ROOF TOP |
| 16,973 | 0.46 | GRASS LANDSCAPING |
| 46,055 | 0.77 | Weighted Average |
| 16,973 | | 36.85% Pervious Area |
| 29,082 | | 63.15% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.7 | 40 | 0.0150 | 0.10 | | **Sheet Flow, GRASS** Grass: Dense n= 0.240 P2= 4.19" |
| 2.1 | 320 | 0.0150 | 2.49 | | **Shallow Concentrated Flow, PAVEMENT** Paved Kv= 20.3 fps |
| 8.8 | 360 | Total | | | |

## Subcatchment 2S: POST-DEVELOPMENT



## Hydrograph for Subcatchment 2S: POST-DEVELOPMENT

| Time (hours) | Runoff (cfs) | Time (hours) | Runoff (cfs) | Time (hours) | Runoff (cfs) |
|---|---|---|---|---|---|
| 0.00 | 0.00 | 5.10 | 0.00 | 10.20 | 0.00 |
| 0.10 | **3.53** | 5.20 | 0.00 | 10.30 | 0.00 |
| 0.20 | **5.18** | 5.30 | 0.00 | 10.40 | 0.00 |
| 0.30 | 4.00 | 5.40 | 0.00 | 10.50 | 0.00 |
| 0.40 | 0.47 | 5.50 | 0.00 | 10.60 | 0.00 |
| 0.50 | 0.00 | 5.60 | 0.00 | 10.70 | 0.00 |
| 0.60 | 0.00 | 5.70 | 0.00 | 10.80 | 0.00 |
| 0.70 | 0.00 | 5.80 | 0.00 | 10.90 | 0.00 |
| 0.80 | 0.00 | 5.90 | 0.00 | 11.00 | 0.00 |
| 0.90 | 0.00 | 6.00 | 0.00 | 11.10 | 0.00 |
| 1.00 | 0.00 | 6.10 | 0.00 | 11.20 | 0.00 |
| 1.10 | 0.00 | 6.20 | 0.00 | 11.30 | 0.00 |
| 1.20 | 0.00 | 6.30 | 0.00 | 11.40 | 0.00 |
| 1.30 | 0.00 | 6.40 | 0.00 | 11.50 | 0.00 |
| 1.40 | 0.00 | 6.50 | 0.00 | 11.60 | 0.00 |
| 1.50 | 0.00 | 6.60 | 0.00 | 11.70 | 0.00 |
| 1.60 | 0.00 | 6.70 | 0.00 | 11.80 | 0.00 |
| 1.70 | 0.00 | 6.80 | 0.00 | 11.90 | 0.00 |
| 1.80 | 0.00 | 6.90 | 0.00 | 12.00 | 0.00 |
| 1.90 | 0.00 | 7.00 | 0.00 | | |
| 2.00 | 0.00 | 7.10 | 0.00 | | |
| 2.10 | 0.00 | 7.20 | 0.00 | | |
| 2.20 | 0.00 | 7.30 | 0.00 | | |
| 2.30 | 0.00 | 7.40 | 0.00 | | |
| 2.40 | 0.00 | 7.50 | 0.00 | | |
| 2.50 | 0.00 | 7.60 | 0.00 | | |
| 2.60 | 0.00 | 7.70 | 0.00 | | |
| 2.70 | 0.00 | 7.80 | 0.00 | | |
| 2.80 | 0.00 | 7.90 | 0.00 | | |
| 2.90 | 0.00 | 8.00 | 0.00 | | |
| 3.00 | 0.00 | 8.10 | 0.00 | | |
| 3.10 | 0.00 | 8.20 | 0.00 | | |
| 3.20 | 0.00 | 8.30 | 0.00 | | |
| 3.30 | 0.00 | 8.40 | 0.00 | | |
| 3.40 | 0.00 | 8.50 | 0.00 | | |
| 3.50 | 0.00 | 8.60 | 0.00 | | |
| 3.60 | 0.00 | 8.70 | 0.00 | | |
| 3.70 | 0.00 | 8.80 | 0.00 | | |
| 3.80 | 0.00 | 8.90 | 0.00 | | |
| 3.90 | 0.00 | 9.00 | 0.00 | | |
| 4.00 | 0.00 | 9.10 | 0.00 | | |
| 4.10 | 0.00 | 9.20 | 0.00 | | |
| 4.20 | 0.00 | 9.30 | 0.00 | | |
| 4.30 | 0.00 | 9.40 | 0.00 | | |
| 4.40 | 0.00 | 9.50 | 0.00 | | |
| 4.50 | 0.00 | 9.60 | 0.00 | | |
| 4.60 | 0.00 | 9.70 | 0.00 | | |
| 4.70 | 0.00 | 9.80 | 0.00 | | |
| 4.80 | 0.00 | 9.90 | 0.00 | | |
| 4.90 | 0.00 | 10.00 | 0.00 | | |
| 5.00 | 0.00 | 10.10 | 0.00 | | |

## Summary for Reach 4R: CURB CUT WIER

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 1.057 ac, 63.15% Impervious, Inflow Depth = 1.30" for 100-yr event
Inflow = 5.18 cfs @ 0.15 hrs, Volume= 0.114 af
Outflow = 5.19 cfs @ 0.16 hrs, Volume= 0.114 af, Atten= 0%, Lag= 0.6 min
Routed to Pond 3P : DETENTION POND

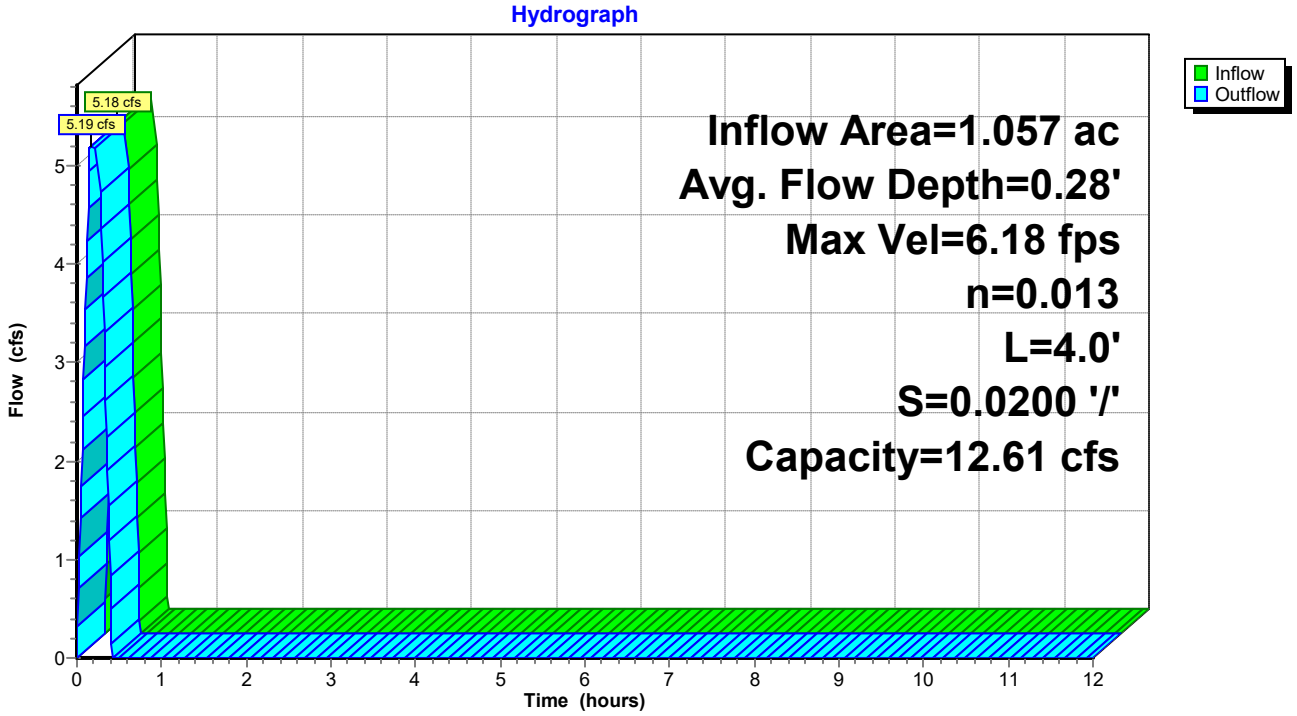
Routing by Stor-Ind+Trans method, Time Span= 0.00-12.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.18 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 4.91 fps, Avg. Travel Time= 0.0 min

Peak Storage= 3 cf @ 0.16 hrs
Average Depth at Peak Storage= 0.28' , Surface Width= 3.00'
Bank-Full Depth= 0.50' Flow Area= 1.5 sf, Capacity= 12.61 cfs

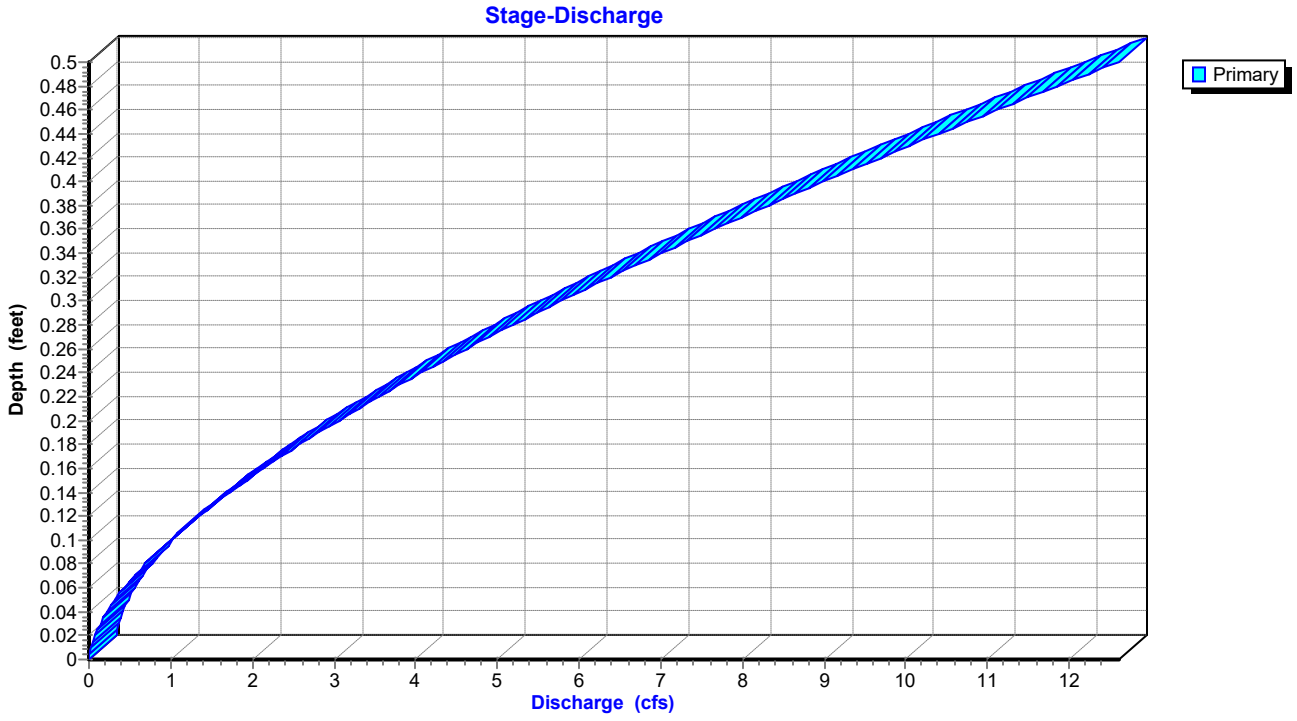
3.00' x 0.50' deep channel, n= 0.013 Concrete, trowel finish
Length= 4.0' Slope= 0.0200 '/'
Inlet Invert= 387.25', Outlet Invert= 387.17'



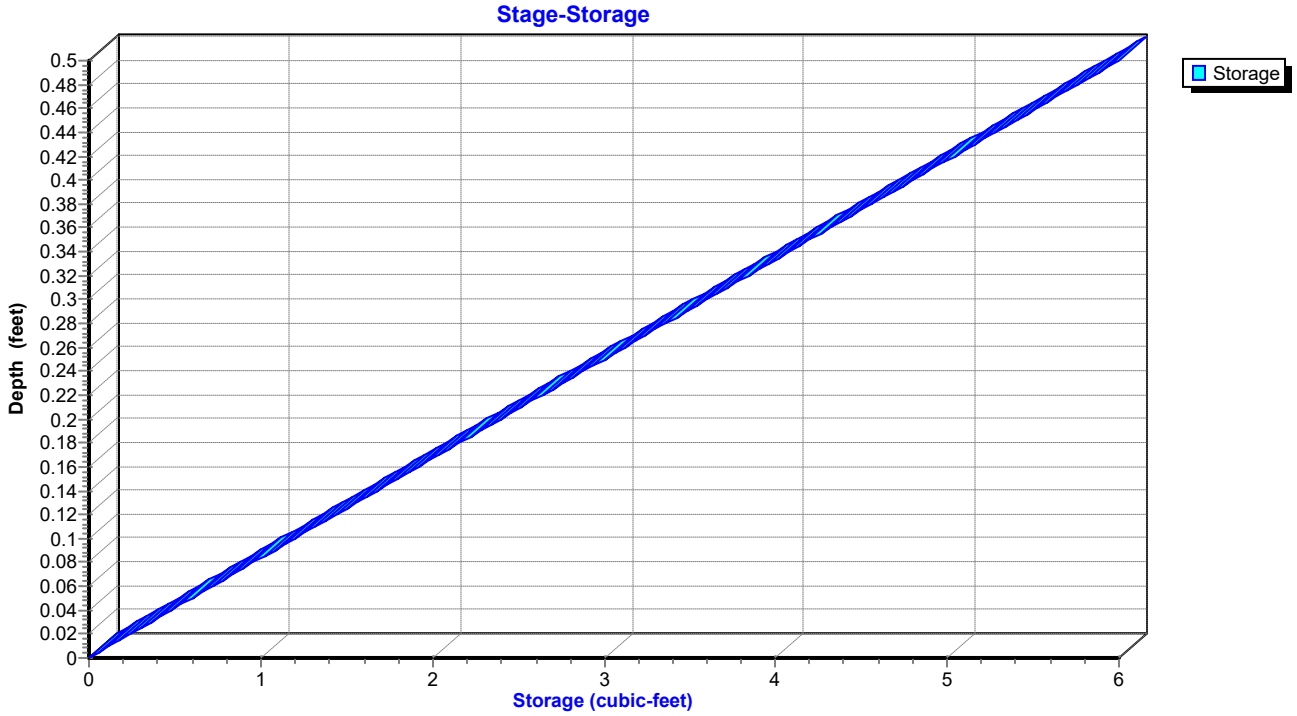
## Reach 4R: CURB CUT WIER




## Reach 4R: CURB CUT WIER



## Reach 4R: CURB CUT WIER



## Hydrograph for Reach 4R: CURB CUT WIER

| Time (hours) | Inflow (cfs) | Storage (cubic-feet) | Elevation (feet) | Outflow (cfs) |
|---|---|---|---|---|
| 0.00 | **0.00** | **0** | **387.25** | **0.00** |
| 0.50 | **0.00** | **0** | **387.25** | **0.00** |
| 1.00 | 0.00 | 0 | 387.25 | 0.00 |
| 1.50 | 0.00 | 0 | 387.25 | 0.00 |
| 2.00 | 0.00 | 0 | 387.25 | 0.00 |
| 2.50 | 0.00 | 0 | 387.25 | 0.00 |
| 3.00 | 0.00 | 0 | 387.25 | 0.00 |
| 3.50 | 0.00 | 0 | 387.25 | 0.00 |
| 4.00 | 0.00 | 0 | 387.25 | 0.00 |
| 4.50 | 0.00 | 0 | 387.25 | 0.00 |
| 5.00 | 0.00 | 0 | 387.25 | 0.00 |
| 5.50 | 0.00 | 0 | 387.25 | 0.00 |
| 6.00 | 0.00 | 0 | 387.25 | 0.00 |
| 6.50 | 0.00 | 0 | 387.25 | 0.00 |
| 7.00 | 0.00 | 0 | 387.25 | 0.00 |
| 7.50 | 0.00 | 0 | 387.25 | 0.00 |
| 8.00 | 0.00 | 0 | 387.25 | 0.00 |
| 8.50 | 0.00 | 0 | 387.25 | 0.00 |
| 9.00 | 0.00 | 0 | 387.25 | 0.00 |
| 9.50 | 0.00 | 0 | 387.25 | 0.00 |
| 10.00 | 0.00 | 0 | 387.25 | 0.00 |
| 10.50 | 0.00 | 0 | 387.25 | 0.00 |
| 11.00 | 0.00 | 0 | 387.25 | 0.00 |
| 11.50 | 0.00 | 0 | 387.25 | 0.00 |
| 12.00 | 0.00 | 0 | 387.25 | 0.00 |

## Stage-Discharge for Reach 4R: CURB CUT WIER

| Elevation (feet) | Velocity (ft/sec) | Discharge (cfs) |
|---|---|---|
| 387.25 | 0.00 | 0.00 |
| 387.26 | 0.75 | 0.02 |
| 387.27 | 1.18 | 0.07 |
| 387.28 | 1.54 | 0.14 |
| 387.29 | 1.86 | 0.22 |
| 387.30 | 2.15 | 0.32 |
| 387.31 | 2.41 | 0.43 |
| 387.32 | 2.66 | 0.56 |
| 387.33 | 2.90 | 0.70 |
| 387.34 | 3.12 | 0.84 |
| 387.35 | 3.34 | 1.00 |
| 387.36 | 3.54 | 1.17 |
| 387.37 | 3.74 | 1.35 |
| 387.38 | 3.92 | 1.53 |
| 387.39 | 4.11 | 1.72 |
| 387.40 | 4.28 | 1.93 |
| 387.41 | 4.45 | 2.14 |
| 387.42 | 4.62 | 2.36 |
| 387.43 | 4.78 | 2.58 |
| 387.44 | 4.93 | 2.81 |
| 387.45 | 5.09 | 3.05 |
| 387.46 | 5.23 | 3.30 |
| 387.47 | 5.38 | 3.55 |
| 387.48 | 5.52 | 3.81 |
| 387.49 | 5.65 | 4.07 |
| 387.50 | 5.79 | 4.34 |
| 387.51 | 5.92 | 4.62 |
| 387.52 | 6.05 | 4.90 |
| 387.53 | 6.17 | 5.19 |
| 387.54 | 6.30 | 5.48 |
| 387.55 | 6.42 | 5.77 |
| 387.56 | 6.53 | 6.08 |
| 387.57 | 6.65 | 6.38 |
| 387.58 | 6.76 | 6.69 |
| 387.59 | 6.87 | 7.01 |
| 387.60 | 6.98 | 7.33 |
| 387.61 | 7.09 | 7.65 |
| 387.62 | 7.19 | 7.98 |
| 387.63 | 7.30 | 8.32 |
| 387.64 | 7.40 | 8.65 |
| 387.65 | 7.50 | 9.00 |
| 387.66 | 7.59 | 9.34 |
| 387.67 | 7.69 | 9.69 |
| 387.68 | 7.79 | 10.04 |
| 387.69 | 7.88 | 10.40 |
| 387.70 | 7.97 | 10.76 |
| 387.71 | 8.06 | 11.12 |
| 387.72 | 8.15 | 11.49 |
| 387.73 | 8.24 | 11.86 |
| 387.74 | 8.32 | 12.23 |
| 387.75 | **8.41** | **12.61** |

## Stage-Area-Storage for Reach 4R: CURB CUT WIER

| Elevation (feet) | End-Area (sq-ft) | Storage (cubic-feet) |
|---|---|---|
| 387.25 | 0.0 | 0 |
| 387.26 | 0.0 | 0 |
| 387.27 | 0.1 | 0 |
| 387.28 | 0.1 | 0 |
| 387.29 | 0.1 | 0 |
| 387.30 | 0.2 | 1 |
| 387.31 | 0.2 | 1 |
| 387.32 | 0.2 | 1 |
| 387.33 | 0.2 | 1 |
| 387.34 | 0.3 | 1 |
| 387.35 | 0.3 | 1 |
| 387.36 | 0.3 | 1 |
| 387.37 | 0.4 | 1 |
| 387.38 | 0.4 | 2 |
| 387.39 | 0.4 | 2 |
| 387.40 | 0.4 | 2 |
| 387.41 | 0.5 | 2 |
| 387.42 | 0.5 | 2 |
| 387.43 | 0.5 | 2 |
| 387.44 | 0.6 | 2 |
| 387.45 | 0.6 | 2 |
| 387.46 | 0.6 | 3 |
| 387.47 | 0.7 | 3 |
| 387.48 | 0.7 | 3 |
| 387.49 | 0.7 | 3 |
| 387.50 | 0.8 | 3 |
| 387.51 | 0.8 | 3 |
| 387.52 | 0.8 | 3 |
| 387.53 | 0.8 | 3 |
| 387.54 | 0.9 | 3 |
| 387.55 | 0.9 | 4 |
| 387.56 | 0.9 | 4 |
| 387.57 | 1.0 | 4 |
| 387.58 | 1.0 | 4 |
| 387.59 | 1.0 | 4 |
| 387.60 | 1.1 | 4 |
| 387.61 | 1.1 | 4 |
| 387.62 | 1.1 | 4 |
| 387.63 | 1.1 | 5 |
| 387.64 | 1.2 | 5 |
| 387.65 | 1.2 | 5 |
| 387.66 | 1.2 | 5 |
| 387.67 | 1.3 | 5 |
| 387.68 | 1.3 | 5 |
| 387.69 | 1.3 | 5 |
| 387.70 | 1.4 | 5 |
| 387.71 | 1.4 | 6 |
| 387.72 | 1.4 | 6 |
| 387.73 | 1.4 | 6 |
| 387.74 | 1.5 | 6 |
| 387.75 | **1.5** | **6** |

## Summary for Pond 3P: DETENTION POND

Inflow Area = 1.057 ac, 63.15% Impervious, Inflow Depth = 1.30" for 100-yr event
Inflow = 5.19 cfs @ 0.16 hrs, Volume= 0.114 af
Outflow = 3.55 cfs @ 0.31 hrs, Volume= 0.114 af, Atten= 32%, Lag= 9.2 min
Primary = 3.55 cfs @ 0.31 hrs, Volume= 0.114 af

Routing by Stor-Ind method, Time Span= 0.00-12.00 hrs, dt= 0.01 hrs
Peak Elev= 386.41' @ 0.31 hrs Surf.Area= 1,402 sf Storage= 2,110 cf

Plug-Flow detention time= 10.4 min calculated for 0.114 af (100% of inflow)
Center-of-Mass det. time= 10.4 min ( 22.8 - 12.4 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 384.50' | 2,986 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

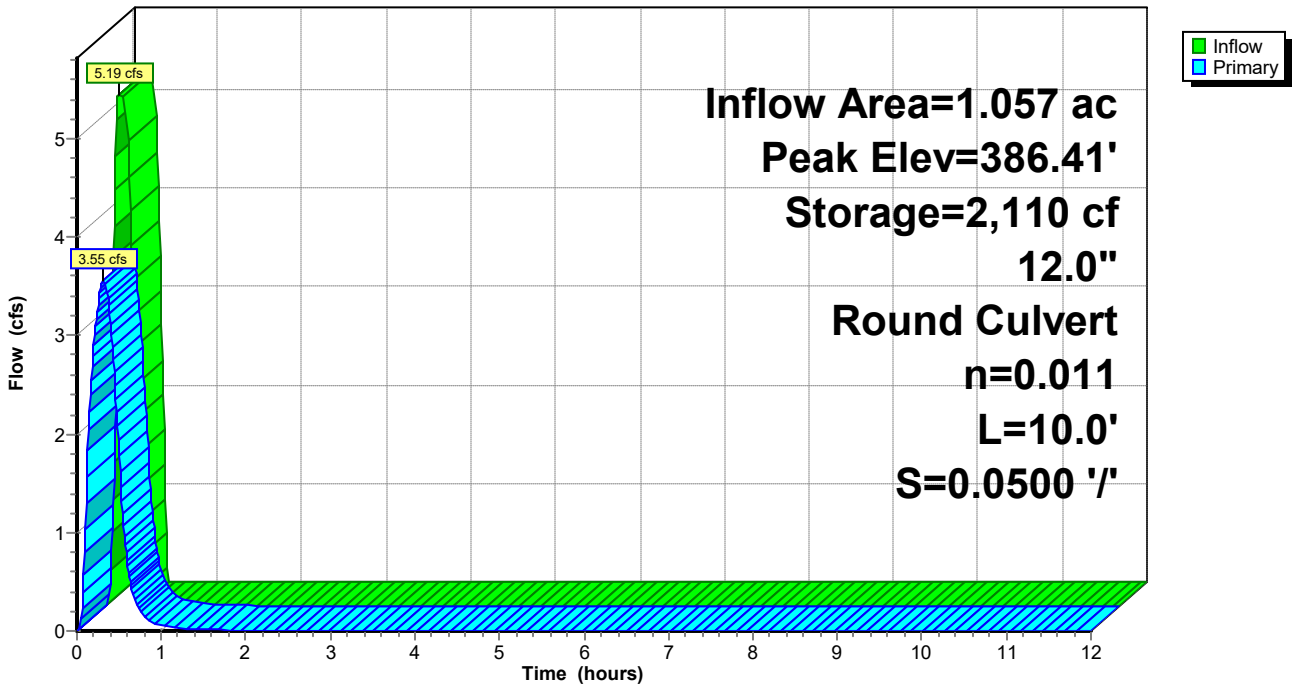
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 384.50 | 724 | 0 | 0 |
| 385.00 | 986 | 428 | 428 |
| 386.00 | 1,273 | 1,130 | 1,557 |
| 387.00 | 1,585 | 1,429 | 2,986 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 384.50' | **12.0" Round 12" RCP**<br>L= 10.0' CMP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 384.50' / 384.00' S= 0.0500 '/' Cc= 0.900<br>n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf |

**Primary OutFlow** Max=3.55 cfs @ 0.31 hrs HW=386.41' (Free Discharge)
↑**1=12" RCP** (Inlet Controls 3.55 cfs @ 4.52 fps)

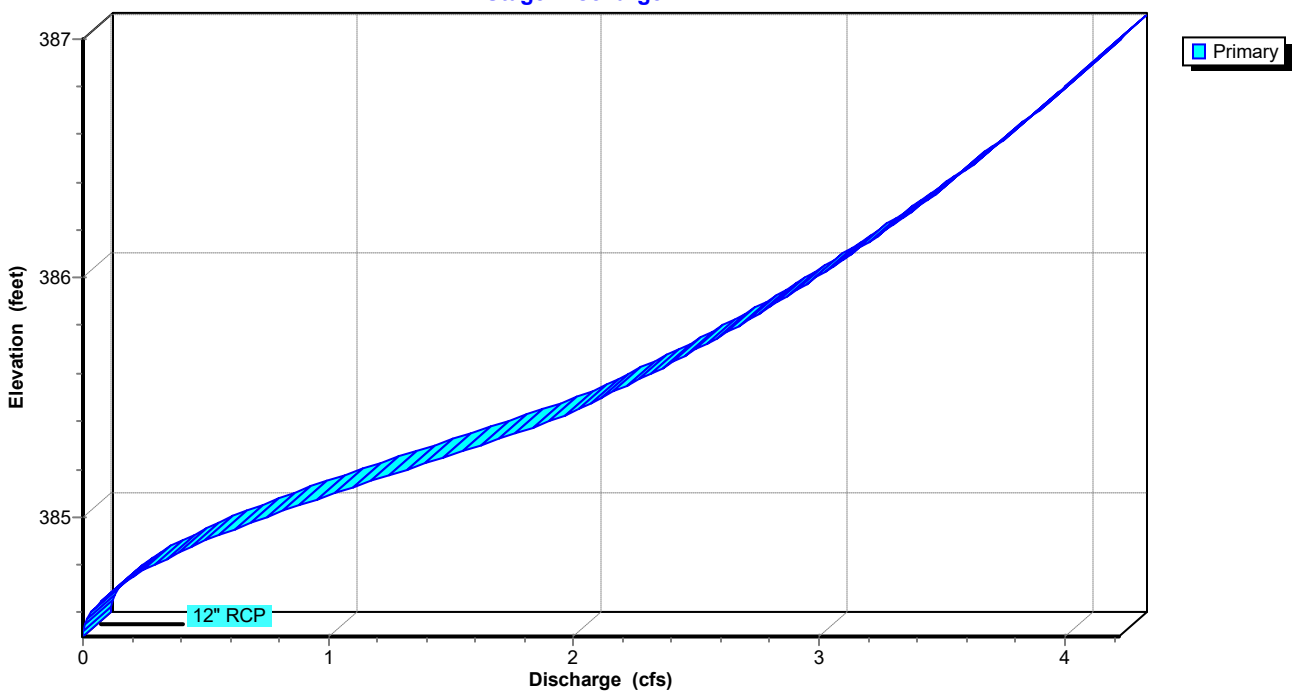
## Pond 3P: DETENTION POND

Hydrograph

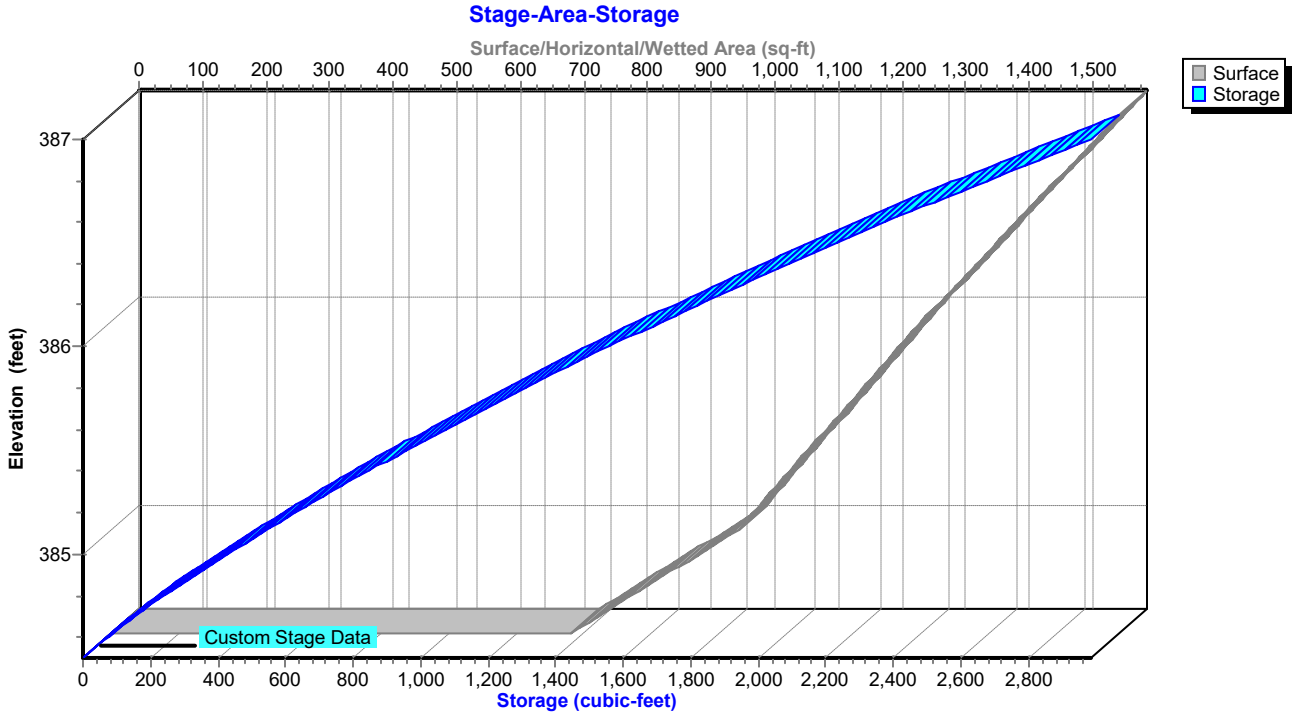



## Pond 3P: DETENTION POND

Stage-Discharge



## Pond 3P: DETENTION POND



## Hydrograph for Pond 3P: DETENTION POND

| Time (hours) | Inflow (cfs) | Storage (cubic-feet) | Elevation (feet) | Primary (cfs) |
|---|---|---|---|---|
| 0.00 | **0.00** | **0** | **384.50** | **0.00** |
| 0.50 | **0.00** | **797** | **385.36** | **1.78** |
| 1.00 | 0.00 | 97 | 384.63 | 0.06 |
| 1.50 | 0.00 | 46 | 384.56 | 0.01 |
| 2.00 | 0.00 | 29 | 384.54 | 0.01 |
| 2.50 | 0.00 | 21 | 384.53 | 0.00 |
| 3.00 | 0.00 | 17 | 384.52 | 0.00 |
| 3.50 | 0.00 | 13 | 384.52 | 0.00 |
| 4.00 | 0.00 | 11 | 384.51 | 0.00 |
| 4.50 | 0.00 | 9 | 384.51 | 0.00 |
| 5.00 | 0.00 | 7 | 384.51 | 0.00 |
| 5.50 | 0.00 | 6 | 384.51 | 0.00 |
| 6.00 | 0.00 | 5 | 384.51 | 0.00 |
| 6.50 | 0.00 | 4 | 384.50 | 0.00 |
| 7.00 | 0.00 | 3 | 384.50 | 0.00 |
| 7.50 | 0.00 | 2 | 384.50 | 0.00 |
| 8.00 | 0.00 | 2 | 384.50 | 0.00 |
| 8.50 | 0.00 | 2 | 384.50 | 0.00 |
| 9.00 | 0.00 | 1 | 384.50 | 0.00 |
| 9.50 | 0.00 | 1 | 384.50 | 0.00 |
| 10.00 | 0.00 | 1 | 384.50 | 0.00 |
| 10.50 | 0.00 | 1 | 384.50 | 0.00 |
| 11.00 | 0.00 | 1 | 384.50 | 0.00 |
| 11.50 | 0.00 | 0 | 384.50 | 0.00 |
| 12.00 | 0.00 | 0 | 384.50 | 0.00 |

## Stage-Discharge for Pond 3P: DETENTION POND

| Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) |
|---|---|---|---|---|---|
| 384.50 | 0.00 | 385.52 | 2.15 | 386.54 | 3.70 |
| 384.52 | 0.00 | 385.54 | 2.19 | 386.56 | 3.73 |
| 384.54 | 0.01 | 385.56 | 2.23 | 386.58 | 3.75 |
| 384.56 | 0.01 | 385.58 | 2.27 | 386.60 | 3.78 |
| 384.58 | 0.02 | 385.60 | 2.31 | 386.62 | 3.80 |
| 384.60 | 0.03 | 385.62 | 2.35 | 386.64 | 3.82 |
| 384.62 | 0.05 | 385.64 | 2.39 | 386.66 | 3.85 |
| 384.64 | 0.07 | 385.66 | 2.43 | 386.68 | 3.87 |
| 384.66 | 0.09 | 385.68 | 2.46 | 386.70 | 3.89 |
| 384.68 | 0.11 | 385.70 | 2.50 | 386.72 | 3.92 |
| 384.70 | 0.13 | 385.72 | 2.53 | 386.74 | 3.94 |
| 384.72 | 0.16 | 385.74 | 2.57 | 386.76 | 3.96 |
| 384.74 | 0.19 | 385.76 | 2.60 | 386.78 | 3.98 |
| 384.76 | 0.22 | 385.78 | 2.64 | 386.80 | 4.01 |
| 384.78 | 0.26 | 385.80 | 2.67 | 386.82 | 4.03 |
| 384.80 | 0.29 | 385.82 | 2.70 | 386.84 | 4.05 |
| 384.82 | 0.33 | 385.84 | 2.74 | 386.86 | 4.07 |
| 384.84 | 0.37 | 385.86 | 2.77 | 386.88 | 4.09 |
| 384.86 | 0.41 | 385.88 | 2.80 | 386.90 | 4.12 |
| 384.88 | 0.45 | 385.90 | 2.83 | 386.92 | 4.14 |
| 384.90 | 0.50 | 385.92 | 2.86 | 386.94 | 4.16 |
| 384.92 | 0.55 | 385.94 | 2.89 | 386.96 | 4.18 |
| 384.94 | 0.59 | 385.96 | 2.93 | 386.98 | 4.20 |
| 384.96 | 0.64 | 385.98 | 2.96 | 387.00 | **4.22** |
| 384.98 | 0.69 | 386.00 | 2.99 | | |
| 385.00 | 0.75 | 386.02 | 3.02 | | |
| 385.02 | 0.80 | 386.04 | 3.04 | | |
| 385.04 | 0.85 | 386.06 | 3.07 | | |
| 385.06 | 0.91 | 386.08 | 3.10 | | |
| 385.08 | 0.97 | 386.10 | 3.13 | | |
| 385.10 | 1.02 | 386.12 | 3.16 | | |
| 385.12 | 1.08 | 386.14 | 3.19 | | |
| 385.14 | 1.14 | 386.16 | 3.22 | | |
| 385.16 | 1.20 | 386.18 | 3.24 | | |
| 385.18 | 1.26 | 386.20 | 3.27 | | |
| 385.20 | 1.32 | 386.22 | 3.30 | | |
| 385.22 | 1.38 | 386.24 | 3.32 | | |
| 385.24 | 1.44 | 386.26 | 3.35 | | |
| 385.26 | 1.50 | 386.28 | 3.38 | | |
| 385.28 | 1.56 | 386.30 | 3.40 | | |
| 385.30 | 1.62 | 386.32 | 3.43 | | |
| 385.32 | 1.68 | 386.34 | 3.46 | | |
| 385.34 | 1.74 | 386.36 | 3.48 | | |
| 385.36 | 1.79 | 386.38 | 3.51 | | |
| 385.38 | 1.85 | 386.40 | 3.53 | | |
| 385.40 | 1.90 | 386.42 | 3.56 | | |
| 385.42 | 1.95 | 386.44 | 3.58 | | |
| 385.44 | 2.00 | 386.46 | 3.61 | | |
| 385.46 | 2.04 | 386.48 | 3.63 | | |
| 385.48 | 2.08 | 386.50 | 3.66 | | |
| 385.50 | 2.11 | 386.52 | 3.68 | | |

## Stage-Area-Storage for Pond 3P: DETENTION POND

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---|---|---|
| 384.50 | 724 | 0 |
| 384.55 | 750 | 37 |
| 384.60 | 776 | 75 |
| 384.65 | 803 | 114 |
| 384.70 | 829 | 155 |
| 384.75 | 855 | 197 |
| 384.80 | 881 | 241 |
| 384.85 | 907 | 285 |
| 384.90 | 934 | 332 |
| 384.95 | 960 | 379 |
| 385.00 | 986 | 428 |
| 385.05 | 1,000 | 477 |
| 385.10 | 1,015 | 528 |
| 385.15 | 1,029 | 579 |
| 385.20 | 1,043 | 630 |
| 385.25 | 1,058 | 683 |
| 385.30 | 1,072 | 736 |
| 385.35 | 1,086 | 790 |
| 385.40 | 1,101 | 845 |
| 385.45 | 1,115 | 900 |
| 385.50 | 1,130 | 956 |
| 385.55 | 1,144 | 1,013 |
| 385.60 | 1,158 | 1,071 |
| 385.65 | 1,173 | 1,129 |
| 385.70 | 1,187 | 1,188 |
| 385.75 | 1,201 | 1,248 |
| 385.80 | 1,216 | 1,308 |
| 385.85 | 1,230 | 1,369 |
| 385.90 | 1,244 | 1,431 |
| 385.95 | 1,259 | 1,494 |
| 386.00 | 1,273 | 1,557 |
| 386.05 | 1,289 | 1,621 |
| 386.10 | 1,304 | 1,686 |
| 386.15 | 1,320 | 1,751 |
| 386.20 | 1,335 | 1,818 |
| 386.25 | 1,351 | 1,885 |
| 386.30 | 1,367 | 1,953 |
| 386.35 | 1,382 | 2,022 |
| 386.40 | 1,398 | 2,091 |
| 386.45 | 1,413 | 2,161 |
| 386.50 | 1,429 | 2,233 |
| 386.55 | 1,445 | 2,304 |
| 386.60 | 1,460 | 2,377 |
| 386.65 | 1,476 | 2,450 |
| 386.70 | 1,491 | 2,525 |
| 386.75 | 1,507 | 2,600 |
| 386.80 | 1,523 | 2,675 |
| 386.85 | 1,538 | 2,752 |
| 386.90 | 1,554 | 2,829 |
| 386.95 | 1,569 | 2,907 |
| 387.00 | **1,585** | **2,986** |

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