

Subarea Hydrograph Computation

Title: Design Point 5

Description: 2 Hour
10 Yr

Hydrograph No.: 6
Branch No.: 3

Subarea drainage area (acres): 1.73
 Total upstream drainage area (acres): 2.21
 Percent impervious area: 39
 Total precipitation multiplication factor: 1
 Hydrograph base flow (cfs): 0

Impervious area; SCS curve number: 98

Pervious area; SCS curve number: 87

Computation method selection: SCS Dimensionless Hydrograph

Time of concentration (minutes)= 11.7

Channel routing method: Channel storage

Reach length (ft)= 400

Slope (ft/ft)= .16

Manning's n= .035

Channel type is trapezoidal: Bottom width (ft)= 1
 Sideslope (H to 1V)= 4

		Unit hydrograph				
Time	0.00	1.20	2.40	3.61	4.81	
Discharge	0.0000	0.1959	0.6531	1.24	2.02	
Time	6.01	7.21	8.41	9.62	10.82	
Discharge	3.07	4.31	5.36	6.07	6.47	
Time	12.02	13.22	14.42	15.63	16.83	
Discharge	6.53	6.47	6.07	5.62	5.09	
Time	18.03	19.23	20.43	21.64	22.84	
Discharge	4.44	3.66	3.00	2.55	2.16	
Time	24.04	26.44	28.85	31.25	33.66	
Discharge	1.83	1.35	0.9600	0.6988	0.5551	
Time	36.06	38.46	40.87	43.27	45.68	
Discharge	0.4310	0.3265	0.2286	0.1437	0.0653	
Time	48.08					
Discharge	0.0000					

```

*****
Time   Rain Perv- Perv- Imp- Imp- Subarea Routed Total
       ious ious  erv.  erv.  Hydro- Routed  Hyd.
       Loss Excess Loss Excess graph  Upstream
*****
  0.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
 10.00  0.11  0.11  0.00  0.09  0.02    0.00    0.00    0.00
 20.00  0.33  0.32  0.01  0.09  0.25    0.04    0.05    0.09
 30.00  1.03  0.53  0.50  0.04  0.99    0.66    0.86    1.52
 40.00  0.58  0.15  0.43  0.01  0.57    4.62    5.98   10.59
 50.00  0.30  0.06  0.24  0.00  0.29    5.34    6.80   12.14
 60.00  0.21  0.04  0.18  0.00  0.21    3.79    4.79    8.58
 70.00  0.16  0.02  0.13  0.00  0.16    2.60    3.29    5.89
 80.00  0.08  0.01  0.07  0.00  0.08    1.85    2.34    4.18
 90.00  0.06  0.01  0.05  0.00  0.06    1.17    1.47    2.64
100.00  0.06  0.01  0.05  0.00  0.06    0.78    0.98    1.76
110.00  0.06  0.01  0.06  0.00  0.06    0.65    0.83    1.47
120.00  0.06  0.01  0.06  0.00  0.06    0.62    0.79    1.40
130.00  0.00  0.00  0.00  0.00  0.00    0.61    0.78    1.40
140.00  0.00  0.00  0.00  0.00  0.00    0.25    0.31    0.57
150.00  0.00  0.00  0.00  0.00  0.00    0.06    0.08    0.14
160.00  0.00  0.00  0.00  0.00  0.00    0.02    0.02    0.03
170.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
180.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
190.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
200.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
210.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
220.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
230.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
240.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
*****
Totals  3.05  1.27  1.78  0.23  2.82

```

Runoff volume= .3173544 acre-ft
Total volume= .7218649 acre-ft
Peak discharge (cfs)= 12.13982

Subarea Hydrograph Computation

Title: Design Point 6

Description: 2 Hour
10 Yr

Hydrograph No.: 7
Branch No.: 3

Subarea drainage area (acres): 5.89
Total upstream drainage area (acres): 3.94
Percent impervious area: 31
Total precipitation multiplication factor: 1
Hydrograph base flow (cfs): 0

Impervious area; SCS curve number: 98

Pervious area; SCS curve number: 87

Computation method selection: SCS Dimensionless Hydrograph

Time of concentration (minutes)= 8.64

Channel routing method: Channel storage

Reach length (ft)= 265

Slope (ft/ft)= .071

Manning's n= .013

Channel type is circular: Diameter (inches)= 24

		Unit hydrograph				
Time	0.00	1.02	2.04	3.06	4.07	
Discharge	0.0000	0.7873	2.62	4.99	8.14	
Time	5.09	6.11	7.13	8.15	9.17	
Discharge	12.33	17.32	21.52	24.41	25.98	
Time	10.18	11.20	12.22	13.24	14.26	
Discharge	26.24	25.98	24.41	22.57	20.47	
Time	15.28	16.29	17.31	18.33	19.35	
Discharge	17.85	14.70	12.07	10.23	8.66	
Time	20.37	22.40	24.44	26.48	28.52	
Discharge	7.35	5.43	3.86	2.81	2.23	
Time	30.55	32.59	34.63	36.66	38.70	
Discharge	1.73	1.31	0.9185	0.5773	0.2624	
Time	40.74					
Discharge	0.0000					

```

*****
Time   Rain Perv- Perv- Imp- Imp- Subarea Routed Total
       ious ious  erv.  erv.  Hydro- Routed  Hyd.
       Loss Excess Loss Excess  graph  Upstream
*****
 0.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
10.00  0.11  0.11  0.00  0.09  0.02    0.00    0.00    0.00
20.00  0.33  0.32  0.01  0.09  0.25    0.13    0.09    0.21
30.00  1.03  0.53  0.50  0.04  0.99    2.26    1.52    3.77
40.00  0.58  0.15  0.43  0.01  0.57   17.72   10.59   28.31
50.00  0.30  0.06  0.24  0.00  0.29   17.69   12.14   29.83
60.00  0.21  0.04  0.18  0.00  0.21   11.62    8.58   20.20
70.00  0.16  0.02  0.13  0.00  0.16    7.82    5.89   13.71
80.00  0.08  0.01  0.07  0.00  0.08    5.63    4.18    9.86
90.00  0.06  0.01  0.05  0.00  0.06    3.47    2.64    6.11
100.00 0.06  0.01  0.05  0.00  0.06    2.37    1.76    4.14
110.00 0.04  0.01  0.06  0.00  0.06    2.11    1.47    3.58
120.00 0.04  0.01  0.06  0.00  0.06    2.07    1.40    3.48
130.00 0.00  0.00  0.00  0.00  0.00    2.08    1.40    3.47
140.00 0.00  0.00  0.00  0.00  0.00    0.56    0.57    1.13
150.00 0.00  0.00  0.00  0.00  0.00    0.11    0.14    0.26
160.00 0.00  0.00  0.00  0.00  0.00    0.01    0.03    0.04
170.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
180.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
190.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
200.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
210.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
220.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
230.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
240.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
*****
Totals 3.05  1.27  1.78  0.23  2.82

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Runoff volume= 1.042559 acre-ft
Total volume= 1.764424 acre-ft
Peak discharge (cfs)= 29.82711

Subarea Hydrograph Computation

Title: Design Point 7

Description: 2 Hour
10 Yr

Hydrograph No.: 8
Branch No.: 3

Subarea drainage area (acres): 17.82
Total upstream drainage area (acres): 9.83
Percent impervious area: 31
Total precipitation multiplication factor: 1
Hydrograph base flow (cfs): 0

Impervious area; SCS curve number: 98

Pervious area; SCS curve number: 87

Computation method selection: SCS Dimensionless Hydrograph

Time of concentration (minutes)= 11.44

Channel routing method: Channel storage

Reach length (ft)= 141

Slope (ft/ft)= .0629

Manning's n= .013

Channel type is circular: Diameter (inches)= 24

		Unit hydrograph				
Time	0.00	1.19	2.37	3.56	4.75	
Discharge	0.0000	2.04	6.82	12.95	21.13	
Time	5.93	7.12	8.30	9.49	10.68	
Discharge	32.03	44.98	55.89	63.38	67.47	
Time	11.86	13.05	14.24	15.42	16.61	
Discharge	68.15	67.47	63.38	58.61	53.16	
Time	17.80	18.98	20.17	21.36	22.54	
Discharge	46.34	38.17	31.35	26.58	22.49	
Time	23.73	26.10	28.47	30.85	33.22	
Discharge	19.08	14.11	10.02	7.29	5.79	
Time	35.59	37.96	40.34	42.71	45.08	
Discharge	4.50	3.41	2.39	1.50	0.6815	
Time	47.46					
Discharge	0.0000					

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*****
Time   Rain   Perv-   Perv-   Imp-   Imp-   Subarea   Routed   Total
        ious   ious   erv.   erv.   Hydro-   Upstream  Hyd.
        Loss Excess Loss Excess  graph
*****
  0.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
 10.00  0.11  0.11  0.00  0.09  0.02    0.00    0.00    0.00
 20.00  0.33  0.32  0.01  0.09  0.25    0.31    0.21    0.53
 30.00  1.03  0.53  0.50  0.04  0.99    5.67    3.77    9.45
 40.00  0.58  0.15  0.43  0.01  0.57   45.17   28.31   73.49
 50.00  0.30  0.06  0.24  0.00  0.29   52.68   29.83   82.50
 60.00  0.21  0.04  0.18  0.00  0.21   37.56   20.20   57.76
 70.00  0.16  0.02  0.13  0.00  0.16   25.94   13.71   39.65
 80.00  0.08  0.01  0.07  0.00  0.08   18.54    9.86   28.40
 90.00  0.06  0.01  0.05  0.00  0.06   11.70    6.11   17.81
100.00  0.06  0.01  0.05  0.00  0.06    7.82    4.14   11.96
110.00  0.06  0.01  0.06  0.00  0.06    6.57    3.58   10.15
120.00  0.06  0.01  0.06  0.00  0.06    6.27    3.48    9.75
130.00  0.00  0.00  0.00  0.00  0.00    6.24    3.47    9.71
140.00  0.00  0.00  0.00  0.00  0.00    2.49    1.13    3.62
150.00  0.00  0.00  0.00  0.00  0.00    0.62    0.26    0.88
160.00  0.00  0.00  0.00  0.00  0.00    0.15    0.04    0.19
170.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
180.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
190.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
200.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
210.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
220.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
230.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
240.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
*****
Totals  3.05  1.27  1.78  0.23  2.82

```

Runoff volume= 3.136787 acre-ft
Total volume= 4.901211 acre-ft
Peak discharge (cfs)= 82.50259

Subarea Hydrograph Computation

Title: Design Point 8

Description: 2 Hour
10 Yr

Hydrograph No.: 9
Branch No.: 3

Subarea drainage area (acres): 2.34
Total upstream drainage area (acres): 27.65
Percent impervious area: 42
Total precipitation multiplication factor: 1
Hydrograph base flow (cfs): 0

Impervious area; SCS curve number: 98

Pervious area; SCS curve number: 87

Computation method selection: SCS Dimensionless Hydrograph

Time of concentration (minutes)= 10.72

Channel routing method: Channel storage

Reach length (ft)= 214

Slope (ft/ft)= .0122

Manning's n= .013

Channel type is circular: Diameter (inches)= 36

		Unit hydrograph				
Time	0.00	1.14	2.29	3.43	4.57	
Discharge	0.0000	0.2786	0.9288	1.76	2.88	
Time	5.72	6.86	8.00	9.15	10.29	
Discharge	4.37	6.13	7.62	8.64	9.19	
Time	11.43	12.58	13.72	14.86	16.00	
Discharge	9.29	9.19	8.64	7.99	7.24	
Time	17.15	18.29	19.43	20.58	21.72	
Discharge	6.32	5.20	4.27	3.62	3.06	
Time	22.86	25.15	27.44	29.72	32.01	
Discharge	2.60	1.92	1.37	0.9938	0.7895	
Time	34.30	36.58	38.87	41.16	43.44	
Discharge	0.6130	0.4644	0.3251	0.2043	0.0929	
Time	45.73					
Discharge	0.0000					

```

*****
Time   Rain  Perv- Perv-  Imp-  Imp-  Subarea  Routed  Total
        ious  ious  erv.  erv.  Hydro-  Upstream  Hyd.
        Loss Excess Loss Excess  graph  Hyd.
*****
  0.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
 10.00  0.11  0.11  0.00  0.09  0.02    0.00    0.00    0.00
 20.00  0.33  0.32  0.01  0.09  0.25    0.06    0.48    0.54
 30.00  1.03  0.53  0.50  0.04  0.99    1.03    9.12   10.14
 40.00  0.58  0.15  0.43  0.01  0.57    6.82   71.73   78.55
 50.00  0.30  0.06  0.24  0.00  0.29    7.33   78.52   85.85
 60.00  0.21  0.04  0.18  0.00  0.21    5.01   58.39   63.40
 70.00  0.16  0.02  0.13  0.00  0.16    3.41   40.12   43.53
 80.00  0.08  0.01  0.07  0.00  0.08    2.44   28.71   31.15
 90.00  0.06  0.01  0.05  0.00  0.06    1.52   18.14   19.66
100.00  0.06  0.01  0.05  0.00  0.06    1.02   12.14   13.16
110.00  0.06  0.01  0.06  0.00  0.06    0.87   10.22   11.09
120.00  0.06  0.01  0.06  0.00  0.06    0.84    9.76   10.60
130.00  0.00  0.00  0.00  0.00  0.00    0.83    9.72   10.55
140.00  0.00  0.00  0.00  0.00  0.00    0.30    3.92    4.22
150.00  0.00  0.00  0.00  0.00  0.00    0.07    1.08    1.16
160.00  0.00  0.00  0.00  0.00  0.00    0.02    0.25    0.26
170.00  0.00  0.00  0.00  0.00  0.00    0.00    0.02    0.02
180.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
190.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
200.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
210.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
220.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
230.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
240.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
*****
Totals  3.05  1.27  1.78  0.23  2.82

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Runoff volume= .434932 acre-ft
Total volume= 5.287428 acre-ft
Peak discharge (cfs)= 85.8506

Subarea Hydrograph Computation

Title: Design Point 9

Description: 2 Hour
10 Yr

Hydrograph No.: 10
Branch No.: 3

Subarea drainage area (acres): 7.17
Total upstream drainage area (acres): 29.99
Percent impervious area: 42
Total precipitation multiplication factor: 1
Hydrograph base flow (cfs): 0

Impervious area; SCS curve number: 98

Pervious area; SCS curve number: 67

Computation method selection: SCS Dimensionless Hydrograph

Time of concentration (minutes)= 9.19

Channel routing method: Channel storage

Reach length (ft)= 123
Slope (ft/ft)= .0122
Manning's n= .013

Channel type is circular: Diameter (inches)= 36

		Unit hydrograph				
Time	0.00	1.05	2.10	3.15	4.21	
Discharge	0.0000	0.9283	3.09	5.88	9.59	
Time	5.26	6.31	7.36	8.41	9.46	
Discharge	14.54	20.42	25.37	28.78	30.63	
Time	10.51	11.57	12.62	13.67	14.72	
Discharge	30.94	30.63	28.78	26.61	24.14	
Time	15.77	16.82	17.87	18.93	19.98	
Discharge	21.04	17.33	14.23	12.07	10.21	
Time	21.03	23.13	25.23	27.34	29.44	
Discharge	8.66	6.41	4.55	3.31	2.63	
Time	31.54	33.64	35.75	37.85	39.95	
Discharge	2.04	1.55	1.08	0.6808	0.3094	
Time	42.06					
Discharge	0.0000					

```

*****
Time   Rain   Perv-   Perv-   Imp-   Imp-   Subarea   Routed   Total
        ious   ious   erv.   erv.   Hydro-   Upstream   Hyd.
        Loss Excess Loss Excess   graph
*****
  0.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
 10.00  0.11  0.11  0.00  0.09  0.02    0.00    0.00    0.00
 20.00  0.33  0.32  0.01  0.09  0.25    0.20    0.51    0.71
 30.00  1.03  0.53  0.50  0.04  0.99    3.47    9.94   13.41
 40.00  0.58  0.15  0.43  0.01  0.57   22.82   77.04   99.86
 50.00  0.30  0.04  0.24  0.00  0.29   22.55   78.52  101.07
 60.00  0.21  0.04  0.18  0.00  0.21   14.81   72.03   86.84
 70.00  0.16  0.02  0.13  0.00  0.16    9.93   43.82   53.75
 80.00  0.08  0.01  0.07  0.00  0.08    7.16   31.33   38.49
 90.00  0.06  0.01  0.05  0.00  0.06    4.39   19.88   24.27
100.00  0.06  0.01  0.05  0.00  0.06    2.99   13.27   16.26
110.00  0.06  0.01  0.06  0.00  0.06    2.62   11.13   13.76
120.00  0.06  0.01  0.06  0.00  0.06    2.56   10.61   13.17
130.00  0.00  0.00  0.00  0.00  0.00    2.56   10.55   13.11
140.00  0.00  0.00  0.00  0.00  0.00    0.76    4.40    5.16
150.00  0.00  0.00  0.00  0.00  0.00    0.16    1.24    1.41
160.00  0.00  0.00  0.00  0.00  0.00    0.02    0.31    0.33
170.00  0.00  0.00  0.00  0.00  0.00    0.00    0.03    0.03
180.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
190.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
200.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
210.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
220.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
230.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
240.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
*****
Totals  3.05  1.27  1.78  0.23  2.82

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Runoff volume= 1.336178 acre-ft
Total volume= 6.633714 acre-ft
Peak discharge (cfs)= 101.0654

Branch Confluence

Title: Design Point 9 Combined

Description: 2 Hour
10 Yr

Hydrograph No.: 11
Branch No.: 2

Combined Branches: 2 3

```
*****  
Time          Flow *    Time          Flow *    Time          Flow  
*****  
10.00         0.00 *    100.00       21.65 *    190.00       0.00  
20.00         1.03 *    110.00       18.25 *    200.00       0.00  
30.00         22.50 *    120.00       17.36 *    210.00       0.00  
40.00        147.14 *    130.00       17.20 *    220.00       0.00  
50.00        146.38 *    140.00        6.53 *    230.00       0.00  
60.00        116.16 *    150.00        1.91 *    240.00       0.00  
70.00         72.59 *    160.00        0.49 *  
80.00         51.45 *    170.00        0.09 *  
90.00         32.22 *    180.00        0.02 *  
*****
```

Subarea Hydrograph Computation

Title: Design Point 10

Description: 2 Hour
10 Yr

Hydrograph No.: 12
Branch No.: 3

Subarea drainage area (acres): .78
Total upstream drainage area (acres): 0
Percent impervious area: 67
Total precipitation multiplication factor: 1
Hydrograph base flow (cfs): 0

Impervious area; SCS curve number: 98

Pervious area; SCS curve number: 97

Computation method selection: SCS Dimensionless Hydrograph

Time of concentration (minutes)= 5

Channel routing method: Channel storage

Reach length (ft)= 44

Slope (ft/ft)= .022

Manning's n= .013

Channel type is circular: Diameter (inches)= 36

		Unit hydrograph				
Time	0.00	0.80	1.60	2.40	3.20	
Discharge	0.0000	0.1327	0.4424	0.8406	1.37	
Time	4.00	4.80	5.60	6.40	7.20	
Discharge	2.08	2.92	3.63	4.11	4.38	
Time	8.00	8.80	9.60	10.40	11.20	
Discharge	4.42	4.38	4.11	3.80	3.45	
Time	12.00	12.80	13.60	14.40	15.20	
Discharge	3.01	2.48	2.04	1.73	1.46	
Time	16.00	17.60	19.20	20.80	22.40	
Discharge	1.24	0.9158	0.6503	0.4734	0.3760	
Time	24.00	25.60	27.20	28.80	30.40	
Discharge	0.2920	0.2212	0.1548	0.0973	0.0442	
Time	32.00					
Discharge	0.0000					

```

*****
Time   Rain Perv- Perv- Imp- Imp- Subarea Routed Total
       ious ious  erv.  erv.  Hydro- Routed  Hyd.
       Loss Excess Loss Excess graph  Upstream
*****
 0.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
10.00  0.11  0.10  0.01  0.09  0.02    0.00    0.00    0.00
20.00  0.33  0.13  0.20  0.09  0.25    0.05    0.00    0.05
30.00  1.03  0.08  0.95  0.04  0.99    0.92    0.00    0.92
40.00  0.58  0.01  0.57  0.01  0.57    3.98    0.00    3.98
50.00  0.30  0.00  0.29  0.00  0.29    2.82    0.00    2.82
60.00  0.21  0.00  0.21  0.00  0.21    1.53    0.00    1.53
70.00  0.16  0.00  0.16  0.00  0.16    1.03    0.00    1.03
80.00  0.08  0.00  0.08  0.00  0.08    0.76    0.00    0.76
90.00  0.06  0.00  0.06  0.00  0.06    0.43    0.00    0.43
100.00 0.06  0.00  0.06  0.00  0.06    0.31    0.00    0.31
110.00 0.06  0.00  0.06  0.00  0.06    0.29    0.00    0.29
120.00 0.06  0.00  0.06  0.00  0.06    0.29    0.00    0.29
130.00 0.00  0.00  0.00  0.00  0.00    0.29    0.00    0.29
140.00 0.00  0.00  0.00  0.00  0.00    0.04    0.00    0.04
150.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
160.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
170.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
180.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
190.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
200.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
210.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
220.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
230.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
240.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
*****
Totals 3.05  0.34  2.71  0.23  2.82

```

Runoff volume= .1754365 acre-ft
Total volume= .1754365 acre-ft
Peak discharge (cfs)= 3.9797

Subarea Hydrograph Computation

Title: Design Point 11

Description: 2 Hour
10 Yr

Hydrograph No.: 13
Branch No.: 3

Subarea drainage area (acres): .18
Total upstream drainage area (acres): .78
Percent impervious area: 80
Total precipitation multiplication factor: 1
Hydrograph base flow (cfs): 0

Impervious area; SCS curve number: 98

Pervious area; SCS curve number: 97

Computation method selection: SCS Dimensionless Hydrograph

Time of concentration (minutes)= 6.46

Channel routing method: Channel storage

Reach length (ft)= 16

Slope (ft/ft)= .02

Manning's n= .013

Channel type is circular: Diameter (inches)= 18

		Unit hydrograph				
Time	0.00	0.89	1.78	2.66	3.55	
Discharge	0.0000	0.0276	0.0920	0.1748	0.2853	
Time	4.44	5.33	6.21	7.10	7.99	
Discharge	0.4325	0.6073	0.7545	0.8558	0.9110	
Time	8.88	9.76	10.65	11.54	12.43	
Discharge	0.9202	0.9110	0.8558	0.7914	0.7177	
Time	13.31	14.20	15.09	15.98	16.86	
Discharge	0.6257	0.5153	0.4233	0.3589	0.3037	
Time	17.75	19.53	21.30	23.08	24.85	
Discharge	0.2576	0.1905	0.1353	0.0985	0.0782	
Time	26.63	28.40	30.18	31.95	33.73	
Discharge	0.0607	0.0460	0.0322	0.0202	0.0092	
Time	35.50					
Discharge	0.0000					

```

*****
Time   Rain Perv- Perv- Imp- Imp- Subarea Routed Total
       ious ious  erv.  erv.  Hydro- Upstream Total
       Loss Excess Loss Excess graph   Hyd.
*****
  0.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
 10.00  0.11  0.10  0.01  0.09  0.02    0.00    0.00    0.00
 20.00  0.33  0.13  0.20  0.09  0.25    0.01    0.05    0.06
 30.00  1.03  0.08  0.95  0.04  0.99    0.22    0.92    1.14
 40.00  0.58  0.01  0.57  0.01  0.57    0.92    3.98    4.90
 50.00  0.30  0.00  0.29  0.00  0.29    0.69    2.82    3.51
 60.00  0.21  0.00  0.21  0.00  0.21    0.40    1.53    1.93
 70.00  0.16  0.00  0.16  0.00  0.16    0.26    1.03    1.28
 80.00  0.08  0.00  0.08  0.00  0.08    0.19    0.76    0.94
 90.00  0.06  0.00  0.06  0.00  0.06    0.11    0.43    0.54
100.00  0.06  0.00  0.06  0.00  0.06    0.08    0.31    0.38
110.00  0.06  0.00  0.06  0.00  0.06    0.07    0.29    0.36
120.00  0.06  0.00  0.06  0.00  0.06    0.07    0.29    0.36
130.00  0.00  0.00  0.00  0.00  0.00    0.07    0.29    0.36
140.00  0.00  0.00  0.00  0.00  0.00    0.01    0.04    0.05
150.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.01
160.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
170.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
180.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
190.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
200.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
210.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
220.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
230.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
240.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
*****
Totals  3.05  0.34  2.71  0.23  2.82

```

Runoff volume= 4.257962E-02 acre-ft
Total volume= .2180161 acre-ft
Peak discharge (cfs)= 4.897799

Branch Confluence

Title: Design Point 11 Combined

Description: 2 Hour
10 Yr

Hydrograph No.: 14
Branch No.: 2

Combined Branches: 2 3

```
*****  
Time          Flow *    Time          Flow *    Time          Flow  
*****  
10.00         0.00 *    100.00       22.03 *    190.00       0.00  
20.00         1.09 *    110.00       18.61 *    200.00       0.00  
30.00        23.64 *    120.00       17.72 *    210.00       0.00  
40.00       152.04 *    130.00       17.56 *    220.00       0.00  
50.00       149.90 *    140.00        6.58 *    230.00       0.00  
60.00       118.09 *    150.00        1.91 *    240.00       0.00  
70.00        73.87 *    160.00        0.49 *  
80.00        52.39 *    170.00        0.09 *  
90.00        32.76 *    180.00        0.02 *  
*****
```


Subarea Hydrograph Computation

Title: Design Point 12

Description: 2 Hour
10 Yr

Hydrograph No.: 15
Branch No.: 3

Subarea drainage area (acres): 4.32
Total upstream drainage area (acres): 0
Percent impervious area: 15
Total precipitation multiplication factor: 1
Hydrograph base flow (cfs): 0

Impervious area; SCS curve number: 98

Pervious area; SCS curve number: 97

Computation method selection: SCS Dimensionless Hydrograph

Time of concentration (minutes)= 8.14

Channel routing method: Channel storage

Reach length (ft)= 1000

Slope (ft/ft)= .0373

Manning's n= .013

Channel type is circular: Diameter (inches)= 36

		Unit hydrograph				
Time	0.00	0.99	1.98	2.97	3.95	
Discharge	0.0000	0.5950	1.98	3.77	6.15	
Time	4.94	5.93	6.92	7.91	8.90	
Discharge	9.32	13.09	16.26	18.44	19.63	
Time	9.88	10.87	11.86	12.85	13.84	
Discharge	19.83	19.63	18.44	17.06	15.47	
Time	14.83	15.81	16.80	17.79	18.78	
Discharge	13.49	11.11	9.12	7.73	6.54	
Time	19.77	21.74	23.72	25.70	27.68	
Discharge	5.55	4.11	2.92	2.12	1.69	
Time	29.65	31.63	33.61	35.58	37.56	
Discharge	1.31	0.9916	0.6941	0.4363	0.1983	
Time	39.54					
Discharge	0.0000					

```

*****
Time   Rain  Perv-  Perv-  Imp-  Imp-  Subarea  Routed  Total
        ious  ious  erv.  erv.  Hydro-  Upstream  Hyd.
        Loss Excess Loss Excess  graph
*****
  0.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
 10.00  0.11  0.10  0.01  0.09  0.02    0.00    0.00    0.00
 20.00  0.33  0.13  0.20  0.09  0.25    0.14    0.00    0.14
 30.00  1.03  0.08  0.95  0.04  0.99    4.15    0.00    4.15
 40.00  0.58  0.01  0.57  0.01  0.57   19.97    0.00   19.97
 50.00  0.30  0.00  0.29  0.00  0.29   16.62    0.00   16.62
 60.00  0.21  0.00  0.21  0.00  0.21   10.01    0.00   10.01
 70.00  0.16  0.00  0.16  0.00  0.16    6.41    0.00    6.41
 80.00  0.08  0.00  0.08  0.00  0.08    4.59    0.00    4.59
 90.00  0.06  0.00  0.06  0.00  0.06    2.76    0.00    2.76
100.00  0.06  0.00  0.06  0.00  0.06    1.89    0.00    1.89
110.00  0.06  0.00  0.06  0.00  0.06    1.69    0.00    1.69
120.00  0.06  0.00  0.06  0.00  0.06    1.66    0.00    1.66
130.00  0.00  0.00  0.00  0.00  0.00    1.66    0.00    1.66
140.00  0.00  0.00  0.00  0.00  0.00    0.42    0.00    0.42
150.00  0.00  0.00  0.00  0.00  0.00    0.08    0.00    0.08
160.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
170.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
180.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
190.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
200.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
210.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
220.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
230.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
240.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
*****
Totals  3.05  0.34  2.71  0.23  2.82

```

Runoff volume= .9923412 acre-ft
Total volume= .9923412 acre-ft
Peak discharge (cfs)= 19.97015

Branch Confluence

Title: Design Point 12

Description: 2 Hour
10 Yr

Hydrograph No.: 16
Branch No.: 2

Combined Branches: 2 3

```
*****  
Time          Flow *    Time          Flow *    Time          Flow  
*****  
10.00         0.00 *    100.00       23.92 *    190.00       0.00  
20.00         1.23 *    110.00       20.30 *    200.00       0.00  
30.00        27.80 *    120.00       19.38 *    210.00       0.00  
40.00       172.01 *    130.00       19.22 *    220.00       0.00  
50.00       166.52 *    140.00        7.00 *    230.00       0.00  
60.00       128.10 *    150.00        1.99 *    240.00       0.00  
70.00        80.28 *    160.00        0.49 *  
80.00        56.98 *    170.00        0.09 *  
90.00        35.52 *    180.00        0.02 *  
*****
```

Subarea Hydrograph Computation

Title: Design Point 13

Description: 2 Hour
10 Yr

Hydrograph No.: 17
Branch No.: 4

Subarea drainage area (acres): 1.32
Total upstream drainage area (acres): 0
Percent impervious area: 54
Total precipitation multiplication factor: 1
Hydrograph base flow (cfs): 0

Impervious area; SCS curve number: 98

Pervious area; SCS curve number: 87

Computation method selection: SCS Dimensionless Hydrograph

Time of concentration (minutes)= 6.31

		Unit hydrograph				
Time	0.00	0.89	1.76	2.64	3.51	
Discharge	0.0000	0.2045	0.6817	1.30	2.11	
Time	4.39	5.27	6.15	7.03	7.91	
Discharge	3.20	4.50	5.59	6.34	6.75	
Time	8.79	9.66	10.54	11.42	12.30	
Discharge	6.82	6.75	6.34	5.86	5.32	
Time	13.18	14.06	14.94	15.81	16.69	
Discharge	4.64	3.82	3.14	2.66	2.25	
Time	17.57	19.33	21.09	22.84	24.60	
Discharge	1.91	1.41	1.00	0.7294	0.5795	
Time	26.36	28.12	29.87	31.63	33.39	
Discharge	0.4499	0.3409	0.2386	0.1500	0.0682	
Time	35.14					
Discharge	0.0000					

```

*****
Time   Rain Perv- Perv- Imp- Imp- Subarea Routed Total
       ious ious  erv.  erv.  Hydro- Routed  Hyd.
       Loss Excess Loss Excess graph  Upstream
*****
 0.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
10.00  0.11  0.11  0.00  0.09  0.02    0.00    0.00    0.00
20.00  0.33  0.32  0.01  0.09  0.25    0.06    0.00    0.06
30.00  1.03  0.53  0.50  0.04  0.99    0.93    0.00    0.93
40.00  0.58  0.15  0.43  0.01  0.57    5.20    0.00    5.20
50.00  0.30  0.06  0.24  0.00  0.29    4.34    0.00    4.34
60.00  0.21  0.04  0.18  0.00  0.21    2.58    0.00    2.58
70.00  0.14  0.02  0.13  0.00  0.14    1.73    0.00    1.73
80.00  0.08  0.01  0.07  0.00  0.08    1.27    0.00    1.27
90.00  0.06  0.01  0.05  0.00  0.06    0.75    0.00    0.75
100.00 0.06  0.01  0.05  0.00  0.06    0.52    0.00    0.52
110.00 0.06  0.01  0.06  0.00  0.06    0.48    0.00    0.48
120.00 0.06  0.01  0.06  0.00  0.06    0.48    0.00    0.48
130.00 0.00  0.00  0.00  0.00  0.00    0.48    0.00    0.48
140.00 0.00  0.00  0.00  0.00  0.00    0.09    0.00    0.09
150.00 0.00  0.00  0.00  0.00  0.00    0.01    0.00    0.01
160.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
170.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
180.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
190.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
200.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
210.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
220.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
230.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
240.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
*****
Totals 3.05  1.27  1.78  0.23  2.82

```

Runoff volume= .260625 acre-ft
Total volume= .260625 acre-ft
Peak discharge (cfs)= 5.201959

Subarea Hydrograph Computation

Title: Design Point 14

Description: 2 Hour
10 Yr

Hydrograph No.: 18
Branch No.: 4

Subarea drainage area (acres): 8.84
Total upstream drainage area (acres): 1.32
Percent impervious area: 30
Total precipitation multiplication factor: 1
Hydrograph base flow (cfs): 0

Impervious area; SCS curve number: 98

Pervious area; SCS curve number: 87

Computation method selection: SCS Dimensionless Hydrograph

Time of concentration (minutes)= 6.85

Channel routing method: Channel storage

Reach length (ft)= 220

Slope (ft/ft)= .0951

Manning's n= .013

Channel type is circular: Diameter (inches)= 18

		Unit hydrograph				
Time	0.00	0.91	1.82	2.73	3.64	
Discharge	0.0000	1.32	4.40	8.37	13.65	
Time	4.55	5.47	6.38	7.29	8.20	
Discharge	20.69	29.06	36.10	40.95	43.59	
Time	9.11	10.02	10.93	11.84	12.75	
Discharge	44.03	43.59	40.95	37.87	34.34	
Time	13.66	14.58	15.49	16.40	17.31	
Discharge	29.94	24.66	20.25	17.17	14.53	
Time	18.22	20.04	21.96	23.69	25.51	
Discharge	12.33	9.11	6.47	4.71	3.74	
Time	27.33	29.15	30.97	32.80	34.62	
Discharge	2.91	2.20	1.54	0.9687	0.4403	
Time	36.44					
Discharge	0.0000					

```

*****
Time   Rain Perv- Perv- Imp- Imp- Subarea Routed Total
       ious ious  erv.  erv.  Hydro- Upstream Total
       Loss Excess Loss Excess graph  Hyd.
*****
 0.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
10.00  0.11  0.11  0.00  0.09  0.02    0.00    0.00    0.00
20.00  0.33  0.22  0.01  0.09  0.25    0.20    0.06    0.26
30.00  1.03  0.53  0.50  0.04  0.99    3.63    0.93    4.56
40.00  0.58  0.15  0.43  0.01  0.57   28.93    5.20   34.13
50.00  0.30  0.06  0.24  0.00  0.29   26.73    4.34   31.07
60.00  0.21  0.04  0.18  0.00  0.21   16.67    2.58   19.25
70.00  0.16  0.02  0.13  0.00  0.16   11.34    1.73   13.07
80.00  0.08  0.01  0.07  0.00  0.08    8.34    1.27    9.62
90.00  0.06  0.01  0.05  0.00  0.06    4.96    0.75    5.70
100.00 0.06  0.01  0.05  0.00  0.06    3.45    0.52    3.98
110.00 0.06  0.01  0.06  0.00  0.06    3.17    0.48    3.65
120.00 0.06  0.01  0.06  0.00  0.06    3.14    0.48    3.62
130.00 0.00  0.00  0.00  0.00  0.00    3.15    0.48    3.63
140.00 0.00  0.00  0.00  0.00  0.00    0.64    0.09    0.73
150.00 0.00  0.00  0.00  0.00  0.00    0.11    0.01    0.12
160.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
170.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
180.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
190.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
200.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
210.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
220.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
230.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
240.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
*****
Totals 3.05  1.27  1.78  0.23  2.82

```

Runoff volume= 1.576697 acre-ft
Total volume= 1.837322 acre-ft
Peak discharge (cfs)= 34.13436

Subarea Hydrograph Computation

Title: Design Point 15

Description: 2 Hour
10 Yr

Hydrograph No.: 19
Branch No.: 4

Subarea drainage area (acres): 2.75
Total upstream drainage area (acres): 10.16
Percent impervious area: 39
Total precipitation multiplication factor: 1
Hydrograph base flow (cfs): 0

Impervious area; SCS curve number: 98

Pervious area; SCS curve number: 87

Computation method selection: SCS Dimensionless Hydrograph

Time of concentration (minutes)= 8.5

Channel routing method: Channel storage

Reach length (ft)= 235

Slope (ft/ft)= .005

Manning's n= .016

Channel type is trapezoidal: Bottom width (ft)= 0
Sideslope (H to 1V)= 25

		Unit hydrograph				
Time	0.00	1.01	2.02	3.03	4.04	
Discharge	0.0000	0.3706	1.24	2.35	3.83	
Time	5.05	6.06	7.07	8.08	9.09	
Discharge	5.81	8.15	10.13	11.49	12.23	
Time	10.10	11.11	12.12	13.13	14.14	
Discharge	12.35	12.23	11.49	10.62	9.64	
Time	15.15	16.16	17.17	18.18	19.19	
Discharge	8.40	6.92	5.68	4.82	4.08	
Time	20.20	22.22	24.24	26.26	28.28	
Discharge	3.46	2.56	1.82	1.32	1.05	
Time	30.30	32.32	34.34	36.36	38.38	
Discharge	0.8154	0.6177	0.4324	0.2718	0.1235	
Time	40.40					
Discharge	0.0000					


```

*****
Time   Rain Perv- Perv- Imp- Imp- Subarea Routed Total
       ious ious  erv.  erv.  Hydro- Upstream Total
       Loss Excess Loss Excess  graph  Hyd.
*****
  0.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
 10.00  0.11  0.11  0.00  0.09  0.02    0.00    0.00    0.00
 20.00  0.33  0.32  0.01  0.09  0.25    0.08    0.26    0.33
 30.00  1.03  0.53  0.50  0.04  0.99    1.30    4.56    5.86
 40.00  0.58  0.15  0.43  0.01  0.57    8.89   34.13   43.02
 50.00  0.30  0.06  0.24  0.00  0.29    8.56   31.07   39.63
 60.00  0.21  0.04  0.18  0.00  0.21    5.53   19.25   24.79
 70.00  0.14  0.02  0.13  0.00  0.14    3.69   13.07   16.76
 80.00  0.08  0.01  0.07  0.00  0.08    2.68    9.62   12.29
 90.00  0.05  0.01  0.05  0.00  0.06    1.63    5.70    7.33
100.00  0.04  0.01  0.05  0.00  0.04    1.12    3.98    5.09
110.00  0.04  0.01  0.04  0.00  0.04    0.99    3.65    4.64
120.00  0.04  0.01  0.04  0.00  0.04    0.98    3.62    4.60
130.00  0.00  0.00  0.00  0.00  0.00    0.98    3.63    4.61
140.00  0.00  0.00  0.00  0.00  0.00    0.26    0.73    0.99
150.00  0.00  0.00  0.00  0.00  0.00    0.05    0.12    0.17
160.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
170.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
180.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
190.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
200.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
210.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
220.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
230.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
240.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
*****
Totals  3.05  1.27  1.78  0.23  2.82

```

Runoff volume= .5059254 acre-ft
Total volume= 2.343248 acre-ft
Peak discharge (cfs)= 43.02198

Subarea Hydrograph Computation

Title: Design Point 16

Description: 2 Hour
10 Yr

Hydrograph No.: 20
Branch No.: 4

Subarea drainage area (acres): 4.47
 Total upstream drainage area (acres): 12.91
 Percent impervious area: 39
 Total precipitation multiplication factor: 1
 Hydrograph base flow (cfs): 0

Impervious area; SCS curve number: 98

Pervious area; SCS curve number: 87

Computation method selection: SCS Dimensionless Hydrograph

Time of concentration (minutes)= 7.78

Channel routing method: Channel storage

Reach length (ft)= .01

Slope (ft/ft)= .001

Manning's n= .05

Channel type is trapezoidal: Bottom width (ft)= 0
 Sideslope (H to 1V)= 100

		Unit hydrograph				
Time	0.00	0.97	1.93	2.90	3.87	
Discharge	0.0000	0.6294	2.10	3.99	6.50	
Time	4.83	5.80	6.77	7.73	8.70	
Discharge	9.86	13.85	17.20	19.51	20.77	
Time	9.67	10.63	11.60	12.57	13.54	
Discharge	20.98	20.77	19.51	18.04	16.36	
Time	14.50	15.47	16.44	17.40	18.37	
Discharge	14.27	11.75	9.65	8.18	6.92	
Time	19.34	21.27	23.20	25.14	27.07	
Discharge	5.87	4.34	3.08	2.24	1.78	
Time	29.00	30.94	32.87	34.80	36.74	
Discharge	1.38	1.05	0.7343	0.4615	0.2098	
Time	38.67					
Discharge	0.0000					

```

*****
Time   Rain Perv- Perv- Imp- Imp- Subarea Routed Total
       ious ious  erv.  erv.  Hydro- Upstream Total
       Loss Excess Loss Excess graph  Hyd.
*****
  0.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
 10.00  0.11  0.11  0.00  0.09  0.02    0.00    0.00    0.00
 20.00  0.33  0.32  0.01  0.09  0.25    0.13    0.33    0.46
 30.00  1.03  0.53  0.50  0.04  0.99    2.20    5.86    8.05
 40.00  0.58  0.15  0.43  0.01  0.57   14.98   43.02   58.00
 50.00  0.30  0.06  0.24  0.00  0.29   13.98   39.63   53.61
 60.00  0.21  0.04  0.18  0.00  0.21    8.86   24.79   33.65
 70.00  0.16  0.02  0.13  0.00  0.16    5.93   16.76   22.69
 80.00  0.08  0.01  0.07  0.00  0.08    4.32   12.29   16.61
 90.00  0.06  0.01  0.05  0.00  0.06    2.60    7.33    9.94
100.00  0.06  0.01  0.05  0.00  0.06    1.79    5.09    6.89
110.00  0.06  0.01  0.06  0.00  0.06    1.62    4.64    6.26
120.00  0.06  0.01  0.06  0.00  0.06    1.60    4.60    6.20
130.00  0.00  0.00  0.00  0.00  0.00    1.60    4.61    6.21
140.00  0.00  0.00  0.00  0.00  0.00    0.38    0.99    1.37
150.00  0.00  0.00  0.00  0.00  0.00    0.07    0.17    0.24
160.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
170.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
180.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
190.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
200.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
210.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
220.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
230.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
240.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
*****
Totals  3.05  1.27  1.78  0.23  2.82

```

Runoff volume= .8272245 acre-ft
Total volume= 3.170472 acre-ft
Peak discharge (cfs)= 58.00126

Subarea Hydrograph Computation

Title: Design Point 17

Description: 2 Hour
10 Yr

Hydrograph No.: 21
Branch No.: 4

Subarea drainage area (acres): .63
 Total upstream drainage area (acres): 17.38
 Percent impervious area: 100
 Total precipitation multiplication factor: 1
 Hydrograph base flow (cfs): 0

Impervious area; SCS curve number: 98

Pervious area; SCS curve number: 87

Computation method selection: SCS Dimensionless Hydrograph

Time of concentration (minutes)= 5

Channel routing method: Channel storage

Reach length (ft)= 61

Slope (ft/ft)= .0277

Manning's n= .013

Channel type is circular: Diameter (inches)= 24

		Unit hydrograph				
Time	0.00	0.80	1.60	2.40	3.20	
Discharge	0.0000	0.1072	0.3573	0.6789	1.11	
Time	4.00	4.80	5.60	6.40	7.20	
Discharge	1.68	2.36	2.93	3.32	3.54	
Time	8.00	8.80	9.60	10.40	11.20	
Discharge	3.57	3.54	3.32	3.07	2.79	
Time	12.00	12.80	13.60	14.40	15.20	
Discharge	2.43	2.00	1.64	1.39	1.18	
Time	16.00	17.60	19.20	20.80	22.40	
Discharge	1.00	0.7397	0.5253	0.3823	0.3037	
Time	24.00	25.60	27.20	28.80	30.40	
Discharge	0.2358	0.1787	0.1251	0.0786	0.0357	
Time	32.00					
Discharge	0.0000					

```

*****
Time   Rain Perv- Perv- Imp- Imp- Subarea Routed Total
       ious ious  erv.  erv.  Hydro- Upstream Total
       Loss Excess Loss Excess  graph  Hyd.
*****
 0.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
10.00  0.11  0.11  0.00  0.09  0.02    0.00    0.00    0.00
20.00  0.33  0.32  0.01  0.09  0.25    0.05    0.45    0.50
30.00  1.03  0.53  0.50  0.04  0.99    0.80   40.13   40.92
40.00  0.58  0.15  0.43  0.01  0.57    3.26   40.13   43.39
50.00  0.30  0.06  0.24  0.00  0.29    2.29   40.13   42.42
60.00  0.21  0.04  0.18  0.00  0.21    1.24   40.13   41.37
70.00  0.14  0.02  0.13  0.00  0.14    0.83   40.13   40.96
80.00  0.08  0.01  0.07  0.00  0.08    0.61   40.13   40.74
90.00  0.06  0.01  0.05  0.00  0.06    0.35   40.13   40.48
100.00 0.06  0.01  0.05  0.00  0.06    0.25   40.13   40.38
110.00 0.06  0.01  0.06  0.00  0.06    0.23   40.13   40.36
120.00 0.06  0.01  0.06  0.00  0.06    0.23   40.13   40.36
130.00 0.00  0.00  0.00  0.00  0.00    0.23   40.13   40.36
140.00 0.00  0.00  0.00  0.00  0.00    0.03    6.96    6.99
150.00 0.00  0.00  0.00  0.00  0.00    0.00    0.27    0.27
160.00 0.00  0.00  0.00  0.00  0.00    0.00    0.01    0.01
170.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
180.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
190.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
200.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
210.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
220.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
230.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
240.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
*****
Totals 3.05  1.27  1.78  0.23  2.82

```

Runoff volume= .143551 acre-ft
Total volume= 6.329324 acre-ft
Peak discharge (cfs)= 43.39216

Subarea Hydrograph Computation

Title: Design Point 18

Description: 2 Hour
10 Yr

Hydrograph No.: 22
Branch No.: 4

Subarea drainage area (acres): 28.34
Total upstream drainage area (acres): 18.01
Percent impervious area: 45
Total precipitation multiplication factor: 1
Hydrograph base flow (cfs): 0

Impervious area; SCS curve number: 98

Pervious area; SCS curve number: 87

Computation method selection: SCS Dimensionless Hydrograph

Time of concentration (minutes)= 11.11

Channel routing method: Channel storage

Reach length (ft)= 58
Slope (ft/ft)= .0405
Manning's n= .013

Channel type is circular: Diameter (inches)= 24

		Unit hydrograph				
Time	0.00	1.17	2.33	3.50	4.67	
Discharge	0.0000	3.31	11.02	20.94	34.17	
Time	5.83	7.00	8.17	9.33	10.50	
Discharge	51.81	72.75	90.39	102.51	109.13	
Time	11.67	12.83	14.00	15.17	16.33	
Discharge	110.23	109.13	102.51	94.80	85.98	
Time	17.50	18.67	19.83	21.00	22.17	
Discharge	74.96	61.73	50.71	42.99	36.38	
Time	23.33	25.67	28.00	30.33	32.66	
Discharge	30.86	22.82	16.20	11.79	9.37	
Time	35.00	37.33	39.66	42.00	44.33	
Discharge	7.28	5.51	3.86	2.43	1.10	
Time	46.66					
Discharge	0.0000					

```

*****
Time   Rain Perv- Perv- Imp- Imp- Subarea Routed Total
       ious ious erv.  erv.  Hydro- Upstream Total
       Loss Excess Loss Excess graph  Hyd.
*****
  0.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
 10.00  0.11  0.11  0.00  0.09  0.02    0.00    0.00    0.00
 20.00  0.33  0.32  0.01  0.09  0.25    0.75    0.50    1.25
 30.00  1.03  0.53  0.50  0.04  0.99   12.84   40.92   53.77
 40.00  0.58  0.15  0.43  0.01  0.57   82.31  43.39  125.71
 50.00  0.30  0.06  0.24  0.00  0.29   89.73  42.42  132.16
 60.00  0.21  0.04  0.18  0.00  0.21   61.84  41.37  103.21
 70.00  0.16  0.02  0.13  0.00  0.16   42.11  40.96   83.07
 80.00  0.08  0.01  0.07  0.00  0.08   29.92  40.74   70.66
 90.00  0.06  0.01  0.05  0.00  0.06   18.75  40.48   59.23
100.00  0.06  0.01  0.05  0.00  0.06   12.55  40.38   52.92
110.00  0.06  0.01  0.06  0.00  0.06   10.61  40.36   50.97
120.00  0.06  0.01  0.06  0.00  0.06   10.15  40.36   50.51
130.00  0.00  0.00  0.00  0.00  0.00   10.10  40.36   50.47
140.00  0.00  0.00  0.00  0.00  0.00    3.86    6.99   10.85
150.00  0.00  0.00  0.00  0.00  0.00    0.94    0.27    1.22
160.00  0.00  0.00  0.00  0.00  0.00    0.21    0.01    0.22
170.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
180.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
190.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
200.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
210.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
220.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
230.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
240.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
*****
Totals  3.05  1.27  1.78  0.23  2.82

```

Runoff volume= 5.32614 acre-ft
Total volume= 11.65547 acre-ft
Peak discharge (cfs)= 132.1553

Subarea Hydrograph Computation

Title: Design Point 19

Description: 2 Hour
10 Yr

Hydrograph No.: 23
Branch No.: 4

Subarea drainage area (acres): .89
Total upstream drainage area (acres): 46.35
Percent impervious area: 39
Total precipitation multiplication factor: 1
Hydrograph base flow (cfs): 0

Impervious area; SCS curve number: 98

Pervious area; SCS curve number: 87

Computation method selection: SCS Dimensionless Hydrograph

Time of concentration (minutes)= 9.09

Channel routing method: Channel storage

Reach length (ft)= 440

Slope (ft/ft)= .04

Manning's n= .013

Channel type is circular: Diameter (inches)= 30

		Unit hydrograph				
Time	0.00	1.05	2.09	3.14	4.18	
Discharge	0.0000	0.1159	0.3863	0.7340	1.20	
Time	5.23	6.27	7.32	8.36	9.41	
Discharge	1.82	2.55	3.17	3.59	3.82	
Time	10.45	11.50	12.54	13.59	14.64	
Discharge	3.86	3.82	3.59	3.32	3.01	
Time	15.68	16.73	17.77	18.82	19.86	
Discharge	2.63	2.16	1.78	1.51	1.27	
Time	20.91	23.00	25.09	27.18	29.27	
Discharge	1.08	0.7996	0.5679	0.4133	0.3284	
Time	31.36	33.45	35.54	37.63	39.73	
Discharge	0.2550	0.1931	0.1352	0.0850	0.0386	
Time	41.82					
Discharge	0.0000					


```

*****
Time   Rain Perv- Perv- Imp- Imp- Subarea Routed Total
       ious ious erv.  erv.  Hydro- Routed  Hyd.
       Loss Excess Loss Excess graph  Upstream
*****
0.00   0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
10.00  0.11 0.11 0.00 0.09 0.02 0.00 0.00 0.00
20.00  0.33 0.32 0.01 0.09 0.25 0.02 1.10 1.12
30.00  1.03 0.53 0.50 0.04 0.99 0.41 52.09 52.49
40.00  0.58 0.15 0.43 0.01 0.57 2.78 87.43 90.22
50.00  0.30 0.06 0.24 0.00 0.29 2.76 87.43 90.20
60.00  0.21 0.04 0.18 0.00 0.21 1.82 87.43 89.25
70.00  0.16 0.02 0.13 0.00 0.16 1.22 87.43 88.65
80.00  0.08 0.01 0.07 0.00 0.08 0.88 87.43 88.31
90.00  0.06 0.01 0.05 0.00 0.06 0.54 87.43 87.97
100.00 0.06 0.01 0.05 0.00 0.06 0.37 87.43 87.80
110.00 0.06 0.01 0.06 0.00 0.06 0.32 51.04 51.36
120.00 0.06 0.01 0.06 0.00 0.06 0.32 50.53 50.84
130.00 0.00 0.00 0.00 0.00 0.00 0.32 50.47 50.78
140.00 0.00 0.00 0.00 0.00 0.00 0.09 12.50 12.59
150.00 0.00 0.00 0.00 0.00 0.00 0.02 1.83 1.85
160.00 0.00 0.00 0.00 0.00 0.00 0.00 0.34 0.34
170.00 0.00 0.00 0.00 0.00 0.00 0.00 0.03 0.03
180.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
190.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
200.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
210.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
220.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
230.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
240.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
*****
Totals 3.05 1.27 1.78 0.23 2.82

```

Runoff volume= .1635937 acre-ft
Total volume= 11.6223 acre-ft
Peak discharge (cfs)= 90.21557

Subarea Hydrograph Computation

Title: Design Point 20

Description: 2 Hour
10 Yr

Hydrograph No.: 24
Branch No.: 4

Subarea drainage area (acres): .9
Total upstream drainage area (acres): 47.24
Percent impervious area: 39
Total precipitation multiplication factor: 1
Hydrograph base flow (cfs): 0

Impervious area; SCS curve number: 98

Pervious area; SCS curve number: 87

Computation method selection: SCS Dimensionless Hydrograph

Time of concentration (minutes)= 7.64

Channel routing method: Channel storage

Reach length (ft)= 30

Slope (ft/ft)= .04

Manning's n= .013

Channel type is circular: Diameter (inches)= 30

		Unit hydrograph				
Time	0.00	0.96	1.92	2.88	3.83	
Discharge	0.0000	0.1278	0.4261	0.8096	1.32	
Time	4.79	5.75	6.71	7.67	8.63	
Discharge	2.00	2.81	3.49	3.96	4.22	
Time	9.58	10.54	11.50	12.46	13.42	
Discharge	4.26	4.22	3.96	3.66	3.32	
Time	14.38	15.33	16.29	17.25	18.21	
Discharge	2.90	2.39	1.96	1.66	1.41	
Time	19.17	21.08	23.00	24.92	26.84	
Discharge	1.19	0.8920	0.6264	0.4559	0.3622	
Time	28.75	30.67	32.59	34.50	36.42	
Discharge	0.2812	0.2131	0.1491	0.0937	0.0426	
Time	38.34					
Discharge	0.0000					

```

*****
Time   Rain Perv- Perv- Imp- Imp- Subarea Routed Total
       ious ious  erv.  erv.  Hydro- Upstream Total
       Loss Excess Loss Excess  graph  Hyd.
*****
 0.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
10.00  0.11  0.11  0.00  0.09  0.02    0.00    0.00    0.00
20.00  0.33  0.32  0.01  0.09  0.25    0.03   27.52   27.55
30.00  1.03  0.53  0.50  0.04  0.99    0.45    0.00    0.45
40.00  0.58  0.15  0.43  0.01  0.57    3.04   87.43   90.47
50.00  0.30  0.06  0.24  0.00  0.29    2.82   87.43   90.25
60.00  0.21  0.04  0.18  0.00  0.21    1.78   87.43   89.21
70.00  0.16  0.02  0.13  0.00  0.16    1.19   87.43   88.62
80.00  0.08  0.01  0.07  0.00  0.08    0.87   87.43   88.30
90.00  0.06  0.01  0.05  0.00  0.06    0.52   87.43   87.95
100.00 0.06  0.01  0.05  0.00  0.06    0.36   87.43   87.79
110.00 0.06  0.01  0.06  0.00  0.06    0.33   87.43   87.76
120.00 0.06  0.01  0.06  0.00  0.06    0.32    0.00    0.32
130.00 0.00  0.00  0.00  0.00  0.00    0.32    0.00    0.32
140.00 0.00  0.00  0.00  0.00  0.00    0.05   87.43   87.51
150.00 0.00  0.00  0.00  0.00  0.00    0.01   83.41   83.42
160.00 0.00  0.00  0.00  0.00  0.00    0.00    5.97    5.97
170.00 0.00  0.00  0.00  0.00  0.00    0.00    0.35    0.35
180.00 0.00  0.00  0.00  0.00  0.00    0.00    0.01    0.01
190.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
200.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
210.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
220.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
230.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
240.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
*****
Totals 3.05  1.27  1.78  0.23  2.82

```

Runoff volume= .1667702 acre-ft
Total volume= 12.62019 acre-ft
Peak discharge (cfs)= 90.46867

Subarea Hydrograph Computation

Title: Design Point 22

Description: 2 Hour
10 Yr

Hydrograph No.: 25
Branch No.: 4

Subarea drainage area (acres): 1.17
Total upstream drainage area (acres): 48.14
Percent impervious area: 85
Total precipitation multiplication factor: 1
Hydrograph base flow (cfs): 0

Impervious area; SCS curve number: 98

Pervious area; SCS curve number: 87

Computation method selection: SCS Dimensionless Hydrograph

Time of concentration (minutes)= 10.37

Channel routing method: Channel storage

Reach length (ft)= 900

Slope (ft/ft)= .03

Manning's n= .013

Channel type is circular: Diameter (inches)= 30

		Unit hydrograph				
Time	0.00	1.12	2.24	3.37	4.49	
Discharge	0.0000	0.1419	0.4731	0.8988	1.47	
Time	5.61	6.73	7.86	8.98	10.10	
Discharge	2.22	3.12	3.88	4.40	4.68	
Time	11.22	12.34	13.47	14.59	15.71	
Discharge	4.73	4.68	4.40	4.07	3.69	
Time	16.83	17.96	19.08	20.20	21.32	
Discharge	3.22	2.65	2.18	1.85	1.56	
Time	22.44	24.69	26.93	29.18	31.42	
Discharge	1.32	0.9793	0.6954	0.5062	0.4021	
Time	33.67	35.91	38.15	40.40	42.64	
Discharge	0.3122	0.2365	0.1656	0.1041	0.0473	
Time	44.89					
Discharge	0.0000					

```

*****
Time   Rain Perv- Perv- Imp- Imp- Subarea Routed Total
       ious ious  erv.  erv.  Hydro- Upstream Total
       Loss Excess Loss Excess graph  Hyd.
*****
  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
 10.00  0.11  0.11  0.00  0.09  0.02  0.00  0.00  0.00
 20.00  0.33  0.32  0.01  0.09  0.25  0.06  25.22  25.28
 30.00  1.03  0.53  0.50  0.04  0.99  1.01  3.79  4.80
 40.00  0.58  0.15  0.43  0.01  0.57  4.66  75.72  80.38
 50.00  0.30  0.06  0.24  0.00  0.29  4.41  75.72  80.13
 60.00  0.21  0.04  0.18  0.00  0.21  2.83  75.72  78.55
 70.00  0.16  0.02  0.13  0.00  0.16  1.86  75.72  77.58
 80.00  0.08  0.01  0.07  0.00  0.08  1.30  75.72  77.02
 90.00  0.06  0.01  0.05  0.00  0.06  0.80  75.72  76.52
100.00  0.06  0.01  0.05  0.00  0.06  0.54  75.72  76.26
110.00  0.06  0.01  0.06  0.00  0.06  0.46  75.72  76.18
120.00  0.06  0.01  0.06  0.00  0.06  0.44  75.72  76.16
130.00  0.00  0.00  0.00  0.00  0.00  0.44  7.76  8.20
140.00  0.00  0.00  0.00  0.00  0.00  0.15  75.72  75.87
150.00  0.00  0.00  0.00  0.00  0.00  0.04  75.72  75.75
160.00  0.00  0.00  0.00  0.00  0.00  0.01  13.21  13.22
170.00  0.00  0.00  0.00  0.00  0.00  0.00  1.19  1.19
180.00  0.00  0.00  0.00  0.00  0.00  0.00  0.12  0.12
190.00  0.00  0.00  0.00  0.00  0.00  0.00  0.01  0.01
200.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
210.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
220.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
230.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
240.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
*****
Totals  3.05  1.27  1.78  0.23  2.82

```

Runoff volume= .2620572 acre-ft
Total volume= 12.44068 acre-ft
Peak discharge (cfs)= 80.37813

Subarea Hydrograph Computation

Title: Design point 21

Description: 2 Hour
10 Yr

Hydrograph No.: 26
Branch No.: 5

Subarea drainage area (acres):	10.89
Total upstream drainage area (acres):	0
Percent impervious area:	85
Total precipitation multiplication factor:	1
Hydrograph base flow (cfs):	0

Impervious area; SCS curve number:	98
------------------------------------	----

Pervious area; SCS curve number:	87
----------------------------------	----

Computation method selection: SCS Dimensionless Hydrograph

Time of concentration (minutes)= 10.11

		Unit hydrograph				
Time	0.00	1.11	2.21	3.32	4.43	
Discharge	0.0000	1.34	4.47	8.48	13.84	
Time	5.53	6.64	7.75	8.85	9.96	
Discharge	20.99	29.47	36.62	41.53	44.21	
Time	11.07	12.17	13.28	14.39	15.49	
Discharge	44.65	44.21	41.53	38.40	34.83	
Time	16.60	17.71	18.81	19.92	21.03	
Discharge	30.36	25.01	20.54	17.41	14.74	
Time	22.13	24.35	26.56	28.77	30.98	
Discharge	12.50	9.24	6.56	4.78	3.80	
Time	33.20	35.41	37.62	39.84	42.05	
Discharge	2.95	2.23	1.56	0.9824	0.4465	
Time	44.26					
Discharge	0.0000					

```

*****
Time      Rain  Perv-  Perv-  Imp-  Imp-  Subarea  Routed  Total
          ious  ious  erv.  erv.  Hydro-  Upstream  Hyd.
          Loss Excess Loss Excess  graph  Hyd.
*****
  0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
 10.00    0.11    0.11    0.00    0.09    0.02    0.00    0.00    0.00
 20.00    0.33    0.32    0.01    0.09    0.25    0.59    0.00    0.59
 30.00    1.03    0.53    0.50    0.04    0.99    9.58    0.00    9.58
 40.00    0.58    0.15    0.43    0.01    0.57    44.05    0.00    44.05
 50.00    0.30    0.06    0.24    0.00    0.29    41.04    0.00    41.04
 60.00    0.21    0.04    0.18    0.00    0.21    26.17    0.00    26.17
 70.00    0.16    0.02    0.13    0.00    0.16    17.16    0.00    17.16
 80.00    0.08    0.01    0.07    0.00    0.08    12.06    0.00    12.06
 90.00    0.06    0.01    0.05    0.00    0.06    7.42     0.00    7.42
100.00    0.06    0.01    0.05    0.00    0.06    4.99     0.00    4.99
110.00    0.06    0.01    0.06    0.00    0.06    4.29     0.00    4.29
120.00    0.06    0.01    0.06    0.00    0.06    4.14     0.00    4.14
130.00    0.00    0.00    0.00    0.00    0.00    4.12     0.00    4.12
140.00    0.00    0.00    0.00    0.00    0.00    1.39     0.00    1.39
150.00    0.00    0.00    0.00    0.00    0.00    0.32     0.00    0.32
160.00    0.00    0.00    0.00    0.00    0.00    0.06     0.00    0.06
170.00    0.00    0.00    0.00    0.00    0.00    0.00     0.00    0.00
180.00    0.00    0.00    0.00    0.00    0.00    0.00     0.00    0.00
190.00    0.00    0.00    0.00    0.00    0.00    0.00     0.00    0.00
200.00    0.00    0.00    0.00    0.00    0.00    0.00     0.00    0.00
210.00    0.00    0.00    0.00    0.00    0.00    0.00     0.00    0.00
220.00    0.00    0.00    0.00    0.00    0.00    0.00     0.00    0.00
230.00    0.00    0.00    0.00    0.00    0.00    0.00     0.00    0.00
240.00    0.00    0.00    0.00    0.00    0.00    0.00     0.00    0.00
*****
Totals=  3.05  1.27  1.78  0.23  2.82

```

Runoff volume= 2.443254 acre-ft
Total volume= 2.443254 acre-ft
Peak discharge (cfs)= 44.05476

Branch Confluence

Title: Design Point 22

Description: 2 Hour
10 Yr

Hydrograph No.: 27
Branch No.: 2

Combined Branches: 2 3 4 5

```
*****  
Time          Flow *    Time          Flow *    Time          Flow  
*****  
10.00         0.00 *    100.00       105.17 *    190.00         0.01  
20.00         27.09 *    110.00       100.77 *    200.00         0.00  
30.00         42.18 *    120.00        99.68 *    210.00         0.00  
40.00        296.44 *    130.00        31.55 *    220.00         0.00  
50.00        287.69 *    140.00        84.26 *    230.00         0.00  
60.00        232.83 *    150.00        78.07 *    240.00         0.00  
70.00        175.01 *    160.00        13.77 *  
80.00        146.06 *    170.00         1.28 *  
90.00        119.47 *    180.00         0.14 *  
*****
```


Channel Routing

Title: Design Point 22 Routed Thru Pipe

Description: 2 Hour
10 Yr

Hydrograph No.: 28
Branch No.: 2

Channel routing method: Channel storage

Reach length (ft)= 205
Slope (ft/ft)= .0616
Manning's n= .013

Channel type is circular: Diameter (inches)= 36

Routed Hydrograph

```
*****  
Time          Flow %      Time          Flow %      Time          Flow  
*****  
10.00         0.00 %      100.00       176.43 %   190.00       0.01  
20.00         26.72 %      110.00       176.43 %   200.00       0.00  
30.00         41.98 %      120.00       174.68 %   210.00       0.00  
40.00         176.43 %     130.00        80.91 %   220.00       0.00  
50.00         176.43 %     140.00       176.43 %   230.00       0.00  
60.00         176.43 %     150.00       176.43 %   240.00       0.00  
70.00         176.43 %     160.00        14.88 %  
80.00         176.43 %     170.00         1.76 %  
90.00         176.43 %     180.00         0.18 %  
*****
```

Channel capacity was exceeded.

Maximum ponded storage at channel inlet (cubic-ft)= 153201.3

Channel Routing

Title: Design Point 22 Routed Thru Channel

Description: 2 Hour
10 Yr

Hydrograph No.: 29
Branch No.: 2

Channel routing method: Channel storage

Reach length (ft)= 415
Slope (ft/ft)= .0372
Manning's n= .035

Channel type is trapezoidal: Bottom width (ft)= 3
Sideslope (H to 1V)= 2

Routed Hydrograph

```
*****  
Time      Flow *   Time      Flow *   Time      Flow  
*****  
10.00      0.00 *   100.00    176.43 *   190.00      0.01  
20.00     26.72 *   110.00    176.43 *   200.00      0.00  
30.00     41.98 *   120.00    174.68 *   210.00      0.00  
40.00    176.43 *   130.00     80.91 *   220.00      0.00  
50.00    176.43 *   140.00    176.43 *   230.00      0.00  
60.00    176.43 *   150.00    176.43 *   240.00      0.00  
70.00    176.43 *   160.00     14.88 *  
80.00    176.43 *   170.00      1.76 *  
90.00    176.43 *   180.00      0.18 *  
*****
```

Subarea Hydrograph Computation

Title: Design Point 23

Description: 2 Hour
10 Yr

Hydrograph No.: 30
Branch No.: 3

Subarea drainage area (acres): 8.92
 Total upstream drainage area (acres): 0
 Percent impervious area: 85
 Total precipitation multiplication factor: 1
 Hydrograph base flow (cfs): 0

Impervious area; SCS curve number: 98

Pervious area; SCS curve number: 87

Computation method selection: SCS Dimensionless Hydrograph

Time of concentration (minutes)= 8.01

		Unit hydrograph				
Time	0.00	0.98	1.96	2.94	3.92	
Discharge	0.0000	1.24	4.13	7.84	12.80	
Time	4.90	5.88	6.86	7.84	8.83	
Discharge	19.40	27.24	33.85	38.39	40.86	
Time	9.81	10.79	11.77	12.75	13.73	
Discharge	41.28	40.86	38.39	35.50	32.19	
Time	14.71	15.69	16.67	17.65	18.63	
Discharge	28.07	23.11	18.99	16.10	13.62	
Time	19.61	21.57	23.53	25.50	27.46	
Discharge	11.56	8.54	6.07	4.42	3.51	
Time	29.42	31.38	33.34	35.30	37.26	
Discharge	2.72	2.06	1.44	0.9081	0.4128	
Time	39.22					
Discharge	0.0000					

```

*****
Time   Rain Perv- Perv- Imp- Imp- Subarea Routed Total
       ious ious  erv.  erv.  Hydro- Upstream Total
       Loss Excess Loss Excess graph   Hvd.
*****
 0.00  0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
10.00  0.11  0.11  0.00  0.09  0.02    0.00    0.00    0.00
20.00  0.33  0.32  0.01  0.09  0.25    0.55    0.00    0.55
30.00  1.03  0.53  0.50  0.04  0.99    8.86    0.00    8.86
40.00  0.58  0.15  0.43  0.01  0.57   39.94    0.00   39.94
50.00  0.30  0.06  0.24  0.00  0.29   33.29    0.00   33.29
60.00  0.21  0.04  0.18  0.00  0.21   20.10    0.00   20.10
70.00  0.16  0.02  0.13  0.00  0.16   12.95    0.00   12.95
80.00  0.08  0.01  0.07  0.00  0.08    9.31    0.00    9.31
90.00  0.06  0.01  0.05  0.00  0.06    5.59    0.00    5.59
100.00 0.06  0.01  0.05  0.00  0.06    3.84    0.00    3.84
110.00 0.06  0.01  0.06  0.00  0.06    3.43    0.00    3.43
120.00 0.06  0.01  0.06  0.00  0.06    3.38    0.00    3.38
130.00 0.00  0.00  0.00  0.00  0.00    3.38    0.00    3.38
140.00 0.00  0.00  0.00  0.00  0.00    0.83    0.00    0.83
150.00 0.00  0.00  0.00  0.00  0.00    0.16    0.00    0.16
160.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
170.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
180.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
190.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
200.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
210.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
220.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
230.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
240.00 0.00  0.00  0.00  0.00  0.00    0.00    0.00    0.00
*****
Totals 3.05  1.27  1.78  0.23  2.82

```

Runoff volume= 2.005548 acre-ft
Total volume= 2.005548 acre-ft
Peak discharge (cfs)= 39.94387

Branch Confluence

Title: Design Point 23 Combined

Description: 2 Hour
10 Yr

Hydrograph No.: 31
Branch No.: 2

Combined Branches: 2 3

```
*****  
Time          Flow *    Time          Flow *    Time          Flow  
*****  
10.00         0.00 *   100.00       180.27 *   190.00       0.01  
20.00         27.27 *   110.00       179.86 *   200.00       0.00  
30.00         50.84 *   120.00       178.07 *   210.00       0.00  
40.00        216.38 *   130.00        84.29 *   220.00       0.00  
50.00        209.72 *   140.00       177.27 *   230.00       0.00  
60.00        196.53 *   150.00       176.59 *   240.00       0.00  
70.00        189.38 *   160.00        14.88 *  
80.00        185.74 *   170.00         1.76 *  
90.00        182.03 *   180.00         0.18 *  
*****
```

Channel Routing

Title: Design Point 23 Routed Thru Pipe

Description: 2 Hour
10 Yr

Hydrograph No.: 32
Branch No.: 2

Channel routing method: Channel storage

Reach length (ft)= 438
Slope (ft/ft)= .0245
Manning's n= .013

Channel type is circular: Diameter (inches)= 42

Routed Hydrograph

```
*****  
Time          Flow *    Time          Flow *    Time          Flow  
*****  
10.00         0.00 *    100.00       167.84 *    190.00       0.03  
20.00         26.11 *    110.00       167.84 *    200.00       0.00  
30.00         49.99 *    120.00       167.84 *    210.00       0.00  
40.00         167.84 *    130.00       167.84 *    220.00       0.00  
50.00         167.84 *    140.00       167.84 *    230.00       0.00  
60.00         167.84 *    150.00       167.84 *    240.00       0.00  
70.00         167.84 *    160.00       167.84 *  
80.00         167.84 *    170.00         2.62 *  
90.00         167.84 *    180.00         0.37 *  
*****
```

Channel capacity was exceeded.
Maximum ponded storage at channel inlet (cubic-ft)= 111328.9

Subarea Hydrograph Computation

Title: Design Point 29

Description: 2 Hour
10 Yr

Hydrograph No.: 33
Branch No.: 2

Subarea drainage area (acres): 2.26
Total upstream drainage area (acres): 126.44
Percent impervious area: 39
Total precipitation multiplication factor: 1
Hydrograph base flow (cfs): 0

Impervious area; SCS curve number: 98

Pervious area; SCS curve number: 90.4

Computation method selection: SCS Dimensionless Hydrograph

Time of concentration (minutes)= 10.1

Channel routing method: Channel storage

Reach length (ft)= 600
Slope (ft/ft)= .0235
Manning's n= .013

Channel type is trapezoidal: Bottom width (ft)= 4.5
Sideslope (H to 1V)= .88

		Unit hydrograph				
Time	0.00	1.11	2.21	3.32	4.42	
Discharge	0.0000	0.2782	0.9272	1.76	2.87	
Time	5.53	6.64	7.74	8.85	9.95	
Discharge	4.36	6.12	7.60	8.62	9.18	
Time	11.06	12.17	13.27	14.38	15.48	
Discharge	9.27	9.18	8.62	7.97	7.23	
Time	16.59	17.70	18.80	19.91	21.01	
Discharge	6.30	5.19	4.27	3.62	3.06	
Time	22.12	24.33	26.54	28.76	30.97	
Discharge	2.60	1.92	1.36	0.9921	0.7881	
Time	33.18	35.39	37.60	39.82	42.03	
Discharge	0.6119	0.4636	0.3245	0.2040	0.0927	
Time	44.24					
Discharge	0.0000					

```

*****
Time      Rain  Perv-   Perv-   Imp-   Imp-   Subarea  Routed   Total
          Loss  Excess  Loss  Excess  Hydro-  Upstream  Hyd.
          Loss  Excess  Loss  Excess  graph  Hyd.
*****
0.00      0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
10.00     0.11  0.11  0.00  0.09  0.02  0.00  0.00  0.00
20.00     0.33  0.29  0.04  0.09  0.25  0.06  26.11  26.16
30.00     1.03  0.39  0.64  0.04  0.99  1.13  49.99  51.12
40.00     0.58  0.10  0.48  0.01  0.57  7.55  167.84  175.39
50.00     0.30  0.04  0.26  0.00  0.29  7.63  167.84  175.47
60.00     0.21  0.02  0.19  0.00  0.21  5.06  167.84  172.90
70.00     0.16  0.01  0.14  0.00  0.16  3.39  167.84  171.23
80.00     0.08  0.01  0.08  0.00  0.08  2.41  167.84  170.25
90.00     0.06  0.01  0.06  0.00  0.06  1.49  167.84  169.33
100.00    0.06  0.01  0.06  0.00  0.06  1.00  167.84  168.85
110.00    0.06  0.00  0.06  0.00  0.06  0.87  167.84  168.71
120.00    0.06  0.00  0.06  0.00  0.06  0.84  167.84  168.68
130.00    0.00  0.00  0.00  0.00  0.00  0.83  167.84  168.67
140.00    0.00  0.00  0.00  0.00  0.00  0.28  167.84  168.12
150.00    0.00  0.00  0.00  0.00  0.00  0.06  167.84  167.91
160.00    0.00  0.00  0.00  0.00  0.00  0.01  167.84  167.85
170.00    0.00  0.00  0.00  0.00  0.00  0.00  2.62  2.62
180.00    0.00  0.00  0.00  0.00  0.00  0.00  0.37  0.37
190.00    0.00  0.00  0.00  0.00  0.00  0.00  0.03  0.03
200.00    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
210.00    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
220.00    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
230.00    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
240.00    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
*****
Totals    3.05  0.99  2.06  0.23  2.82

```

Runoff volume= .4491249 acre-ft
Total volume= 31.59201 acre-ft
Peak discharge (cfs)= 175.4727

