ATTACHMENT 2

Rational Method Hydrology Calculations
Proposed Option No. 2

Note: This Attachment contains the Rational Method Flow Rate Results for Proposed Drainage Option No. 2, one of two options recommended to reduce the runoff and cliff erosion of Rimforest.

Option No. 2 directs the flow into Daley Creek (See Exhibit “F” for Point Number Locations).

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                San Bernardino County Rational Hydrology Program

                    (Hydrology Manual Date - August 1986)

 CIVILCADD/CIVILDESIGN  Engineering Software, (c) 1989-2005 Version 7.1
        Rational Hydrology Study        Date: 07/07/09
----------------------------------------------------------------------
Rimforest, All area to Daley Creek Weir Wall
Option2.out


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Program License Serial Number 4500

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 *********   Hydrology Study Control Information **********

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Rational hydrology study storm event year is   100.0
Computed rainfall intensity:
Storm year =   100.00   1 hour rainfall =     2.050 (In.)
Slope used for rainfall intensity curve b =  0.7000
Soil antecedent moisture condition (AMC) = 2


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Process from Point/Station        1.000 to Point/Station        2.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
UNDEVELOPED (average cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
SCS curve number for soil(AMC 2)  = 84.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.301(In/Hr)
Initial subarea data:
Initial area flow distance =   455.000(Ft.)
Top (of initial area) elevation =  6005.000(Ft.)
Bottom (of initial area) elevation =  5950.000(Ft.)
Difference in elevation =    55.000(Ft.)
Slope =    0.12088  s(%)=      12.09
TC = k(0.706)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.461 min.
Rainfall intensity =      6.160(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.856
Subarea runoff =     45.247(CFS)
Total initial stream area =        8.580(Ac.)
Pervious area fraction = 1.000
Initial area Fm value =    0.301(In/Hr)


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Process from Point/Station        2.000 to Point/Station        3.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
______________________________________________________________________
Estimated mean flow rate at midpoint of channel =    152.890(CFS)
Depth of flow =   1.040(Ft.), Average velocity =  14.125(Ft/s)
       ******* Irregular Channel Data ***********
----------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00             10.00
        2             50.00              0.00
        3            100.00             10.00
Manning's 'N' friction factor =   0.035
----------------------------------------------------------------
Sub-Channel flow  =     76.445(CFS)
  '     '        flow top width =     10.404(Ft.)
  '     '    velocity=   14.125(Ft/s)
  '     '        area =      5.412(Sq.Ft)
  '     '        Froude number =     3.451

Upstream point elevation =  5950.000(Ft.)
Downstream point elevation =  5802.000(Ft.)
Flow length =   545.000(Ft.)
Travel time  =    0.64 min.
Time of concentration =   13.10 min.
Depth of flow =   1.040(Ft.)
Average velocity =  14.125(Ft/s)
Total irregular channel flow =    76.445(CFS)
Irregular channel normal depth above invert elev. =   1.040(Ft.)
Average velocity of channel(s) =  14.125(Ft/s)
 Adding area flow to channel
UNDEVELOPED (average cover) subarea
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Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
SCS curve number for soil(AMC 2)  = 84.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.301(In/Hr)
Rainfall intensity =      5.947(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.855
Subarea runoff =     62.331(CFS) for   12.590(Ac.)
Total runoff =    107.578(CFS)
Effective area this stream =       21.17(Ac.)
Total Study Area (Main Stream No. 1) =       21.17(Ac.)
Area averaged Fm value =    0.301(In/Hr)
Depth of flow =   1.183(Ft.), Average velocity =  15.384(Ft/s)


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Process from Point/Station        3.000 to Point/Station        4.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
______________________________________________________________________
Estimated mean flow rate at midpoint of channel =    294.082(CFS)
Depth of flow =   1.541(Ft.), Average velocity =  12.387(Ft/s)
        ******* Irregular Channel Data ***********
----------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00             10.00
        2             50.00              0.00
        3            100.00             10.00
Manning's 'N' friction factor =   0.035
----------------------------------------------------------------
Sub-Channel flow  =    147.041(CFS)
  '     '        flow top width =     15.408(Ft.)
  '     '    velocity=   12.387(Ft/s)
  '     '        area =     11.871(Sq.Ft)
  '     '        Froude number =     2.487

Upstream point elevation =  5802.000(Ft.)
Downstream point elevation =  5658.000(Ft.)
Flow length =  1164.000(Ft.)
Travel time  =    1.57 min.
Time of concentration =   14.67 min.
Depth of flow =   1.541(Ft.)
Average velocity =  12.387(Ft/s)
Total irregular channel flow =   147.041(CFS)
Irregular channel normal depth above invert elev. =   1.541(Ft.)
Average velocity of channel(s) =  12.387(Ft/s)
 Adding area flow to channel
UNDEVELOPED (average cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
SCS curve number for soil(AMC 2)  = 84.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.301(In/Hr)
Rainfall intensity =      5.495(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.851
Subarea runoff =     78.858(CFS) for   18.710(Ac.)
Total runoff =    186.435(CFS)
Effective area this stream =       39.88(Ac.)
Total Study Area (Main Stream No. 1) =       39.88(Ac.)
Area averaged Fm value =    0.301(In/Hr)
Depth of flow =   1.684(Ft.), Average velocity =  13.144(Ft/s)


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Process from Point/Station        4.000 to Point/Station        5.000
**** IMPROVED CHANNEL TRAVEL TIME ****
______________________________________________________________________
Upstream point elevation =  5658.000(Ft.)
Downstream point elevation =  5630.000(Ft.)
Channel length thru subarea  =   961.000(Ft.)
Channel base width      =    5.000(Ft.)
Slope or 'Z' of left channel bank =   0.000
Slope or 'Z' of right channel bank =   0.000
Estimated mean flow rate at midpoint of channel =    206.116(CFS)
Manning's 'N'    = 0.015
Maximum depth of channel  =    8.000(Ft.)
Flow(q) thru subarea =    206.116(CFS)
Depth of flow =   2.196(Ft.), Average velocity =  18.768(Ft/s)
Channel flow top width =    5.000(Ft.)
Flow Velocity =   18.77(Ft/s)
Travel time  =    0.85 min.
Time of concentration =   15.52 min.
Critical depth =      3.750(Ft.)
 Adding area flow to channel
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UNDEVELOPED (average cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
SCS curve number for soil(AMC 2)  = 84.00
Pervious ratio(Ap) = 1.0000     Max loss rate(Fm)=     0.301(In/Hr)
Rainfall intensity =      5.282(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.849
Subarea runoff =     39.283(CFS) for   10.470(Ac.)
Total runoff =    225.718(CFS)
Effective area this stream =       50.35(Ac.)
Total Study Area (Main Stream No. 1) =       50.35(Ac.)
Area averaged Fm value =    0.301(In/Hr)
Depth of flow =   2.349(Ft.), Average velocity =  19.214(Ft/s)
Critical depth =      4.000(Ft.)


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Process from Point/Station        5.000 to Point/Station       13.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =  5630.000(Ft.)
Downstream point/station elevation =  5602.780(Ft.)
Pipe length  =   432.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   225.718(CFS)
Nearest computed pipe diameter  =     42.00(In.)
Calculated individual pipe flow  =   225.718(CFS)
Normal flow depth in pipe =   30.98(In.)
Flow top width inside pipe =   36.95(In.)
Critical depth could not be calculated.
Pipe flow velocity =     29.68(Ft/s)
Travel time through pipe =    0.24 min.
Time of concentration (TC) =    15.77 min.


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Process from Point/Station        5.000 to Point/Station       13.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     50.350(Ac.)
Runoff from this stream =    225.718(CFS)
Time of concentration =   15.77 min.
Rainfall intensity =     5.225(In/Hr)
Area averaged loss rate (Fm) =    0.3006(In/Hr)
Area averaged Pervious ratio (Ap) = 1.0000
Program is now starting with Main Stream No. 2


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Process from Point/Station       10.000 to Point/Station       11.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
RESIDENTIAL(1 acre lot)
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
SCS curve number for soil(AMC 2)  = 75.00
Pervious ratio(Ap) = 0.8000     Max loss rate(Fm)=     0.362(In/Hr)
Initial subarea data:
Initial area flow distance =   831.000(Ft.)
Top (of initial area) elevation =  5670.000(Ft.)
Bottom (of initial area) elevation =  5646.000(Ft.)
Difference in elevation =    24.000(Ft.)
Slope =    0.02888  s(%)=       2.89
TC = k(0.469)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   14.025 min.
Rainfall intensity =      5.671(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.842
Subarea runoff =     44.908(CFS)
Total initial stream area =        9.400(Ac.)
Pervious area fraction = 0.800
Initial area Fm value =    0.362(In/Hr)


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Process from Point/Station       11.000 to Point/Station       12.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =  5646.000(Ft.)
End of street segment elevation =  5616.000(Ft.)
Length of street segment  =   916.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  22.000(Ft.)
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Distance from crown to crossfall grade break  =  18.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.025
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     54.130(CFS)
Depth of flow =   0.543(Ft.), Average velocity =   6.029(Ft/s)
Warning: depth of flow exceeds top of curb
Distance that curb overflow reaches into property =    1.71(Ft.)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  20.798(Ft.)
Flow velocity =   6.03(Ft/s)
Travel time =    2.53 min.     TC =   16.56  min.
 Adding area flow to street
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
SCS curve number for soil(AMC 2)  = 75.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.045(In/Hr)
Rainfall intensity =      5.049(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.856
Subarea runoff =     18.334(CFS) for    5.240(Ac.)
Total runoff =     63.242(CFS)
Effective area this stream =       14.64(Ac.)
Total Study Area (Main Stream No. 2) =       64.99(Ac.)
Area averaged Fm value =    0.249(In/Hr)
Street flow at end of street =     63.242(CFS)
Half street flow at end of street =     31.621(CFS)
Depth of flow =   0.569(Ft.), Average velocity =   6.181(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    2.76(Ft.)
Flow width (from curb towards crown)=  22.000(Ft.)


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Process from Point/Station       11.000 to Point/Station       12.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
RESIDENTIAL(3 - 4 dwl/acre)
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
SCS curve number for soil(AMC 2)  = 75.00
Pervious ratio(Ap) = 0.6000     Max loss rate(Fm)=     0.272(In/Hr)
Time of concentration =    16.56 min.
Rainfall intensity =      5.049(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.855
Subarea runoff =     17.971(CFS) for    4.180(Ac.)
Total runoff =     81.213(CFS)
Effective area this stream =       18.82(Ac.)
Total Study Area (Main Stream No. 2) =       69.17(Ac.)
Area averaged Fm value =    0.254(In/Hr)


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Process from Point/Station       11.000 to Point/Station       12.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 2 in normal stream number 1
Stream flow area =     18.820(Ac.)
Runoff from this stream =     81.213(CFS)
Time of concentration =   16.56 min.
Rainfall intensity =     5.049(In/Hr)
Area averaged loss rate (Fm) =    0.2540(In/Hr)
Area averaged Pervious ratio (Ap) = 0.5607


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Process from Point/Station       20.000 to Point/Station       21.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
RESIDENTIAL(5 - 7 dwl/acre)
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
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SCS curve number for soil(AMC 2)  = 75.00
Pervious ratio(Ap) = 0.5000     Max loss rate(Fm)=     0.226(In/Hr)
Initial subarea data:
Initial area flow distance =   448.000(Ft.)
Top (of initial area) elevation =  5643.000(Ft.)
Bottom (of initial area) elevation =  5324.000(Ft.)
Difference in elevation =   319.000(Ft.)
Slope =    0.71205  s(%)=      71.21
TC = k(0.389)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    4.786 min.
Rainfall intensity =     12.036(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.883
Subarea runoff =     23.383(CFS)
Total initial stream area =        2.200(Ac.)
Pervious area fraction = 0.500
Initial area Fm value =    0.226(In/Hr)


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Process from Point/Station       21.000 to Point/Station       22.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =  5624.000(Ft.)
Downstream point/station elevation =  5619.000(Ft.)
Pipe length  =   281.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    23.383(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    23.383(CFS)
Normal flow depth in pipe =   15.87(In.)
Flow top width inside pipe =   22.72(In.)
Critical Depth =   20.61(In.)
Pipe flow velocity =     10.61(Ft/s)
Travel time through pipe =    0.44 min.
Time of concentration (TC) =     5.23 min.


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Process from Point/Station       21.000 to Point/Station       22.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
RESIDENTIAL(5 - 7 dwl/acre)
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
SCS curve number for soil(AMC 2)  = 75.00
Pervious ratio(Ap) = 0.5000     Max loss rate(Fm)=     0.226(In/Hr)
Time of concentration =     5.23 min.
Rainfall intensity =     11.315(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.882
Subarea runoff =      8.453(CFS) for    0.990(Ac.)
Total runoff =     31.836(CFS)
Effective area this stream =        3.19(Ac.)
Total Study Area (Main Stream No. 2) =       72.36(Ac.)
Area averaged Fm value =    0.226(In/Hr)


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Process from Point/Station       22.000 to Point/Station       12.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =  5619.000(Ft.)
Downstream point/station elevation =  5612.000(Ft.)
Pipe length  =   526.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    31.836(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    31.836(CFS)
Normal flow depth in pipe =   19.88(In.)
Flow top width inside pipe =   23.80(In.)
Critical Depth =   23.31(In.)
Pipe flow velocity =     10.16(Ft/s)
Travel time through pipe =    0.86 min.
Time of concentration (TC) =     6.09 min.


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Process from Point/Station       22.000 to Point/Station       12.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
SCS curve number for soil(AMC 2)  = 75.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.045(In/Hr)
Time of concentration =     6.09 min.
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Rainfall intensity =     10.167(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.886
Subarea runoff =     12.920(CFS) for    1.780(Ac.)
Total runoff =     44.756(CFS)
Effective area this stream =        4.97(Ac.)
Total Study Area (Main Stream No. 2) =       74.14(Ac.)
Area averaged Fm value =    0.162(In/Hr)


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Process from Point/Station       22.000 to Point/Station       12.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      4.970(Ac.)
Runoff from this stream =     44.756(CFS)
Time of concentration =    6.09 min.
Rainfall intensity =    10.167(In/Hr)
Area averaged loss rate (Fm) =    0.1616(In/Hr)
Area averaged Pervious ratio (Ap) = 0.3567
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1     81.21    18.820     16.56    0.254      5.049
2     44.76     4.970      6.09    0.162     10.167
Qmax(1) =
           1.000 *    1.000 *    81.213) +
           0.488 *    1.000 *    44.756) + =     103.073
Qmax(2) =
           2.068 *    0.368 *    81.213) +
           1.000 *    1.000 *    44.756) + =     106.523

Total of 2 streams to confluence:
Flow rates before confluence point:
      81.213      44.756
Maximum flow rates at confluence using above data:
      103.073      106.523
Area of streams before confluence:
       18.820        4.970
Effective area values after confluence:
       23.790       11.893
Results of confluence:
Total flow rate =    106.523(CFS)
Time of concentration =     6.090 min.
Effective stream area after confluence =     11.893(Ac.)
Study area average Pervious fraction(Ap) =  0.518
Study area average soil loss rate(Fm) =    0.235(In/Hr)
Study area total (this main stream) =      23.79(Ac.)


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Process from Point/Station       12.000 to Point/Station       13.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =  5610.000(Ft.)
Downstream point/station elevation =  5602.780(Ft.)
Pipe length  =   562.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   106.523(CFS)
Nearest computed pipe diameter  =     42.00(In.)
Calculated individual pipe flow  =   106.523(CFS)
Normal flow depth in pipe =   32.16(In.)
Flow top width inside pipe =   35.58(In.)
Critical Depth =   37.64(In.)
Pipe flow velocity =     13.47(Ft/s)
Travel time through pipe =    0.70 min.
Time of concentration (TC) =     6.79 min.


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Process from Point/Station       12.000 to Point/Station       13.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =     11.893(Ac.)
Runoff from this stream =    106.523(CFS)
Time of concentration =    6.79 min.
Rainfall intensity =     9.426(In/Hr)
Area averaged loss rate (Fm) =    0.2347(In/Hr)
Area averaged Pervious ratio (Ap) = 0.5181
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)
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1    225.72    50.350     15.77    0.301      5.225
2    106.52    11.893      6.79    0.235      9.426
Qmax(1) =
           1.000 *    1.000 *   225.718) +
           0.543 *    1.000 *   106.523) + =     283.548
Qmax(2) =
           1.853 *    0.430 *   225.718) +
           1.000 *    1.000 *   106.523) + =     286.572

Total of 2 main streams to confluence:
Flow rates before confluence point:
     226.718     107.523
Maximum flow rates at confluence using above data:
      283.548      286.572
Area of streams before confluence:
       50.350       11.893
Effective area values after confluence:
       62.243       33.565


Results of confluence:
Total flow rate =    286.572(CFS)
Time of concentration =     6.786 min.
Effective stream area after confluence  =     33.565(Ac.)
Study area average Pervious fraction(Ap) =  0.908
Study area average soil loss rate(Fm) =    0.288(In/Hr)
Study area total =      62.24(Ac.)


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Process from Point/Station       13.000 to Point/Station       14.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =  5602.780(Ft.)
Downstream point/station elevation =  5593.000(Ft.)
Pipe length  =  1002.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   286.572(CFS)
Nearest computed pipe diameter  =     63.00(In.)
Calculated individual pipe flow  =   286.572(CFS)
Normal flow depth in pipe =   50.44(In.)
Flow top width inside pipe =   50.34(In.)
Critical Depth =   56.01(In.)
Pipe flow velocity =     15.43(Ft/s)
Travel time through pipe =    1.08 min.
Time of concentration (TC) =     7.87 min.
End of computations, Total Study Area =           74.14 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.845
Area averaged SCS curve number =  81.1
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