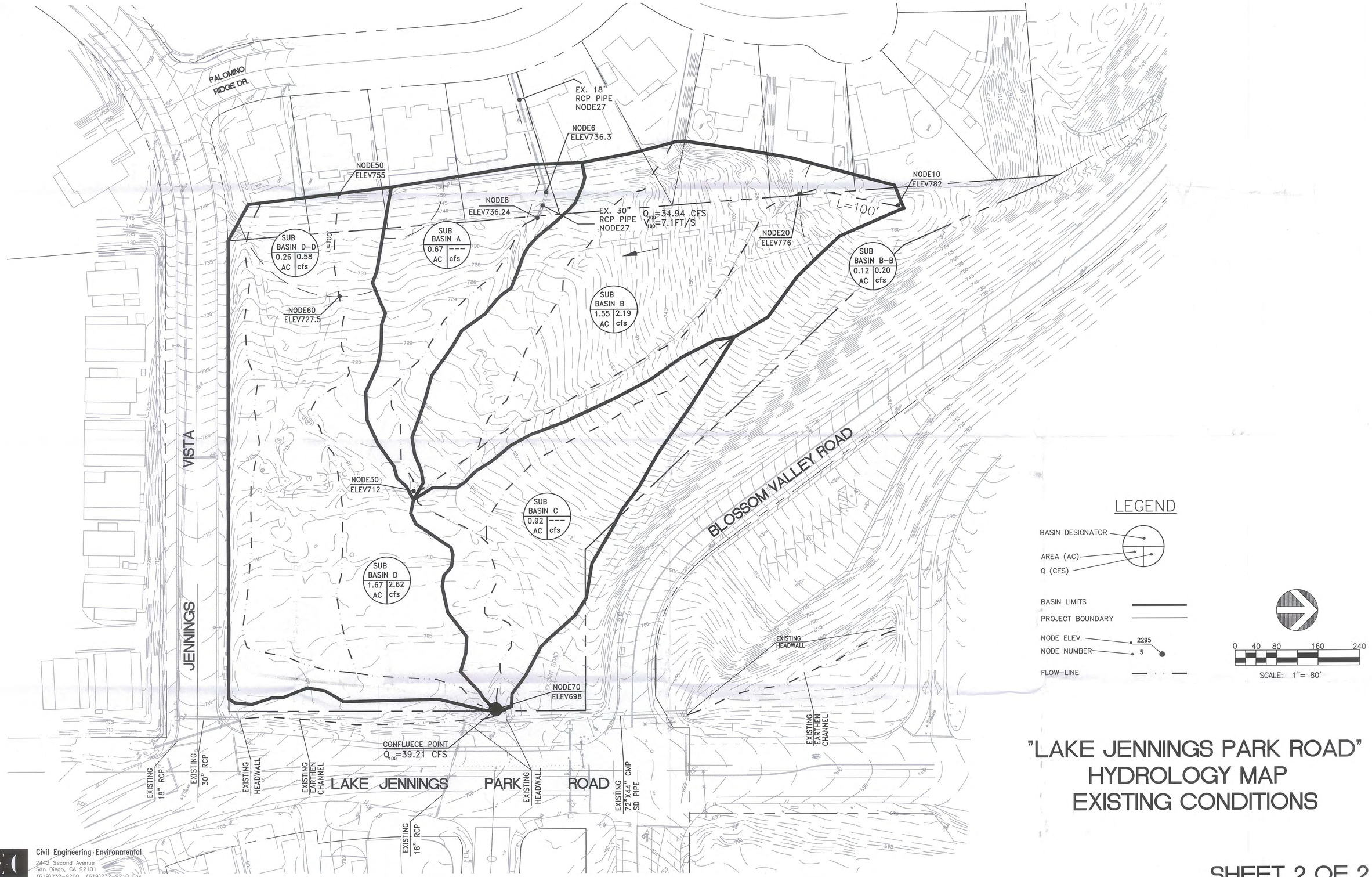


LEGEND

BASIN DESIGNATOR
AREA (AC)
Q (CFS)

BASIN LIMITS
PROJECT BOUNDARY
NODE ELEV. 2295
NODE NUMBER 5
FLOW-LINE

0 40 80 160 240
SCALE: 1"= 80'

"LAKE JENNINGS PARK ROAD" HYDROLOGY MAP EXISTING CONDITIONS

REC Consultants, Inc.
Civil Engineering · Environmental
2442 Second Avenue
San Diego, CA 92101
(619)232-9200 (619)232-9210 Fax

APPENDIX B
POST DEVELOPMENT CONDITIONS

```
            San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2012 Version 7.9

Rational method hydrology  program based on
San Diego County Flood Control Division 2003 hydrology manual
      Rational Hydrology Study        Date: 06/23/14
--------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

--------------------------------------------------------------------------
LAKE JENNINGS PARK ROAD RESIDENTIAL DEVELOPMENT
100 YR PEAK FLOWS - POST DEVELOPMENT CONDITIONS


Program License Serial Number 6292

--------------------------------------------------------------------------
Rational hydrology study storm event year is   100.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour,  precipitation(inches) =  2.700
24 hour precipitation(inches) =  6.300
P6/P24 =    42.9%
Adjusted 6 hour precipitation (inches) =  2.835
Adjusted P6/P24 =    45.0%
San Diego hydrology manual 'C' values used


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** INITIAL AREA EVALUATION ****
BASIN X-X (OFFSITE)
--------------------------------------------------------------------------
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
[UNDISTURBED NATURAL TERRAIN                  ]
(Permanent Open Space   )
Impervious value, Ai = 0.000
Sub-Area C Value = 0.300
Initial subarea total flow distance  =  100.000(Ft.)
Highest elevation = 1000.400(Ft.)
Lowest elevation =  975.000(Ft.)
Elevation difference =   25.400(Ft.) Slope = 25.400 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of  25.40 %, in a development type of
 Permanent Open Space
In Accordance With Figure 3-3
Initial Area Time of Concentration =   4.90 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.3000)*( 100.000^.5)/(  25.400^(1/3)]=   4.90
Calculated TC of    4.899 minutes is less than 5 minutes,
```

```
 resetting TC to 5.0 minutes for rainfall intensity calculations
Rainfall intensity (I) =      7.469(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.300
Subarea runoff =      0.896(CFS)
Total initial stream area =        0.400(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.000 to Point/Station        3.000
**** IMPROVED CHANNEL TRAVEL TIME ****
BASIN X (OFFSITE)
------------------------------------------------------------------------------
Upstream point elevation =   975.000(Ft.)
Downstream point elevation =   823.000(Ft.)
Channel length thru subarea  =   390.000(Ft.)
Channel base width       =   10.000(Ft.)
Slope or 'Z' of left channel bank =   5.000
Slope or 'Z' of right channel bank =   5.000
Estimated mean flow rate at midpoint of channel =      6.138(CFS)
Manning's 'N'    = 0.020
Maximum depth of channel  =    0.500(Ft.)
Flow(q) thru subarea =      6.138(CFS)
Depth of flow =   0.074(Ft.), Average velocity =   7.987(Ft/s)
Channel flow top width =   10.741(Ft.)
Flow Velocity =    7.99(Ft/s)
Travel time  =    0.81 min.
Time of concentration =    5.71 min.
Critical depth =      0.219(Ft.)
 Adding area flow to channel
Rainfall intensity (I) =      6.854(In/Hr) for a   100.0 year storm
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
[UNDISTURBED NATURAL TERRAIN                    ]
(Permanent Open Space    )
Impervious value, Ai = 0.000
Sub-Area C Value = 0.300
Rainfall intensity =      6.854(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for total area
(Q=KCIA) is C = 0.300  CA =      1.650
Subarea runoff =     10.413(CFS) for      5.100(Ac.)
Total runoff =     11.310(CFS)      Total area =       5.500(Ac.)
Depth of flow =   0.107(Ft.), Average velocity =  10.076(Ft/s)
Critical depth =      0.324(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        4.000
**** IMPROVED CHANNEL TRAVEL TIME ****
BASIN Y (OFFSITE)
------------------------------------------------------------------------------
Upstream point elevation =   823.000(Ft.)
Downstream point elevation =   756.000(Ft.)
Channel length thru subarea  =  2200.000(Ft.)
Channel base width       =   24.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
```

```
Slope or 'Z' of right channel bank =   1.000
Estimated mean flow rate at midpoint of channel =     23.153(CFS)
Manning's 'N'    = 0.015
Maximum depth of channel  =    0.500(Ft.)
Flow(q) thru subarea =     23.153(CFS)
Depth of flow =   0.177(Ft.), Average velocity =   5.405(Ft/s)
Channel flow top width =   24.354(Ft.)
Flow Velocity =    5.41(Ft/s)
Travel time  =    6.78 min.
Time of concentration =   12.50 min.
Critical depth =      0.305(Ft.)
 Adding area flow to channel
Rainfall intensity (I) =      4.137(In/Hr) for a   100.0 year storm
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
[LOW DENSITY RESIDENTIAL                        ]
(2.9 DU/A or Less       )
Impervious value, Ai = 0.250
Sub-Area C Value = 0.450
Rainfall intensity =      4.137(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for total area
(Q=KCIA) is C = 0.410  CA =      8.445
Subarea runoff =     23.629(CFS) for     15.100(Ac.)
Total runoff =     34.939(CFS)      Total area =      20.600(Ac.)
Depth of flow =   0.227(Ft.), Average velocity =   6.358(Ft/s)
Critical depth =      0.402(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        5.000 to Point/Station        6.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
EXISTING 18" RCP
------------------------------------------------------------------------------
Upstream point/station elevation =   745.800(Ft.)
Downstream point/station elevation =   736.300(Ft.)
Pipe length  =   130.00(Ft.) Slope =   0.0731  Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    34.939(CFS)
Given pipe size =     18.00(In.)
NOTE: Normal flow is pressure flow in user selected pipe size.
The approximate hydraulic grade line above the pipe invert is
    13.982(Ft.)  at the headworks or inlet of the pipe(s)
 Pipe friction loss =     14.377(Ft.)
 Minor friction loss =      9.105(Ft.)    K-factor =   1.50
Pipe flow velocity =     19.77(Ft/s)
Travel time through pipe =    0.11 min.
Time of concentration (TC) =    12.61 min.
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        6.000 to Point/Station        8.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
EXISTING 30" RCP

------------------------------------------------------------------------------
Upstream point/station elevation =   736.300(Ft.)
Downstream point/station elevation =   736.240(Ft.)
Pipe length  =    12.00(Ft.) Slope =   0.0050  Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    34.939(CFS)
Given pipe size =     30.00(In.)
NOTE: Normal flow is pressure flow in user selected pipe size.
The approximate hydraulic grade line above the pipe invert is
     1.207(Ft.)  at the headworks or inlet of the pipe(s)
 Pipe friction loss =      0.087(Ft.)
 Minor friction loss =      1.180(Ft.)    K-factor =   1.50
Pipe flow velocity =      7.12(Ft/s)
Travel time through pipe =    0.03 min.
Time of concentration (TC) =    12.63 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        8.000 to Point/Station        8.000
**** CONFLUENCE OF MINOR STREAMS ****
BASIN X + BASIN Y

------------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     20.600(Ac.)
Runoff from this stream =     34.939(CFS)
Time of concentration =   12.63 min.
Rainfall intensity =     4.108(In/Hr)
Summary of stream data:

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


1       34.939     12.63                4.108
Qmax(1) =
         1.000 *    1.000 *    34.939) + =      34.939

Total of 1 streams to confluence:
Flow rates before confluence point:
      34.939
Maximum flow rates at confluence using above data:
       34.939
Area of streams before confluence:
       20.600
Results of confluence:
Total flow rate =     34.939(CFS)
Time of concentration =    12.634 min.
Effective stream area after confluence =     20.600(Ac.)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       10.000 to Point/Station       15.000
**** INITIAL AREA EVALUATION ****
BASIN P-P

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
[LOW DENSITY RESIDENTIAL                    ]
(1.0 DU/A or Less       )
Impervious value, Ai = 0.100
Sub-Area C Value = 0.360
Initial subarea total flow distance  =   25.000(Ft.)
Highest elevation =  750.000(Ft.)
Lowest elevation =  735.000(Ft.)
Elevation difference =   15.000(Ft.) Slope = 60.000 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of  60.00 %, in a development type of
 1.0 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration =   3.40 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.3600)*( 100.000^.5)/(  60.000^(1/3)]=   3.40
Calculated TC of    3.402 minutes is less than 5 minutes,
 resetting TC to 5.0 minutes for rainfall intensity calculations
Rainfall intensity (I) =      7.469(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.360
Subarea runoff =      0.081(CFS)
Total initial stream area =        0.030(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       15.000 to Point/Station       30.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
BASIN P
PROPOSED CONCRETE DITCH

Estimated mean flow rate at midpoint of channel =      0.417(CFS)
Depth of flow =   0.208(Ft.), Average velocity =   2.824(Ft/s)
      ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
      1              0.00               1.00
      2              0.25               0.50
      3              0.75               0.00
      4              1.25               0.00
      5              1.75               0.50
      6              2.00               1.00
Manning's 'N' friction factor =   0.015
------------------------------------------------------------------
Sub-Channel flow  =      0.417(CFS)
   '      '    flow top width =      0.917(Ft.)
   '      '    velocity=    2.824(Ft/s)
```

```
'      '    area =      0.148(Sq.Ft)
'      '    Froude number =     1.240

Upstream point elevation =   735.000(Ft.)
Downstream point elevation =   732.000(Ft.)
Flow length =   257.000(Ft.)
Travel time  =    1.52 min.
Time of concentration =    4.92 min.
Depth of flow =   0.208(Ft.)
Average velocity =   2.824(Ft/s)
Total irregular channel flow =     0.417(CFS)
Irregular channel normal depth above invert elev. =   0.208(Ft.)
Average velocity of channel(s) =   2.824(Ft/s)
 Adding area flow to channel
Calculated TC of    4.919 minutes is less than 5 minutes,
 resetting TC to 5.0 minutes for rainfall intensity calculations
Rainfall intensity (I) =      7.469(In/Hr) for a   100.0 year storm
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
[LOW DENSITY RESIDENTIAL                    ]
(1.0 DU/A or Less       )
Impervious value, Ai = 0.100
Sub-Area C Value = 0.360
Rainfall intensity =      7.469(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for total area
(Q=KCIA) is C = 0.360  CA =      0.101
Subarea runoff =      0.672(CFS) for      0.250(Ac.)
Total runoff =      0.753(CFS)      Total area =       0.280(Ac.)
Depth of flow =   0.288(Ft.), Average velocity =   3.318(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       30.000 to Point/Station       30.000
**** CONFLUENCE OF MINOR STREAMS ****
BASIN X + BASIN Y + BASIN P
------------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      0.280(Ac.)
Runoff from this stream =      0.753(CFS)
Time of concentration =    4.92 min.
Rainfall intensity =     7.469(In/Hr)
Summary of stream data:

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


1       34.939     12.63                4.108
2        0.753      4.92                7.469
Qmax(1) =
         1.000 *    1.000 *    34.939) +
         0.550 *    1.000 *     0.753) + =      35.353
Qmax(2) =
         1.000 *    0.389 *    34.939) +
         1.000 *    1.000 *     0.753) + =      14.357
```

```
Total of 2 streams to confluence:
Flow rates before confluence point:
      34.939       0.753
Maximum flow rates at confluence using above data:
       35.353       14.357
Area of streams before confluence:
       20.600        0.280
Results of confluence:
Total flow rate =      35.353(CFS)
Time of concentration =    12.634 min.
Effective stream area after confluence =      20.880(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       20.000 to Point/Station       25.000
**** INITIAL AREA EVALUATION ****
BASIN Q-Q
------------------------------------------------------------------------
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
[LOW DENSITY RESIDENTIAL                     ]
(1.0 DU/A or Less       )
Impervious value, Ai = 0.100
Sub-Area C Value = 0.360
Initial subarea total flow distance  =   25.000(Ft.)
Highest elevation =  778.000(Ft.)
Lowest elevation =  776.000(Ft.)
Elevation difference =    2.000(Ft.) Slope =  8.000 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of   8.00 %, in a development type of
 1.0 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration =   6.66 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.3600)*( 100.000^.5)/(   8.000^(1/3)]=   6.66
Rainfall intensity (I) =      6.208(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.360
Subarea runoff =      0.067(CFS)
Total initial stream area =       0.030(Ac.)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       25.000 to Point/Station       30.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
BASIN Q
PROPOSED CONCRETE DITCH

------------------------------------------------------------------------
Estimated mean flow rate at midpoint of channel =      0.447(CFS)
Depth of flow =   0.072(Ft.), Average velocity =   5.934(Ft/s)
      ******* Irregular Channel Data ***********
------------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
      1              0.00               1.00
      2              0.25               0.50
      3              0.75               0.00
      4              1.25               0.00
      5              1.75               0.00
      6              2.00               1.00
Manning's 'N' friction factor =   0.015
------------------------------------------------------------------
Sub-Channel flow  =      0.447(CFS)
  '      '    flow top width =      1.090(Ft.)
  '      '    velocity=    5.934(Ft/s)
  '      '    area =       0.075(Sq.Ft)
  '      '    Froude number =     3.978

Upstream point elevation =   760.000(Ft.)
Downstream point elevation =   732.000(Ft.)
Flow length =   200.000(Ft.)
Travel time  =    0.56 min.
Time of concentration =    7.22 min.
Depth of flow =   0.072(Ft.)
Average velocity =   5.934(Ft/s)
Total irregular channel flow =     0.447(CFS)
Irregular channel normal depth above invert elev. =   0.072(Ft.)
Average velocity of channel(s) =   5.934(Ft/s)
 Adding area flow to channel
Rainfall intensity (I) =      5.893(In/Hr) for a   100.0 year storm
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
[LOW DENSITY RESIDENTIAL                        ]
(1.0 DU/A or Less       )
Impervious value, Ai = 0.100
Sub-Area C Value = 0.360
Rainfall intensity =      5.893(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for total area
(Q=KCIA) is C = 0.360  CA =      0.133
Subarea runoff =      0.718(CFS) for      0.340(Ac.)
Total runoff =      0.785(CFS)      Total area =       0.370(Ac.)
Depth of flow =   0.102(Ft.), Average velocity =   7.257(Ft/s)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       30.000 to Point/Station       30.000
**** CONFLUENCE OF MINOR STREAMS ****
BASIN X + BASIN Y + BASIN P + BASIN Q
BY-PASSED FLOWS

----------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 3
Stream flow area =      0.370(Ac.)
Runoff from this stream =      0.785(CFS)
Time of concentration =    7.22 min.
Rainfall intensity =     5.893(In/Hr)
Summary of stream data:

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


1        34.939      12.63                4.108
2         0.753       4.92                7.469
3         0.785       7.22                5.893
Qmax(1) =
          1.000 *     1.000 *    34.939) +
          0.550 *     1.000 *     0.753) +
          0.697 *     1.000 *     0.785) + =       35.900
Qmax(2) =
          1.000 *     0.389 *    34.939) +
          1.000 *     1.000 *     0.753) +
          1.000 *     0.681 *     0.785) + =       14.892
Qmax(3) =
          1.000 *     0.572 *    34.939) +
          0.789 *     1.000 *     0.753) +
          1.000 *     1.000 *     0.785) + =       21.351

Total of 3 streams to confluence:
Flow rates before confluence point:
      34.939       0.753       0.785
Maximum flow rates at confluence using above data:
       35.900       14.892       21.351
Area of streams before confluence:
       20.600        0.280        0.370
Results of confluence:
Total flow rate =      35.900(CFS)
Time of concentration =    12.634 min.
Effective stream area after confluence =      21.250(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       30.000 to Point/Station       31.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
PROPOSED 24" RCP

----------------------------------------------------------------------------
Upstream point/station elevation =    727.000(Ft.)
Downstream point/station elevation =    726.000(Ft.)
Pipe length  =    45.50(Ft.) Slope =    0.0220  Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    35.900(CFS)
Given pipe size =     24.00(In.)
```

```
NOTE: Normal flow is pressure flow in user selected pipe size.
The approximate hydraulic grade line above the pipe invert is
     3.187(Ft.)  at the headworks or inlet of the pipe(s)
 Pipe friction loss =       1.145(Ft.)
 Minor friction loss =      3.042(Ft.)    K-factor =   1.50
Pipe flow velocity =      11.43(Ft/s)
Travel time through pipe =     0.07 min.
Time of concentration (TC) =     12.70 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        31.000 to Point/Station        32.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
PROPOSED 24" RCP
------------------------------------------------------------------------------
Upstream point/station elevation =    726.000(Ft.)
Downstream point/station elevation =    721.400(Ft.)
Pipe length  =    149.40(Ft.) Slope =    0.0308  Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     35.900(CFS)
Given pipe size =      24.00(In.)
Calculated individual pipe flow  =     35.900(CFS)
Normal flow depth in pipe =    17.86(In.)
Flow top width inside pipe =    20.94(In.)
Critical depth could not be calculated.
Pipe flow velocity =      14.31(Ft/s)
Travel time through pipe =     0.17 min.
Time of concentration (TC) =     12.87 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        32.000 to Point/Station        33.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
PROPOSED 24" RCP
------------------------------------------------------------------------------
Upstream point/station elevation =    721.400(Ft.)
Downstream point/station elevation =    711.000(Ft.)
Pipe length  =    129.90(Ft.) Slope =    0.0801  Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     35.900(CFS)
Given pipe size =      24.00(In.)
Calculated individual pipe flow  =     35.900(CFS)
Normal flow depth in pipe =    12.86(In.)
Flow top width inside pipe =    23.94(In.)
Critical depth could not be calculated.
Pipe flow velocity =      20.96(Ft/s)
Travel time through pipe =     0.10 min.
Time of concentration (TC) =     12.98 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        33.000 to Point/Station        34.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
PROPOSED 24" RCP
------------------------------------------------------------------------------
Upstream point/station elevation =    711.000(Ft.)
Downstream point/station elevation =    697.200(Ft.)
Pipe length  =    292.70(Ft.) Slope =    0.0471  Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     35.900(CFS)
```

```
Given pipe size =     24.00(In.)
Calculated individual pipe flow  =    35.900(CFS)
Normal flow depth in pipe =   15.23(In.)
Flow top width inside pipe =   23.11(In.)
Critical depth could not be calculated.
Pipe flow velocity =     17.07(Ft/s)
Travel time through pipe =    0.29 min.
Time of concentration (TC) =    13.26 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       34.000 to Point/Station       34.000
**** CONFLUENCE OF MAIN STREAMS ****
BASIN X + BASIN Y + BASIN P + BASIN Q
------------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     21.250(Ac.)
Runoff from this stream =     35.900(CFS)
Time of concentration =   13.17 min.
Rainfall intensity =     3.999(In/Hr)
Summary of stream data:

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


1       35.900     13.17                3.999
Qmax(1) =
         1.000 *    1.000 *    35.900) + =      35.900

Total of 1 main streams to confluence:
Flow rates before confluence point:
      35.900
Maximum flow rates at confluence using above data:
       35.900
Area of streams before confluence:
       21.250


Results of confluence:
Total flow rate =     35.900(CFS)
Time of concentration =    13.174 min.
Effective stream area after confluence  =     21.250(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       40.000 to Point/Station       45.000
**** INITIAL AREA EVALUATION ****
BASIN A-A
------------------------------------------------------------------------------
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
[MEDIUM DENSITY RESIDENTIAL                 ]
(4.3 DU/A or Less       )
```

```
Impervious value, Ai = 0.300
Sub-Area C Value = 0.480
Initial subarea total flow distance  =   75.000(Ft.)
Highest elevation =  725.750(Ft.)
Lowest elevation =  725.000(Ft.)
Elevation difference =    0.750(Ft.) Slope =  1.000 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 70.00 (Ft)
for the top area slope value of   1.00 %, in a development type of
 4.3 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration =   9.34 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.4800)*(  70.000^.5)/(   1.000^(1/3)]=   9.34
Rainfall intensity (I) =      4.993(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.480
Subarea runoff =      0.479(CFS)
Total initial stream area =        0.200(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       45.000 to Point/Station       65.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
BASIN A
------------------------------------------------------------------------------
Top of street segment elevation =   725.000(Ft.)
End of street segment elevation =   706.800(Ft.)
Length of street segment  =   416.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  12.000(Ft.)
Distance from crown to crossfall grade break  =  10.500(Ft.)
Slope from gutter to grade break (v/hz) =   0.085
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   1.500(Ft.)
Gutter hike from flowline =  1.370(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 =      1.971(CFS)
Depth of flow =   0.221(Ft.), Average velocity =   3.695(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =   6.858(Ft.)
Flow velocity =   3.69(Ft/s)
Travel time =    1.88 min.     TC =   11.21  min.
 Adding area flow to street
Rainfall intensity (I) =      4.437(In/Hr) for a   100.0 year storm
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
[MEDIUM DENSITY RESIDENTIAL                 ]
(4.3 DU/A or Less       )
Impervious value, Ai = 0.300
Sub-Area C Value = 0.480
```

```
Rainfall intensity =      4.437(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for total area
(Q=KCIA) is C = 0.480  CA =      0.768
Subarea runoff =      2.928(CFS) for      1.400(Ac.)
Total runoff =      3.407(CFS)      Total area =      1.600(Ac.)
Street flow at end of street =      3.407(CFS)
Half street flow at end of street =      3.407(CFS)
Depth of flow =   0.257(Ft.), Average velocity =   4.195(Ft/s)
Flow width (from curb towards crown)=   8.655(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       65.000 to Point/Station       65.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      1.600(Ac.)
Runoff from this stream =      3.407(CFS)
Time of concentration =   11.21 min.
Rainfall intensity =     4.437(In/Hr)
Summary of stream data:

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


1         3.407      11.21                4.437
Qmax(1) =
          1.000 *     1.000 *     3.407) + =       3.407

Total of 1 streams to confluence:
Flow rates before confluence point:
        3.407
Maximum flow rates at confluence using above data:
        3.407
Area of streams before confluence:
        1.600
Results of confluence:
Total flow rate =      3.407(CFS)
Time of concentration =    11.214 min.
Effective stream area after confluence =      1.600(Ac.)

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       55.000 to Point/Station       60.000
**** INITIAL AREA EVALUATION ****
BASIN B-B
------------------------------------------------------------------------------
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
[MEDIUM DENSITY RESIDENTIAL                    ]
(4.3 DU/A or Less        )
Impervious value, Ai = 0.300
Sub-Area C Value = 0.480
Initial subarea total flow distance  =    50.000(Ft.)
Highest elevation =  773.500(Ft.)
```

```
Lowest elevation =  773.000(Ft.)
Elevation difference =    0.500(Ft.) Slope =  1.000 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 70.00 (Ft)
for the top area slope value of   1.00 %, in a development type of
 4.3 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration =   9.34 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.4800)*(  70.000^.5)/(   1.000^(1/3)]=   9.34
Rainfall intensity (I) =      4.993(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.480
Subarea runoff =      0.192(CFS)
Total initial stream area =        0.080(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       60.000 to Point/Station       65.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
BASIN B
------------------------------------------------------------------------------
Top of street segment elevation =   746.000(Ft.)
End of street segment elevation =   706.800(Ft.)
Length of street segment  =   630.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  12.000(Ft.)
Distance from crown to crossfall grade break  =  10.500(Ft.)
Slope from gutter to grade break (v/hz) =   0.085
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   1.500(Ft.)
Gutter hike from flowline =  1.370(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 =      3.426(CFS)
Depth of flow =   0.245(Ft.), Average velocity =   4.806(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =   8.061(Ft.)
Flow velocity =   4.81(Ft/s)
Travel time =    2.18 min.     TC =   11.52  min.
 Adding area flow to street
Rainfall intensity (I) =      4.360(In/Hr) for a   100.0 year storm
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
[MEDIUM DENSITY RESIDENTIAL                 ]
(4.3 DU/A or Less       )
Impervious value, Ai = 0.300
Sub-Area C Value = 0.480
Rainfall intensity =      4.360(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for total area
(Q=KCIA) is C = 0.480  CA =      1.541
Subarea runoff =      6.525(CFS) for      3.130(Ac.)
```

```
Total runoff =      6.717(CFS)      Total area =       3.210(Ac.)
Street flow at end of street =      6.717(CFS)
Half street flow at end of street =      6.717(CFS)
Depth of flow =   0.297(Ft.), Average velocity =   5.640(Ft/s)
Flow width (from curb towards crown)=  10.620(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       65.000 to Point/Station       65.000
**** CONFLUENCE OF MINOR STREAMS ****
BASIN A + BASIN B
------------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      3.210(Ac.)
Runoff from this stream =      6.717(CFS)
Time of concentration =   11.52 min.
Rainfall intensity =     4.360(In/Hr)
Summary of stream data:

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


1         3.407      11.21                4.437
2         6.717      11.52                4.360
Qmax(1) =
          1.000 *    1.000 *     3.407) +
          1.000 *    0.973 *     6.717) + =       9.945
Qmax(2) =
          0.983 *    1.000 *     3.407) +
          1.000 *    1.000 *     6.717) + =      10.065

Total of 2 streams to confluence:
Flow rates before confluence point:
       3.407       6.717
Maximum flow rates at confluence using above data:
        9.945       10.065
Area of streams before confluence:
        1.600        3.210
Results of confluence:
Total flow rate =     10.065(CFS)
Time of concentration =    11.522 min.
Effective stream area after confluence =      4.810(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       65.000 to Point/Station       70.000
**** IMPROVED CHANNEL TRAVEL TIME ****
3 FEET WIDE SPILLWAY
------------------------------------------------------------------------------
Upstream point elevation =   706.800(Ft.)
Downstream point elevation =   703.500(Ft.)
Channel length thru subarea  =    10.200(Ft.)
Channel base width       =    3.000(Ft.)
Slope or 'Z' of left channel bank = 100.000
Slope or 'Z' of right channel bank = 100.000
```

```
Manning's 'N'    = 0.005
Maximum depth of channel  =    0.500(Ft.)
Flow(q) thru subarea =     10.065(CFS)
Depth of flow =   0.064(Ft.), Average velocity =  16.917(Ft/s)
Channel flow top width =   15.716(Ft.)
Flow Velocity =   16.92(Ft/s)
Travel time  =    0.01 min.
Time of concentration =   11.53 min.
Critical depth =      0.215(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       70.000 to Point/Station       75.000
**** SUBAREA FLOW ADDITION ****
BASIN G
------------------------------------------------------------------------------
Rainfall intensity (I) =      4.357(In/Hr) for a   100.0 year storm
User specified 'C' value of 0.300 given for subarea
Time of concentration =    11.53 min.
Rainfall intensity =      4.357(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for total area
(Q=KCIA) is C = 0.476  CA =      2.339
Subarea runoff =      0.125(CFS) for      0.100(Ac.)
Total runoff =     10.190(CFS)      Total area =       4.910(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       75.000 to Point/Station       75.000
**** 6 HOUR HYDROGRAPH ****
------------------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Hydrograph Data - Section 6, San Diego County Hydrology manual, June 2003


Time of Concentration =  11.53
Basin Area =    26.16 Acres
6 Hour Rainfall =  2.835 Inches
Runoff Coefficient =  0.089
Peak Discharge =    10.19 CFS
     Time (Min)     Discharge (CFS)
       0               0.000
       11               0.395
       22               0.403
       33               0.420
       44               0.430
       55               0.450
       66               0.462
       77               0.487
       88               0.501
       99               0.532
       110               0.549
       121               0.589
       132               0.612
       143               0.665
       154               0.696
       165               0.772
       176               0.819
```

187	0.939
198	1.018
209	1.244
220	1.417
231	2.080
242	2.931
253	10.190
264	1.668
275	1.116
286	0.873
297	0.732
308	0.637
319	0.568
330	0.516
341	0.474
352	0.440
363	0.411

++

6 - H O U R S T O R M

R u n o f f H y d r o g r a p h

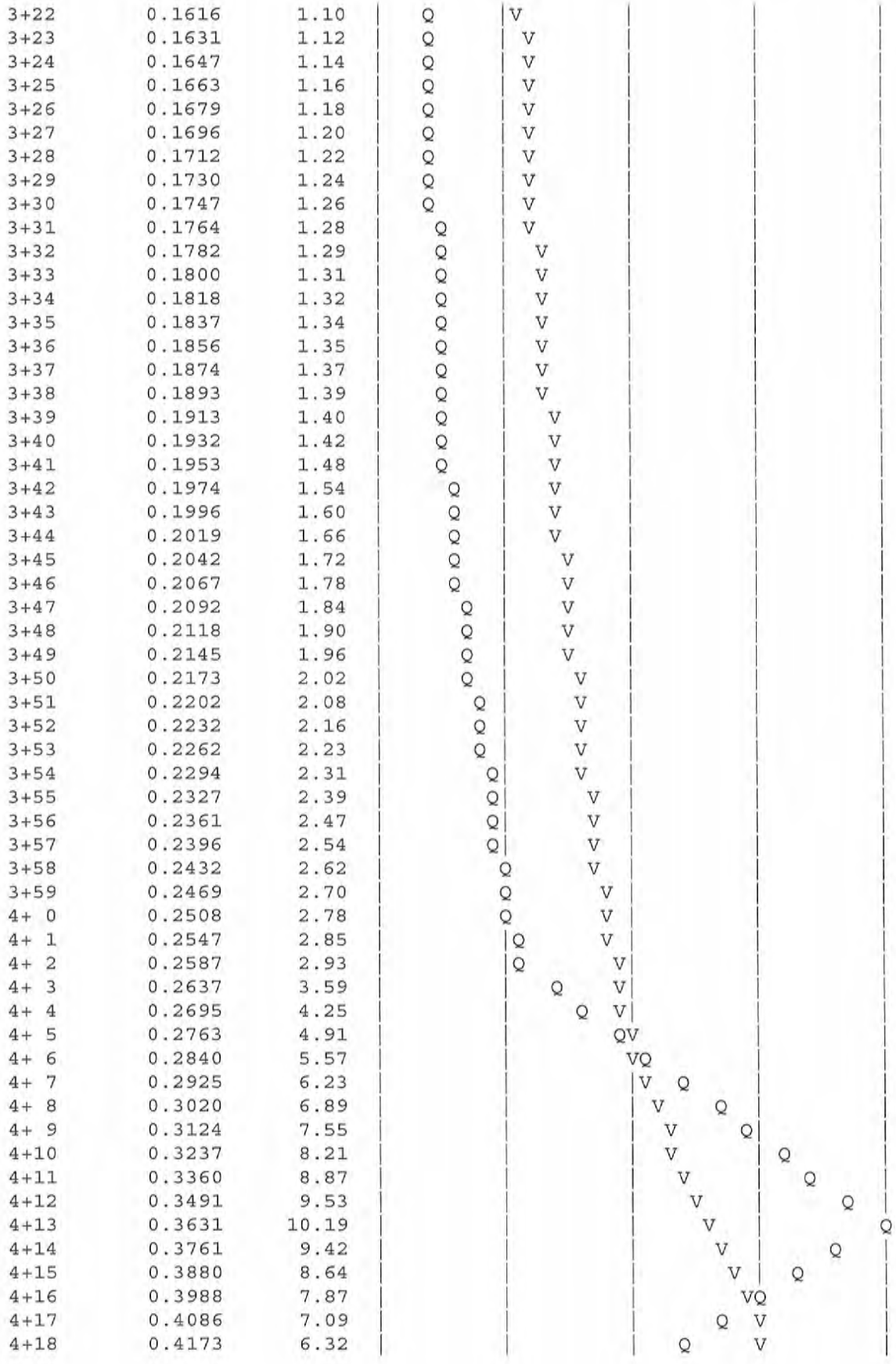
Hydrograph in 1 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.1	7.6	10.2
0+ 0	0.0000	0.00	Q	|	|	|	|
0+ 1	0.0000	0.04	Q	|	|	|	|
0+ 2	0.0001	0.07	Q	|	|	|	|
0+ 3	0.0003	0.11	Q	|	|	|	|
0+ 4	0.0005	0.14	Q	|	|	|	|
0+ 5	0.0007	0.18	Q	|	|	|	|
0+ 6	0.0010	0.22	Q	|	|	|	|
0+ 7	0.0014	0.25	Q	|	|	|	|
0+ 8	0.0018	0.29	VQ	|	|	|	|
0+ 9	0.0022	0.32	VQ	|	|	|	|
0+10	0.0027	0.36	VQ	|	|	|	|
0+11	0.0033	0.39	VQ	|	|	|	|
0+12	0.0038	0.40	VQ	|	|	|	|
0+13	0.0044	0.40	VQ	|	|	|	|
0+14	0.0049	0.40	VQ	|	|	|	|
0+15	0.0054	0.40	VQ	|	|	|	|
0+16	0.0060	0.40	VQ	|	|	|	|
0+17	0.0065	0.40	VQ	|	|	|	|
0+18	0.0071	0.40	VQ	|	|	|	|
0+19	0.0077	0.40	VQ	|	|	|	|
0+20	0.0082	0.40	VQ	|	|	|	|
0+21	0.0088	0.40	VQ	|	|	|	|
0+22	0.0093	0.40	VQ	|	|	|	|
0+23	0.0099	0.40	VQ	|	|	|	|
0+24	0.0104	0.41	VQ	|	|	|	|
0+25	0.0110	0.41	VQ	|	|	|	|
0+26	0.0116	0.41	VQ	|	|	|	|
0+27	0.0121	0.41	VQ	|	|	|	|
0+28	0.0127	0.41	VQ	|	|	|	|
0+29	0.0133	0.41	VQ	|	|	|	|
0+30	0.0138	0.42	|Q	|	|	|	|

0+31	0.0144	0.42	Q				
0+32	0.0150	0.42	Q				
0+33	0.0156	0.42	Q				
0+34	0.0161	0.42	Q				
0+35	0.0167	0.42	Q				
0+36	0.0173	0.42	Q				
0+37	0.0179	0.42	Q				
0+38	0.0185	0.42	Q				
0+39	0.0191	0.43	Q				
0+40	0.0196	0.43	Q				
0+41	0.0202	0.43	Q				
0+42	0.0208	0.43	Q				
0+43	0.0214	0.43	Q				
0+44	0.0220	0.43	Q				
0+45	0.0226	0.43	Q				
0+46	0.0232	0.43	Q				
0+47	0.0238	0.44	Q				
0+48	0.0244	0.44	Q				
0+49	0.0250	0.44	Q				
0+50	0.0256	0.44	Q				
0+51	0.0262	0.44	Q				
0+52	0.0268	0.44	Q				
0+53	0.0275	0.45	QV				
0+54	0.0281	0.45	QV				
0+55	0.0287	0.45	QV				
0+56	0.0293	0.45	QV				
0+57	0.0299	0.45	QV				
0+58	0.0306	0.45	QV				
0+59	0.0312	0.45	QV				
1+ 0	0.0318	0.46	QV				
1+ 1	0.0324	0.46	QV				
1+ 2	0.0331	0.46	QV				
1+ 3	0.0337	0.46	QV				
1+ 4	0.0343	0.46	QV				
1+ 5	0.0350	0.46	QV				
1+ 6	0.0356	0.46	QV				
1+ 7	0.0363	0.46	QV				
1+ 8	0.0369	0.47	QV				
1+ 9	0.0375	0.47	QV				
1+10	0.0382	0.47	QV				
1+11	0.0388	0.47	QV				
1+12	0.0395	0.48	QV				
1+13	0.0402	0.48	QV				
1+14	0.0408	0.48	Q V				
1+15	0.0415	0.48	Q V				
1+16	0.0421	0.48	Q V				
1+17	0.0428	0.49	Q V				
1+18	0.0435	0.49	Q V				
1+19	0.0442	0.49	Q V				
1+20	0.0448	0.49	Q V				
1+21	0.0455	0.49	Q V				
1+22	0.0462	0.49	Q V				
1+23	0.0469	0.49	Q V				
1+24	0.0476	0.50	Q V				
1+25	0.0482	0.50	Q V				
1+26	0.0489	0.50	Q V				
1+27	0.0496	0.50	Q V				

1+28	0.0503	0.50	Q V				
1+29	0.0510	0.50	Q V				
1+30	0.0517	0.51	Q V				
1+31	0.0524	0.51	Q V				
1+32	0.0531	0.51	QV				
1+33	0.0538	0.51	QV				
1+34	0.0545	0.52	Q V				
1+35	0.0552	0.52	Q V				
1+36	0.0560	0.52	Q V				
1+37	0.0567	0.53	Q V				
1+38	0.0574	0.53	Q V				
1+39	0.0581	0.53	Q V				
1+40	0.0589	0.53	Q V				
1+41	0.0596	0.53	Q V				
1+42	0.0604	0.54	Q V				
1+43	0.0611	0.54	Q V				
1+44	0.0618	0.54	Q V				
1+45	0.0626	0.54	Q V				
1+46	0.0633	0.54	Q V				
1+47	0.0641	0.54	Q V				
1+48	0.0648	0.55	Q V				
1+49	0.0656	0.55	Q V				
1+50	0.0663	0.55	Q V				
1+51	0.0671	0.55	Q V				
1+52	0.0679	0.56	Q V				
1+53	0.0686	0.56	Q V				
1+54	0.0694	0.56	Q V				
1+55	0.0702	0.57	Q V				
1+56	0.0710	0.57	Q V				
1+57	0.0718	0.57	Q V				
1+58	0.0726	0.58	Q V				
1+59	0.0734	0.58	Q V				
2+ 0	0.0742	0.59	Q V				
2+ 1	0.0750	0.59	Q V				
2+ 2	0.0758	0.59	Q V				
2+ 3	0.0766	0.59	Q V				
2+ 4	0.0774	0.59	Q V				
2+ 5	0.0783	0.60	Q V				
2+ 6	0.0791	0.60	Q V				
2+ 7	0.0799	0.60	Q V				
2+ 8	0.0808	0.60	Q V				
2+ 9	0.0816	0.61	Q V				
2+10	0.0824	0.61	Q V				
2+11	0.0833	0.61	Q V				
2+12	0.0841	0.61	Q V				
2+13	0.0850	0.62	Q V				
2+14	0.0858	0.62	Q V				
2+15	0.0867	0.63	Q V				
2+16	0.0875	0.63	Q V				
2+17	0.0884	0.64	Q V				
2+18	0.0893	0.64	Q V				
2+19	0.0902	0.65	Q V				
2+20	0.0911	0.65	Q V				
2+21	0.0920	0.66	Q V				
2+22	0.0929	0.66	Q V				
2+23	0.0938	0.66	Q V				
2+24	0.0947	0.67	Q V				

2+25	0.0957	0.67	Q V				
2+26	0.0966	0.67	Q V				
2+27	0.0975	0.68	Q V				
2+28	0.0984	0.68	Q V				
2+29	0.0994	0.68	Q V				
2+30	0.1003	0.68	Q V				
2+31	0.1013	0.69	Q V				
2+32	0.1022	0.69	Q V				
2+33	0.1032	0.69	Q V				
2+34	0.1041	0.70	Q V				
2+35	0.1051	0.70	Q V				
2+36	0.1061	0.71	Q V				
2+37	0.1071	0.72	Q V				
2+38	0.1081	0.72	Q V				
2+39	0.1091	0.73	Q V				
2+40	0.1101	0.74	Q V				
2+41	0.1111	0.74	Q V				
2+42	0.1122	0.75	Q V				
2+43	0.1132	0.76	Q V				
2+44	0.1143	0.77	Q V				
2+45	0.1153	0.77	Q V				
2+46	0.1164	0.78	Q V				
2+47	0.1175	0.78	Q V				
2+48	0.1185	0.78	Q V				
2+49	0.1196	0.79	Q V				
2+50	0.1207	0.79	Q V				
2+51	0.1218	0.80	Q V				
2+52	0.1229	0.80	Q V				
2+53	0.1240	0.81	Q V				
2+54	0.1251	0.81	Q V				
2+55	0.1263	0.81	Q V				
2+56	0.1274	0.82	Q V				
2+57	0.1285	0.83	Q V				
2+58	0.1297	0.84	Q V				
2+59	0.1309	0.85	Q V				
3+ 0	0.1321	0.86	Q V				
3+ 1	0.1333	0.87	Q V				
3+ 2	0.1345	0.88	Q V				
3+ 3	0.1357	0.89	Q V				
3+ 4	0.1370	0.91	Q V				
3+ 5	0.1382	0.92	Q V				
3+ 6	0.1395	0.93	Q V				
3+ 7	0.1408	0.94	Q V				
3+ 8	0.1421	0.95	Q V				
3+ 9	0.1434	0.95	Q V				
3+10	0.1447	0.96	Q V				
3+11	0.1461	0.97	Q V				
3+12	0.1474	0.97	Q V				
3+13	0.1488	0.98	Q V				
3+14	0.1501	0.99	Q V				
3+15	0.1515	1.00	Q V				
3+16	0.1529	1.00	Q V				
3+17	0.1543	1.01	Q V				
3+18	0.1557	1.02	Q V				
3+19	0.1571	1.04	Q V				
3+20	0.1586	1.06	Q V				
3+21	0.1600	1.08	Q V				



```
4+19       0.4249      5.54   |         |         |Q        |V        |
4+20       0.4315      4.77   |         |       Q |         |V        |
4+21       0.4370      3.99   |         |    Q    |         | V       |
4+22       0.4414      3.22   |         | Q       |         | V       |
4+23       0.4448      2.44   |        Q|         |         | V       |
4+24       0.4471      1.67   |     Q   |         |         | V       |
4+25       0.4493      1.62   |     Q   |         |         |  V      |
4+26       0.4515      1.57   |     Q   |         |         |  V      |
4+27       0.4536      1.52   |    Q    |         |         |  V      |
4+28       0.4556      1.47   |    Q    |         |         |  V      |
4+29       0.4576      1.42   |    Q    |         |         |  V      |
4+30       0.4594      1.37   |    Q    |         |         |  V      |
4+31       0.4613      1.32   |    Q    |         |         |  V      |
4+32       0.4630      1.27   |   Q     |         |         |   V     |
4+33       0.4647      1.22   |   Q     |         |         |   V     |
4+34       0.4663      1.17   |   Q     |         |         |   V     |
4+35       0.4678      1.12   |   Q     |         |         |   V     |
4+36       0.4693      1.09   |   Q     |         |         |   V     |
4+37       0.4708      1.07   |   Q     |         |         |   V     |
4+38       0.4722      1.05   |   Q     |         |         |   V     |
4+39       0.4737      1.03   |   Q     |         |         |   V     |
4+40       0.4750      1.01   |  Q      |         |         |   V     |
4+41       0.4764      0.98   |  Q      |         |         |    V    |
4+42       0.4777      0.96   |  Q      |         |         |    V    |
4+43       0.4790      0.94   |  Q      |         |         |    V    |
4+44       0.4803      0.92   |  Q      |         |         |    V    |
4+45       0.4815      0.90   |  Q      |         |         |    V    |
4+46       0.4827      0.87   |  Q      |         |         |    V    |
4+47       0.4839      0.86   |  Q      |         |         |    V    |
4+48       0.4851      0.85   |  Q      |         |         |    V    |
4+49       0.4862      0.83   |  Q      |         |         |    V    |
4+50       0.4874      0.82   |  Q      |         |         |    V    |
4+51       0.4885      0.81   |  Q      |         |         |    V    |
4+52       0.4896      0.80   |  Q      |         |         |     V   |
4+53       0.4906      0.78   |  Q      |         |         |     V   |
4+54       0.4917      0.77   |  Q      |         |         |     V   |
4+55       0.4928      0.76   | Q       |         |         |     V   |
4+56       0.4938      0.74   | Q       |         |         |     V   |
4+57       0.4948      0.73   | Q       |         |         |     V   |
4+58       0.4958      0.72   | Q       |         |         |     V   |
4+59       0.4968      0.71   | Q       |         |         |     V   |
5+ 0       0.4977      0.71   | Q       |         |         |     V   |
5+ 1       0.4987      0.70   | Q       |         |         |     V   |
5+ 2       0.4996      0.69   | Q       |         |         |     V   |
5+ 3       0.5006      0.68   | Q       |         |         |     V   |
5+ 4       0.5015      0.67   | Q       |         |         |     V   |
5+ 5       0.5024      0.66   | Q       |         |         |      V  |
5+ 6       0.5033      0.65   | Q       |         |         |      V  |
5+ 7       0.5042      0.65   | Q       |         |         |      V  |
5+ 8       0.5051      0.64   | Q       |         |         |      V  |
5+ 9       0.5060      0.63   | Q       |         |         |      V  |
5+10       0.5068      0.62   | Q       |         |         |      V  |
5+11       0.5077      0.62   | Q       |         |         |      V  |
5+12       0.5085      0.61   | Q       |         |         |      V  |
5+13       0.5093      0.61   | Q       |         |         |      V  |
5+14       0.5102      0.60   | Q       |         |         |      V  |
5+15       0.5110      0.59   | Q       |         |         |      V  |
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5+16	0.5118	0.59	Q				V
5+17	0.5126	0.58	Q				V
5+18	0.5134	0.57	Q				V
5+19	0.5142	0.57	Q				V
5+20	0.5149	0.56	Q				V
5+21	0.5157	0.56	Q				V
5+22	0.5165	0.55	Q				V
5+23	0.5172	0.55	Q				V
5+24	0.5180	0.54	Q				V
5+25	0.5187	0.54	Q				V
5+26	0.5195	0.53	Q				V
5+27	0.5202	0.53	Q				V
5+28	0.5209	0.53	Q				V
5+29	0.5216	0.52	Q				V
5+30	0.5223	0.52	Q				V
5+31	0.5230	0.51	Q				V
5+32	0.5237	0.51	Q				V
5+33	0.5244	0.50	Q				V
5+34	0.5251	0.50	Q				V
5+35	0.5258	0.50	Q				V
5+36	0.5265	0.49	Q				V
5+37	0.5272	0.49	Q				V
5+38	0.5278	0.49	Q				V
5+39	0.5285	0.48	Q				V
5+40	0.5292	0.48	Q				V
5+41	0.5298	0.47	Q				V
5+42	0.5305	0.47	Q				V
5+43	0.5311	0.47	Q				V
5+44	0.5317	0.46	Q				V
5+45	0.5324	0.46	Q				V
5+46	0.5330	0.46	Q				V
5+47	0.5336	0.46	Q				V
5+48	0.5343	0.45	Q				V
5+49	0.5349	0.45	Q				V
5+50	0.5355	0.45	Q				V
5+51	0.5361	0.44	Q				V
5+52	0.5367	0.44	Q				V
5+53	0.5373	0.44	Q				V
5+54	0.5379	0.43	Q				V
5+55	0.5385	0.43	Q				V
5+56	0.5391	0.43	Q				V
5+57	0.5397	0.43	Q				V
5+58	0.5403	0.42	Q				V
5+59	0.5408	0.42	Q				V
6+ 0	0.5414	0.42	Q				V
6+ 1	0.5420	0.42	Q				V
6+ 2	0.5426	0.41	Q				V
6+ 3	0.5431	0.41	Q				V

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Process from Point/Station 75.000 to Point/Station 75.000

**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area = 4.910(Ac.)
Runoff from this stream = 10.190(CFS)
Time of concentration = 11.53 min.
Rainfall intensity = 4.357(In/Hr)
Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	35.900	13.17	3.999
2	10.190	11.53	4.357

Qmax(1) =
1.000 * 1.000 * 35.900) +
0.918 * 1.000 * 10.190) + = 45.252
Qmax(2) =
1.000 * 0.875 * 35.900) +
1.000 * 1.000 * 10.190) + = 41.616

Total of 2 main streams to confluence:
Flow rates before confluence point:
35.900 10.190
Maximum flow rates at confluence using above data:
45.252 41.616
Area of streams before confluence:
21.250 4.910

Results of confluence:
Total flow rate = 45.252(CFS)
Time of concentration = 13.174 min.
Effective stream area after confluence = 26.160(Ac.)
End of computations, total study area = 26.160 (Ac.)