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Appendix C – Proposed Hydrology (Un-Mitigated Peak Flow)

Hydrologic Work Maps
AES Output

NODE 106 TOTAL
A = 73.4 AC
Un-Mitigated:
Q100 = 38.9 CFS
V100 = 5.8 FT/S
Mitigated Q100 = 30.22 cfs

106

Proposed Storage at Node 106. Refer to exhibit in Appendix D.

129

NODE 129 TOTAL
ΔE = 96 ft
L = 1,122 ft
s = 8.5%
n = 0.03
R = 0.45 ft
V = 1.49/n*R^(2/3)*s^(1/2)
V = 8.5 ft/s

I = 7.44*P6*D^(-0.645)
I = 7.9 in/hr
A = 11.3 AC
P6 = 3.0 in
D = 5.0 min
c=0.23
Q100 = C*I*A
Unmitigated Q100 = 20.5 cfs
Mitigated Q100 = 14.2 cfs

Proposed Storage at Node 129. Refer to exhibit in Appendix D.

NODE 128 TOTAL
A = 24.2 AC
Un-Mitigated:
Q100 = 17.5 CFS
V100 = 4.3 FT/S
Mitigated Q100 = 9.3 cfs

128

Proposed Detention Basin at Node 128. Refer to exhibit in Appendix D.

NODE 156 TOTAL
A = 21.0 AC
Un-Mitigated:
Q100 = 16.4 CFS
V100 = 5.5 FT/S
Mitigated Q100 = 13.4 cfs

156

Proposed Pipe Storage at Node 156. Refer to exhibit in Appendix D

166

NODE 166 TOTAL
A = 57.3 AC
Un-Mitigated:
Q100 = 54.5 CFS
V100 = 4.4 FT/S
Mitigated Q100 = 19.8 cfs

Proposed Detention Basin at Node 165. Refer to exhibit in Appendix D.

AES Code 8
"Add Area"
A = 45.9 AC
C = 0.23

AES Code 8
"Add Area"
A = 42.04 AC
C = 0.20

EXISTING PUBLIC CULVERT
Per SanGIS:
21" X 15" CSPA

SEE OFF-SITE DRAINAGE MAP IN APPENDIX E

NODE 118 TOTAL
Q100 = 26.2 CFS
V100 = 3.9 FT/S
A = 51.2 AC

118

NODE 180 TOTAL
ΔE = 52 ft
L = 419 ft
s = 11.0%
n = 0.03
R = 0.45 ft
V = 1.49/n*R^(2/3)*s^(1/2)
V = 9.7 ft/s

I = 7.44*P6*D^(-0.645)
I = 7.9 in/hr
A = 7.04 AC
P6 = 3.0 in
D = 5.0 min
c=0.20
Q100 = C*I*A
Q100 = 11.1 cfs

180

EXISTING PUBLIC CULVERT
Per SanGIS:
21" X 15" CSPA

NODE 138 TOTAL
Q100 = 45.5 CFS
V100 = 3.7 FT/S
A = 89.1 AC

138

EXISTING 36" CULVERT
L = 16'

PROPOSED EXTENSION TO
L=36'

NODE 149 TOTAL
Q100 = 66.5 CFS
V100 = 4.2 FT/S
A = 108.6 AC

149

EXISTING PUBLIC CULVERT
Per SanGIS:
18" CSP

SEE AREA B DRAINAGE MAP

100-YR Inundation, refer to Appendix F

NODE 170 TOTAL
ΔE = 51 ft
L = 585 ft
s = 8.7%
n = 0.03
R = 0.505 ft
V = 1.49/n*R^(2/3)*s^(1/2)
V = 9.3 ft/s

I = 7.44*P6*D^(-0.645)
I = 7.9 in/hr
A = 13.61 AC
P6 = 3.0 in
D = 5.0 min
c=0.20
Q100 = C*I*A
Q100 = 21.5 cfs

170

AREA A NORTH

AREA A SOUTH

JEWEL VALLEY RD

Area A North

Area A South

Michael Baker
INTERNATIONAL
9755 Clairemont Mesa Boulevard
San Diego, CA 92124
Phone: (858) 614-5000 ·
MBAKERINTL.COM

300 150 0 300 600 900
SCALE: 1"=300'

SCALE 1"=300'

LEGEND
DRAINAGE BOUNDARY
FLOW PATH
DRAINAGE NODE (100)

185614 - STARLIGHT SOLAR
PROPOSED DRAINAGE MAP
ON-SITE AREA A

```
****************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
         (c) Copyright 1982-2016 Advanced Engineering Software (aes)
             Ver. 23.0 Release Date: 07/01/2016  License ID 1264

                           Analysis prepared by:






 ************************** DESCRIPTION OF STUDY **************************
* 185614 STARLIGHT SOLAR                                                   *
* PR Q100 ON-SITE AREA A                                                   *
* 2024-02-27                                                               *
 **************************************************************************

  FILE NAME: 614PRA.DAT
  TIME/DATE OF STUDY: 17:33 02/27/2024
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.000
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  24.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.85
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

+--------------------------------------------------------------------------+
| BEGIN AREA DRAINING TO NODE 106                                          |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    102.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
```

```
  USER-SPECIFIED RUNOFF COEFFICIENT = .2300
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    96.00
  UPSTREAM ELEVATION(FEET) =   3720.00
  DOWNSTREAM ELEVATION(FEET) =   3710.00
  ELEVATION DIFFERENCE(FEET) =     10.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.122
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.291
  SUBAREA RUNOFF(CFS) =      0.14
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.14

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3710.00  DOWNSTREAM(FEET) =   3690.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   363.00   CHANNEL SLOPE =  0.0551
  CHANNEL BASE(FEET) =   60.00   "Z" FACTOR =  99.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.006
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2300
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.94
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.84
  AVERAGE FLOW DEPTH(FEET) =   0.02   TRAVEL TIME(MIN.) =   7.22
  Tc(MIN.) =   14.34
  SUBAREA AREA(ACRES) =     1.71       SUBAREA RUNOFF(CFS) =    1.58
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.230
  TOTAL AREA(ACRES) =        1.8         PEAK FLOW RATE(CFS) =       1.67

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.03   FLOW VELOCITY(FEET/SEC.) =   1.04
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    103.00 =     459.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    104.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3690.00  DOWNSTREAM(FEET) =   3670.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1099.00   CHANNEL SLOPE =  0.0182
  CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =  99.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.493
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2300
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.18
  AVERAGE FLOW DEPTH(FEET) =   0.09   TRAVEL TIME(MIN.) =  15.58
  Tc(MIN.) =   29.92
  SUBAREA AREA(ACRES) =    14.45       SUBAREA RUNOFF(CFS) =    8.29
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.230
  TOTAL AREA(ACRES) =       16.3         PEAK FLOW RATE(CFS) =       9.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
```

```
  DEPTH(FEET) =  0.11   FLOW VELOCITY(FEET/SEC.) =   1.37
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    104.00 =    1558.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    106.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3660.00  DOWNSTREAM(FEET) =   3554.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1371.00   CHANNEL SLOPE =  0.0773
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   7.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.301
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2300
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.77
  AVERAGE FLOW DEPTH(FEET) =   0.55   TRAVEL TIME(MIN.) =   3.96
  Tc(MIN.) =   33.88
  SUBAREA AREA(ACRES) =    11.27       SUBAREA RUNOFF(CFS) =    5.96
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.230
  TOTAL AREA(ACRES) =       27.5         PEAK FLOW RATE(CFS) =      14.57

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.58   FLOW VELOCITY(FEET/SEC.) =   6.09
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    106.00 =    2929.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.301
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2300
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2300
  SUBAREA AREA(ACRES) =   45.90   SUBAREA RUNOFF(CFS) =   24.29
  TOTAL AREA(ACRES) =       73.4   TOTAL RUNOFF(CFS) =      38.86
  TC(MIN.) =   33.88

+--------------------------------------------------------------------------+
| BEGIN AREA DRAINING TO NODE 118                                          |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    112.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    91.00
  UPSTREAM ELEVATION(FEET) =   3720.00
  DOWNSTREAM ELEVATION(FEET) =   3710.00
  ELEVATION DIFFERENCE(FEET) =     10.00
```

Results here used to developed 100yr inflow hydrograph for storage analysis.

NODE 106

```
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.174
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.262
  SUBAREA RUNOFF(CFS) =      0.13
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.13

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    113.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3710.00  DOWNSTREAM(FEET) =   3655.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   313.00   CHANNEL SLOPE =  0.1757
  CHANNEL BASE(FEET) =   50.00   "Z" FACTOR =  99.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.483
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.07
  AVERAGE FLOW DEPTH(FEET) =   0.02   TRAVEL TIME(MIN.) =   4.87
  Tc(MIN.) =   12.04
  SUBAREA AREA(ACRES) =     1.85       SUBAREA RUNOFF(CFS) =    1.66
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =        2.0         PEAK FLOW RATE(CFS) =       1.75

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.02   FLOW VELOCITY(FEET/SEC.) =   1.68
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    113.00 =     404.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    113.00 TO NODE    114.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3655.00  DOWNSTREAM(FEET) =   3650.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   772.00   CHANNEL SLOPE =  0.0065
  CHANNEL BASE(FEET) =   23.00   "Z" FACTOR =  15.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.011
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.28
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.25
  AVERAGE FLOW DEPTH(FEET) =   0.19   TRAVEL TIME(MIN.) =  10.28
  Tc(MIN.) =   22.32
  SUBAREA AREA(ACRES) =    14.69       SUBAREA RUNOFF(CFS) =    8.85
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =       16.6         PEAK FLOW RATE(CFS) =      10.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.25   FLOW VELOCITY(FEET/SEC.) =   1.47
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    114.00 =    1176.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    114.00 TO NODE    116.00 IS CODE =  51
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3650.00  DOWNSTREAM(FEET) =   3610.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   489.00   CHANNEL SLOPE =  0.0818
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  14.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.879
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.07
  AVERAGE FLOW DEPTH(FEET) =   0.43   TRAVEL TIME(MIN.) =   1.61
  Tc(MIN.) =   23.93
  SUBAREA AREA(ACRES) =    10.78       SUBAREA RUNOFF(CFS) =    6.21
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =       27.4         PEAK FLOW RATE(CFS) =      15.79

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.46   FLOW VELOCITY(FEET/SEC.) =   5.32
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    116.00 =    1665.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    116.00 TO NODE    118.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3610.00  DOWNSTREAM(FEET) =   3570.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1110.00   CHANNEL SLOPE =  0.0360
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  20.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.561
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      21.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.88
  AVERAGE FLOW DEPTH(FEET) =   0.53   TRAVEL TIME(MIN.) =   4.77
  Tc(MIN.) =   28.70
  SUBAREA AREA(ACRES) =    23.78       SUBAREA RUNOFF(CFS) =   12.18
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =       51.2         PEAK FLOW RATE(CFS) =      26.22

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.57   FLOW VELOCITY(FEET/SEC.) =   4.07
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    118.00 =    2775.00 FEET.

+--------------------------------------------------------------------------+
| BEGIN AREA DRAINING TO NODE 128                                          |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    120.00 TO NODE    122.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  *USER SPECIFIED(SUBAREA):
```

NODE 118

```
  USER-SPECIFIED RUNOFF COEFFICIENT = .2300
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   3694.00
  DOWNSTREAM ELEVATION(FEET) =   3690.00
  ELEVATION DIFFERENCE(FEET) =      4.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.866
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.099
  SUBAREA RUNOFF(CFS) =      0.13
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.13

****************************************************************************
  FLOW PROCESS FROM NODE    122.00 TO NODE    123.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3690.00  DOWNSTREAM(FEET) =   3674.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   251.00   CHANNEL SLOPE =  0.0637
  CHANNEL BASE(FEET) =   30.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.158
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2300
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.14
  AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =   3.67
  Tc(MIN.) =   13.53
  SUBAREA AREA(ACRES) =     1.73       SUBAREA RUNOFF(CFS) =    1.65
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.230
  TOTAL AREA(ACRES) =        1.8         PEAK FLOW RATE(CFS) =       1.76

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.04   FLOW VELOCITY(FEET/SEC.) =   1.41
  LONGEST FLOWPATH FROM NODE    120.00 TO NODE    123.00 =     351.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    123.00 TO NODE    124.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3674.00  DOWNSTREAM(FEET) =   3616.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   657.00   CHANNEL SLOPE =  0.0883
  CHANNEL BASE(FEET) =   35.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.361
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2300
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.14
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.07
  AVERAGE FLOW DEPTH(FEET) =   0.06   TRAVEL TIME(MIN.) =   5.29
  Tc(MIN.) =   18.82
  SUBAREA AREA(ACRES) =     6.07       SUBAREA RUNOFF(CFS) =    4.69
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.230
  TOTAL AREA(ACRES) =        7.9         PEAK FLOW RATE(CFS) =       6.12

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.07   FLOW VELOCITY(FEET/SEC.) =   2.39
```

```
  LONGEST FLOWPATH FROM NODE    120.00 TO NODE    124.00 =    1008.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    124.00 TO NODE    128.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3616.00  DOWNSTREAM(FEET) =   3560.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   576.00   CHANNEL SLOPE =  0.0972
  CHANNEL BASE(FEET) =   13.00   "Z" FACTOR =  14.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.129
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2300
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.34
  AVERAGE FLOW DEPTH(FEET) =   0.18   TRAVEL TIME(MIN.) =   2.21
  Tc(MIN.) =   21.04
  SUBAREA AREA(ACRES) =    16.34       SUBAREA RUNOFF(CFS) =   11.76
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.230
  TOTAL AREA(ACRES) =       24.2         PEAK FLOW RATE(CFS) =      17.45

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.22   FLOW VELOCITY(FEET/SEC.) =   4.98
  LONGEST FLOWPATH FROM NODE    120.00 TO NODE    128.00 =    1584.00 FEET.

+--------------------------------------------------------------------------+
| BEGIN AREA DRAINING TO NODE 138                                          |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    130.00 TO NODE    132.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    96.00
  UPSTREAM ELEVATION(FEET) =   3688.00
  DOWNSTREAM ELEVATION(FEET) =   3684.00
  ELEVATION DIFFERENCE(FEET) =      4.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.865
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.099
  SUBAREA RUNOFF(CFS) =      0.19
  TOTAL AREA(ACRES) =      0.19   TOTAL RUNOFF(CFS) =      0.19

****************************************************************************
  FLOW PROCESS FROM NODE    132.00 TO NODE    133.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3684.00  DOWNSTREAM(FEET) =   3660.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   396.00   CHANNEL SLOPE =  0.0606
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   6.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
```

Results here used to developed 100yr inflow hydrograph for storage analysis.

NODE 128

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.464
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .2000
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.00
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.92
 AVERAGE FLOW DEPTH(FEET) =   0.24   TRAVEL TIME(MIN.) =   2.26
 Tc(MIN.) =   12.12
 SUBAREA AREA(ACRES) =     1.81       SUBAREA RUNOFF(CFS) =    1.62
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
 TOTAL AREA(ACRES) =        2.0         PEAK FLOW RATE(CFS) =       1.79

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.29   FLOW VELOCITY(FEET/SEC.) =   3.43
 LONGEST FLOWPATH FROM NODE    130.00 TO NODE    133.00 =     492.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    133.00 TO NODE    134.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   3660.00  DOWNSTREAM(FEET) =   3638.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   510.00   CHANNEL SLOPE =  0.0431
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  14.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.904
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .2000
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.28
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.03
 AVERAGE FLOW DEPTH(FEET) =   0.32   TRAVEL TIME(MIN.) =   2.80
 Tc(MIN.) =   14.93
 SUBAREA AREA(ACRES) =     6.37       SUBAREA RUNOFF(CFS) =    4.97
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
 TOTAL AREA(ACRES) =        8.4         PEAK FLOW RATE(CFS) =       6.54

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.37   FLOW VELOCITY(FEET/SEC.) =   3.39
 LONGEST FLOWPATH FROM NODE    130.00 TO NODE    134.00 =    1002.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    134.00 TO NODE    136.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   3638.00  DOWNSTREAM(FEET) =   3590.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1409.00   CHANNEL SLOPE =  0.0341
 CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =  20.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.054
 *USER SPECIFIED(SUBAREA):
 USER-SPECIFIED RUNOFF COEFFICIENT = .2000
 S.C.S. CURVE NUMBER (AMC II) =   0
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      15.01
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.40
 AVERAGE FLOW DEPTH(FEET) =   0.36   TRAVEL TIME(MIN.) =   6.91
 Tc(MIN.) =   21.84
 SUBAREA AREA(ACRES) =    27.56       SUBAREA RUNOFF(CFS) =   16.83
```

```
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =       35.9         PEAK FLOW RATE(CFS) =      21.95

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.43   FLOW VELOCITY(FEET/SEC.) =   3.75
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    136.00 =    2411.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    136.00 TO NODE    138.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3590.00  DOWNSTREAM(FEET) =   3512.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1556.00   CHANNEL SLOPE =  0.0501
  CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =  25.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.555
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      35.53
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.72
  AVERAGE FLOW DEPTH(FEET) =   0.21   TRAVEL TIME(MIN.) =   6.96
  Tc(MIN.) =   28.80
  SUBAREA AREA(ACRES) =    53.16       SUBAREA RUNOFF(CFS) =   27.16
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =       89.1         PEAK FLOW RATE(CFS) =      45.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.25   FLOW VELOCITY(FEET/SEC.) =   3.99
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    138.00 =    3967.00 FEET.

+--------------------------------------------------------------------------+
| BEGIN AREA DRAINING TO NODE 149                                          |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    140.00 TO NODE    142.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   3698.00
  DOWNSTREAM ELEVATION(FEET) =   3690.00
  ELEVATION DIFFERENCE(FEET) =      8.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.101
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.790
  SUBAREA RUNOFF(CFS) =      0.50
  TOTAL AREA(ACRES) =      0.43   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
  FLOW PROCESS FROM NODE    142.00 TO NODE    143.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
```

NODE 138

```
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3690.00  DOWNSTREAM(FEET) =   3680.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   169.00   CHANNEL SLOPE =  0.0592
  CHANNEL BASE(FEET) =   30.00   "Z" FACTOR =   7.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.932
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.23
  AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =   2.29
  Tc(MIN.) =   10.39
  SUBAREA AREA(ACRES) =     1.09       SUBAREA RUNOFF(CFS) =    1.08
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =        1.5         PEAK FLOW RATE(CFS) =       1.50

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.04   FLOW VELOCITY(FEET/SEC.) =   1.40
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    143.00 =     269.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    143.00 TO NODE    144.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3680.00  DOWNSTREAM(FEET) =   3640.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   409.00   CHANNEL SLOPE =  0.0978
  CHANNEL BASE(FEET) =   12.00   "Z" FACTOR =   6.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.368
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.17
  AVERAGE FLOW DEPTH(FEET) =   0.10   TRAVEL TIME(MIN.) =   2.15
  Tc(MIN.) =   12.54
  SUBAREA AREA(ACRES) =     5.35       SUBAREA RUNOFF(CFS) =    4.67
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =        6.9         PEAK FLOW RATE(CFS) =       6.00

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.12   FLOW VELOCITY(FEET/SEC.) =   3.77
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    144.00 =     678.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    144.00 TO NODE    146.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3640.00  DOWNSTREAM(FEET) =   3564.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   872.00   CHANNEL SLOPE =  0.0872
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  14.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.746
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
```

```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.31
  AVERAGE FLOW DEPTH(FEET) =   0.19   TRAVEL TIME(MIN.) =   3.37
  Tc(MIN.) =   15.91
  SUBAREA AREA(ACRES) =    11.26       SUBAREA RUNOFF(CFS) =    8.44
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =       18.1         PEAK FLOW RATE(CFS) =      13.58

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.22   FLOW VELOCITY(FEET/SEC.) =   4.61
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    146.00 =    1550.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    146.00 TO NODE    148.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3564.00  DOWNSTREAM(FEET) =   3516.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   774.00   CHANNEL SLOPE =  0.0620
  CHANNEL BASE(FEET) =   18.00   "Z" FACTOR =   9.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.361
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      21.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.42
  AVERAGE FLOW DEPTH(FEET) =   0.24   TRAVEL TIME(MIN.) =   2.92
  Tc(MIN.) =   18.83
  SUBAREA AREA(ACRES) =    23.02       SUBAREA RUNOFF(CFS) =   15.47
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =       41.2         PEAK FLOW RATE(CFS) =      27.66

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.28   FLOW VELOCITY(FEET/SEC.) =   4.86
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    148.00 =    2324.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    148.00 TO NODE    149.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3516.00  DOWNSTREAM(FEET) =   3490.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   742.00   CHANNEL SLOPE =  0.0350
  CHANNEL BASE(FEET) =    9.00   "Z" FACTOR =  20.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.062
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      35.44
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.22
  AVERAGE FLOW DEPTH(FEET) =   0.46   TRAVEL TIME(MIN.) =   2.93
  Tc(MIN.) =   21.76
  SUBAREA AREA(ACRES) =    25.43       SUBAREA RUNOFF(CFS) =   15.57
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =       66.6         PEAK FLOW RATE(CFS) =      40.77

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
```

```
  DEPTH(FEET) =  0.49   FLOW VELOCITY(FEET/SEC.) =   4.38
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    149.00 =    3066.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    149.00 TO NODE    149.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.062
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2000
  SUBAREA AREA(ACRES) =   42.04   SUBAREA RUNOFF(CFS) =   25.74
  TOTAL AREA(ACRES) =      108.6   TOTAL RUNOFF(CFS) =      66.51
  TC(MIN.) =   21.76

+----------------------------------------------------------------------------+
| BEGIN AREA DRAINING TO NODE 156                                            |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    150.00 TO NODE    152.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2300
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   3690.00
  DOWNSTREAM ELEVATION(FEET) =   3680.00
  ELEVATION DIFFERENCE(FEET) =     10.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.269
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.209
  SUBAREA RUNOFF(CFS) =      1.43
  TOTAL AREA(ACRES) =      1.00   TOTAL RUNOFF(CFS) =      1.43

****************************************************************************
  FLOW PROCESS FROM NODE    152.00 TO NODE    153.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3680.00  DOWNSTREAM(FEET) =   3668.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   431.00   CHANNEL SLOPE =  0.0278
  CHANNEL BASE(FEET) =   14.00   "Z" FACTOR =   9.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.561
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2300
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.26
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.61
  AVERAGE FLOW DEPTH(FEET) =   0.09   TRAVEL TIME(MIN.) =   4.46
  Tc(MIN.) =   11.73
  SUBAREA AREA(ACRES) =     1.57       SUBAREA RUNOFF(CFS) =    1.65
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.230
```

NODE 149

```
  TOTAL AREA(ACRES) =        2.6         PEAK FLOW RATE(CFS) =       2.70

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.10   FLOW VELOCITY(FEET/SEC.) =   1.74
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE    153.00 =     531.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    153.00 TO NODE    154.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3668.00  DOWNSTREAM(FEET) =   3616.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   723.00   CHANNEL SLOPE =  0.0719
  CHANNEL BASE(FEET) =   30.00   "Z" FACTOR =  15.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.645
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2300
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.47
  AVERAGE FLOW DEPTH(FEET) =   0.09   TRAVEL TIME(MIN.) =   4.88
  Tc(MIN.) =   16.60
  SUBAREA AREA(ACRES) =     9.50       SUBAREA RUNOFF(CFS) =    7.96
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.230
  TOTAL AREA(ACRES) =       12.1         PEAK FLOW RATE(CFS) =      10.12

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.11   FLOW VELOCITY(FEET/SEC.) =   2.92
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE    154.00 =    1254.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    154.00 TO NODE    156.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3616.00  DOWNSTREAM(FEET) =   3570.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   591.00   CHANNEL SLOPE =  0.0778
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.411
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2300
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.61
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.47
  AVERAGE FLOW DEPTH(FEET) =   0.50   TRAVEL TIME(MIN.) =   1.80
  Tc(MIN.) =   18.40
  SUBAREA AREA(ACRES) =     8.89       SUBAREA RUNOFF(CFS) =    6.97
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.230
  TOTAL AREA(ACRES) =       21.0         PEAK FLOW RATE(CFS) =      16.44

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.54   FLOW VELOCITY(FEET/SEC.) =   5.70
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE    156.00 =    1845.00 FEET.

+---------------------------------------------------------------------------+
| BEGIN AREA DRAINING TO NODE 166                                           |
|                                                                           |
```

Results here used to developed 100yr inflow hydrograph for storage analysis.

NODE 156

```
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    160.00 TO NODE    162.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2300
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    93.00
  UPSTREAM ELEVATION(FEET) =   3644.00
  DOWNSTREAM ELEVATION(FEET) =   3630.00
  ELEVATION DIFFERENCE(FEET) =     14.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.010
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.356
  SUBAREA RUNOFF(CFS) =      0.92
  TOTAL AREA(ACRES) =      0.63   TOTAL RUNOFF(CFS) =      0.92

****************************************************************************
  FLOW PROCESS FROM NODE    162.00 TO NODE    163.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3630.00  DOWNSTREAM(FEET) =   3610.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   213.00   CHANNEL SLOPE =  0.0939
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.860
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2300
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.34
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.77
  AVERAGE FLOW DEPTH(FEET) =   0.25   TRAVEL TIME(MIN.) =   0.94
  Tc(MIN.) =    7.95
  SUBAREA AREA(ACRES) =     2.10       SUBAREA RUNOFF(CFS) =    2.83
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.230
  TOTAL AREA(ACRES) =        2.7         PEAK FLOW RATE(CFS) =       3.68

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.29   FLOW VELOCITY(FEET/SEC.) =   4.24
  LONGEST FLOWPATH FROM NODE    160.00 TO NODE    163.00 =     306.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    163.00 TO NODE    164.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3610.00  DOWNSTREAM(FEET) =   3560.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   562.00   CHANNEL SLOPE =  0.0890
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.158
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2300
  S.C.S. CURVE NUMBER (AMC II) =   0
```

```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.41
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.38
  AVERAGE FLOW DEPTH(FEET) =   0.44   TRAVEL TIME(MIN.) =   1.74
  Tc(MIN.) =    9.69
  SUBAREA AREA(ACRES) =    11.32       SUBAREA RUNOFF(CFS) =   13.43
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.230
  TOTAL AREA(ACRES) =       14.0         PEAK FLOW RATE(CFS) =      16.67

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.52   FLOW VELOCITY(FEET/SEC.) =   6.08
  LONGEST FLOWPATH FROM NODE    160.00 TO NODE    164.00 =     868.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    164.00 TO NODE    165.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3560.00  DOWNSTREAM(FEET) =   3550.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   539.00   CHANNEL SLOPE =  0.0186
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  17.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.393
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2300
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      26.49
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.28
  AVERAGE FLOW DEPTH(FEET) =   0.69   TRAVEL TIME(MIN.) =   2.74
  Tc(MIN.) =   12.43
  SUBAREA AREA(ACRES) =    19.40       SUBAREA RUNOFF(CFS) =   19.60
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.230
  TOTAL AREA(ACRES) =       33.4         PEAK FLOW RATE(CFS) =      33.79

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.75   FLOW VELOCITY(FEET/SEC.) =   3.51
  LONGEST FLOWPATH FROM NODE    160.00 TO NODE    165.00 =    1407.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    165.00 TO NODE    166.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3550.00  DOWNSTREAM(FEET) =   3524.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   285.00   CHANNEL SLOPE =  0.0912
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.253
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2300
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      35.47
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.42
  AVERAGE FLOW DEPTH(FEET) =   0.69   TRAVEL TIME(MIN.) =   0.64
  Tc(MIN.) =   13.07
  SUBAREA AREA(ACRES) =     3.43       SUBAREA RUNOFF(CFS) =    3.35
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.230
  TOTAL AREA(ACRES) =       36.9         PEAK FLOW RATE(CFS) =      36.07

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
```

Results here used to developed 100yr inflow hydrograph for storage analysis.

NODE 165

```
  DEPTH(FEET) =  0.70   FLOW VELOCITY(FEET/SEC.) =   7.38
  LONGEST FLOWPATH FROM NODE    160.00 TO NODE    166.00 =    1692.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    166.00 TO NODE    166.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.07
  RAINFALL INTENSITY(INCH/HR) =   4.25
  TOTAL STREAM AREA(ACRES) =    36.88
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     36.07

****************************************************************************
  FLOW PROCESS FROM NODE    161.00 TO NODE    161.10 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2300
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   3654.00
  DOWNSTREAM ELEVATION(FEET) =   3640.00
  ELEVATION DIFFERENCE(FEET) =     14.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.269
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.209
  SUBAREA RUNOFF(CFS) =      0.61
  TOTAL AREA(ACRES) =      0.43   TOTAL RUNOFF(CFS) =      0.61

****************************************************************************
  FLOW PROCESS FROM NODE    161.10 TO NODE    161.20 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3640.00  DOWNSTREAM(FEET) =   3580.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   475.00   CHANNEL SLOPE =  0.1263
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.240
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2300
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.15
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.62
  AVERAGE FLOW DEPTH(FEET) =   0.10   TRAVEL TIME(MIN.) =   2.19
  Tc(MIN.) =    9.46
  SUBAREA AREA(ACRES) =     5.82       SUBAREA RUNOFF(CFS) =    7.01
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.230
  TOTAL AREA(ACRES) =        6.2         PEAK FLOW RATE(CFS) =       7.53

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.15   FLOW VELOCITY(FEET/SEC.) =   4.44
  LONGEST FLOWPATH FROM NODE    161.00 TO NODE    161.20 =     575.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    161.20 TO NODE    161.30 IS CODE =  51
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3580.00  DOWNSTREAM(FEET) =   3556.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   481.00   CHANNEL SLOPE =  0.0499
  CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.561
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2300
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.53
  AVERAGE FLOW DEPTH(FEET) =   0.19   TRAVEL TIME(MIN.) =   2.27
  Tc(MIN.) =   11.73
  SUBAREA AREA(ACRES) =     5.93       SUBAREA RUNOFF(CFS) =    6.22
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.230
  TOTAL AREA(ACRES) =       12.2         PEAK FLOW RATE(CFS) =      12.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.21   FLOW VELOCITY(FEET/SEC.) =   3.88
  LONGEST FLOWPATH FROM NODE    161.00 TO NODE    161.30 =    1056.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    161.30 TO NODE    166.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3556.00  DOWNSTREAM(FEET) =   3524.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   530.00   CHANNEL SLOPE =  0.0604
  CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.120
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2300
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.41
  AVERAGE FLOW DEPTH(FEET) =   0.23   TRAVEL TIME(MIN.) =   2.00
  Tc(MIN.) =   13.73
  SUBAREA AREA(ACRES) =     8.20       SUBAREA RUNOFF(CFS) =    7.77
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.230
  TOTAL AREA(ACRES) =       20.4         PEAK FLOW RATE(CFS) =      19.31

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.25   FLOW VELOCITY(FEET/SEC.) =   4.66
  LONGEST FLOWPATH FROM NODE    161.00 TO NODE    166.00 =    1586.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    166.00 TO NODE    166.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.73
  RAINFALL INTENSITY(INCH/HR) =   4.12
  TOTAL STREAM AREA(ACRES) =    20.38
```

```
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     19.31

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       36.07    13.07        4.253         36.88
     2       19.31    13.73        4.120         20.38

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF       Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       54.46    13.07       4.253
     2       54.26    13.73       4.120

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      54.46   Tc(MIN.) =   13.07
 TOTAL AREA(ACRES) =       57.3
 LONGEST FLOWPATH FROM NODE    160.00 TO NODE    166.00 =    1692.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =       57.3  TC(MIN.) =     13.07
 PEAK FLOW RATE(CFS)   =      54.46
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

NODE 166 (Unmitigated)

```
_____________________________________________________________________________
*****************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2016 Advanced Engineering Software (aes)
              Ver. 23.0 Release Date: 07/01/2016  License ID 1264

                              Analysis prepared by:
```

Mitigated Analysis for Node 166

```
 ************************** DESCRIPTION OF STUDY **************************
* 185614 STARLIGHT SOLAR                                                 *
* PR MITIGATED ON-SITE AREA A - NODES 165 AND 166                        *
* 2024-02-27                                                             *
 *************************************************************************

  FILE NAME: 614PRAM.DAT
  TIME/DATE OF STUDY: 18:38 02/27/2024
-----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
-----------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.000
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  24.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.85
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

+---------------------------------------------------------------------------+
| BEGIN AREA DRAINING TO NODE 166                                           |
| Use HydraFlow Hydrograph Output for Node 165 Basin Outflow                |
|                                                                           |
+---------------------------------------------------------------------------+
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    165.00 TO NODE    165.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED HYDROLOGY INFORMATION AT NODE<<<<<
============================================================================
  USER-SPECIFIED VALUES ARE AS FOLLOWS:
  TC(MIN) = 264.00   RAIN INTENSITY(INCH/HOUR) =  0.61
  TOTAL AREA(ACRES) =    33.40   TOTAL RUNOFF(CFS) =      9.00

****************************************************************************
  FLOW PROCESS FROM NODE    165.00 TO NODE    166.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3550.00  DOWNSTREAM(FEET) =   3524.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   285.00   CHANNEL SLOPE =  0.0912
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.611
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2300
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.24
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.32
  AVERAGE FLOW DEPTH(FEET) =   0.42   TRAVEL TIME(MIN.) =   0.89
  Tc(MIN.) =  264.89
  SUBAREA AREA(ACRES) =     3.43       SUBAREA RUNOFF(CFS) =    0.48
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.421
  TOTAL AREA(ACRES) =       36.8         PEAK FLOW RATE(CFS) =       9.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.42   FLOW VELOCITY(FEET/SEC.) =   5.30
  LONGEST FLOWPATH FROM NODE      0.00 TO NODE    166.00 =     285.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    166.00 TO NODE    166.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =  264.89
  RAINFALL INTENSITY(INCH/HR) =   0.61
  TOTAL STREAM AREA(ACRES) =    36.83
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.46

****************************************************************************
  FLOW PROCESS FROM NODE    161.00 TO NODE    161.10 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2300
  S.C.S. CURVE NUMBER (AMC II) =   0
```

```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   3654.00
  DOWNSTREAM ELEVATION(FEET) =   3640.00
  ELEVATION DIFFERENCE(FEET) =     14.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.269
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.209
  SUBAREA RUNOFF(CFS) =      0.61
  TOTAL AREA(ACRES) =      0.43   TOTAL RUNOFF(CFS) =      0.61

****************************************************************************
  FLOW PROCESS FROM NODE    161.10 TO NODE    161.20 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3640.00  DOWNSTREAM(FEET) =   3580.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   475.00   CHANNEL SLOPE =  0.1263
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.240
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2300
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.15
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.62
  AVERAGE FLOW DEPTH(FEET) =   0.10   TRAVEL TIME(MIN.) =   2.19
  Tc(MIN.) =    9.46
  SUBAREA AREA(ACRES) =     5.82       SUBAREA RUNOFF(CFS) =    7.01
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.230
  TOTAL AREA(ACRES) =        6.2         PEAK FLOW RATE(CFS) =       7.53

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.15   FLOW VELOCITY(FEET/SEC.) =   4.44
  LONGEST FLOWPATH FROM NODE    161.00 TO NODE    161.20 =     575.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    161.20 TO NODE    161.30 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3580.00  DOWNSTREAM(FEET) =   3556.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   481.00   CHANNEL SLOPE =  0.0499
  CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.561
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2300
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.53
  AVERAGE FLOW DEPTH(FEET) =   0.19   TRAVEL TIME(MIN.) =   2.27
  Tc(MIN.) =   11.73
  SUBAREA AREA(ACRES) =     5.93       SUBAREA RUNOFF(CFS) =    6.22
```

```
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.230
  TOTAL AREA(ACRES) =       12.2         PEAK FLOW RATE(CFS) =      12.78

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.21   FLOW VELOCITY(FEET/SEC.) =   3.88
  LONGEST FLOWPATH FROM NODE    161.00 TO NODE    161.30 =    1056.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    161.30 TO NODE    166.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3556.00  DOWNSTREAM(FEET) =   3524.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   530.00   CHANNEL SLOPE =  0.0604
  CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.120
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2300
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.41
  AVERAGE FLOW DEPTH(FEET) =   0.23   TRAVEL TIME(MIN.) =   2.00
  Tc(MIN.) =   13.73
  SUBAREA AREA(ACRES) =     8.20       SUBAREA RUNOFF(CFS) =    7.77
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.230
  TOTAL AREA(ACRES) =       20.4         PEAK FLOW RATE(CFS) =      19.31

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.25   FLOW VELOCITY(FEET/SEC.) =   4.66
  LONGEST FLOWPATH FROM NODE    161.00 TO NODE    166.00 =    1586.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    166.00 TO NODE    166.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.73
  RAINFALL INTENSITY(INCH/HR) =   4.12
  TOTAL STREAM AREA(ACRES) =    20.38
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     19.31

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        9.46   264.89        0.611         36.83
      2       19.31    13.73        4.120         20.38

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.
```

```
  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       19.80    13.73       4.120
      2       12.32   264.89       0.611

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      19.80   Tc(MIN.) =   13.73
  TOTAL AREA(ACRES) =       57.2
  LONGEST FLOWPATH FROM NODE    161.00 TO NODE    166.00 =    1586.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       57.2  TC(MIN.) =     13.73
  PEAK FLOW RATE(CFS)   =      19.80
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

NODE 166 (Mitigated)

SEE AREA A DRAINAGE MAP

EX. 36" Culvert To be extended from L=16' to L=36' to accommodate fire access

JEWEL VALLEY ROAD

100-YR Inundation, refer to Appendix F

SEE AREA A DRAINAGE MAP

AREA A SOUTH

216

NODE 216 TOTAL
Q100 = 7.6 CFS
V100 = 0.9 FT/S
A = 13.2 AC

226

NODE 226 TOTAL
Q100 = 3.9 CFS
V100 = 1.5 FT/S
A = 5.7 AC

AREA B

AREA C

SEE AREA C DRAINAGE MAP

EX 24" CMP
PR 36" CMP
Refer to Appendix F for floodplain & EX culvert extension

EX 36 CMP
Refer to Appendix F for floodplain & EX culvert extension

100-YR Inundation, refer to Appendix F

24' FIRE ACCESS ROAD

20' ACCESS ROAD

GATE

E= 3626 AC
E= 3590 AC
A= 0.1 AC
C= 0.20
L= 100'
A= 2.83 AC
C= 0.20
L= 262'
E= 3626 AC
A= 4.83 AC
C= 0.20
L= 933'
A= 3.55 AC
C= 0.20
L= 513'
E= 3500 AC
E= 3516 AC
A= 0.3 AC
C= 0.20
L= 90'
A= 1.91 AC
C= 0.20
L= 262'
E= 3500 AC
E= 3510 AC
A= 3.5 AC
C= 0.20
L= 529'
E= 3510 AC
A= 1.73 AC
C= 0.20
L= 306'
E= 3514 AC
E= 3530 AC
A= 0.16 AC
C= 0.20
L= 98'
E= 3482 AC

LEGEND
DRAINAGE BOUNDARY
FLOW PATH
DRAINAGE NODE (100)

SCALE: 1"=100'

100 50 0 100 200 300
SCALE: 1"=100'

Michael Baker
INTERNATIONAL
9755 Clairemont Mesa Boulevard
San Diego, CA 92124
Phone: (858) 614-5000
MBAKERINTL.COM

185614 - STARLIGHT SOLAR
PROPOSED DRAINAGE MAP
ON-SITE AREA B

```
_______________________________________________________________________
***********************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2016 Advanced Engineering Software (aes)
              Ver. 23.0 Release Date: 07/01/2016  License ID 1264

                              Analysis prepared by:




 ************************** DESCRIPTION OF STUDY **************************
* 185614 STARLIGHT SOLAR                                                  *
* PR Q100 ON-SITE AREA B                                                  *
* 2024-03-01                                                              *
 ***************************************************************************

  FILE NAME: 614PRB.DAT
  TIME/DATE OF STUDY: 08:31 03/02/2024
-------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
-------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.000
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  24.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.85
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

***********************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE    202.00 IS CODE =  21
-------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
=========================================================================
  *USER SPECIFIED(SUBAREA):
```

```
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   3626.00
  DOWNSTREAM ELEVATION(FEET) =   3590.00
  ELEVATION DIFFERENCE(FEET) =     36.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.520
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.075
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    204.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3590.00  DOWNSTREAM(FEET) =   3526.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   262.00   CHANNEL SLOPE =  0.2443
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   8.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.285
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.41
  AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =   1.81
  Tc(MIN.) =    9.33
  SUBAREA AREA(ACRES) =     2.83       SUBAREA RUNOFF(CFS) =    2.99
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =        2.9         PEAK FLOW RATE(CFS) =       3.10

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.05   FLOW VELOCITY(FEET/SEC.) =   3.12
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    204.00 =     362.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    204.00 TO NODE    216.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3526.00  DOWNSTREAM(FEET) =   3500.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   933.00   CHANNEL SLOPE =  0.0279
  CHANNEL BASE(FEET) =   25.00   "Z" FACTOR =  15.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.425
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.74
  AVERAGE FLOW DEPTH(FEET) =   0.10   TRAVEL TIME(MIN.) =   8.95
```

```
  Tc(MIN.) =   18.28
  SUBAREA AREA(ACRES) =     4.83       SUBAREA RUNOFF(CFS) =    3.31
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =        7.8         PEAK FLOW RATE(CFS) =       5.32

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.11   FLOW VELOCITY(FEET/SEC.) =   1.82
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    216.00 =    1295.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    204.00 TO NODE    216.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   18.28
  RAINFALL INTENSITY(INCH/HR) =   3.43
  TOTAL STREAM AREA(ACRES) =     7.76
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.32

****************************************************************************
  FLOW PROCESS FROM NODE    210.00 TO NODE    212.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    98.00
  UPSTREAM ELEVATION(FEET) =   3530.00
  DOWNSTREAM ELEVATION(FEET) =   3514.00
  ELEVATION DIFFERENCE(FEET) =     16.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.444
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.115
  SUBAREA RUNOFF(CFS) =      0.20
  TOTAL AREA(ACRES) =      0.16   TOTAL RUNOFF(CFS) =      0.20

****************************************************************************
  FLOW PROCESS FROM NODE    212.00 TO NODE    214.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3514.00  DOWNSTREAM(FEET) =   3510.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   306.00   CHANNEL SLOPE =  0.0131
  CHANNEL BASE(FEET) =   30.00   "Z" FACTOR =  45.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.852
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.90
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.65
```

```
  AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =   7.79
  Tc(MIN.) =   15.24
  SUBAREA AREA(ACRES) =     1.73       SUBAREA RUNOFF(CFS) =    1.33
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =        1.9         PEAK FLOW RATE(CFS) =       1.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.06   FLOW VELOCITY(FEET/SEC.) =   0.80
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    214.00 =     404.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    214.00 TO NODE    216.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3510.00  DOWNSTREAM(FEET) =   3500.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   513.00   CHANNEL SLOPE =  0.0195
  CHANNEL BASE(FEET) =   55.00   "Z" FACTOR =  35.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.817
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.48
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.90
  AVERAGE FLOW DEPTH(FEET) =   0.05   TRAVEL TIME(MIN.) =   9.51
  Tc(MIN.) =   24.75
  SUBAREA AREA(ACRES) =     3.55       SUBAREA RUNOFF(CFS) =    2.00
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =        5.4         PEAK FLOW RATE(CFS) =       3.07

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.06   FLOW VELOCITY(FEET/SEC.) =   0.96
  LONGEST FLOWPATH FROM NODE    210.00 TO NODE    216.00 =     917.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    214.00 TO NODE    216.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   24.75
  RAINFALL INTENSITY(INCH/HR) =   2.82
  TOTAL STREAM AREA(ACRES) =     5.44
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.07

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        5.32    18.28        3.425          7.76
      2        3.07    24.75        2.817          5.44
```

```
  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        7.58    18.28       3.425
      2        7.44    24.75       2.817

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       7.58   Tc(MIN.) =   18.28
  TOTAL AREA(ACRES) =       13.2
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    216.00 =    1295.00 FEET.

+---------------------------------------------------------------------------+
| END NODE 216                                                              |
| BEGIN NODE 220                                                            |
|                                                                           |
+---------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    220.00 TO NODE    222.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    90.00
  UPSTREAM ELEVATION(FEET) =   3516.00
  DOWNSTREAM ELEVATION(FEET) =   3510.00
  ELEVATION DIFFERENCE(FEET) =      6.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.166
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.760
  SUBAREA RUNOFF(CFS) =      0.35
  TOTAL AREA(ACRES) =      0.30   TOTAL RUNOFF(CFS) =      0.35

****************************************************************************
  FLOW PROCESS FROM NODE    222.00 TO NODE    224.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3510.00  DOWNSTREAM(FEET) =   3500.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   282.00   CHANNEL SLOPE =  0.0355
  CHANNEL BASE(FEET) =   30.00   "Z" FACTOR =  30.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.370
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.08
  AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =   4.36
  Tc(MIN.) =   12.53
```

NODE 216

```
  SUBAREA AREA(ACRES) =     1.91       SUBAREA RUNOFF(CFS) =    1.67
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =        2.2         PEAK FLOW RATE(CFS) =       1.93

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.05   FLOW VELOCITY(FEET/SEC.) =   1.21
  LONGEST FLOWPATH FROM NODE    220.00 TO NODE    224.00 =     372.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    224.00 TO NODE    226.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3500.00  DOWNSTREAM(FEET) =   3482.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   525.00   CHANNEL SLOPE =  0.0343
  CHANNEL BASE(FEET) =   30.00   "Z" FACTOR =  30.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.409
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.49
  AVERAGE FLOW DEPTH(FEET) =   0.07   TRAVEL TIME(MIN.) =   5.89
  Tc(MIN.) =   18.42
  SUBAREA AREA(ACRES) =     3.50       SUBAREA RUNOFF(CFS) =    2.39
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =        5.7         PEAK FLOW RATE(CFS) =       3.89

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.08   FLOW VELOCITY(FEET/SEC.) =   1.52
  LONGEST FLOWPATH FROM NODE    220.00 TO NODE    226.00 =     897.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        5.7  TC(MIN.) =     18.42
  PEAK FLOW RATE(CFS)   =       3.89
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

NODE 226

EX 36 CMP
Refer to Appendix F for floodplain &
EX culvert extension

AREA C

24' FIRE ACCESS ROAD

~20' ACCESS ROAD

A= 5.93 AC
C= 0.20
L= 640'

A= 3.77 AC
C= 0.20
L= 476'

A= 2.19 AC
C= 0.20
L= 686'

A= 3.17 AC
C= 0.20
L= 250'

A= 0.7 AC
C= 0.20
L= 201'

A= 0.09 AC
C= 0.20
L= 83'

A= 6 AC
C= 0.20
L= 501'

A= 6.09 AC
C= 0.20
L= 699'

A= 7.19 AC
C= 0.20
L= 619'

A= 2.82 AC
C= 0.20
L= 362'

A= 0.71 AC
C= 0.20
L= 99'

A= 6.76 AC
C= 0.20
L= 595'

A= 0.12 AC
C= 0.20
L= 97'

E=3,472

330

NODE 230 TOTAL
Q100 = 26.7 CFS
V100 = 2.4 FT/S
A = 45.5 AC

100-YR Inundation, refer to
Appendix F

E=3,488

E=3,496

E=3,528

E=3,540

E=3,510

E=3,560

E=3,530

E=3,570

E=3,578

E=3,580

E=3,584

E=3,610

E=3,630

C:\USERS\PUBLIC\WBIPW\JKM\DWS872241\185614_PR_MAPS_2024-02-28.DWG 3/13/2024 6:44 PM

SCALE 1"=100'

100 50 0 100 200 300

SCALE: 1"=100'

Michael Baker
INTERNATIONAL
9755 Clairemont Mesa Boulevard
San Diego, CA 92124
Phone: (858) 614-5000 ·
MBAKERINTL.COM

185614 - STARLIGHT SOLAR

PROPOSED DRAINAGE MAP
OFF-SITE & ON-SITE AREA C

```
_____________________________________________________________________________
*****************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2016 Advanced Engineering Software (aes)
              Ver. 23.0 Release Date: 07/01/2016  License ID 1264

                              Analysis prepared by:




 ************************** DESCRIPTION OF STUDY **************************
* 185614 STARLIGHT SOLAR                                                  *
* PR Q100 ONSITE & OFFSITE AREA C                                         *
* 2024-03-01                                                              *
 *************************************************************************

  FILE NAME: 614PRC.DAT
  TIME/DATE OF STUDY: 08:42 03/02/2024
-----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
-----------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.000
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  24.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.85
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

*****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    302.00 IS CODE =  21
-----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
=============================================================================
  *USER SPECIFIED(SUBAREA):
```

```
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    83.00
  UPSTREAM ELEVATION(FEET) =   3560.00
  DOWNSTREAM ELEVATION(FEET) =   3540.00
  ELEVATION DIFFERENCE(FEET) =     20.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.851
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.451
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
  FLOW PROCESS FROM NODE    302.00 TO NODE    304.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3540.00  DOWNSTREAM(FEET) =   3528.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   201.00   CHANNEL SLOPE =  0.0597
  CHANNEL BASE(FEET) =   18.00   "Z" FACTOR =   6.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.005
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.47
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.01
  AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =   3.30
  Tc(MIN.) =   10.15
  SUBAREA AREA(ACRES) =     0.70       SUBAREA RUNOFF(CFS) =    0.70
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =        0.8         PEAK FLOW RATE(CFS) =       0.79

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.03   FLOW VELOCITY(FEET/SEC.) =   1.30
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    304.00 =     284.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    304.00 TO NODE    312.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3528.00  DOWNSTREAM(FEET) =   3510.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   250.00   CHANNEL SLOPE =  0.0720
  CHANNEL BASE(FEET) =   17.00   "Z" FACTOR =  24.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.451
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.20
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.05
  AVERAGE FLOW DEPTH(FEET) =   0.06   TRAVEL TIME(MIN.) =   2.03
```

```
  Tc(MIN.) =   12.18
  SUBAREA AREA(ACRES) =     3.17       SUBAREA RUNOFF(CFS) =    2.82
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =        4.0         PEAK FLOW RATE(CFS) =       3.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.08   FLOW VELOCITY(FEET/SEC.) =   2.30
  LONGEST FLOWPATH FROM NODE    300.00 TO NODE    312.00 =     534.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    304.00 TO NODE    312.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.18
  RAINFALL INTENSITY(INCH/HR) =   4.45
  TOTAL STREAM AREA(ACRES) =     3.96
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.52

****************************************************************************
  FLOW PROCESS FROM NODE    306.00 TO NODE    308.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    97.00
  UPSTREAM ELEVATION(FEET) =   3630.00
  DOWNSTREAM ELEVATION(FEET) =   3610.00
  ELEVATION DIFFERENCE(FEET) =     20.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.406
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.135
  SUBAREA RUNOFF(CFS) =      0.15
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.15

****************************************************************************
  FLOW PROCESS FROM NODE    308.00 TO NODE    310.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3610.00  DOWNSTREAM(FEET) =   3584.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   595.00   CHANNEL SLOPE =  0.0437
  CHANNEL BASE(FEET) =    9.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.691
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.60
```

```
  AVERAGE FLOW DEPTH(FEET) =   0.13   TRAVEL TIME(MIN.) =   3.82
  Tc(MIN.) =   11.23
  SUBAREA AREA(ACRES) =     6.76       SUBAREA RUNOFF(CFS) =    6.34
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =        6.9         PEAK FLOW RATE(CFS) =       6.46

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.20   FLOW VELOCITY(FEET/SEC.) =   3.31
  LONGEST FLOWPATH FROM NODE    306.00 TO NODE    310.00 =     692.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    310.00 TO NODE    311.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3584.00  DOWNSTREAM(FEET) =   3530.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   619.00   CHANNEL SLOPE =  0.0872
  CHANNEL BASE(FEET) =   35.00   "Z" FACTOR =   4.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.941
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.96
  AVERAGE FLOW DEPTH(FEET) =   0.09   TRAVEL TIME(MIN.) =   3.48
  Tc(MIN.) =   14.71
  SUBAREA AREA(ACRES) =     7.19       SUBAREA RUNOFF(CFS) =    5.67
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =       14.1         PEAK FLOW RATE(CFS) =      11.09

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.10   FLOW VELOCITY(FEET/SEC.) =   3.07
  LONGEST FLOWPATH FROM NODE    306.00 TO NODE    311.00 =    1311.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    311.00 TO NODE    312.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3530.00  DOWNSTREAM(FEET) =   3510.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   501.00   CHANNEL SLOPE =  0.0399
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   4.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.688
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.30
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.24
  AVERAGE FLOW DEPTH(FEET) =   0.80   TRAVEL TIME(MIN.) =   1.59
  Tc(MIN.) =   16.30
  SUBAREA AREA(ACRES) =     6.00       SUBAREA RUNOFF(CFS) =    4.43
```

```
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =       20.1         PEAK FLOW RATE(CFS) =      14.80

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.83   FLOW VELOCITY(FEET/SEC.) =   5.39
  LONGEST FLOWPATH FROM NODE    306.00 TO NODE    312.00 =    1812.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    311.00 TO NODE    312.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.30
  RAINFALL INTENSITY(INCH/HR) =   3.69
  TOTAL STREAM AREA(ACRES) =    20.07
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     14.80

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        3.52    12.18        4.451          3.96
      2       14.80    16.30        3.688         20.07

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       14.59    12.18       4.451
      2       17.72    16.30       3.688

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      17.72   Tc(MIN.) =   16.30
  TOTAL AREA(ACRES) =       24.0
  LONGEST FLOWPATH FROM NODE    306.00 TO NODE    312.00 =    1812.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    312.00 TO NODE    314.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3510.00  DOWNSTREAM(FEET) =   3488.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   645.00   CHANNEL SLOPE =  0.0341
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  25.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.297
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      19.68
```

```
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.48
  AVERAGE FLOW DEPTH(FEET) =   0.48   TRAVEL TIME(MIN.) =   3.09
  Tc(MIN.) =   19.39
  SUBAREA AREA(ACRES) =     5.93       SUBAREA RUNOFF(CFS) =    3.91
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =       30.0         PEAK FLOW RATE(CFS) =      19.76

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.48   FLOW VELOCITY(FEET/SEC.) =   3.49
  LONGEST FLOWPATH FROM NODE    306.00 TO NODE    314.00 =    2457.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    314.00 TO NODE    330.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3488.00  DOWNSTREAM(FEET) =   3472.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   476.00   CHANNEL SLOPE =  0.0336
  CHANNEL BASE(FEET) =   30.00   "Z" FACTOR =  36.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.019
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.79
  AVERAGE FLOW DEPTH(FEET) =   0.20   TRAVEL TIME(MIN.) =   2.85
  Tc(MIN.) =   22.24
  SUBAREA AREA(ACRES) =     3.77       SUBAREA RUNOFF(CFS) =    2.28
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =       33.7         PEAK FLOW RATE(CFS) =      20.36

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.20   FLOW VELOCITY(FEET/SEC.) =   2.72
  LONGEST FLOWPATH FROM NODE    306.00 TO NODE    330.00 =    2933.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    314.00 TO NODE    330.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   22.24
  RAINFALL INTENSITY(INCH/HR) =   3.02
  TOTAL STREAM AREA(ACRES) =    33.73
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     20.36

****************************************************************************
  FLOW PROCESS FROM NODE    316.00 TO NODE    318.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
```

```
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    99.00
  UPSTREAM ELEVATION(FEET) =   3580.00
  DOWNSTREAM ELEVATION(FEET) =   3578.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =   11.836
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    85.30
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.534
  SUBAREA RUNOFF(CFS) =      0.64
  TOTAL AREA(ACRES) =      0.71   TOTAL RUNOFF(CFS) =      0.64

****************************************************************************
  FLOW PROCESS FROM NODE    318.00 TO NODE    320.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3578.00  DOWNSTREAM(FEET) =   3540.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   363.00   CHANNEL SLOPE =  0.1047
  CHANNEL BASE(FEET) =   30.00   "Z" FACTOR =  99.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.770
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.72
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.54
  AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =   3.92
  Tc(MIN.) =   15.76
  SUBAREA AREA(ACRES) =     2.82       SUBAREA RUNOFF(CFS) =    2.13
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =        3.5         PEAK FLOW RATE(CFS) =       2.66

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.04   FLOW VELOCITY(FEET/SEC.) =   1.81
  LONGEST FLOWPATH FROM NODE    316.00 TO NODE    320.00 =     462.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    320.00 TO NODE    322.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3540.00  DOWNSTREAM(FEET) =   3496.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   699.00   CHANNEL SLOPE =  0.0629
  CHANNEL BASE(FEET) =    7.00   "Z" FACTOR =   5.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.332
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
```

```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.51
  AVERAGE FLOW DEPTH(FEET) =   0.17   TRAVEL TIME(MIN.) =   3.32
  Tc(MIN.) =   19.08
  SUBAREA AREA(ACRES) =     6.09       SUBAREA RUNOFF(CFS) =    4.06
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =        9.6         PEAK FLOW RATE(CFS) =       6.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.20   FLOW VELOCITY(FEET/SEC.) =   3.94
  LONGEST FLOWPATH FROM NODE    316.00 TO NODE    322.00 =    1161.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    322.00 TO NODE    330.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3496.00  DOWNSTREAM(FEET) =   3472.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   686.00   CHANNEL SLOPE =  0.0350
  CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =  22.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.890
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.43
  AVERAGE FLOW DEPTH(FEET) =   0.16   TRAVEL TIME(MIN.) =   4.71
  Tc(MIN.) =   23.79
  SUBAREA AREA(ACRES) =     2.19       SUBAREA RUNOFF(CFS) =    1.27
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =       11.8         PEAK FLOW RATE(CFS) =       6.83

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.16   FLOW VELOCITY(FEET/SEC.) =   2.38
  LONGEST FLOWPATH FROM NODE    316.00 TO NODE    330.00 =    1847.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    322.00 TO NODE    330.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   23.79
  RAINFALL INTENSITY(INCH/HR) =   2.89
  TOTAL STREAM AREA(ACRES) =    11.81
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.83

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       20.36    22.24        3.019         33.73
```

```
    2        6.83    23.79        2.890         11.81

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       26.74    22.24       3.019
      2       26.32    23.79       2.890

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      26.74   Tc(MIN.) =   22.24
  TOTAL AREA(ACRES) =       45.5
  LONGEST FLOWPATH FROM NODE    306.00 TO NODE    330.00 =    2933.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       45.5  TC(MIN.) =     22.24
  PEAK FLOW RATE(CFS)   =      26.74
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

SEE AREA C WORK MAP

E= 3,692
400
A= 0.19 AC
C= 0.20
L= 90'
401
E= 3,690
A= 1.66 AC
C= 0.20
L= 265'
E= 3,684
402
A= 5.45 AC
C= 0.20
L= 383'
404
E= 3,680
A= 11.55 AC
C= 0.20
L= 983'
406
E= 3,660
A= 7.24 AC
C= 0.20
L= 660'
E= 3,660
412
A= 0.09 AC
C= 0.20
L= 90'
414
E= 3,658
A= 2.18 AC
C= 0.20
L= 456'
E= 3,634
408
A= 6.49 AC
C= 0.20
L= 763'
E= 3,634
416
A=7.97 AC
C= 0.20
L= 710'
AREA D EAST
E= 3,610
410
A= 18.08 AC
C= 0.20
L= 1,016'
E= 3,600
418
A= 12.41 AC
C= 0.20
L= 981'
E= 3,560
420
NODE 420 TOTAL
Q100 = 25.3 CFS
V100 = 2.2 FT/S
A = 73.3 AC
AREA E
AREA D SOUTH
SEE AREA D SOUTH
(SOUTHERLY FLOW)
WORK MAP
SEE AREA E
(SOUTHERLY FLOW)
WORK MAP

SCALE 1"=150'

150 75 0 150 300 450
SCALE: 1"=150'

Michael Baker
INTERNATIONAL
9755 Clairemont Mesa Boulevard
San Diego, CA 92124
Phone: (858) 614-5000
MBAKERINTL.COM

185614 - STARLIGHT SOLAR

PROPOSED DRAINAGE MAP
ON-SITE AREA D (EASTERLY FLOW)

```
_____________________________________________________________________________
*****************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2016 Advanced Engineering Software (aes)
              Ver. 23.0 Release Date: 07/01/2016  License ID 1264

                            Analysis prepared by:




 ************************** DESCRIPTION OF STUDY **************************
* 185614 STARLIGHT SOLAR                                                  *
* PR Q100 AREA D (EASTERLY FLOW)                                          *
* 2024-03-01                                                              *
 ***************************************************************************

  FILE NAME: 614PRD.DAT
  TIME/DATE OF STUDY: 08:47 03/02/2024
-----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
-----------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.000
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  24.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.85
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

*****************************************************************************
  FLOW PROCESS FROM NODE    400.00 TO NODE    401.00 IS CODE =  21
-----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
=============================================================================
```

```
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    96.00
  UPSTREAM ELEVATION(FEET) =   3692.00
  DOWNSTREAM ELEVATION(FEET) =   3690.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =   11.780
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    86.25
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.548
  SUBAREA RUNOFF(CFS) =      0.17
  TOTAL AREA(ACRES) =      0.19   TOTAL RUNOFF(CFS) =      0.17

****************************************************************************
  FLOW PROCESS FROM NODE    401.00 TO NODE    402.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3690.00  DOWNSTREAM(FEET) =   3684.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   265.00   CHANNEL SLOPE =  0.0226
  CHANNEL BASE(FEET) =   30.00   "Z" FACTOR =  99.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.430
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.68
  AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =   6.46
  Tc(MIN.) =   18.24
  SUBAREA AREA(ACRES) =     1.66       SUBAREA RUNOFF(CFS) =    1.14
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =        1.8         PEAK FLOW RATE(CFS) =       1.27

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.04   FLOW VELOCITY(FEET/SEC.) =   0.86
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    402.00 =     361.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    402.00 TO NODE    404.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3684.00  DOWNSTREAM(FEET) =   3680.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   383.00   CHANNEL SLOPE =  0.0104
  CHANNEL BASE(FEET) =   30.00   "Z" FACTOR =  99.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.735
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.79
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.83
  AVERAGE FLOW DEPTH(FEET) =   0.09   TRAVEL TIME(MIN.) =   7.68
  Tc(MIN.) =   25.92
  SUBAREA AREA(ACRES) =     5.45       SUBAREA RUNOFF(CFS) =    2.98
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =        7.3         PEAK FLOW RATE(CFS) =       3.99

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.10   FLOW VELOCITY(FEET/SEC.) =   0.95
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    404.00 =     744.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    404.00 TO NODE    406.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3680.00  DOWNSTREAM(FEET) =   3660.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   983.00   CHANNEL SLOPE =  0.0203
  CHANNEL BASE(FEET) =   43.00   "Z" FACTOR =  99.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.119
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.45
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.30
  AVERAGE FLOW DEPTH(FEET) =   0.09   TRAVEL TIME(MIN.) =  12.56
  Tc(MIN.) =   38.48
  SUBAREA AREA(ACRES) =    11.55       SUBAREA RUNOFF(CFS) =    4.90
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =       18.9         PEAK FLOW RATE(CFS) =       7.99

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.10   FLOW VELOCITY(FEET/SEC.) =   1.44
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    406.00 =    1727.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    406.00 TO NODE    408.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3660.00  DOWNSTREAM(FEET) =   3634.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   660.00   CHANNEL SLOPE =  0.0394
  CHANNEL BASE(FEET) =   17.00   "Z" FACTOR =  16.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.991
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.43
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.80
```

```
  AVERAGE FLOW DEPTH(FEET) =   0.17   TRAVEL TIME(MIN.) =   3.93
  Tc(MIN.) =   42.41
  SUBAREA AREA(ACRES) =     7.24       SUBAREA RUNOFF(CFS) =    2.88
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =       26.1         PEAK FLOW RATE(CFS) =      10.39

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.18   FLOW VELOCITY(FEET/SEC.) =   2.90
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    408.00 =    2387.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    408.00 TO NODE    410.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3634.00  DOWNSTREAM(FEET) =   3610.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   763.00   CHANNEL SLOPE =  0.0315
  CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =  30.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.856
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.61
  AVERAGE FLOW DEPTH(FEET) =   0.21   TRAVEL TIME(MIN.) =   4.87
  Tc(MIN.) =   47.28
  SUBAREA AREA(ACRES) =     6.49       SUBAREA RUNOFF(CFS) =    2.41
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =       32.6         PEAK FLOW RATE(CFS) =      12.09

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.22   FLOW VELOCITY(FEET/SEC.) =   2.60
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    410.00 =    3150.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    410.00 TO NODE    420.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3610.00  DOWNSTREAM(FEET) =   3580.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1016.00   CHANNEL SLOPE =  0.0295
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  25.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.724
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      15.21
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.97
  AVERAGE FLOW DEPTH(FEET) =   0.29   TRAVEL TIME(MIN.) =   5.70
  Tc(MIN.) =   52.98
  SUBAREA AREA(ACRES) =    18.08       SUBAREA RUNOFF(CFS) =    6.24
```

```
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =       50.7         PEAK FLOW RATE(CFS) =      17.47

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.32   FLOW VELOCITY(FEET/SEC.) =   3.09
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    420.00 =    4166.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    410.00 TO NODE    420.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   52.98
  RAINFALL INTENSITY(INCH/HR) =   1.72
  TOTAL STREAM AREA(ACRES) =    50.66
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     17.47

****************************************************************************
  FLOW PROCESS FROM NODE    412.00 TO NODE    414.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    90.00
  UPSTREAM ELEVATION(FEET) =   3660.00
  DOWNSTREAM ELEVATION(FEET) =   3658.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =   11.668
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    88.33
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.576
  SUBAREA RUNOFF(CFS) =      0.18
  TOTAL AREA(ACRES) =      0.20   TOTAL RUNOFF(CFS) =      0.18

****************************************************************************
  FLOW PROCESS FROM NODE    414.00 TO NODE    416.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3658.00  DOWNSTREAM(FEET) =   3634.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   456.00   CHANNEL SLOPE =  0.0526
  CHANNEL BASE(FEET) =   30.00   "Z" FACTOR =  20.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.350
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.89
```

```
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.05
  AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =   7.25
  Tc(MIN.) =   18.92
  SUBAREA AREA(ACRES) =     2.07       SUBAREA RUNOFF(CFS) =    1.39
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =        2.3         PEAK FLOW RATE(CFS) =       1.52

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.04   FLOW VELOCITY(FEET/SEC.) =   1.20
  LONGEST FLOWPATH FROM NODE    412.00 TO NODE    416.00 =     546.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    416.00 TO NODE    418.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3634.00  DOWNSTREAM(FEET) =   3600.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   710.00   CHANNEL SLOPE =  0.0479
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =  20.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.810
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.77
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.00
  AVERAGE FLOW DEPTH(FEET) =   0.09   TRAVEL TIME(MIN.) =   5.93
  Tc(MIN.) =   24.85
  SUBAREA AREA(ACRES) =     7.97       SUBAREA RUNOFF(CFS) =    4.48
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =       10.2         PEAK FLOW RATE(CFS) =       5.76

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.11   FLOW VELOCITY(FEET/SEC.) =   2.36
  LONGEST FLOWPATH FROM NODE    412.00 TO NODE    418.00 =    1256.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    418.00 TO NODE    420.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3600.00  DOWNSTREAM(FEET) =   3580.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   981.00   CHANNEL SLOPE =  0.0204
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  30.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.377
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.71
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.22
  AVERAGE FLOW DEPTH(FEET) =   0.36   TRAVEL TIME(MIN.) =   7.35
  Tc(MIN.) =   32.20
```

```
  SUBAREA AREA(ACRES) =    12.41       SUBAREA RUNOFF(CFS) =    5.90
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =       22.6         PEAK FLOW RATE(CFS) =      10.77

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.39   FLOW VELOCITY(FEET/SEC.) =   2.41
  LONGEST FLOWPATH FROM NODE    412.00 TO NODE    420.00 =    2237.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    418.00 TO NODE    420.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   32.20
  RAINFALL INTENSITY(INCH/HR) =   2.38
  TOTAL STREAM AREA(ACRES) =    22.65
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.77

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       17.47    52.98        1.724         50.66
      2       10.77    32.20        2.377         22.65

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       21.39    32.20       2.377
      2       25.28    52.98       1.724

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      25.28   Tc(MIN.) =   52.98
  TOTAL AREA(ACRES) =       73.3
  LONGEST FLOWPATH FROM NODE    400.00 TO NODE    420.00 =    4166.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       73.3  TC(MIN.) =     52.98
  PEAK FLOW RATE(CFS)   =      25.28
  *** PEAK FLOW RATE TABLE ***
         Q(CFS)   Tc(MIN.)
  1       21.39      32.20
  2       25.28      52.98
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

NODE 420

AREA D EAST

SEE AREA D EAST (EASTERLY FLOW) WORK MAP

SEE AREA D (EASTERLY FLOW) WORK MAP

AREA D SOUTH

AREA E

AREA F

A= 0.13 AC
C= 0.20
L= 98'

E = 3,624

510

512

A=1.05 AC
C= 0.20
L= 275'

E = 3,606

500

E = 3,646

A= 0.31 AC
C= 0.20
L= 86'

502

E = 3,640

A=11.62 AC
C= 0.20
L= 808'

A= 20.24 AC
C= 0.25
L= 959'

E = 3,524

514

A= 19.92 AC
C= 0.25
L= 671'

504

E = 3,590

A=15.42 AC
C= 0.20
L= 1,505'

520

E = 3,500

A= 1.13 AC
C= 0.26
L= 100'

E = 3,522

530

532

E = 3,518

A= 38.66 AC
C= 0.26
L= 1,157'

42" CMP raised above adjacent FG 1.5' (deep)

Downstream pipe discharge with riprap

A= 15.9 AC
C= 0.26
L= 794'

E = 3,484

522

534

E = 3,480

EX. RAILROAD

A= 22.59 AC
C= 0.20
L= 1,621'

CODE 8
"ADD AREA"
A = 22.73
C = 0.20

A= 24.94 AC
C= 0.20
L= 831'

536

E = 3,456

E = 3,450

524

A= 38.62 AC
C= 0.20
L= 1,314'

SEE APPENDIX E
FOR OFF-SITE WORK MAP AND FLOODPLAIN WORK MAP FOR LIMITS OF INUNDATION

A= 31.42 AC
C= 0.20
L= 1,313'

538

E = 3,440

526

E = 3,430

A= 18.34 AC
C= 0.20
L= 940'

A= 41.01 AC
C= 0.20
L= 1,665'

100-YR Inundation, refer to Appendix F

E = 3,420

550

PROJECT SITE (NODE 550)
Q100 = 141.5 cfs
V100 = 3.0 ft/s
A = 323.0 ac

TOTAL (NODE 299)
INCLUDES OFF-SITE
Q100 = 659 cfs
A = 1.34 sq-mi
Refer to Appendix E

C:\USERS\PUBLIC\MB1PW\2W\DMS87224\185614_PR_MAPS_2024-02-28.DWG 3/13/2024 6:48 PM

Michael Baker
INTERNATIONAL
9755 Clairemont Mesa Boulevard
San Diego, CA 92124
Phone: (858) 614-5000 ·
MBAKERINTL.COM

200 100 0 200 400 600
SCALE: 1"=200'

SCALE 1"=200'

LEGEND
DRAINAGE BOUNDARY
FLOW PATH
DRAINAGE NODE 100

185614 - STARLIGHT SOLAR

PROPOSED DRAINAGE MAP

ON-SITE AREA D (SOUTHERLY FLOW), E, F, G & H

```
_____________________________________________________________________________
*****************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2016 Advanced Engineering Software (aes)
              Ver. 23.0 Release Date: 07/01/2016  License ID 1264

                              Analysis prepared by:




 ************************** DESCRIPTION OF STUDY **************************
* 185614 STARLIGHT SOLAR                                                  *
* PR Q100 ONSITE AREAS D (SOUTHERLY FLOW) - H                             *
* 2024-03-01                                                              *
 *************************************************************************

  FILE NAME: 614PRDH.DAT
  TIME/DATE OF STUDY: 08:53 03/02/2024
-----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
-----------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.000
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  24.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.85
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

*****************************************************************************
  FLOW PROCESS FROM NODE    500.00 TO NODE    502.00 IS CODE =  21
-----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
=============================================================================
  *USER SPECIFIED(SUBAREA):
```

```
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    86.00
  UPSTREAM ELEVATION(FEET) =   3646.00
  DOWNSTREAM ELEVATION(FEET) =   3640.00
  ELEVATION DIFFERENCE(FEET) =      6.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.863
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.903
  SUBAREA RUNOFF(CFS) =      0.37
  TOTAL AREA(ACRES) =      0.31   TOTAL RUNOFF(CFS) =      0.37

****************************************************************************
  FLOW PROCESS FROM NODE    502.00 TO NODE    504.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3640.00  DOWNSTREAM(FEET) =   3590.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   808.00   CHANNEL SLOPE =  0.0619
  CHANNEL BASE(FEET) =    8.00   "Z" FACTOR =  15.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.505
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.29
  AVERAGE FLOW DEPTH(FEET) =   0.16   TRAVEL TIME(MIN.) =   4.09
  Tc(MIN.) =   11.95
  SUBAREA AREA(ACRES) =    11.62       SUBAREA RUNOFF(CFS) =   10.47
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =       11.9         PEAK FLOW RATE(CFS) =      10.75

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.23   FLOW VELOCITY(FEET/SEC.) =   4.00
  LONGEST FLOWPATH FROM NODE    500.00 TO NODE    504.00 =     894.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    504.00 TO NODE    520.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3590.00  DOWNSTREAM(FEET) =   3500.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1505.00   CHANNEL SLOPE =  0.0598
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.618
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.18
  AVERAGE FLOW DEPTH(FEET) =   0.56   TRAVEL TIME(MIN.) =   4.84
  Tc(MIN.) =   16.79
```

```
  SUBAREA AREA(ACRES) =    15.42       SUBAREA RUNOFF(CFS) =   11.16
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.200
  TOTAL AREA(ACRES) =       27.4         PEAK FLOW RATE(CFS) =      19.79

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.61   FLOW VELOCITY(FEET/SEC.) =   5.40
  LONGEST FLOWPATH FROM NODE    500.00 TO NODE    520.00 =    2399.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    504.00 TO NODE    520.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.79
  RAINFALL INTENSITY(INCH/HR) =   3.62
  TOTAL STREAM AREA(ACRES) =    27.35
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     19.79

****************************************************************************
  FLOW PROCESS FROM NODE    510.00 TO NODE    512.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    98.00
  UPSTREAM ELEVATION(FEET) =   3624.00
  DOWNSTREAM ELEVATION(FEET) =   3606.00
  ELEVATION DIFFERENCE(FEET) =     18.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.444
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.115
  SUBAREA RUNOFF(CFS) =      0.16
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.16

****************************************************************************
  FLOW PROCESS FROM NODE    512.00 TO NODE    514.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3606.00  DOWNSTREAM(FEET) =   3524.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   959.00   CHANNEL SLOPE =  0.0855
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  20.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.784
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.24
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.64
  AVERAGE FLOW DEPTH(FEET) =   0.36   TRAVEL TIME(MIN.) =   3.45
```

```
  Tc(MIN.) =   10.89
  SUBAREA AREA(ACRES) =    20.24       SUBAREA RUNOFF(CFS) =   24.21
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.250
  TOTAL AREA(ACRES) =       20.4         PEAK FLOW RATE(CFS) =      24.33

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.47   FLOW VELOCITY(FEET/SEC.) =   5.50
  LONGEST FLOWPATH FROM NODE    510.00 TO NODE    514.00 =    1057.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    514.00 TO NODE    520.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3524.00  DOWNSTREAM(FEET) =   3500.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   671.00   CHANNEL SLOPE =  0.0358
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  40.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.079
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      34.51
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.66
  AVERAGE FLOW DEPTH(FEET) =   0.49   TRAVEL TIME(MIN.) =   3.05
  Tc(MIN.) =   13.95
  SUBAREA AREA(ACRES) =    19.92       SUBAREA RUNOFF(CFS) =   20.31
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.250
  TOTAL AREA(ACRES) =       40.3         PEAK FLOW RATE(CFS) =      41.06

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.52   FLOW VELOCITY(FEET/SEC.) =   3.77
  LONGEST FLOWPATH FROM NODE    510.00 TO NODE    520.00 =    1728.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    514.00 TO NODE    520.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.95
  RAINFALL INTENSITY(INCH/HR) =   4.08
  TOTAL STREAM AREA(ACRES) =    40.29
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     41.06

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       19.79    16.79        3.618         27.35
      2       41.06    13.95        4.079         40.29

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
```

```
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       57.49    13.95       4.079
      2       56.21    16.79       3.618

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      57.49   Tc(MIN.) =   13.95
  TOTAL AREA(ACRES) =       67.6
  LONGEST FLOWPATH FROM NODE    500.00 TO NODE    520.00 =    2399.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    520.00 TO NODE    522.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3500.00  DOWNSTREAM(FEET) =   3484.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1157.00   CHANNEL SLOPE =  0.0138
  CHANNEL BASE(FEET) =   13.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.386
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2600
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      74.51
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.13
  AVERAGE FLOW DEPTH(FEET) =   0.84   TRAVEL TIME(MIN.) =   4.67
  Tc(MIN.) =   18.61
  SUBAREA AREA(ACRES) =    38.66       SUBAREA RUNOFF(CFS) =   34.03
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.241
  TOTAL AREA(ACRES) =      106.3         PEAK FLOW RATE(CFS) =      86.63

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.91   FLOW VELOCITY(FEET/SEC.) =   4.34
  LONGEST FLOWPATH FROM NODE    500.00 TO NODE    522.00 =    3556.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    522.00 TO NODE    524.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3484.00  DOWNSTREAM(FEET) =   3450.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1621.00   CHANNEL SLOPE =  0.0210
  CHANNEL BASE(FEET) =   11.00   "Z" FACTOR =  16.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.846
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      93.06
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.70
```

```
  AVERAGE FLOW DEPTH(FEET) =   0.82   TRAVEL TIME(MIN.) =   5.75
  Tc(MIN.) =   24.37
  SUBAREA AREA(ACRES) =    22.59       SUBAREA RUNOFF(CFS) =   12.86
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.234
  TOTAL AREA(ACRES) =      128.9         PEAK FLOW RATE(CFS) =      86.63

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.79   FLOW VELOCITY(FEET/SEC.) =   4.63
  LONGEST FLOWPATH FROM NODE    500.00 TO NODE    524.00 =    5177.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    524.00 TO NODE    524.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.846
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.2285
  SUBAREA AREA(ACRES) =   22.73   SUBAREA RUNOFF(CFS) =   12.94
  TOTAL AREA(ACRES) =      151.6   TOTAL RUNOFF(CFS) =      98.61
  TC(MIN.) =   24.37

****************************************************************************
  FLOW PROCESS FROM NODE    524.00 TO NODE    526.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3450.00  DOWNSTREAM(FEET) =   3430.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1313.00   CHANNEL SLOPE =  0.0152
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.440
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     106.28
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.34
  AVERAGE FLOW DEPTH(FEET) =   0.80   TRAVEL TIME(MIN.) =   6.56
  Tc(MIN.) =   30.93
  SUBAREA AREA(ACRES) =    31.42       SUBAREA RUNOFF(CFS) =   15.33
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.224
  TOTAL AREA(ACRES) =      183.0         PEAK FLOW RATE(CFS) =      99.89

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.78   FLOW VELOCITY(FEET/SEC.) =   3.27
  LONGEST FLOWPATH FROM NODE    500.00 TO NODE    526.00 =    6490.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    526.00 TO NODE    550.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
```

```
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3430.00  DOWNSTREAM(FEET) =   3420.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1665.00   CHANNEL SLOPE =  0.0060
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  40.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.000
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     108.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.49
  AVERAGE FLOW DEPTH(FEET) =   1.04   TRAVEL TIME(MIN.) =  11.16
  Tc(MIN.) =   42.08
  SUBAREA AREA(ACRES) =    41.01       SUBAREA RUNOFF(CFS) =   16.41
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.219
  TOTAL AREA(ACRES) =      224.0         PEAK FLOW RATE(CFS) =      99.89

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.01   FLOW VELOCITY(FEET/SEC.) =   2.44
  LONGEST FLOWPATH FROM NODE    500.00 TO NODE    550.00 =    8155.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    526.00 TO NODE    550.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   42.08
  RAINFALL INTENSITY(INCH/HR) =   2.00
  TOTAL STREAM AREA(ACRES) =   224.05
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     99.89

****************************************************************************
  FLOW PROCESS FROM NODE    530.00 TO NODE    532.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2600
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   3552.00
  DOWNSTREAM ELEVATION(FEET) =   3518.00
  ELEVATION DIFFERENCE(FEET) =     34.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.019
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.351
  SUBAREA RUNOFF(CFS) =      1.87
  TOTAL AREA(ACRES) =      1.13   TOTAL RUNOFF(CFS) =      1.87

****************************************************************************
  FLOW PROCESS FROM NODE    532.00 TO NODE    534.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3518.00  DOWNSTREAM(FEET) =   3480.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   794.00   CHANNEL SLOPE =  0.0479
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  20.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.805
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2600
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.94
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.48
  AVERAGE FLOW DEPTH(FEET) =   0.23   TRAVEL TIME(MIN.) =   3.80
  Tc(MIN.) =   10.82
  SUBAREA AREA(ACRES) =    15.90       SUBAREA RUNOFF(CFS) =   19.86
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.260
  TOTAL AREA(ACRES) =       17.0         PEAK FLOW RATE(CFS) =      21.27

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.32   FLOW VELOCITY(FEET/SEC.) =   4.10
  LONGEST FLOWPATH FROM NODE    530.00 TO NODE    534.00 =     894.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    534.00 TO NODE    536.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3480.00  DOWNSTREAM(FEET) =   3456.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   831.00   CHANNEL SLOPE =  0.0289
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =  35.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.909
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      31.08
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.40
  AVERAGE FLOW DEPTH(FEET) =   0.47   TRAVEL TIME(MIN.) =   4.08
  Tc(MIN.) =   14.89
  SUBAREA AREA(ACRES) =    24.94       SUBAREA RUNOFF(CFS) =   19.50
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.224
  TOTAL AREA(ACRES) =       42.0         PEAK FLOW RATE(CFS) =      36.81

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.51   FLOW VELOCITY(FEET/SEC.) =   3.51
  LONGEST FLOWPATH FROM NODE    530.00 TO NODE    536.00 =    1725.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    536.00 TO NODE    538.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3456.00  DOWNSTREAM(FEET) =   3440.00
```

```
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1314.00   CHANNEL SLOPE =  0.0122
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  80.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.814
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      47.76
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.21
  AVERAGE FLOW DEPTH(FEET) =   0.46   TRAVEL TIME(MIN.) =   9.89
  Tc(MIN.) =   24.79
  SUBAREA AREA(ACRES) =    38.62       SUBAREA RUNOFF(CFS) =   21.74
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.213
  TOTAL AREA(ACRES) =       80.6         PEAK FLOW RATE(CFS) =      48.24

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.46   FLOW VELOCITY(FEET/SEC.) =   2.22
  LONGEST FLOWPATH FROM NODE    530.00 TO NODE    538.00 =    3039.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    538.00 TO NODE    550.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   3440.00  DOWNSTREAM(FEET) =   3420.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   940.00   CHANNEL SLOPE =  0.0213
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  60.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.490
  *USER SPECIFIED(SUBAREA):
  USER-SPECIFIED RUNOFF COEFFICIENT = .2000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      52.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.02
  AVERAGE FLOW DEPTH(FEET) =   0.46   TRAVEL TIME(MIN.) =   5.18
  Tc(MIN.) =   29.97
  SUBAREA AREA(ACRES) =    18.34       SUBAREA RUNOFF(CFS) =    9.13
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.210
  TOTAL AREA(ACRES) =       98.9         PEAK FLOW RATE(CFS) =      51.82

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.46   FLOW VELOCITY(FEET/SEC.) =   2.99
  LONGEST FLOWPATH FROM NODE    530.00 TO NODE    550.00 =    3979.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    538.00 TO NODE    550.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   29.97
  RAINFALL INTENSITY(INCH/HR) =   2.49
```

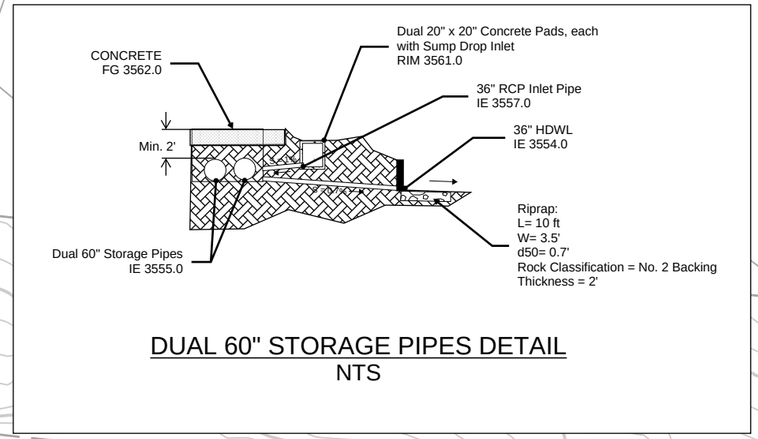
```
  TOTAL STREAM AREA(ACRES) =    98.93
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     51.82

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       99.89    42.08        2.000        224.05
      2       51.82    29.97        2.490         98.93

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      132.06    29.97       2.490
      2      141.52    42.08       2.000

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     141.52   Tc(MIN.) =   42.08
  TOTAL AREA(ACRES) =      323.0
  LONGEST FLOWPATH FROM NODE    500.00 TO NODE    550.00 =    8155.00 FEET.
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =      323.0  TC(MIN.) =     42.08
  PEAK FLOW RATE(CFS)   =     141.52
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

Michael Baker
INTERNATIONAL

Appendix D – Proposed Detention Basin (Mitigated Peak Flow)

Exhibits
Hydraflow Hydrographs Input/Output

Node 106



DUAL 60" STORAGE PIPES DETAIL
NTS

Riprap
L = 10'
W = 7.5'
Thickness= 2.7'
Rock Class 1/4 ton
D50 = 1.8'

Refer to separate exhibit for Node 129

Dual 60" storage pipes
L=410' (each)
Two (2) F-Type inlets with concrete apron (sump condition)
24" Outflow pipe
(see schematic profile top right)

Q100 In = 38.86 cfs
Q100 Out = 30.22 cfs
100-Year Depth = 4.99'

24' FIRE ACCESS ROAD

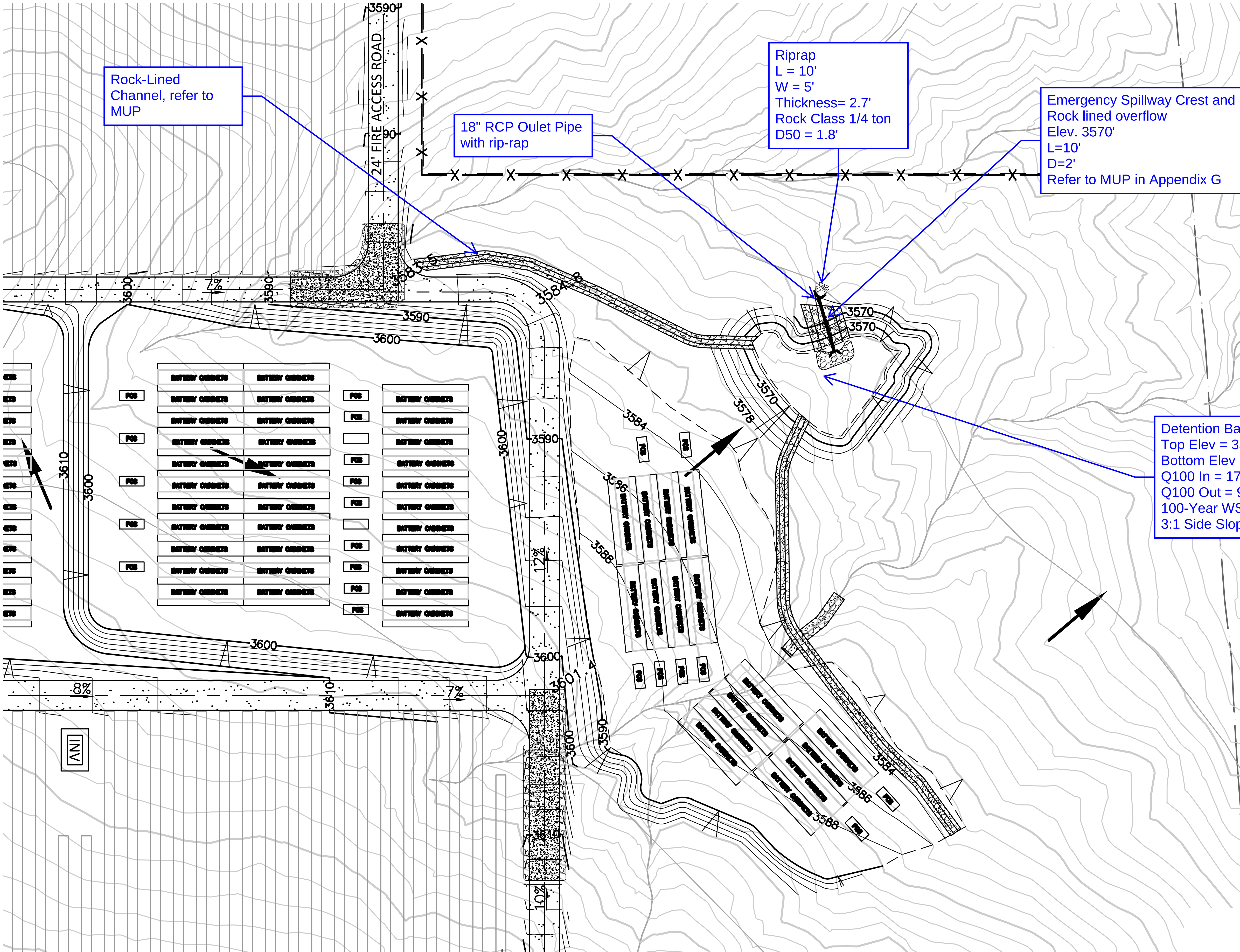
Michael Baker
INTERNATIONAL
9755 Clairemont Mesa Boulevard
San Diego, CA 92124
Phone: (858) 614-5000 · MBAKERINTL.COM

SCALE: 1"=100'

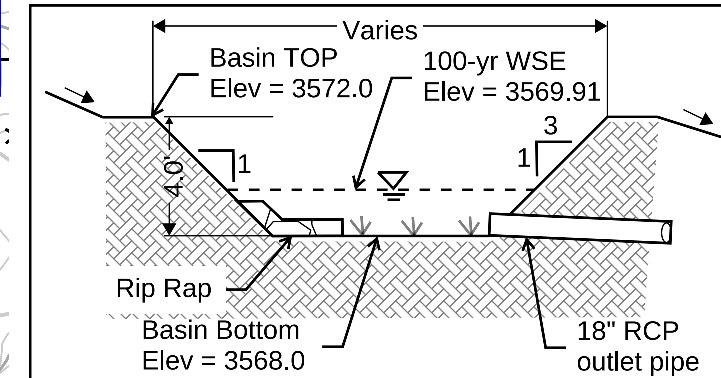
STARLIGHT SOLAR
PROPOSED STORAGE PIPES

MBI 185614
March 2024

Node 128



Rock-Lined Channel, refer to MUP
18" RCP Oulet Pipe with rip-rap
Riprap
L = 10'
W = 5'
Thickness= 2.7'
Rock Class 1/4 ton
D50 = 1.8'
Emergency Spillway Crest and Rock lined overflow
Elev. 3570'
L=10'
D=2'
Refer to MUP in Appendix G
Detention Basin
Top Elev = 3572'
Bottom Elev = 3568'
Q100 In = 17.5 cfs
Q100 Out = 9.3 cfs
100-Year WSE = 3569.91'
3:1 Side Slopes
24' FIRE ACCESS ROAD
3590
3600
3610
3570
3578
3584
3586
3588
7%
8%
12%
10%
INV



DETENTION BASIN DETAIL
NTS

STARLIGHT SOLAR
PROPOSED DETENTION BASIN

MBI 185614
March 2024

Michael Baker
INTERNATIONAL
9755 Clairemont Mesa Boulevard
San Diego, CA 92124
Phone: (858) 614-5000 · MBAKERINTL.COM

SCALE: 1"=80'

Node 129

Riprap
L = 10'
W = 5'
Thickness= 2.7'
Rock Class 1/4 ton
D50 = 1.8'

18" RCP Outlet Pipe

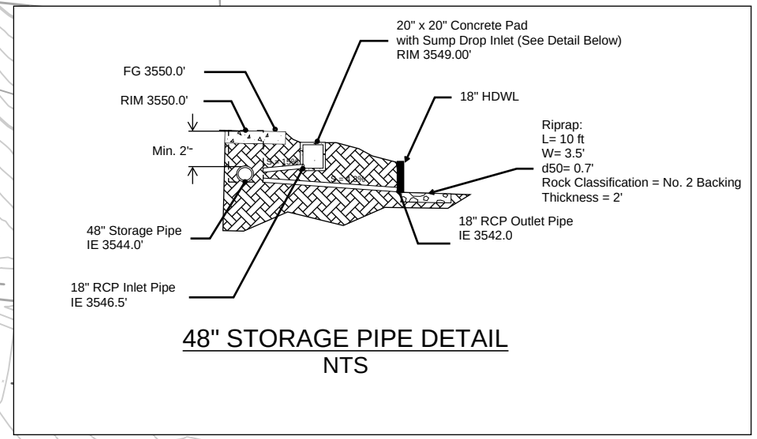
20' x 20' concrete pad
with sump Drop-Inlet

Single 48" Storage Pipe
L= 150'
Q100 In = 20.5 cfs
Q100 Out = 14.2 cfs
100-Year Depth = 3.54'

ACCESS ROAD

IRE ACCESS ROAD

INV



48" STORAGE PIPE DETAIL
NTS

SCALE: 1"=80'

Michael Baker
INTERNATIONAL
9755 Clairemont Mesa Boulevard
San Diego, CA 92124
Phone: (858) 614-5000 · MBAKERINTL.COM

STARLIGHT SOLAR
PROPOSED STORAGE PIPE

MBI 185614
March 2024

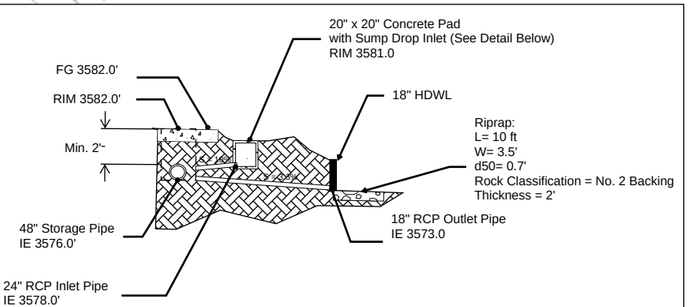
Node 156

20' x 20' concrete pad
with sump Drop-Inlet

Riprap
L = 10'
W = 5'
Thickness= 2.7'
Rock Class 1/4 ton
D50 = 1.8'

Single 48" Storage Pipe
L= 300'
Q100 In = 16.4 cfs
Q100 Out = 13.4 cfs
100-Year Depth = 3.24'

18" RCP Outlet Pipe



48" STORAGE PIPE DETAIL
NTS

24' FIRE ACCESS ROAD

ACCESS GATE

Michael Baker
INTERNATIONAL
9755 Clairemont Mesa Boulevard
San Diego, CA 92124
Phone: (858) 614-5000 · MBAKERINTL.COM

SCALE: 1"=80'

STARLIGHT SOLAR
PROPOSED STORAGE PIPE

MBI 185614
March 2024

Node 165

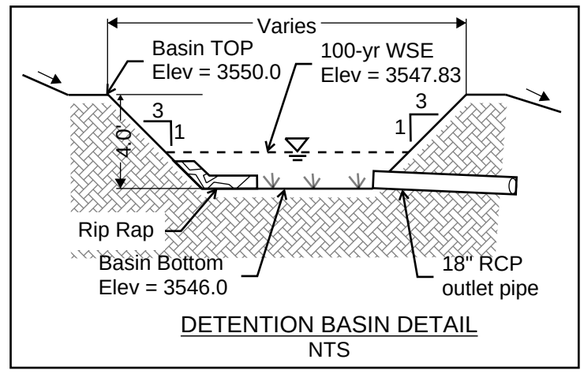
Riprap
L = 10'
W = 5'
Thickness= 2.7'
Rock Class 1/4 ton
D50 = 1.8'

18" RCP Oulet Pipe
Elev = 3546'

Riprap

Detention Basin
Top Elev = 3550'
Bottom Elev = 3546'
Q100 In = 33.8 cfs
Q100 Out = 9.0 cfs
100-Year WSE = 3547.97'
3:1 Side Slopes

Emergency Spillway Crest and
Rock lined overflow
Elev. 3548'
L=15'
D=2'



DETENTION BASIN DETAIL
NTS

SCALE: 1"=80'

Michael Baker
INTERNATIONAL
9755 Clairemont Mesa Boulevard
San Diego, CA 92124
Phone: (858) 614-5000 · MBAKERINTL.COM

STARLIGHT SOLAR
PROPOSED DETENTION BASIN

MBI 185614
March 2024

RATIONAL METHOD HYDROGRAPH PROGRAM

RUN DATE 2/27/2024
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 34 MIN.
6 HOUR RAINFALL 3 INCHES
BASIN AREA 73.4 ACRES
RUNOFF COEFFICIENT 0.23
PEAK DISCHARGE 38.86 CFS

Area A (NE)
Proposed Condition
Node 106

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 34	DISCHARGE (CFS) = 3
TIME (MIN) = 68	DISCHARGE (CFS) = 3.5
TIME (MIN) = 102	DISCHARGE (CFS) = 3.8
TIME (MIN) = 136	DISCHARGE (CFS) = 4.6
TIME (MIN) = 170	DISCHARGE (CFS) = 5.2
TIME (MIN) = 204	DISCHARGE (CFS) = 7.7
TIME (MIN) = 238	DISCHARGE (CFS) = 10.7
TIME (MIN) = 272	DISCHARGE (CFS) = 38.86
TIME (MIN) = 306	DISCHARGE (CFS) = 6.2
TIME (MIN) = 340	DISCHARGE (CFS) = 4.1
TIME (MIN) = 374	DISCHARGE (CFS) = 3.2
TIME (MIN) = 408	DISCHARGE (CFS) = 0

RATIONAL METHOD HYDROGRAPH PROGRAM

RUN DATE 2/27/2024
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 21 MIN.
6 HOUR RAINFALL 3 INCHES
BASIN AREA 24.2 ACRES
RUNOFF COEFFICIENT 0.23
PEAK DISCHARGE 17.45 CFS

Area A (NE)
Proposed Condition
Node 128

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 21	DISCHARGE (CFS) = 1
TIME (MIN) = 42	DISCHARGE (CFS) = 1.1
TIME (MIN) = 63	DISCHARGE (CFS) = 1.2
TIME (MIN) = 84	DISCHARGE (CFS) = 1.3
TIME (MIN) = 105	DISCHARGE (CFS) = 1.4
TIME (MIN) = 126	DISCHARGE (CFS) = 1.6
TIME (MIN) = 147	DISCHARGE (CFS) = 1.7
TIME (MIN) = 168	DISCHARGE (CFS) = 2.1
TIME (MIN) = 189	DISCHARGE (CFS) = 2.4
TIME (MIN) = 210	DISCHARGE (CFS) = 3.5
TIME (MIN) = 231	DISCHARGE (CFS) = 4.8
TIME (MIN) = 252	DISCHARGE (CFS) = 17.45
TIME (MIN) = 273	DISCHARGE (CFS) = 2.8
TIME (MIN) = 294	DISCHARGE (CFS) = 1.9
TIME (MIN) = 315	DISCHARGE (CFS) = 1.4
TIME (MIN) = 336	DISCHARGE (CFS) = 1.2
TIME (MIN) = 357	DISCHARGE (CFS) = 1.1
TIME (MIN) = 378	DISCHARGE (CFS) = 0

RATIONAL METHOD HYDROGRAPH PROGRAM

RUN DATE 2/27/2024
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 5 MIN.
6 HOUR RAINFALL 3 INCHES
BASIN AREA 11.32 ACRES
RUNOFF COEFFICIENT 0.23
PEAK DISCHARGE 20.5 CFS

Area A (NE)
Proposed Condition
Node 129

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 5	DISCHARGE (CFS) = 0.5
TIME (MIN) = 10	DISCHARGE (CFS) = 0.5
TIME (MIN) = 15	DISCHARGE (CFS) = 0.5
TIME (MIN) = 20	DISCHARGE (CFS) = 0.5
TIME (MIN) = 25	DISCHARGE (CFS) = 0.5
TIME (MIN) = 30	DISCHARGE (CFS) = 0.5
TIME (MIN) = 35	DISCHARGE (CFS) = 0.5
TIME (MIN) = 40	DISCHARGE (CFS) = 0.5
TIME (MIN) = 45	DISCHARGE (CFS) = 0.5
TIME (MIN) = 50	DISCHARGE (CFS) = 0.5
TIME (MIN) = 55	DISCHARGE (CFS) = 0.5
TIME (MIN) = 60	DISCHARGE (CFS) = 0.5
TIME (MIN) = 65	DISCHARGE (CFS) = 0.6
TIME (MIN) = 70	DISCHARGE (CFS) = 0.6
TIME (MIN) = 75	DISCHARGE (CFS) = 0.6
TIME (MIN) = 80	DISCHARGE (CFS) = 0.6
TIME (MIN) = 85	DISCHARGE (CFS) = 0.6
TIME (MIN) = 90	DISCHARGE (CFS) = 0.6
TIME (MIN) = 95	DISCHARGE (CFS) = 0.6
TIME (MIN) = 100	DISCHARGE (CFS) = 0.6
TIME (MIN) = 105	DISCHARGE (CFS) = 0.7
TIME (MIN) = 110	DISCHARGE (CFS) = 0.7
TIME (MIN) = 115	DISCHARGE (CFS) = 0.7
TIME (MIN) = 120	DISCHARGE (CFS) = 0.7
TIME (MIN) = 125	DISCHARGE (CFS) = 0.7
TIME (MIN) = 130	DISCHARGE (CFS) = 0.7
TIME (MIN) = 135	DISCHARGE (CFS) = 0.8
TIME (MIN) = 140	DISCHARGE (CFS) = 0.8
TIME (MIN) = 145	DISCHARGE (CFS) = 0.8
TIME (MIN) = 150	DISCHARGE (CFS) = 0.8
TIME (MIN) = 155	DISCHARGE (CFS) = 0.9
TIME (MIN) = 160	DISCHARGE (CFS) = 0.9
TIME (MIN) = 165	DISCHARGE (CFS) = 1
TIME (MIN) = 170	DISCHARGE (CFS) = 1
TIME (MIN) = 175	DISCHARGE (CFS) = 1
TIME (MIN) = 180	DISCHARGE (CFS) = 1.1
TIME (MIN) = 185	DISCHARGE (CFS) = 1.2
TIME (MIN) = 190	DISCHARGE (CFS) = 1.2
TIME (MIN) = 195	DISCHARGE (CFS) = 1.3
TIME (MIN) = 200	DISCHARGE (CFS) = 1.4
TIME (MIN) = 205	DISCHARGE (CFS) = 1.5
TIME (MIN) = 210	DISCHARGE (CFS) = 1.6
TIME (MIN) = 215	DISCHARGE (CFS) = 1.8
TIME (MIN) = 220	DISCHARGE (CFS) = 2
TIME (MIN) = 225	DISCHARGE (CFS) = 2.4
TIME (MIN) = 230	DISCHARGE (CFS) = 2.8
TIME (MIN) = 235	DISCHARGE (CFS) = 4.1
TIME (MIN) = 240	DISCHARGE (CFS) = 5.8
TIME (MIN) = 245	DISCHARGE (CFS) = 20.5
TIME (MIN) = 250	DISCHARGE (CFS) = 3.3
TIME (MIN) = 255	DISCHARGE (CFS) = 2.2
TIME (MIN) = 260	DISCHARGE (CFS) = 1.7
TIME (MIN) = 265	DISCHARGE (CFS) = 1.4
TIME (MIN) = 270	DISCHARGE (CFS) = 1.2
TIME (MIN) = 275	DISCHARGE (CFS) = 1.1
TIME (MIN) = 280	DISCHARGE (CFS) = 1
TIME (MIN) = 285	DISCHARGE (CFS) = 0.9
TIME (MIN) = 290	DISCHARGE (CFS) = 0.9
TIME (MIN) = 295	DISCHARGE (CFS) = 0.8
TIME (MIN) = 300	DISCHARGE (CFS) = 0.8
TIME (MIN) = 305	DISCHARGE (CFS) = 0.7
TIME (MIN) = 310	DISCHARGE (CFS) = 0.7
TIME (MIN) = 315	DISCHARGE (CFS) = 0.7
TIME (MIN) = 320	DISCHARGE (CFS) = 0.6
TIME (MIN) = 325	DISCHARGE (CFS) = 0.6
TIME (MIN) = 330	DISCHARGE (CFS) = 0.6
TIME (MIN) = 335	DISCHARGE (CFS) = 0.6
TIME (MIN) = 340	DISCHARGE (CFS) = 0.5
TIME (MIN) = 345	DISCHARGE (CFS) = 0.5
TIME (MIN) = 350	DISCHARGE (CFS) = 0.5
TIME (MIN) = 355	DISCHARGE (CFS) = 0.5
TIME (MIN) = 360	DISCHARGE (CFS) = 0.5
TIME (MIN) = 365	DISCHARGE (CFS) = 0

RATIONAL METHOD HYDROGRAPH PROGRAM

RUN DATE 2/27/2024
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 18 MIN.
6 HOUR RAINFALL 3 INCHES
BASIN AREA 21 ACRES
RUNOFF COEFFICIENT 0.23
PEAK DISCHARGE 16.44 CFS

Area A (NE)
Proposed Condition
Node 156

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 18	DISCHARGE (CFS) = 0.9
TIME (MIN) = 36	DISCHARGE (CFS) = 0.9
TIME (MIN) = 54	DISCHARGE (CFS) = 1
TIME (MIN) = 72	DISCHARGE (CFS) = 1.1
TIME (MIN) = 90	DISCHARGE (CFS) = 1.1
TIME (MIN) = 108	DISCHARGE (CFS) = 1.2
TIME (MIN) = 126	DISCHARGE (CFS) = 1.3
TIME (MIN) = 144	DISCHARGE (CFS) = 1.5
TIME (MIN) = 162	DISCHARGE (CFS) = 1.6
TIME (MIN) = 180	DISCHARGE (CFS) = 2
TIME (MIN) = 198	DISCHARGE (CFS) = 2.3
TIME (MIN) = 216	DISCHARGE (CFS) = 3.3
TIME (MIN) = 234	DISCHARGE (CFS) = 4.9
TIME (MIN) = 252	DISCHARGE (CFS) = 16.44
TIME (MIN) = 270	DISCHARGE (CFS) = 2.7
TIME (MIN) = 288	DISCHARGE (CFS) = 1.8
TIME (MIN) = 306	DISCHARGE (CFS) = 1.4
TIME (MIN) = 324	DISCHARGE (CFS) = 1.2
TIME (MIN) = 342	DISCHARGE (CFS) = 1
TIME (MIN) = 360	DISCHARGE (CFS) = 0.9
TIME (MIN) = 378	DISCHARGE (CFS) = 0

RATIONAL METHOD HYDROGRAPH PROGRAM

RUN DATE 2/27/2024
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 12 MIN.
6 HOUR RAINFALL 3 INCHES
BASIN AREA 33.4 ACRES
RUNOFF COEFFICIENT 0.23
PEAK DISCHARGE 33.8 CFS

Area A (NE)
Proposed Condition
Node 165

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 12	DISCHARGE (CFS) = 1.4
TIME (MIN) = 24	DISCHARGE (CFS) = 1.4
TIME (MIN) = 36	DISCHARGE (CFS) = 1.5
TIME (MIN) = 48	DISCHARGE (CFS) = 1.5
TIME (MIN) = 60	DISCHARGE (CFS) = 1.6
TIME (MIN) = 72	DISCHARGE (CFS) = 1.6
TIME (MIN) = 84	DISCHARGE (CFS) = 1.7
TIME (MIN) = 96	DISCHARGE (CFS) = 1.8
TIME (MIN) = 108	DISCHARGE (CFS) = 1.9
TIME (MIN) = 120	DISCHARGE (CFS) = 2
TIME (MIN) = 132	DISCHARGE (CFS) = 2.2
TIME (MIN) = 144	DISCHARGE (CFS) = 2.3
TIME (MIN) = 156	DISCHARGE (CFS) = 2.5
TIME (MIN) = 168	DISCHARGE (CFS) = 2.7
TIME (MIN) = 180	DISCHARGE (CFS) = 3.1
TIME (MIN) = 192	DISCHARGE (CFS) = 3.3
TIME (MIN) = 204	DISCHARGE (CFS) = 4.1
TIME (MIN) = 216	DISCHARGE (CFS) = 4.7
TIME (MIN) = 228	DISCHARGE (CFS) = 6.8
TIME (MIN) = 240	DISCHARGE (CFS) = 10.4
TIME (MIN) = 252	DISCHARGE (CFS) = 33.8
TIME (MIN) = 264	DISCHARGE (CFS) = 5.5
TIME (MIN) = 276	DISCHARGE (CFS) = 3.7
TIME (MIN) = 288	DISCHARGE (CFS) = 2.9
TIME (MIN) = 300	DISCHARGE (CFS) = 2.4
TIME (MIN) = 312	DISCHARGE (CFS) = 2.1
TIME (MIN) = 324	DISCHARGE (CFS) = 1.9
TIME (MIN) = 336	DISCHARGE (CFS) = 1.7
TIME (MIN) = 348	DISCHARGE (CFS) = 1.6
TIME (MIN) = 360	DISCHARGE (CFS) = 1.4
TIME (MIN) = 372	DISCHARGE (CFS) = 0

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

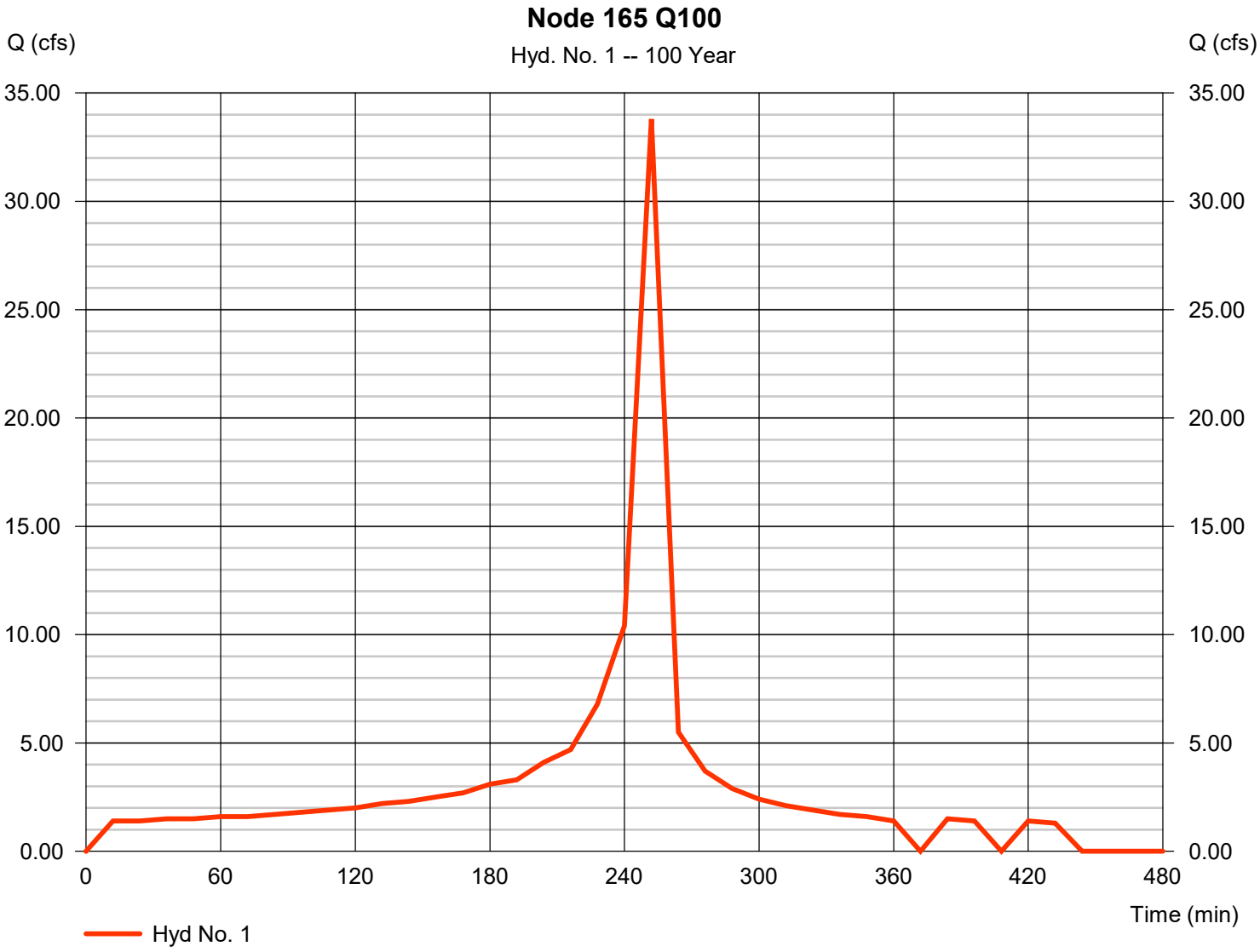
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Manual	33.80	12	252	87,192	------	------	------	Node 165 Q100
2	Reservoir	8.985	12	264	87,160	1	101.97	39,117	Mitigated Q100
4	Manual	16.44	18	252	55,663	------	------	------	Node 156 Q100
5	Reservoir	13.44	18	252	55,922	4	103.24	3,271	Mitigated Q100
7	Manual	17.45	21	252	63,063	------	------	------	Node 128 Q100
8	Reservoir	9.346	21	273	63,050	7	101.91	15,236	Mitigated Q100
10	Manual	38.86	34	272	199,226	------	------	------	Node 106 Q100
11	Reservoir	30.22	34	272	200,132	10	104.99	16,093	Mitigated Q100
13	Manual	20.50	5	245	28,200	------	------	------	Node 129 Q100
14	Reservoir	14.21	5	245	28,199	13	103.54	1,762	Mitigated Q100

Hydrograph Report

Hyd. No. 1

Node 165 Q100

Hydrograph type	= Manual	Peak discharge	= 33.80 cfs
Storm frequency	= 100 yrs	Time to peak	= 252 min
Time interval	= 12 min	Hyd. volume	= 87,192 cuft



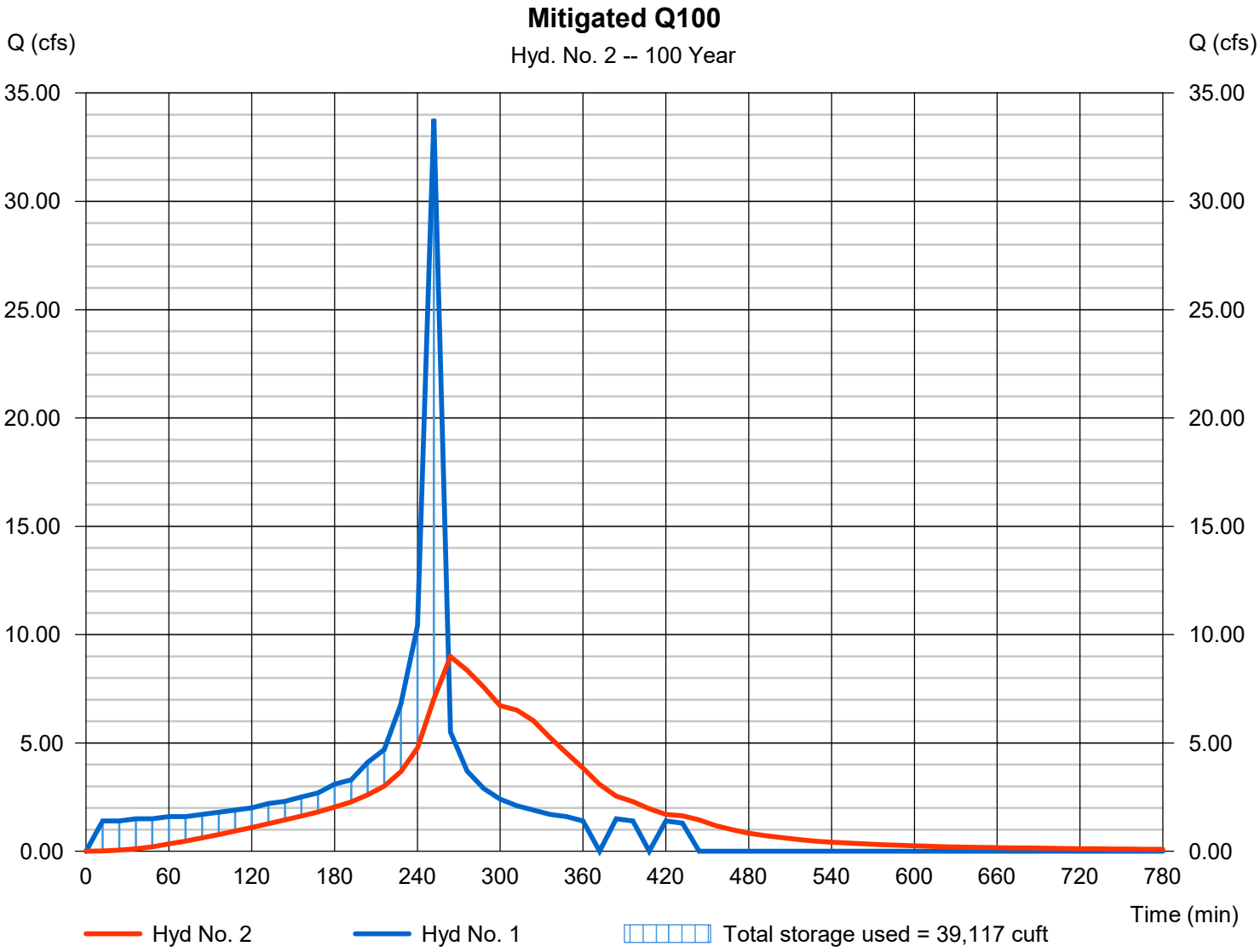
Hydrograph Report

Hyd. No. 2

Mitigated Q100

Hydrograph type	=	Reservoir	Peak discharge	=	8.985 cfs
Storm frequency	=	100 yrs	Time to peak	=	264 min
Time interval	=	12 min	Hyd. volume	=	87,160 cuft
Inflow hyd. No.	=	1 - Node 165 Q100	Max. Elevation	=	101.97 ft
Reservoir name	=	Node 165 Det. Basin	Max. Storage	=	39,117 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - Node 165 Det. Basin

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 100.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	100.00	15,000	0	0
1.00	101.00	20,000	17,438	17,438
2.00	102.00	25,000	22,451	39,890
3.00	103.00	50,000	36,781	76,671

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 18.00	0.00	0.00	0.00
Span (in)	= 18.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 100.00	0.00	0.00	0.00
Length (ft)	= 50.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 100.00	0.00	0.00	0.00
Crest El. (ft)	= 102.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

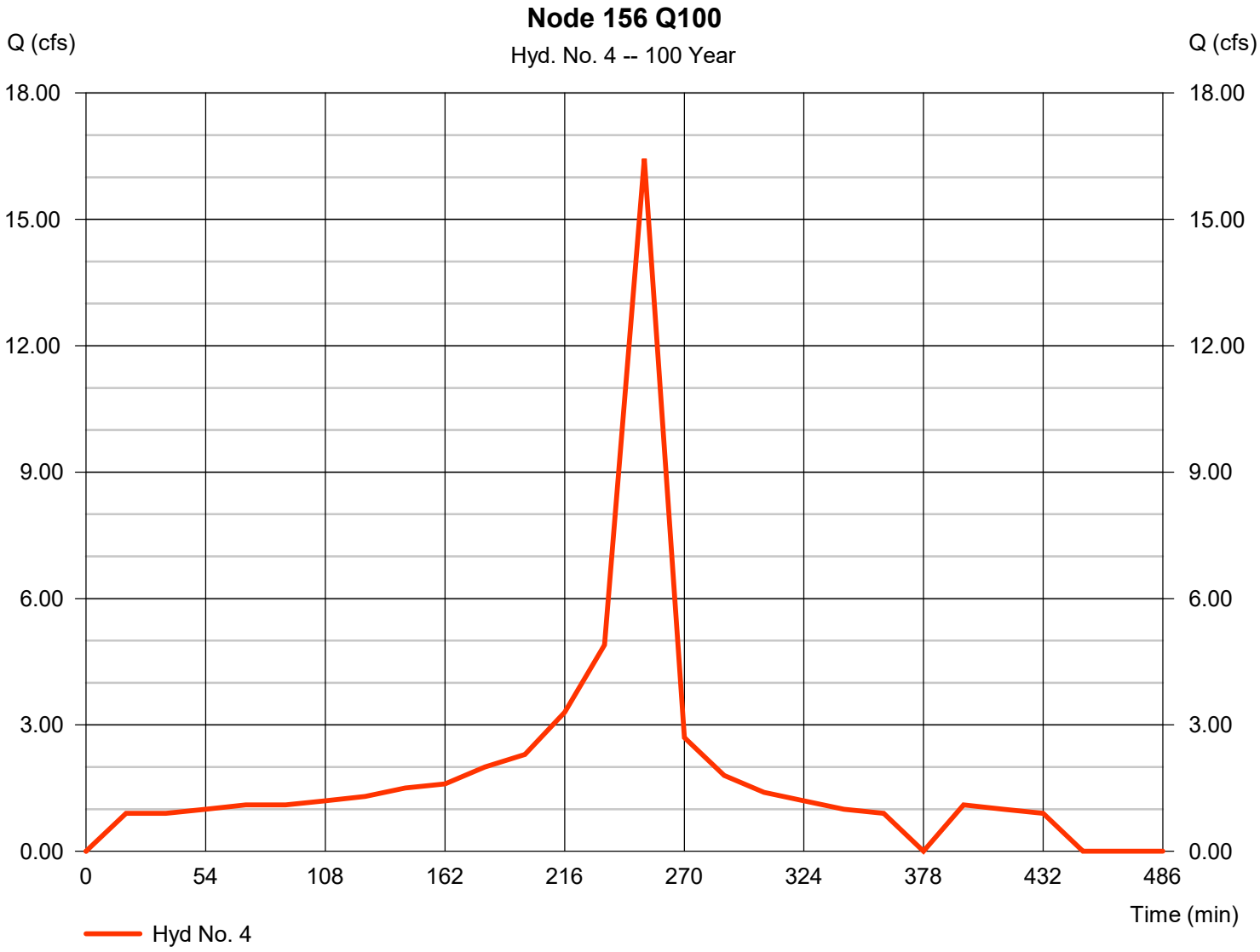
Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	100.00	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.10	1,744	100.10	0.05 ic	---	---	---	0.00	---	---	---	---	---	0.055
0.20	3,488	100.20	0.21 ic	---	---	---	0.00	---	---	---	---	---	0.213
0.30	5,232	100.30	0.47 ic	---	---	---	0.00	---	---	---	---	---	0.471
0.40	6,975	100.40	0.81 ic	---	---	---	0.00	---	---	---	---	---	0.815
0.50	8,719	100.50	1.24 ic	---	---	---	0.00	---	---	---	---	---	1.243
0.60	10,463	100.60	1.74 ic	---	---	---	0.00	---	---	---	---	---	1.742
0.70	12,207	100.70	2.31 ic	---	---	---	0.00	---	---	---	---	---	2.306
0.80	13,951	100.80	2.92 ic	---	---	---	0.00	---	---	---	---	---	2.922
0.90	15,695	100.90	3.58 ic	---	---	---	0.00	---	---	---	---	---	3.580
1.00	17,438	101.00	4.26 ic	---	---	---	0.00	---	---	---	---	---	4.265
1.10	19,684	101.10	4.96 ic	---	---	---	0.00	---	---	---	---	---	4.964
1.20	21,929	101.20	5.65 ic	---	---	---	0.00	---	---	---	---	---	5.654
1.30	24,174	101.30	6.22 oc	---	---	---	0.00	---	---	---	---	---	6.224
1.40	26,419	101.40	6.51 oc	---	---	---	0.00	---	---	---	---	---	6.513
1.50	28,664	101.50	6.47 oc	---	---	---	0.00	---	---	---	---	---	6.470
1.60	30,909	101.60	7.08 oc	---	---	---	0.00	---	---	---	---	---	7.085
1.70	33,154	101.70	7.65 oc	---	---	---	0.00	---	---	---	---	---	7.652
1.80	35,399	101.80	8.18 oc	---	---	---	0.00	---	---	---	---	---	8.181
1.90	37,645	101.90	8.68 oc	---	---	---	0.00	---	---	---	---	---	8.677
2.00	39,890	102.00	9.15 oc	---	---	---	0.00	---	---	---	---	---	9.146
2.10	43,568	102.10	9.59 oc	---	---	---	10.53	---	---	---	---	---	20.12
2.20	47,246	102.20	10.02 oc	---	---	---	29.78	---	---	---	---	---	39.80
2.30	50,924	102.30	10.43 oc	---	---	---	54.72	---	---	---	---	---	65.14
2.40	54,602	102.40	10.82 oc	---	---	---	84.24	---	---	---	---	---	95.06
2.50	58,280	102.50	11.20 oc	---	---	---	117.73	---	---	---	---	---	128.93
2.60	61,959	102.60	11.57 oc	---	---	---	154.76	---	---	---	---	---	166.33
2.70	65,637	102.70	11.88 ic	---	---	---	195.02	---	---	---	---	---	206.90
2.80	69,315	102.80	12.18 ic	---	---	---	238.27	---	---	---	---	---	250.45
2.90	72,993	102.90	12.47 ic	---	---	---	284.31	---	---	---	---	---	296.79
3.00	76,671	103.00	12.76 ic	---	---	---	333.00	---	---	---	---	---	345.76

Hydrograph Report

Hyd. No. 4

Node 156 Q100

Hydrograph type	= Manual	Peak discharge	= 16.44 cfs
Storm frequency	= 100 yrs	Time to peak	= 252 min
Time interval	= 18 min	Hyd. volume	= 55,663 cuft



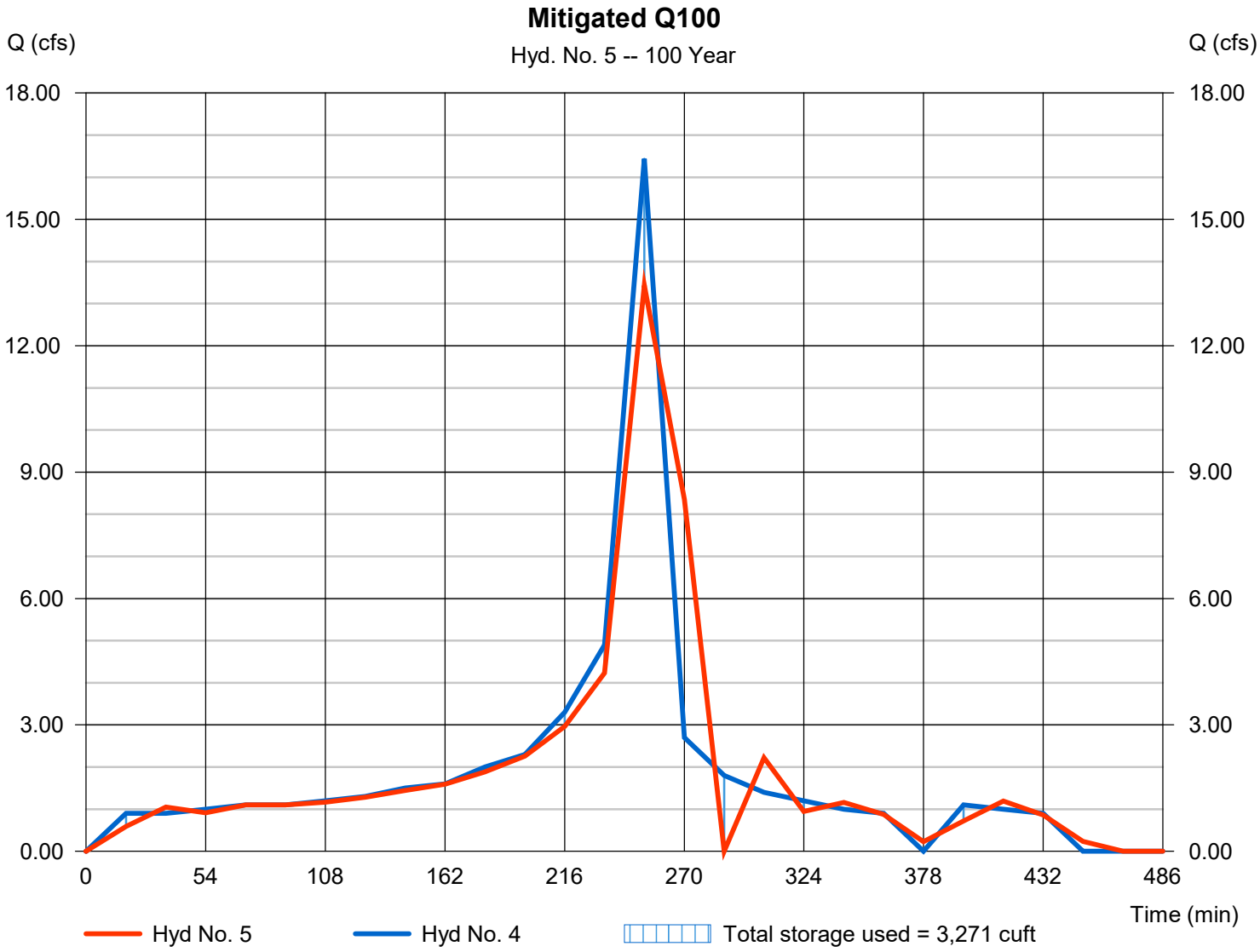
Hydrograph Report

Hyd. No. 5

Mitigated Q100

Hydrograph type	=	Reservoir	Peak discharge	=	13.44 cfs
Storm frequency	=	100 yrs	Time to peak	=	252 min
Time interval	=	18 min	Hyd. volume	=	55,922 cuft
Inflow hyd. No.	=	4 - Node 156 Q100	Max. Elevation	=	103.24 ft
Reservoir name	=	Node 156 Pipe Storage	Max. Storage	=	3,271 cuft

Storage Indication method used.



Pond Report

Pond No. 3 - Node 156 Pipe Storage

Pond Data

UG Chambers -Invert elev. = 100.00 ft, Rise x Span = 4.00 x 4.00 ft, Barrel Len = 300.00 ft, No. Barrels = 1, Slope = 0.00%, Headers = No

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	100.00	n/a	0	0
0.40	100.40	n/a	197	197
0.80	100.80	n/a	341	537
1.20	101.20	n/a	415	952
1.60	101.60	n/a	457	1,409
2.00	102.00	n/a	477	1,886
2.40	102.40	n/a	477	2,363
2.80	102.80	n/a	457	2,820
3.20	103.20	n/a	414	3,234
3.60	103.60	n/a	341	3,575
4.00	104.00	n/a	196	3,771

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 18.00	0.00	0.00	0.00
Span (in)	= 18.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 100.00	0.00	0.00	0.00
Length (ft)	= 15.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	100.00	0.00	---	---	---	---	---	---	---	---	---	0.000
0.04	20	100.04	0.01 ic	---	---	---	---	---	---	---	---	---	0.009
0.08	39	100.08	0.04 ic	---	---	---	---	---	---	---	---	---	0.035
0.12	59	100.12	0.08 ic	---	---	---	---	---	---	---	---	---	0.079
0.16	79	100.16	0.14 ic	---	---	---	---	---	---	---	---	---	0.138
0.20	98	100.20	0.21 ic	---	---	---	---	---	---	---	---	---	0.213
0.24	118	100.24	0.30 ic	---	---	---	---	---	---	---	---	---	0.304
0.28	138	100.28	0.41 ic	---	---	---	---	---	---	---	---	---	0.411
0.32	157	100.32	0.53 ic	---	---	---	---	---	---	---	---	---	0.533
0.36	177	100.36	0.67 ic	---	---	---	---	---	---	---	---	---	0.667
0.40	197	100.40	0.81 ic	---	---	---	---	---	---	---	---	---	0.815
0.44	231	100.44	0.96 oc	---	---	---	---	---	---	---	---	---	0.960
0.48	265	100.48	1.10 oc	---	---	---	---	---	---	---	---	---	1.095
0.52	299	100.52	1.23 oc	---	---	---	---	---	---	---	---	---	1.233
0.56	333	100.56	1.37 oc	---	---	---	---	---	---	---	---	---	1.373
0.60	367	100.60	1.52 oc	---	---	---	---	---	---	---	---	---	1.516
0.64	401	100.64	1.66 oc	---	---	---	---	---	---	---	---	---	1.663
0.68	435	100.68	1.81 oc	---	---	---	---	---	---	---	---	---	1.808
0.72	469	100.72	1.96 oc	---	---	---	---	---	---	---	---	---	1.955
0.76	503	100.76	2.10 oc	---	---	---	---	---	---	---	---	---	2.103
0.80	537	100.80	2.25 oc	---	---	---	---	---	---	---	---	---	2.250
0.84	579	100.84	2.40 oc	---	---	---	---	---	---	---	---	---	2.396
0.88	620	100.88	2.54 oc	---	---	---	---	---	---	---	---	---	2.540
0.92	662	100.92	2.69 oc	---	---	---	---	---	---	---	---	---	2.685
0.96	703	100.96	2.83 oc	---	---	---	---	---	---	---	---	---	2.827
1.00	745	101.00	2.97 oc	---	---	---	---	---	---	---	---	---	2.967
1.04	786	101.04	3.10 oc	---	---	---	---	---	---	---	---	---	3.102
1.08	827	101.08	3.24 oc	---	---	---	---	---	---	---	---	---	3.237
1.12	869	101.12	3.36 oc	---	---	---	---	---	---	---	---	---	3.364
1.16	910	101.16	3.49 oc	---	---	---	---	---	---	---	---	---	3.488
1.20	952	101.20	3.60 oc	---	---	---	---	---	---	---	---	---	3.604
1.24	998	101.24	3.72 oc	---	---	---	---	---	---	---	---	---	3.716

Continues on next page...

Node 156 Pipe Storage

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.28	1,043	101.28	3.82 oc	---	---	---	---	---	---	---	---	---	3.819
1.32	1,089	101.32	3.91 oc	---	---	---	---	---	---	---	---	---	3.913
1.36	1,135	101.36	4.00 oc	---	---	---	---	---	---	---	---	---	3.997
1.40	1,180	101.40	4.07 oc	---	---	---	---	---	---	---	---	---	4.067
1.44	1,226	101.44	4.12 oc	---	---	---	---	---	---	---	---	---	4.120
1.48	1,272	101.48	4.15 oc	---	---	---	---	---	---	---	---	---	4.146
1.52	1,317	101.52	4.39 oc	---	---	---	---	---	---	---	---	---	4.393
1.56	1,363	101.56	4.88 oc	---	---	---	---	---	---	---	---	---	4.883
1.60	1,409	101.60	5.33 oc	---	---	---	---	---	---	---	---	---	5.327
1.64	1,456	101.64	5.74 oc	---	---	---	---	---	---	---	---	---	5.738
1.68	1,504	101.68	6.12 oc	---	---	---	---	---	---	---	---	---	6.121
1.72	1,552	101.72	6.48 oc	---	---	---	---	---	---	---	---	---	6.481
1.76	1,599	101.76	6.82 oc	---	---	---	---	---	---	---	---	---	6.823
1.80	1,647	101.80	7.15 oc	---	---	---	---	---	---	---	---	---	7.148
1.84	1,695	101.84	7.46 oc	---	---	---	---	---	---	---	---	---	7.458
1.88	1,743	101.88	7.76 oc	---	---	---	---	---	---	---	---	---	7.757
1.92	1,790	101.92	8.04 oc	---	---	---	---	---	---	---	---	---	8.044
1.96	1,838	101.96	8.32 oc	---	---	---	---	---	---	---	---	---	8.322
2.00	1,886	102.00	8.59 oc	---	---	---	---	---	---	---	---	---	8.590
2.04	1,933	102.04	8.85 oc	---	---	---	---	---	---	---	---	---	8.851
2.08	1,981	102.08	9.10 oc	---	---	---	---	---	---	---	---	---	9.104
2.12	2,029	102.12	9.35 oc	---	---	---	---	---	---	---	---	---	9.350
2.16	2,077	102.16	9.59 oc	---	---	---	---	---	---	---	---	---	9.589
2.20	2,124	102.20	9.82 oc	---	---	---	---	---	---	---	---	---	9.823
2.24	2,172	102.24	10.05 oc	---	---	---	---	---	---	---	---	---	10.05
2.28	2,220	102.28	10.28 oc	---	---	---	---	---	---	---	---	---	10.28
2.32	2,267	102.32	10.49 oc	---	---	---	---	---	---	---	---	---	10.49
2.36	2,315	102.36	10.71 oc	---	---	---	---	---	---	---	---	---	10.71
2.40	2,363	102.40	10.92 oc	---	---	---	---	---	---	---	---	---	10.92
2.44	2,409	102.44	11.06 ic	---	---	---	---	---	---	---	---	---	11.06
2.48	2,454	102.48	11.19 ic	---	---	---	---	---	---	---	---	---	11.19
2.52	2,500	102.52	11.32 ic	---	---	---	---	---	---	---	---	---	11.32
2.56	2,546	102.56	11.45 ic	---	---	---	---	---	---	---	---	---	11.45
2.60	2,591	102.60	11.57 ic	---	---	---	---	---	---	---	---	---	11.57
2.64	2,637	102.64	11.70 ic	---	---	---	---	---	---	---	---	---	11.70
2.68	2,683	102.68	11.82 ic	---	---	---	---	---	---	---	---	---	11.82
2.72	2,728	102.72	11.94 ic	---	---	---	---	---	---	---	---	---	11.94
2.76	2,774	102.76	12.06 ic	---	---	---	---	---	---	---	---	---	12.06
2.80	2,820	102.80	12.18 ic	---	---	---	---	---	---	---	---	---	12.18
2.84	2,861	102.84	12.30 ic	---	---	---	---	---	---	---	---	---	12.30
2.88	2,902	102.88	12.42 ic	---	---	---	---	---	---	---	---	---	12.42
2.92	2,944	102.92	12.53 ic	---	---	---	---	---	---	---	---	---	12.53
2.96	2,985	102.96	12.65 ic	---	---	---	---	---	---	---	---	---	12.65
3.00	3,027	103.00	12.76 ic	---	---	---	---	---	---	---	---	---	12.76
3.04	3,068	103.04	12.87 ic	---	---	---	---	---	---	---	---	---	12.87
3.08	3,110	103.08	12.99 ic	---	---	---	---	---	---	---	---	---	12.99
3.12	3,151	103.12	13.10 ic	---	---	---	---	---	---	---	---	---	13.10
3.16	3,193	103.16	13.21 ic	---	---	---	---	---	---	---	---	---	13.21
3.20	3,234	103.20	13.32 ic	---	---	---	---	---	---	---	---	---	13.32
3.24	3,268	103.24	13.42 ic	---	---	---	---	---	---	---	---	---	13.42
3.28	3,302	103.28	13.53 ic	---	---	---	---	---	---	---	---	---	13.53
3.32	3,336	103.32	13.64 ic	---	---	---	---	---	---	---	---	---	13.64
3.36	3,370	103.36	13.74 ic	---	---	---	---	---	---	---	---	---	13.74
3.40	3,404	103.40	13.85 ic	---	---	---	---	---	---	---	---	---	13.85
3.44	3,438	103.44	13.95 ic	---	---	---	---	---	---	---	---	---	13.95
3.48	3,472	103.48	14.06 ic	---	---	---	---	---	---	---	---	---	14.06
3.52	3,507	103.52	14.16 ic	---	---	---	---	---	---	---	---	---	14.16
3.56	3,541	103.56	14.26 ic	---	---	---	---	---	---	---	---	---	14.26
3.60	3,575	103.60	14.36 ic	---	---	---	---	---	---	---	---	---	14.36
3.64	3,594	103.64	14.46 ic	---	---	---	---	---	---	---	---	---	14.46
3.68	3,614	103.68	14.56 ic	---	---	---	---	---	---	---	---	---	14.56
3.72	3,633	103.72	14.66 ic	---	---	---	---	---	---	---	---	---	14.66
3.76	3,653	103.76	14.76 ic	---	---	---	---	---	---	---	---	---	14.76
3.80	3,673	103.80	14.86 ic	---	---	---	---	---	---	---	---	---	14.86
3.84	3,692	103.84	14.96 ic	---	---	---	---	---	---	---	---	---	14.96
3.88	3,712	103.88	15.05 ic	---	---	---	---	---	---	---	---	---	15.05
3.92	3,731	103.92	15.15 ic	---	---	---	---	---	---	---	---	---	15.15
3.96	3,751	103.96	15.24 ic	---	---	---	---	---	---	---	---	---	15.24
4.00	3,771	104.00	15.34 ic	---	---	---	---	---	---	---	---	---	15.34

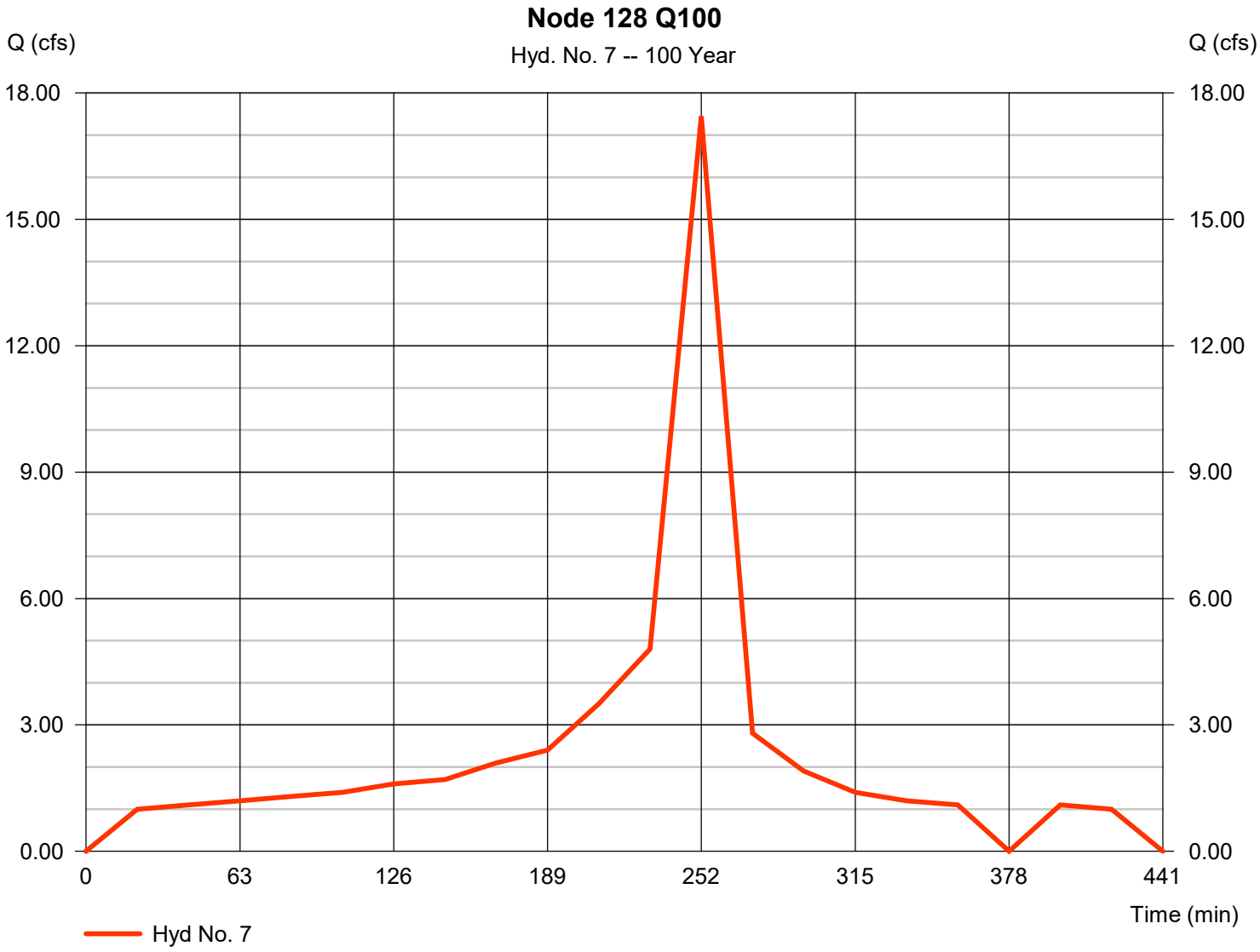
...End

Hydrograph Report

Hyd. No. 7

Node 128 Q100

Hydrograph type	= Manual	Peak discharge	= 17.45 cfs
Storm frequency	= 100 yrs	Time to peak	= 252 min
Time interval	= 21 min	Hyd. volume	= 63,063 cuft



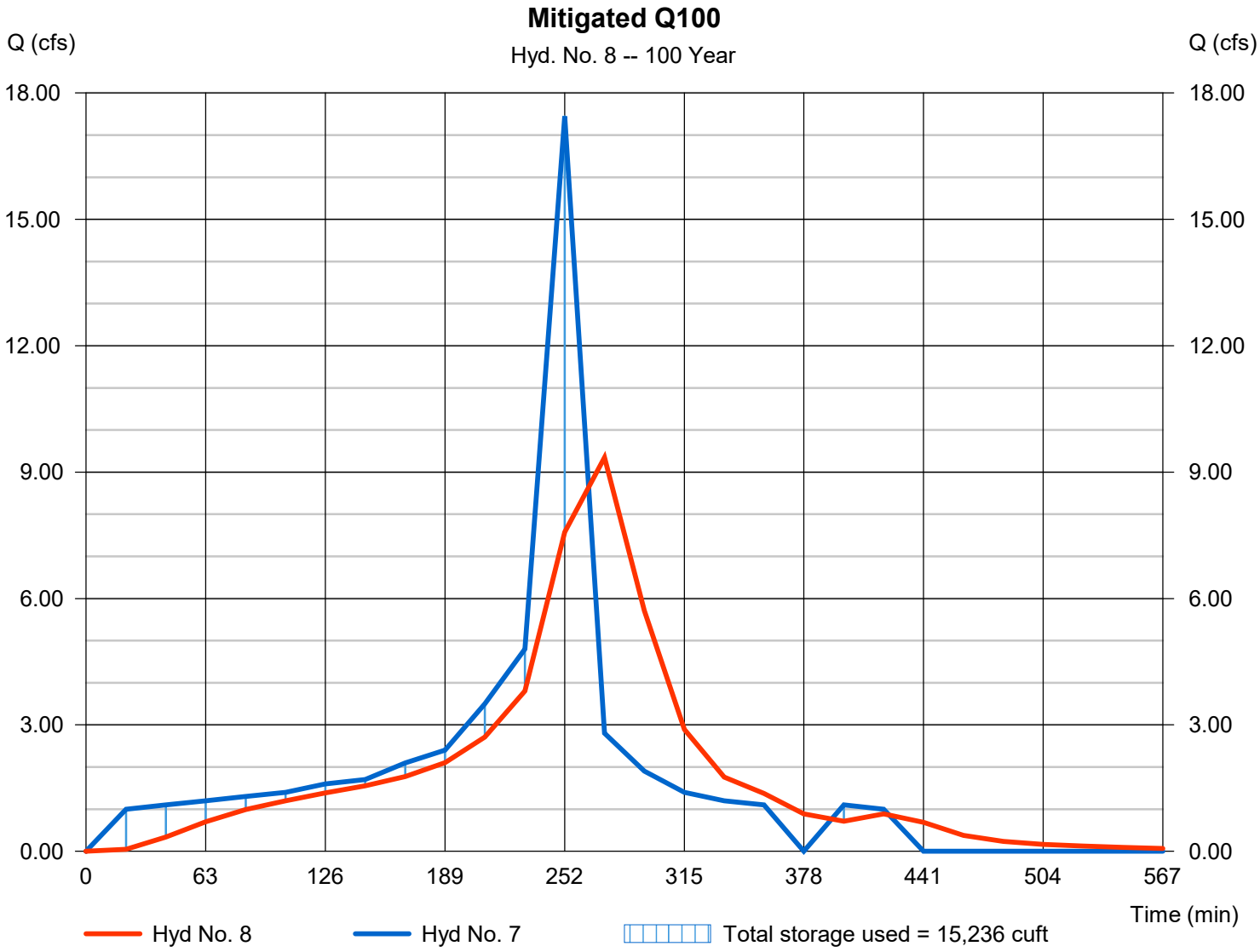
Hydrograph Report

Hyd. No. 8

Mitigated Q100

Hydrograph type	=	Reservoir	Peak discharge	=	9.346 cfs
Storm frequency	=	100 yrs	Time to peak	=	273 min
Time interval	=	21 min	Hyd. volume	=	63,050 cuft
Inflow hyd. No.	=	7 - Node 128 Q100	Max. Elevation	=	101.91 ft
Reservoir name	=	Node 128 Det. Basin	Max. Storage	=	15,236 cuft

Storage Indication method used.



Pond Report

Pond No. 5 - Node 128 Det. Basin

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 100.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	100.00	5,542	0	0
1.00	101.00	8,028	6,746	6,746
2.00	102.00	10,662	9,313	16,059
3.00	103.00	12,987	11,804	27,863
4.00	104.00	50,000	29,487	57,350

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 18.00	0.00	0.00	0.00
Span (in)	= 18.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 100.00	0.00	0.00	0.00
Length (ft)	= 50.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 50.00	0.00	0.00	0.00
Crest El. (ft)	= 101.90	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	100.00	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.10	675	100.10	0.05 ic	---	---	---	0.00	---	---	---	---	---	0.055
0.20	1,349	100.20	0.21 ic	---	---	---	0.00	---	---	---	---	---	0.213
0.30	2,024	100.30	0.47 ic	---	---	---	0.00	---	---	---	---	---	0.471
0.40	2,698	100.40	0.81 ic	---	---	---	0.00	---	---	---	---	---	0.815
0.50	3,373	100.50	1.24 ic	---	---	---	0.00	---	---	---	---	---	1.243
0.60	4,048	100.60	1.74 ic	---	---	---	0.00	---	---	---	---	---	1.742
0.70	4,722	100.70	2.31 ic	---	---	---	0.00	---	---	---	---	---	2.306
0.80	5,397	100.80	2.92 ic	---	---	---	0.00	---	---	---	---	---	2.922
0.90	6,071	100.90	3.58 ic	---	---	---	0.00	---	---	---	---	---	3.580
1.00	6,746	101.00	4.26 ic	---	---	---	0.00	---	---	---	---	---	4.265
1.10	7,677	101.10	4.96 ic	---	---	---	0.00	---	---	---	---	---	4.964
1.20	8,609	101.20	5.65 ic	---	---	---	0.00	---	---	---	---	---	5.654
1.30	9,540	101.30	6.22 oc	---	---	---	0.00	---	---	---	---	---	6.224
1.40	10,471	101.40	6.51 oc	---	---	---	0.00	---	---	---	---	---	6.513
1.50	11,403	101.50	6.47 oc	---	---	---	0.00	---	---	---	---	---	6.470
1.60	12,334	101.60	7.08 oc	---	---	---	0.00	---	---	---	---	---	7.085
1.70	13,265	101.70	7.65 oc	---	---	---	0.00	---	---	---	---	---	7.652
1.80	14,196	101.80	8.18 oc	---	---	---	0.00	---	---	---	---	---	8.181
1.90	15,128	101.90	8.68 oc	---	---	---	0.00	---	---	---	---	---	8.677
2.00	16,059	102.00	9.15 oc	---	---	---	5.27	---	---	---	---	---	14.41
2.10	17,239	102.10	9.59 oc	---	---	---	14.89	---	---	---	---	---	24.48
2.20	18,420	102.20	10.02 oc	---	---	---	27.36	---	---	---	---	---	37.38
2.30	19,600	102.30	10.43 oc	---	---	---	42.12	---	---	---	---	---	52.55
2.40	20,781	102.40	10.82 oc	---	---	---	58.87	---	---	---	---	---	69.69
2.50	21,961	102.50	11.20 oc	---	---	---	77.38	---	---	---	---	---	88.58
2.60	23,142	102.60	11.57 oc	---	---	---	97.51	---	---	---	---	---	109.08
2.70	24,322	102.70	11.88 ic	---	---	---	119.14	---	---	---	---	---	131.02
2.80	25,502	102.80	12.18 ic	---	---	---	142.16	---	---	---	---	---	154.34
2.90	26,683	102.90	12.47 ic	---	---	---	166.50	---	---	---	---	---	178.97
3.00	27,863	103.00	12.76 ic	---	---	---	192.09	---	---	---	---	---	204.85
3.10	30,812	103.10	13.04 ic	---	---	---	218.87	---	---	---	---	---	231.91
3.20	33,761	103.20	13.32 ic	---	---	---	246.79	---	---	---	---	---	260.11
3.30	36,709	103.30	13.59 ic	---	---	---	275.81	---	---	---	---	---	289.39
3.40	39,658	103.40	13.85 ic	---	---	---	305.88	---	---	---	---	---	319.73
3.50	42,607	103.50	14.11 ic	---	---	---	336.97	---	---	---	---	---	351.08
3.60	45,555	103.60	14.36 ic	---	---	---	369.05	---	---	---	---	---	383.41
3.70	48,504	103.70	14.61 ic	---	---	---	402.09	---	---	---	---	---	416.70

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Node 128 Det. Basin

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
3.80	51,453	103.80	14.86 ic	---	---	---	436.05	---	---	---	---	---	450.91
3.90	54,401	103.90	15.10 ic	---	---	---	470.93	---	---	---	---	---	486.03
4.00	57,350	104.00	15.34 ic	---	---	---	506.69	---	---	---	---	---	522.03

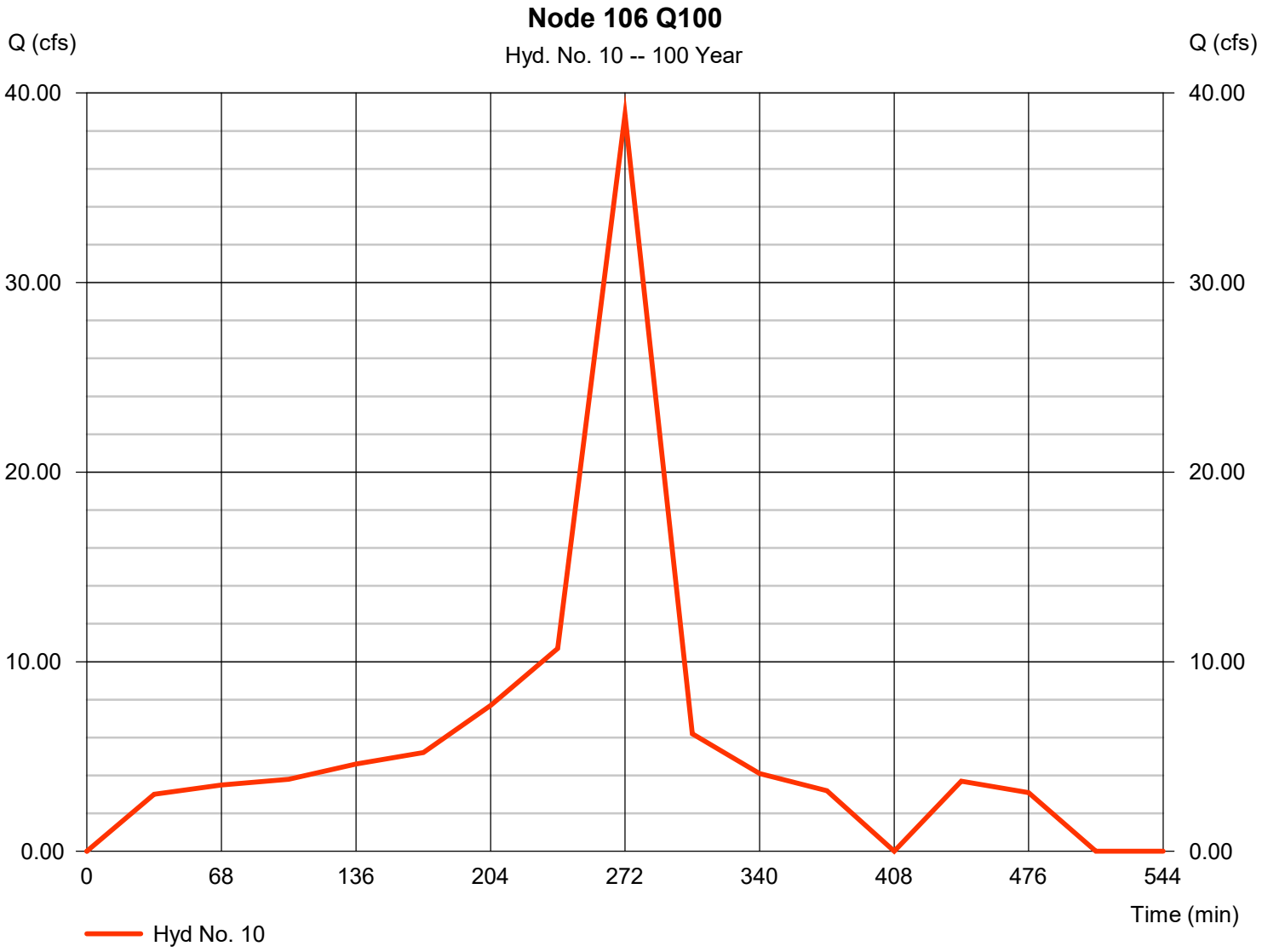
...End

Hydrograph Report

Hyd. No. 10

Node 106 Q100

Hydrograph type	= Manual	Peak discharge	= 38.86 cfs
Storm frequency	= 100 yrs	Time to peak	= 272 min
Time interval	= 34 min	Hyd. volume	= 199,226 cuft



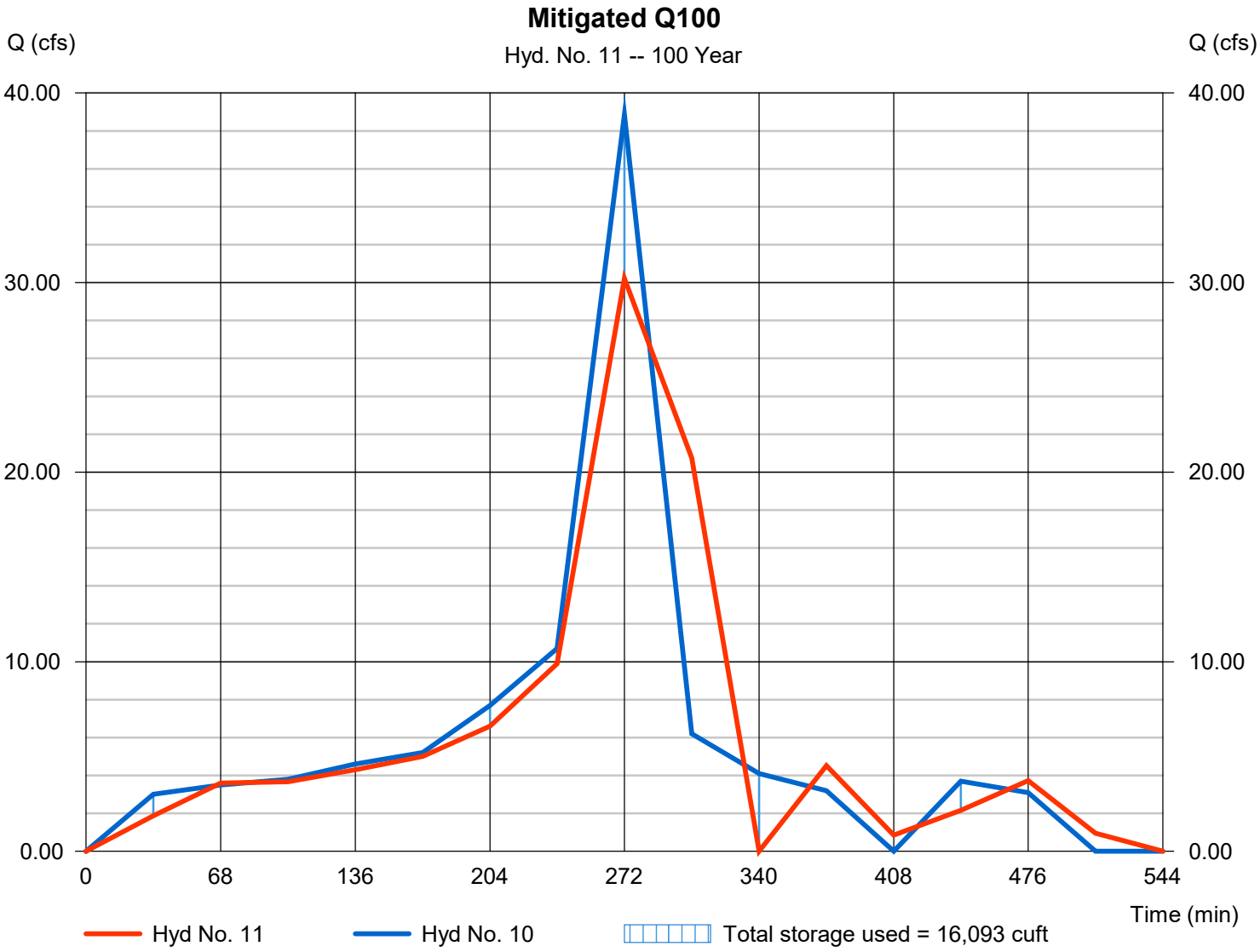
Hydrograph Report

Hyd. No. 11

Mitigated Q100

Hydrograph type	=	Reservoir	Peak discharge	=	30.22 cfs
Storm frequency	=	100 yrs	Time to peak	=	272 min
Time interval	=	34 min	Hyd. volume	=	200,132 cuft
Inflow hyd. No.	=	10 - Node 106 Q100	Max. Elevation	=	104.99 ft
Reservoir name	=	Node 106 Pipe Storage	Max. Storage	=	16,093 cuft

Storage Indication method used.



Pond Report

Pond No. 7 - Node 106 Pipe Storage

Pond Data

UG Chambers -Invert elev. = 100.00 ft, Rise x Span = 5.00 x 5.00 ft, Barrel Len = 410.00 ft, No. Barrels = 2, Slope = 0.00%, Headers = No

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	100.00	n/a	0	0
0.50	100.50	n/a	838	838
1.00	101.00	n/a	1,456	2,294
1.50	101.50	n/a	1,771	4,065
2.00	102.00	n/a	1,951	6,016
2.50	102.50	n/a	2,038	8,054
3.00	103.00	n/a	2,038	10,092
3.50	103.50	n/a	1,950	12,042
4.00	104.00	n/a	1,770	13,812
4.50	104.50	n/a	1,455	15,267
5.00	105.00	n/a	837	16,104

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 24.00	0.00	0.00	0.00
Span (in)	= 24.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 100.00	0.00	0.00	0.00
Length (ft)	= 15.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	100.00	0.00	---	---	---	---	---	---	---	---	---	0.000
0.05	84	100.05	0.02 ic	---	---	---	---	---	---	---	---	---	0.016
0.10	168	100.10	0.06 ic	---	---	---	---	---	---	---	---	---	0.064
0.15	251	100.15	0.14 ic	---	---	---	---	---	---	---	---	---	0.142
0.20	335	100.20	0.25 ic	---	---	---	---	---	---	---	---	---	0.250
0.25	419	100.25	0.39 ic	---	---	---	---	---	---	---	---	---	0.388
0.30	503	100.30	0.55 ic	---	---	---	---	---	---	---	---	---	0.553
0.35	587	100.35	0.75 ic	---	---	---	---	---	---	---	---	---	0.745
0.40	670	100.40	0.97 ic	---	---	---	---	---	---	---	---	---	0.966
0.45	754	100.45	1.19 oc	---	---	---	---	---	---	---	---	---	1.189
0.50	838	100.50	1.40 oc	---	---	---	---	---	---	---	---	---	1.396
0.55	984	100.55	1.61 oc	---	---	---	---	---	---	---	---	---	1.611
0.60	1,129	100.60	1.84 oc	---	---	---	---	---	---	---	---	---	1.839
0.65	1,275	100.65	2.07 oc	---	---	---	---	---	---	---	---	---	2.066
0.70	1,421	100.70	2.30 oc	---	---	---	---	---	---	---	---	---	2.303
0.75	1,566	100.75	2.54 oc	---	---	---	---	---	---	---	---	---	2.540
0.80	1,712	100.80	2.78 oc	---	---	---	---	---	---	---	---	---	2.777
0.85	1,857	100.85	3.03 oc	---	---	---	---	---	---	---	---	---	3.026
0.90	2,003	100.90	3.27 oc	---	---	---	---	---	---	---	---	---	3.272
0.95	2,149	100.95	3.52 oc	---	---	---	---	---	---	---	---	---	3.520
1.00	2,294	101.00	3.77 oc	---	---	---	---	---	---	---	---	---	3.769
1.05	2,471	101.05	4.01 oc	---	---	---	---	---	---	---	---	---	4.011
1.10	2,648	101.10	4.26 oc	---	---	---	---	---	---	---	---	---	4.258
1.15	2,826	101.15	4.50 oc	---	---	---	---	---	---	---	---	---	4.504
1.20	3,003	101.20	4.75 oc	---	---	---	---	---	---	---	---	---	4.753
1.25	3,180	101.25	4.99 oc	---	---	---	---	---	---	---	---	---	4.989
1.30	3,357	101.30	5.23 oc	---	---	---	---	---	---	---	---	---	5.226
1.35	3,534	101.35	5.46 oc	---	---	---	---	---	---	---	---	---	5.462
1.40	3,711	101.40	5.69 oc	---	---	---	---	---	---	---	---	---	5.688
1.45	3,888	101.45	5.92 oc	---	---	---	---	---	---	---	---	---	5.916
1.50	4,065	101.50	6.13 oc	---	---	---	---	---	---	---	---	---	6.130
1.55	4,260	101.55	6.34 oc	---	---	---	---	---	---	---	---	---	6.336

Continues on next page...

Node 106 Pipe Storage

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.60	4,455	101.60	6.54 oc	---	---	---	---	---	---	---	---	---	6.536
1.65	4,650	101.65	6.73 oc	---	---	---	---	---	---	---	---	---	6.726
1.70	4,845	101.70	6.90 oc	---	---	---	---	---	---	---	---	---	6.903
1.75	5,041	101.75	7.07 oc	---	---	---	---	---	---	---	---	---	7.066
1.80	5,236	101.80	7.22 oc	---	---	---	---	---	---	---	---	---	7.216
1.85	5,431	101.85	7.34 oc	---	---	---	---	---	---	---	---	---	7.344
1.90	5,626	101.90	7.45 oc	---	---	---	---	---	---	---	---	---	7.450
1.95	5,821	101.95	7.52 oc	---	---	---	---	---	---	---	---	---	7.524
2.00	6,016	102.00	7.52 oc	---	---	---	---	---	---	---	---	---	7.522
2.05	6,220	102.05	8.69 oc	---	---	---	---	---	---	---	---	---	8.685
2.10	6,423	102.10	9.71 oc	---	---	---	---	---	---	---	---	---	9.710
2.15	6,627	102.15	10.64 oc	---	---	---	---	---	---	---	---	---	10.64
2.20	6,831	102.20	11.49 oc	---	---	---	---	---	---	---	---	---	11.49
2.25	7,035	102.25	12.28 oc	---	---	---	---	---	---	---	---	---	12.28
2.30	7,239	102.30	13.03 oc	---	---	---	---	---	---	---	---	---	13.03
2.35	7,442	102.35	13.73 oc	---	---	---	---	---	---	---	---	---	13.73
2.40	7,646	102.40	14.40 oc	---	---	---	---	---	---	---	---	---	14.40
2.45	7,850	102.45	15.04 oc	---	---	---	---	---	---	---	---	---	15.04
2.50	8,054	102.50	15.66 oc	---	---	---	---	---	---	---	---	---	15.66
2.55	8,258	102.55	16.25 oc	---	---	---	---	---	---	---	---	---	16.25
2.60	8,461	102.60	16.82 oc	---	---	---	---	---	---	---	---	---	16.82
2.65	8,665	102.65	17.37 oc	---	---	---	---	---	---	---	---	---	17.37
2.70	8,869	102.70	17.90 oc	---	---	---	---	---	---	---	---	---	17.90
2.75	9,073	102.75	18.42 oc	---	---	---	---	---	---	---	---	---	18.42
2.80	9,277	102.80	18.93 oc	---	---	---	---	---	---	---	---	---	18.93
2.85	9,480	102.85	19.42 oc	---	---	---	---	---	---	---	---	---	19.42
2.90	9,684	102.90	19.90 oc	---	---	---	---	---	---	---	---	---	19.90
2.95	9,888	102.95	20.37 oc	---	---	---	---	---	---	---	---	---	20.37
3.00	10,092	103.00	20.83 oc	---	---	---	---	---	---	---	---	---	20.83
3.05	10,287	103.05	21.27 oc	---	---	---	---	---	---	---	---	---	21.27
3.10	10,482	103.10	21.71 oc	---	---	---	---	---	---	---	---	---	21.71
3.15	10,677	103.15	22.14 oc	---	---	---	---	---	---	---	---	---	22.14
3.20	10,872	103.20	22.43 ic	---	---	---	---	---	---	---	---	---	22.43
3.25	11,067	103.25	22.69 ic	---	---	---	---	---	---	---	---	---	22.69
3.30	11,262	103.30	22.94 ic	---	---	---	---	---	---	---	---	---	22.94
3.35	11,457	103.35	23.19 ic	---	---	---	---	---	---	---	---	---	23.19
3.40	11,652	103.40	23.43 ic	---	---	---	---	---	---	---	---	---	23.43
3.45	11,847	103.45	23.67 ic	---	---	---	---	---	---	---	---	---	23.67
3.50	12,042	103.50	23.91 ic	---	---	---	---	---	---	---	---	---	23.91
3.55	12,219	103.55	24.15 ic	---	---	---	---	---	---	---	---	---	24.15
3.60	12,396	103.60	24.39 ic	---	---	---	---	---	---	---	---	---	24.39
3.65	12,573	103.65	24.62 ic	---	---	---	---	---	---	---	---	---	24.62
3.70	12,750	103.70	24.85 ic	---	---	---	---	---	---	---	---	---	24.85
3.75	12,927	103.75	25.08 ic	---	---	---	---	---	---	---	---	---	25.08
3.80	13,104	103.80	25.31 ic	---	---	---	---	---	---	---	---	---	25.31
3.85	13,281	103.85	25.53 ic	---	---	---	---	---	---	---	---	---	25.53
3.90	13,458	103.90	25.76 ic	---	---	---	---	---	---	---	---	---	25.76
3.95	13,635	103.95	25.98 ic	---	---	---	---	---	---	---	---	---	25.98
4.00	13,812	104.00	26.20 ic	---	---	---	---	---	---	---	---	---	26.20
4.05	13,957	104.05	26.41 ic	---	---	---	---	---	---	---	---	---	26.41
4.10	14,103	104.10	26.63 ic	---	---	---	---	---	---	---	---	---	26.63
4.15	14,248	104.15	26.84 ic	---	---	---	---	---	---	---	---	---	26.84
4.20	14,394	104.20	27.06 ic	---	---	---	---	---	---	---	---	---	27.06
4.25	14,539	104.25	27.27 ic	---	---	---	---	---	---	---	---	---	27.27
4.30	14,685	104.30	27.48 ic	---	---	---	---	---	---	---	---	---	27.48
4.35	14,830	104.35	27.68 ic	---	---	---	---	---	---	---	---	---	27.68
4.40	14,976	104.40	27.89 ic	---	---	---	---	---	---	---	---	---	27.89
4.45	15,121	104.45	28.09 ic	---	---	---	---	---	---	---	---	---	28.09
4.50	15,267	104.50	28.30 ic	---	---	---	---	---	---	---	---	---	28.30
4.55	15,351	104.55	28.50 ic	---	---	---	---	---	---	---	---	---	28.50
4.60	15,434	104.60	28.70 ic	---	---	---	---	---	---	---	---	---	28.70
4.65	15,518	104.65	28.90 ic	---	---	---	---	---	---	---	---	---	28.90
4.70	15,602	104.70	29.09 ic	---	---	---	---	---	---	---	---	---	29.09
4.75	15,685	104.75	29.29 ic	---	---	---	---	---	---	---	---	---	29.29
4.80	15,769	104.80	29.48 ic	---	---	---	---	---	---	---	---	---	29.48
4.85	15,853	104.85	29.68 ic	---	---	---	---	---	---	---	---	---	29.68
4.90	15,936	104.90	29.87 ic	---	---	---	---	---	---	---	---	---	29.87
4.95	16,020	104.95	30.06 ic	---	---	---	---	---	---	---	---	---	30.06
5.00	16,104	105.00	30.25 ic	---	---	---	---	---	---	---	---	---	30.25

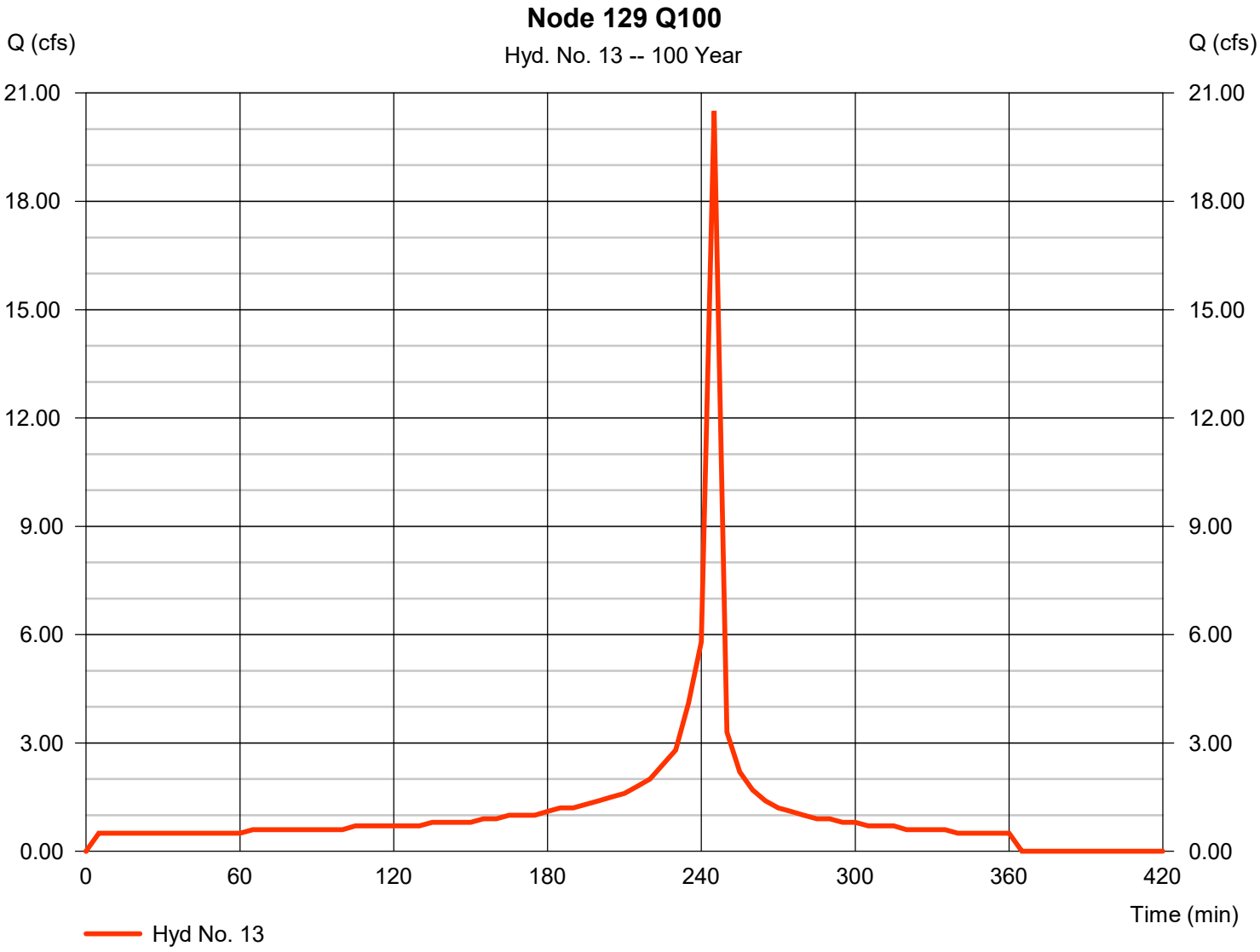
...End

Hydrograph Report

Hyd. No. 13

Node 129 Q100

Hydrograph type	= Manual	Peak discharge	= 20.50 cfs
Storm frequency	= 100 yrs	Time to peak	= 245 min
Time interval	= 5 min	Hyd. volume	= 28,200 cuft



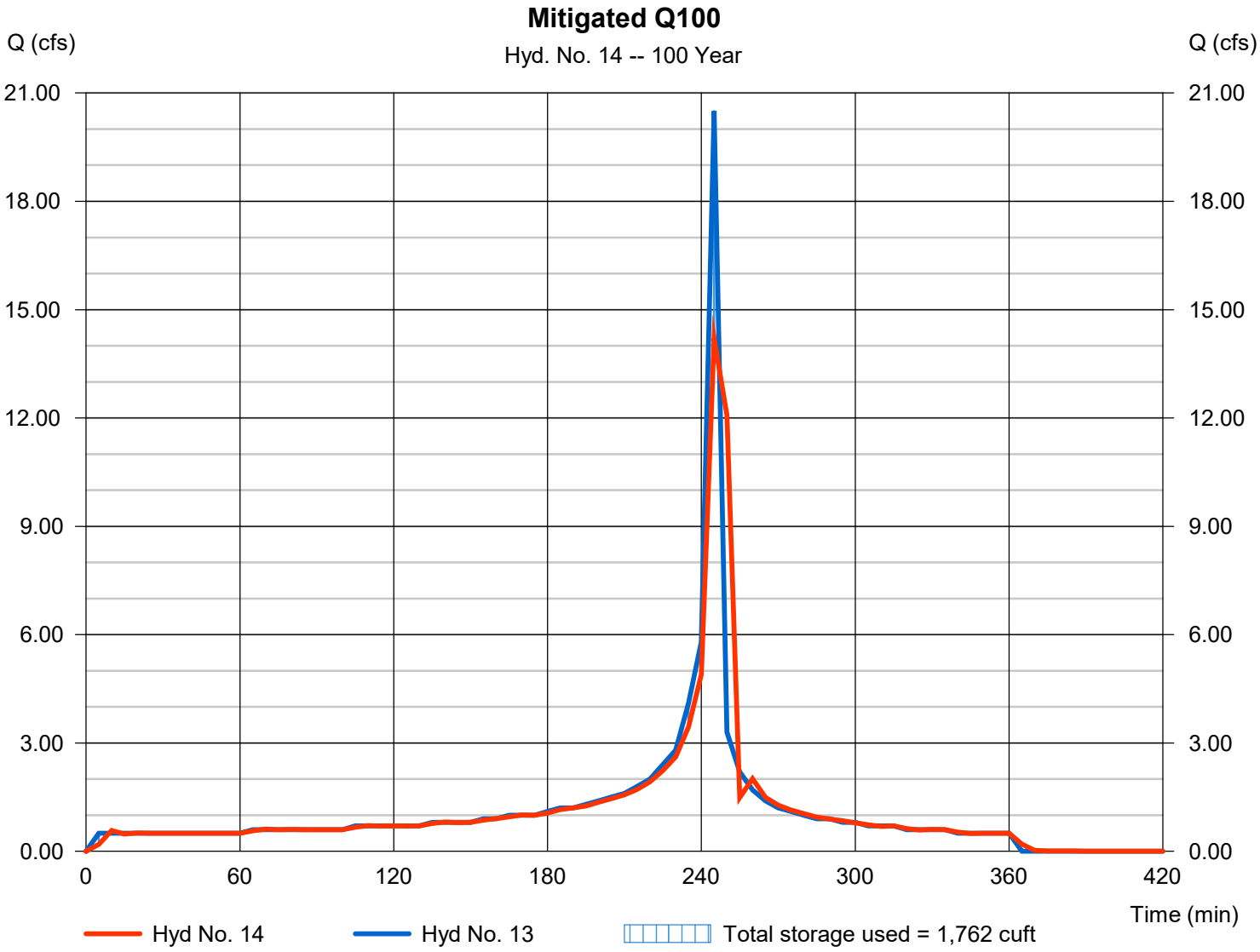
Hydrograph Report

Hyd. No. 14

Mitigated Q100

Hydrograph type	=	Reservoir	Peak discharge	=	14.21 cfs
Storm frequency	=	100 yrs	Time to peak	=	245 min
Time interval	=	5 min	Hyd. volume	=	28,199 cuft
Inflow hyd. No.	=	13 - Node 129 Q100	Max. Elevation	=	103.54 ft
Reservoir name	=	Node 129 Pipe Storage	Max. Storage	=	1,762 cuft

Storage Indication method used.



Pond No. 9 - Node 129 Pipe Storage

Pond Data

UG Chambers -Invert elev. = 100.00 ft, Rise x Span = 4.00 x 4.00 ft, Barrel Len = 150.00 ft, No. Barrels = 1, Slope = 0.00%, Headers = No

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	100.00	n/a	0	0
0.40	100.40	n/a	98	98
0.80	100.80	n/a	170	269
1.20	101.20	n/a	207	476
1.60	101.60	n/a	228	704
2.00	102.00	n/a	239	943
2.40	102.40	n/a	239	1,181
2.80	102.80	n/a	228	1,410
3.20	103.20	n/a	207	1,617
3.60	103.60	n/a	170	1,787
4.00	104.00	n/a	98	1,885

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 18.00	0.00	0.00	0.00
Span (in)	= 18.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 100.00	0.00	0.00	0.00
Length (ft)	= 15.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	100.00	0.00	---	---	---	---	---	---	---	---	---	0.000
0.04	10	100.04	0.01 ic	---	---	---	---	---	---	---	---	---	0.009
0.08	20	100.08	0.04 ic	---	---	---	---	---	---	---	---	---	0.035
0.12	30	100.12	0.08 ic	---	---	---	---	---	---	---	---	---	0.079
0.16	39	100.16	0.14 ic	---	---	---	---	---	---	---	---	---	0.138
0.20	49	100.20	0.21 ic	---	---	---	---	---	---	---	---	---	0.213
0.24	59	100.24	0.30 ic	---	---	---	---	---	---	---	---	---	0.304
0.28	69	100.28	0.41 ic	---	---	---	---	---	---	---	---	---	0.411
0.32	79	100.32	0.53 ic	---	---	---	---	---	---	---	---	---	0.533
0.36	89	100.36	0.67 ic	---	---	---	---	---	---	---	---	---	0.667
0.40	98	100.40	0.81 ic	---	---	---	---	---	---	---	---	---	0.815
0.44	115	100.44	0.96 oc	---	---	---	---	---	---	---	---	---	0.960
0.48	132	100.48	1.10 oc	---	---	---	---	---	---	---	---	---	1.095
0.52	149	100.52	1.23 oc	---	---	---	---	---	---	---	---	---	1.233
0.56	166	100.56	1.37 oc	---	---	---	---	---	---	---	---	---	1.373
0.60	183	100.60	1.52 oc	---	---	---	---	---	---	---	---	---	1.516
0.64	200	100.64	1.66 oc	---	---	---	---	---	---	---	---	---	1.663
0.68	218	100.68	1.81 oc	---	---	---	---	---	---	---	---	---	1.808
0.72	235	100.72	1.96 oc	---	---	---	---	---	---	---	---	---	1.955
0.76	252	100.76	2.10 oc	---	---	---	---	---	---	---	---	---	2.103
0.80	269	100.80	2.25 oc	---	---	---	---	---	---	---	---	---	2.250
0.84	289	100.84	2.40 oc	---	---	---	---	---	---	---	---	---	2.396
0.88	310	100.88	2.54 oc	---	---	---	---	---	---	---	---	---	2.540
0.92	331	100.92	2.69 oc	---	---	---	---	---	---	---	---	---	2.685
0.96	352	100.96	2.83 oc	---	---	---	---	---	---	---	---	---	2.827
1.00	372	101.00	2.97 oc	---	---	---	---	---	---	---	---	---	2.967
1.04	393	101.04	3.10 oc	---	---	---	---	---	---	---	---	---	3.102
1.08	414	101.08	3.24 oc	---	---	---	---	---	---	---	---	---	3.237
1.12	434	101.12	3.36 oc	---	---	---	---	---	---	---	---	---	3.364
1.16	455	101.16	3.49 oc	---	---	---	---	---	---	---	---	---	3.488
1.20	476	101.20	3.60 oc	---	---	---	---	---	---	---	---	---	3.604
1.24	499	101.24	3.72 oc	---	---	---	---	---	---	---	---	---	3.716

Continues on next page...

Node 129 Pipe Storage

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.28	522	101.28	3.82 oc	---	---	---	---	---	---	---	---	---	3.819
1.32	544	101.32	3.91 oc	---	---	---	---	---	---	---	---	---	3.913
1.36	567	101.36	4.00 oc	---	---	---	---	---	---	---	---	---	3.997
1.40	590	101.40	4.07 oc	---	---	---	---	---	---	---	---	---	4.067
1.44	613	101.44	4.12 oc	---	---	---	---	---	---	---	---	---	4.120
1.48	636	101.48	4.15 oc	---	---	---	---	---	---	---	---	---	4.146
1.52	659	101.52	4.39 oc	---	---	---	---	---	---	---	---	---	4.393
1.56	681	101.56	4.88 oc	---	---	---	---	---	---	---	---	---	4.883
1.60	704	101.60	5.33 oc	---	---	---	---	---	---	---	---	---	5.327
1.64	728	101.64	5.74 oc	---	---	---	---	---	---	---	---	---	5.738
1.68	752	101.68	6.12 oc	---	---	---	---	---	---	---	---	---	6.121
1.72	776	101.72	6.48 oc	---	---	---	---	---	---	---	---	---	6.481
1.76	800	101.76	6.82 oc	---	---	---	---	---	---	---	---	---	6.823
1.80	824	101.80	7.15 oc	---	---	---	---	---	---	---	---	---	7.148
1.84	847	101.84	7.46 oc	---	---	---	---	---	---	---	---	---	7.458
1.88	871	101.88	7.76 oc	---	---	---	---	---	---	---	---	---	7.757
1.92	895	101.92	8.04 oc	---	---	---	---	---	---	---	---	---	8.044
1.96	919	101.96	8.32 oc	---	---	---	---	---	---	---	---	---	8.322
2.00	943	102.00	8.59 oc	---	---	---	---	---	---	---	---	---	8.590
2.04	967	102.04	8.85 oc	---	---	---	---	---	---	---	---	---	8.851
2.08	991	102.08	9.10 oc	---	---	---	---	---	---	---	---	---	9.104
2.12	1,014	102.12	9.35 oc	---	---	---	---	---	---	---	---	---	9.350
2.16	1,038	102.16	9.59 oc	---	---	---	---	---	---	---	---	---	9.589
2.20	1,062	102.20	9.82 oc	---	---	---	---	---	---	---	---	---	9.823
2.24	1,086	102.24	10.05 oc	---	---	---	---	---	---	---	---	---	10.05
2.28	1,110	102.28	10.28 oc	---	---	---	---	---	---	---	---	---	10.28
2.32	1,134	102.32	10.49 oc	---	---	---	---	---	---	---	---	---	10.49
2.36	1,158	102.36	10.71 oc	---	---	---	---	---	---	---	---	---	10.71
2.40	1,181	102.40	10.92 oc	---	---	---	---	---	---	---	---	---	10.92
2.44	1,204	102.44	11.06 ic	---	---	---	---	---	---	---	---	---	11.06
2.48	1,227	102.48	11.19 ic	---	---	---	---	---	---	---	---	---	11.19
2.52	1,250	102.52	11.32 ic	---	---	---	---	---	---	---	---	---	11.32
2.56	1,273	102.56	11.45 ic	---	---	---	---	---	---	---	---	---	11.45
2.60	1,296	102.60	11.57 ic	---	---	---	---	---	---	---	---	---	11.57
2.64	1,318	102.64	11.70 ic	---	---	---	---	---	---	---	---	---	11.70
2.68	1,341	102.68	11.82 ic	---	---	---	---	---	---	---	---	---	11.82
2.72	1,364	102.72	11.94 ic	---	---	---	---	---	---	---	---	---	11.94
2.76	1,387	102.76	12.06 ic	---	---	---	---	---	---	---	---	---	12.06
2.80	1,410	102.80	12.18 ic	---	---	---	---	---	---	---	---	---	12.18
2.84	1,430	102.84	12.30 ic	---	---	---	---	---	---	---	---	---	12.30
2.88	1,451	102.88	12.42 ic	---	---	---	---	---	---	---	---	---	12.42
2.92	1,472	102.92	12.53 ic	---	---	---	---	---	---	---	---	---	12.53
2.96	1,493	102.96	12.65 ic	---	---	---	---	---	---	---	---	---	12.65
3.00	1,513	103.00	12.76 ic	---	---	---	---	---	---	---	---	---	12.76
3.04	1,534	103.04	12.87 ic	---	---	---	---	---	---	---	---	---	12.87
3.08	1,555	103.08	12.99 ic	---	---	---	---	---	---	---	---	---	12.99
3.12	1,576	103.12	13.10 ic	---	---	---	---	---	---	---	---	---	13.10
3.16	1,596	103.16	13.21 ic	---	---	---	---	---	---	---	---	---	13.21
3.20	1,617	103.20	13.32 ic	---	---	---	---	---	---	---	---	---	13.32
3.24	1,634	103.24	13.42 ic	---	---	---	---	---	---	---	---	---	13.42
3.28	1,651	103.28	13.53 ic	---	---	---	---	---	---	---	---	---	13.53
3.32	1,668	103.32	13.64 ic	---	---	---	---	---	---	---	---	---	13.64
3.36	1,685	103.36	13.74 ic	---	---	---	---	---	---	---	---	---	13.74
3.40	1,702	103.40	13.85 ic	---	---	---	---	---	---	---	---	---	13.85
3.44	1,719	103.44	13.95 ic	---	---	---	---	---	---	---	---	---	13.95
3.48	1,736	103.48	14.06 ic	---	---	---	---	---	---	---	---	---	14.06
3.52	1,753	103.52	14.16 ic	---	---	---	---	---	---	---	---	---	14.16
3.56	1,770	103.56	14.26 ic	---	---	---	---	---	---	---	---	---	14.26
3.60	1,787	103.60	14.36 ic	---	---	---	---	---	---	---	---	---	14.36
3.64	1,797	103.64	14.46 ic	---	---	---	---	---	---	---	---	---	14.46
3.68	1,807	103.68	14.56 ic	---	---	---	---	---	---	---	---	---	14.56
3.72	1,817	103.72	14.66 ic	---	---	---	---	---	---	---	---	---	14.66
3.76	1,827	103.76	14.76 ic	---	---	---	---	---	---	---	---	---	14.76
3.80	1,836	103.80	14.86 ic	---	---	---	---	---	---	---	---	---	14.86
3.84	1,846	103.84	14.96 ic	---	---	---	---	---	---	---	---	---	14.96
3.88	1,856	103.88	15.05 ic	---	---	---	---	---	---	---	---	---	15.05
3.92	1,866	103.92	15.15 ic	---	---	---	---	---	---	---	---	---	15.15
3.96	1,876	103.96	15.24 ic	---	---	---	---	---	---	---	---	---	15.24
4.00	1,885	104.00	15.34 ic	---	---	---	---	---	---	---	---	---	15.34

...End

Weir Report

Node 165

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Jun 30 2022

Emergency Spillway

Trapezoidal Weir

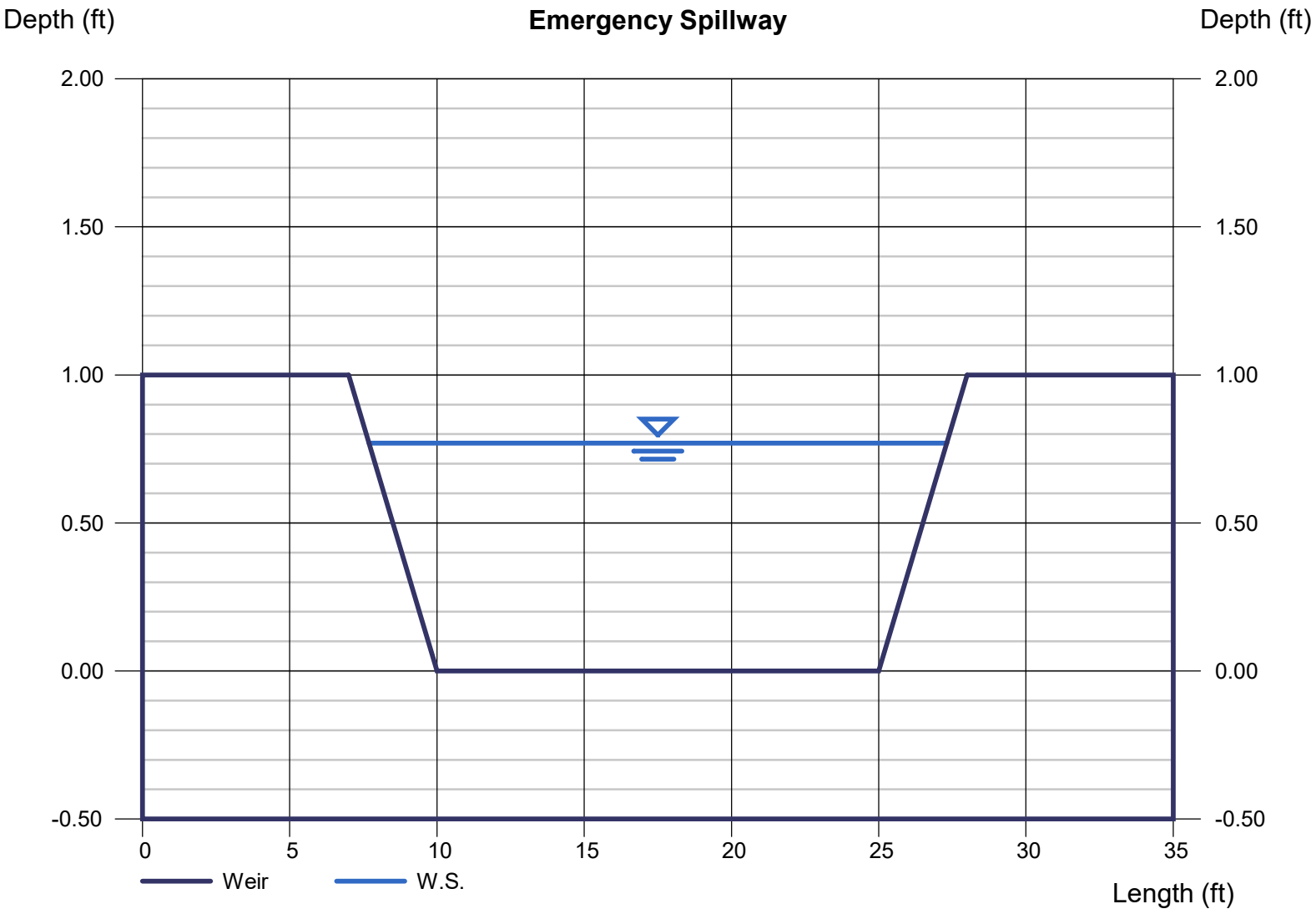
Crest	= Sharp
Bottom Length (ft)	= 15.00
Total Depth (ft)	= 1.00
Side Slope (z:1)	= 3.00

Calculations

Weir Coeff. Cw	= 3.10
Compute by:	Known Q
Known Q (cfs)	= 35.00

Highlighted

Depth (ft)	= 0.77
Q (cfs)	= 35.00
Area (sqft)	= 13.33
Velocity (ft/s)	= 2.63
Top Width (ft)	= 19.62



Weir Report

Emergency Spillway: Node 128

Trapezoidal Weir

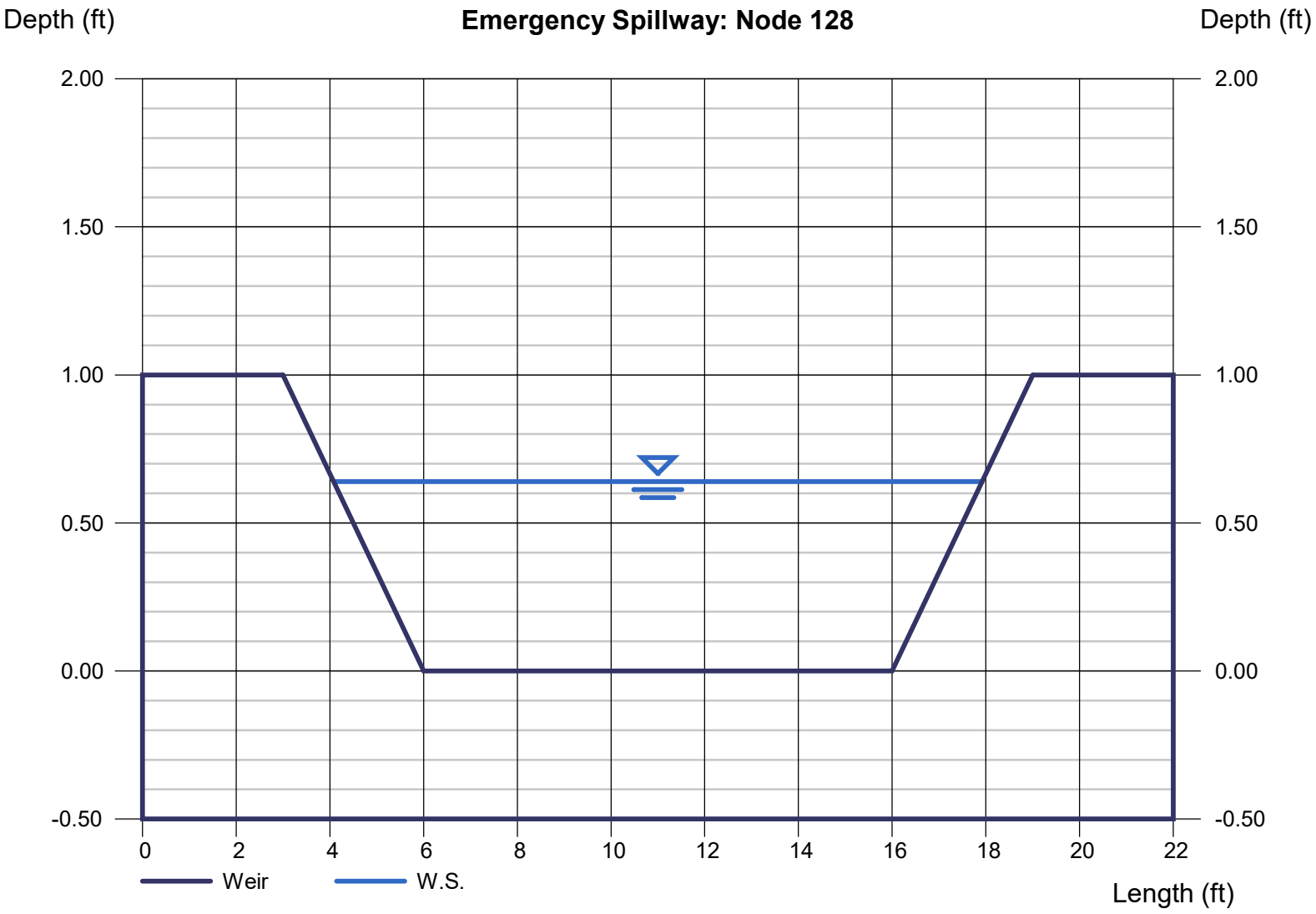
Crest	= Sharp
Bottom Length (ft)	= 10.00
Total Depth (ft)	= 1.00
Side Slope (z:1)	= 3.00

Calculations

Weir Coeff. Cw	= 3.10
Compute by:	Known Q
Known Q (cfs)	= 18.30

Highlighted

Depth (ft)	= 0.64
Q (cfs)	= 18.30
Area (sqft)	= 7.63
Velocity (ft/s)	= 2.40
Top Width (ft)	= 13.84



Starlight
MBI 185614

Storage Drawdown - Node 106

Stage, Storage, and Discharge derived from Hydroflow Hydrographs routing analysis

Q100 Drawdown (max 96 hours)						
Stage (ft)	**Storage (ft3)**	**Discharge (cfs)**	**Incremental Vol. (ft3)**	**Avg. Discharge (cfs)**	**Incremental Time (sec)**	**Incremental Time (hr)**
5.00	11,783	30.25	-	-	-	-
4.50	11,171	28.30	612	29.2750	21	0.01
4.00	10,106	26.20	1,065	27.2500	39	0.01
3.50	8,811	23.91	1,295	25.0550	52	0.01
3.00	7,384	20.83	1,427	22.3700	64	0.02
2.50	5,893	15.66	1,491	18.2450	82	0.02
2.00	4,402	7.52	1,491	11.5900	129	0.04
1.50	2,975	6.13	1,427	6.8250	209	0.06
1.00	1,679	3.77	1,296	4.9500	262	0.07
0.50	614	1.40	1,065	2.5850	412	0.11
0.00	0	0.00	614	0.7000	877	0.24
					Total Time (hours) =	**0.59**

Notes
Dual 410' LF (820 total) of 60" storage pipe with 24" discharge pipe

Starlight
MBI 185614

Storage Drawdown - Node 128

Stage, Storage, and Discharge derived from Hydroflow Hydrographs routing analysis

Q100 Drawdown (max 96 hours)						
Stage (ft)	**Storage (ft3)**	**Discharge (cfs)**	**Incremental Vol. (ft3)**	**Avg. Discharge (cfs)**	**Incremental Time (sec)**	**Incremental Time (hr)**
4.00	57,350	15.34	-	-	-	-
3.50	42,607	14.11	14,743	14.7250	1,001	0.28
3.00	27,863	12.76	14,744	13.4350	1,097	0.30
2.50	21,961	11.20	5,902	11.9800	493	0.14
2.00	16,059	9.15	5,902	10.1750	580	0.16
1.50	11,403	6.47	4,656	7.8100	596	0.17
1.00	6,746	4.26	4,657	5.3650	868	0.24
0.50	3,373	1.24	3,373	2.7500	1,227	0.34
0.00	0	0.00	3,373	0.6200	5,440	1.51
					Total Time (hours) =	**3.14**

Notes
Detention Basin with 18" discharge pipe and overflow weir

Starlight
MBI 185614

Storage Drawdown - Node 129

Stage, Storage, and Discharge derived from Hydroflow Hydrographs routing analysis

Q100 Drawdown (max 96 hours)						
Stage (ft)	**Storage (ft3)**	**Discharge (cfs)**	**Incremental Vol. (ft3)**	**Avg. Discharge (cfs)**	**Incremental Time (sec)**	**Incremental Time (hr)**
4.00	1,257	15.34	-	-	-	-
3.60	1,192	14.36	65	14.8500	4	0.00
3.20	1,078	13.32	114	13.8400	8	0.00
2.80	940	12.18	138	12.7500	11	0.00
2.40	788	10.92	152	11.5500	13	0.00
2.00	629	8.59	159	9.7550	16	0.00
1.60	470	5.33	159	6.9600	23	0.01
1.20	317	3.60	153	4.4650	34	0.01
0.80	179	2.25	138	2.9250	47	0.01
0.40	66	0.81	113	1.5300	74	0.02
0.00	0	0.00	66	0.4050	163	0.05
					Total Time (hours) =	**0.11**

Notes
100' LF of 48" storage pipe with 18" discharge pipe

Starlight
MBI 185614

Storage Drawdown - Node 156

Stage, Storage, and Discharge derived from Hydroflow Hydrographs routing analysis

Q100 Drawdown (max 96 hours)						
Stage (ft)	**Storage (ft3)**	**Discharge (cfs)**	**Incremental Vol. (ft3)**	**Avg. Discharge (cfs)**	**Incremental Time (sec)**	**Incremental Time (hr)**
4.00	3,771	15.34	-	-	-	-
3.60	3,575	14.36	196	14.8500	13	0.00
3.20	3,234	13.32	341	13.8400	25	0.01
2.80	2,820	12.18	414	12.7500	32	0.01
2.40	2,363	10.92	457	11.5500	40	0.01
2.00	1,886	8.59	477	9.7550	49	0.01
1.60	1,409	5.33	477	6.9600	69	0.02
1.20	952	3.60	457	4.4650	102	0.03
0.80	537	2.25	415	2.9250	142	0.04
0.40	197	0.81	340	1.5300	222	0.06
0.00	0	0.00	197	0.4050	486	0.14
					Total Time (hours) =	**0.32**

Notes
300' LF of 48" storage pipe with 18" discharge pipe

Starlight
MBI 185614

Storage Drawdown - Node 165

Stage, Storage, and Discharge derived from Hydroflow Hydrographs routing analysis

Q100 Drawdown (max 96 hours)						
Stage (ft)	**Storage (ft3)**	**Discharge (cfs)**	**Incremental Vol. (ft3)**	**Avg. Discharge (cfs)**	**Incremental Time (sec)**	**Incremental Time (hr)**
3.00	76,671	12.76	-	-	-	-
2.50	58,280	11.20	18,391	11.9800	1,535	0.43
2.00	39,890	9.15	18,390	10.1750	1,807	0.50
1.50	28,664	6.47	11,226	7.8100	1,437	0.40
1.00	17,438	4.26	11,226	5.3650	2,092	0.58
0.50	8,719	1.24	8,719	2.7500	3,171	0.88
0.00	0	0.00	8,719	0.6200	14,063	3.91
					Total Time (hours) =	**6.70**

Notes
Detention Basin with 18" discharge pipe and overflow weir

Inlet Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Wednesday, Mar 13 2024

Node 129

Drop Curb Inlet

Location	= Sag
Curb Length (ft)	= 16.00
Throat Height (in)	= 6.00
Grate Area (sqft)	= -0-
Grate Width (ft)	= -0-
Grate Length (ft)	= -0-

Gutter

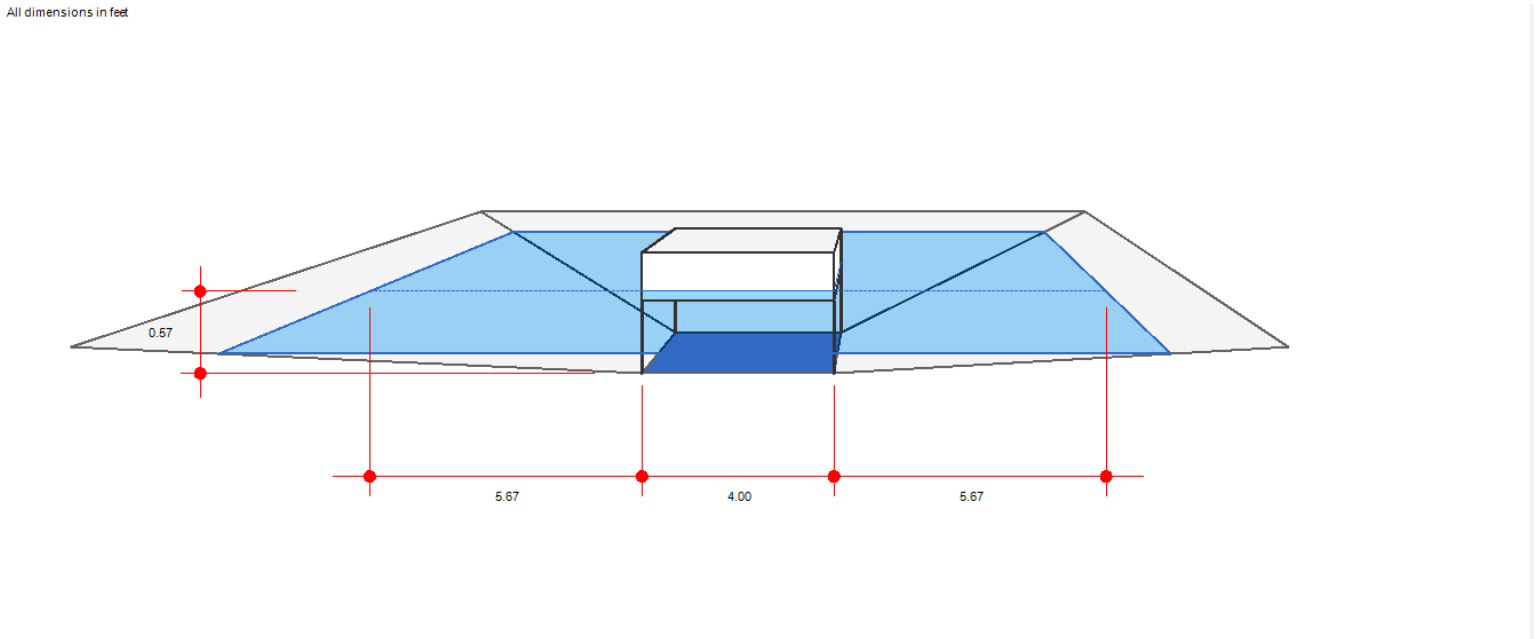
Slope, Sw (ft/ft)	= 0.100
Slope, Sx (ft/ft)	= 0.100
Local Depr (in)	= -0-
Gutter Width (ft)	= -0-
Gutter Slope (%)	= -0-
Gutter n-value	= -0-

Calculations

Compute by:	Known Q
Q (cfs)	= 20.50

Highlighted

Q Total (cfs)	= 20.50
Q Capt (cfs)	= 20.50
Q Bypass (cfs)	= -0-
Depth at Inlet (in)	= 6.80
Efficiency (%)	= 100
Gutter Spread (ft)	= 5.67
Gutter Vel (ft/s)	= -0-
Bypass Spread (ft)	= -0-
Bypass Depth (in)	= -0-



Inlet Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Wednesday, Mar 13 2024

Node 156

Drop Curb Inlet

Location	= Sag
Curb Length (ft)	= 16.00
Throat Height (in)	= 6.00
Grate Area (sqft)	= -0-
Grate Width (ft)	= -0-
Grate Length (ft)	= -0-

Gutter

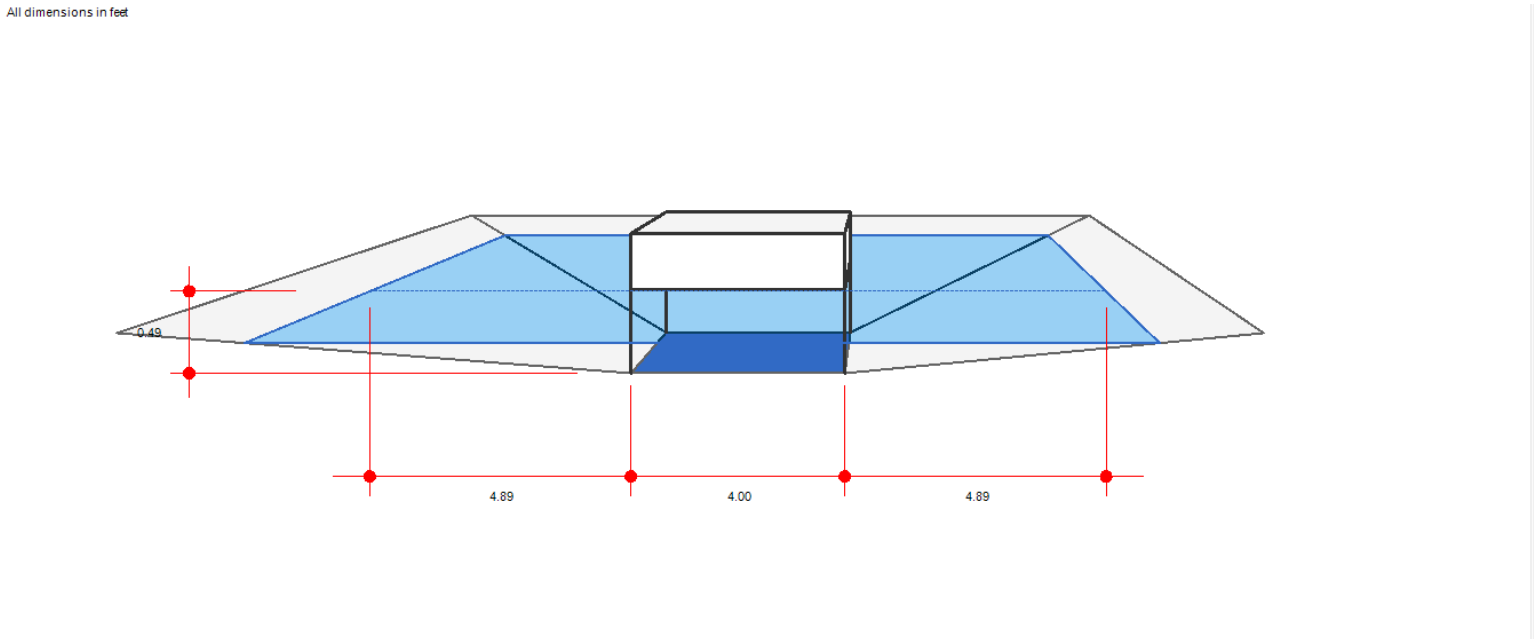
Slope, Sw (ft/ft)	= 0.100
Slope, Sx (ft/ft)	= 0.100
Local Depr (in)	= -0-
Gutter Width (ft)	= -0-
Gutter Slope (%)	= -0-
Gutter n-value	= -0-

Calculations

Compute by:	Known Q
Q (cfs)	= 16.40

Highlighted

Q Total (cfs)	= 16.40
Q Capt (cfs)	= 16.40
Q Bypass (cfs)	= -0-
Depth at Inlet (in)	= 5.86
Efficiency (%)	= 100
Gutter Spread (ft)	= 4.89
Gutter Vel (ft/s)	= -0-
Bypass Spread (ft)	= -0-
Bypass Depth (in)	= -0-



Inlet Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Wednesday, Mar 13 2024

Node 106

Two (2) inlets are proposed

50% of Q100

Drop Curb Inlet

Location	= Sag
Curb Length (ft)	= 16.00
Throat Height (in)	= 6.00
Grate Area (sqft)	= -0-
Grate Width (ft)	= -0-
Grate Length (ft)	= -0-

Gutter

Slope, Sw (ft/ft)	= 0.100
Slope, Sx (ft/ft)	= 0.100
Local Depr (in)	= -0-
Gutter Width (ft)	= -0-
Gutter Slope (%)	= -0-
Gutter n-value	= -0-

Calculations

Compute by:	Known Q
Q (cfs)	= 19.50

Highlighted

Q Total (cfs)	= 19.50
Q Capt (cfs)	= 19.50
Q Bypass (cfs)	= -0-
Depth at Inlet (in)	= 6.58
Efficiency (%)	= 100
Gutter Spread (ft)	= 5.48
Gutter Vel (ft/s)	= -0-
Bypass Spread (ft)	= -0-
Bypass Depth (in)	= -0-

All dimensions in feet