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Final Concept Drainage Report

South Mountain Freeway

I-10 Papago to I-10 Maricopa

Volume II: Technical Appendix
Segments I, II and III

Contract 88-24
Price Expressway
General Consultant
TRACS No. H-2222-01D

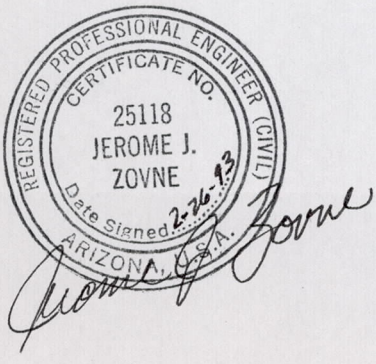
Prepared for :

Arizona Department of Transportation

Prepared by:

HDR Engineering, Inc.

Phoenix, Arizona



February, 1993

South Mountain Freeway Concept Drainage Report
Volume II
Technical Appendix
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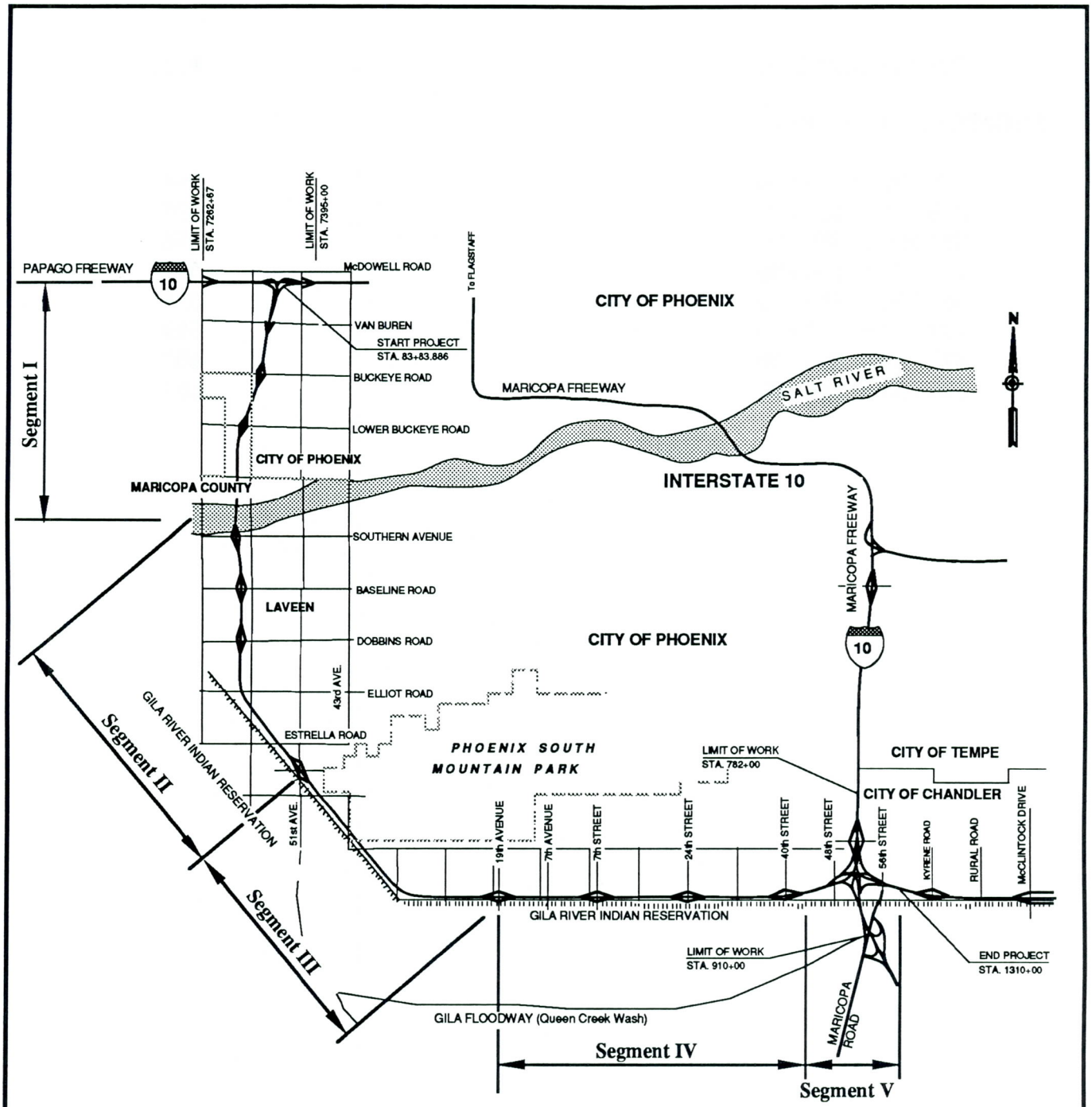


CONTRACT 88-24 SOUTH MOUNTAIN FREEWAY GENERAL CONSULTANT TRACS NO. H-2222-01D	**CONCEPT DRAINAGE REPORT** **FIGURE I.1** **PROJECT LOCATION MAP**	HDR HDR Engineering, Inc.

SOUTH MOUNTAIN FREEWAY
SEGMENT I
TECHNICAL APPENDIX

SEGMENT I
PRECIPITATION CALCULATIONS

Job No. | No.

Computation

HDR

Project 00173042044 S. Mtn. Freeway | Computed EL | Date 4/20/92

Subject Precip. | Checked | Date

Task | Sheet | Of

100 yr - 6 hr. = 3.40" (from Table 1)

100 yr - 24 hr = 4.00" (" " ")

100 yr - 1 hr = $0.494 + 0.755\left(3.4^2/4\right) = 2.68"$ > Plot on Fig. 1

24 yr - 1 hr. = $-0.011 + .942\left(1.2^2/1.45\right) = 0.81"$

50 yr - 1 hr = 2.30" 50 yr - 6 hr = 3.00"

(6 hr.) (1 hr.)

50 yr - 2 hr = $.341(3.00) + .659(2.30) = 2.54"$

100 yr - 2 hr = $.341(3.40) + .659(2.68) = 2.93"$

50 yr - 3 hr = $.549(3.00) + .431(2.30) = 2.70"$

100 yr - 3 hr = $.549(3.40) + .431(2.68) = 3.09"$

(24 hr) (24 hr 6 hr.)

50 yr - 12 hr. = $3.55 - .51(3.55 - 3.00) = 3.26"$

100 yr - 12 hr = $4.00 - .51(4.00 - 3.40) = 3.69"$

1 hr.

50 yr - 5 min = $.29(2.30) = 0.67"$

50 yr - 15 min = $.57(2.30) = 1.31"$

100 yr - 5 min = $.29(2.68) = 0.78"$

100 yr - 15 min = $.57(2.68) = 1.53"$

Summary

	50 yr	100 yr.	10 yr
5 min	0.67"	0.78"	0.46"
15 min	1.31"	1.53"	0.72"
1 hr	2.30"	2.68"	1.00"
2 hr	2.54"	2.93"	1.77"
3 hr	2.70"	3.09"	1.88"
6 hr	3.00"	3.40"	2.10"
12 hr	3.26"	3.69"	2.35"
24 hr.	3.55"	4.00"	2.60"

ADDENDUM to "HYDROLOGIC DESIGN FOR HIGHWAY DRAINAGE IN ARIZONA" April 1975

Steps to be used to determine precipitation values for various durations and return periods.

STEP 1. From the precipitation maps in the manual "Hydrologic Design for Highway Drainage in Arizona", determine the precipitation values for the 6 and 24 hour duration storms for return periods of 2, 5, 10, 25, 50 and 100 years. Tabulate these values in Table 1 in the column headed 'Map Values'

TABLE 1

Return Period (Years)	Precipitation Values (inches)			
	6 hour duration		24 hour duration	
	Map Value	Corrected Value	Map Value	Corrected Value
2	1.2	1.20	1.6	1.65
5	1.7	1.75	2.2	2.25
10	2.1	2.10	2.6	2.60
25	2.6	2.55	3.2	3.10
50	3.0	3.00	3.4	3.55
100	3.4	3.40	4.0	4.00

NOTE: There is a possibility of making an error while reading the maps because, (1) a site is not easy to locate precisely on a series of 12 maps, (2) there may be some slight registration differences in printing, and (3) precise interpolation between isolines is difficult. In order to minimize any errors in reading the maps, these values should be plotted on the diagram "Precipitation Depth versus Return Period" Fig. 1.

Project No. 00173 042 044 Station N. S. Mtn. Fwy.

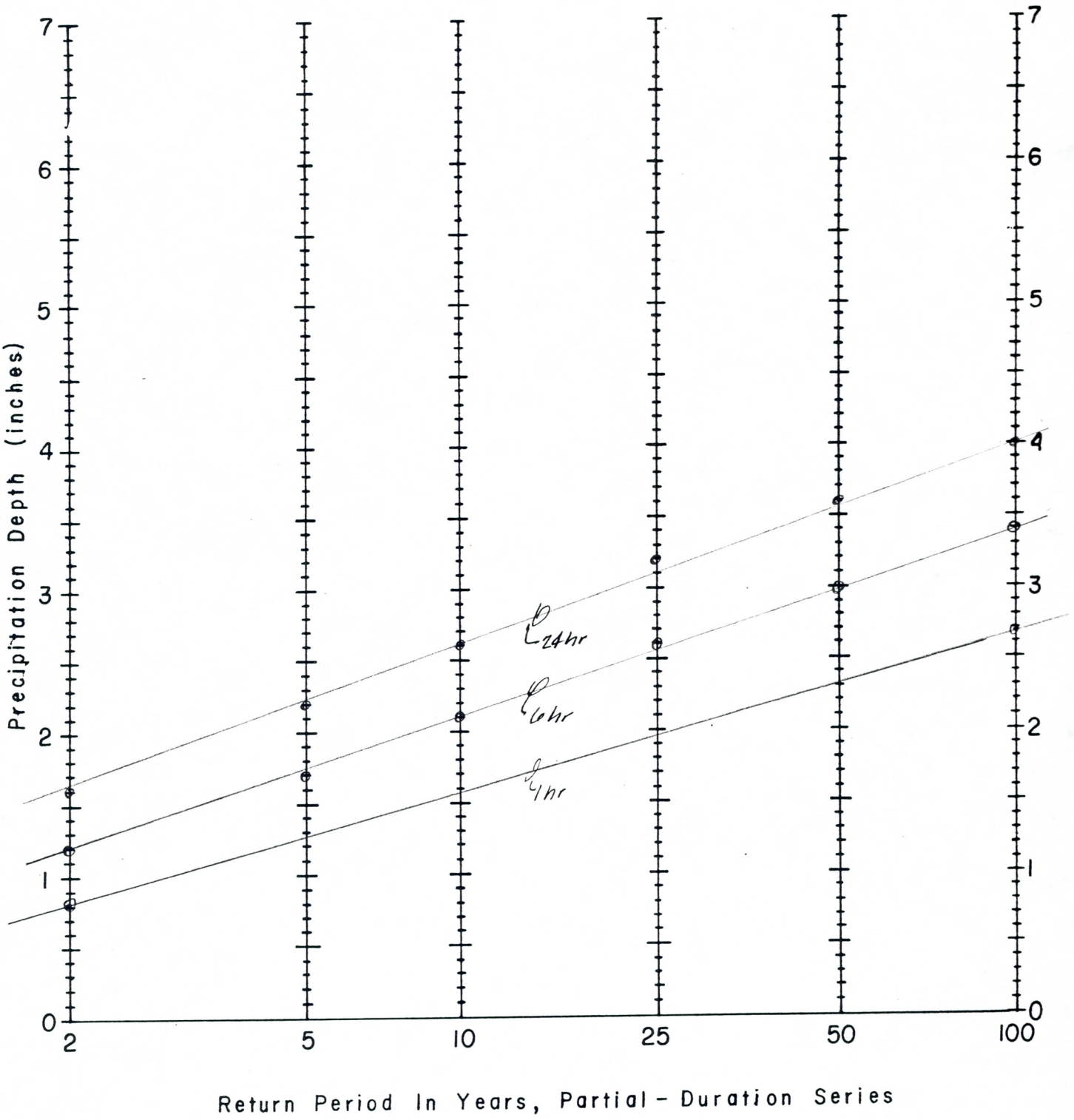


Figure 1 Precipitation Depth Versus Return Period for Partial – Duration Series

SEGMENT I
SUBAREA PARAMETER SHEETS
(TIME OF CONCENTRATION CALCULATIONS)

Price Road Phase II 00173 039 044
Hydrology (South Mountain Freeway)

Computed EL Date 4/20/92
Sheet 1 of
Equations from TR-55

Subarea SM100 D.A. = .103 s.m. CN = 85.5 (see separate calc.)

Sheet Flow: $Tt = 0.007(nL)^{0.8}/(P2)^{0.5}s^{0.4}$ = .50 hrs.

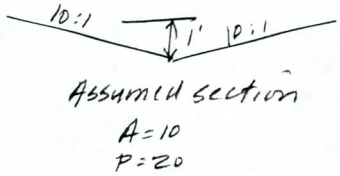
n = .05 (Fallow)
L = 300 ft.
P2 = 1.55 in.
s = .003 ft/ft

Concentrated Flow: Paved ____ Unpaved ✓

Use Fig. 3.1, p.3-2 TR-55
s = .0022 ft/ft L = 1352'
v = 0.76 ft/sec

Tt = L/3600v = 0.49 hrs.

Channel Flow:
$V = 1.49\, r^{2/3} s^{1/2}/n$ = 1.5 ft/sec
r = a/p = 0.5
s = .0022 ft/ft L = 1350'
n = .03



Assumed section
A = 10
P = 20

Tt = L/3600v = 0.25 hrs.

Total Tc = 0.50 hr. + 0.49 hr. + 0.25 hr. = 1.24 hrs.

Tlag = 0.6 Tc = 0.74 hrs.

Subarea SM101 D.A. = .0375 s.m. CN = 81 (see separate calc.)

Sheet Flow: $Tt = 0.007(nL)^{0.8}/(P2)^{0.5}s^{0.4}$ = 0.10 hrs.

n = .04
L = 50 ft.
P2 = ~~1.55~~ 1.45 in.
s = .007 ft/ft

Concentrated Flow: Paved ____ Unpaved ✓

L = 3000't
Use Fig. 3.1, p.3-2 TR-55
s = .0025 ft/ft
v = 0.8 ft/sec

Tt = L/3600v = 1.04 hrs.

Channel Flow:
$V = 1.49\, r^{2/3} s^{1/2}/n$ = _____ ft/sec
r = a/p = _____
s = _____ ft/ft
n = _____

Tt = L/3600v = _____ hrs.

Total Tc = 0.10 hr. + 1.04 hr. + - hr. = 1.14 hrs.

Tlag = 0.6 Tc = 0.68 hrs.

Price Road Phase II 00173 039 044
Hydrology (South Mountain Freeway)

Computed EL Date 4/21/92
Sheet 2 of
Equations from TR-55

Subarea SM102A D.A. = .125 s.m. CN = 88 (see separate calc.)

Sheet Flow: $Tt = 0.007(nL)^{0.8}/(P2)^{0.5}s^{0.4}$ = .14 hrs.

n = .011
L = 300 ft.
P2 = ~~1.55~~ in. 1.65
s = .003 ft/ft

Concentrated Flow: Paved ✓ Unpaved ____

Use Fig. 3.1, p.3-2 TR-55
L = 2600' ± s = .003 ft/ft
v = 1.11 ft/sec

Tt = L/3600v = .65 hrs.

Channel Flow:
$V = 1.49\, r^{2/3} s^{1/2}/n$ = _____ ft/sec
r = a/p = _____
s = _____ ft/ft
n = _____

Tt = L/3600v = _____ hrs.

Total Tc = .14 hr. + .65 hr. + _____ hr. = .79 hrs.

Tlag = 0.6 Tc = .47 hrs.

Subarea SM102B D.A. = .117 s.m. CN = 81 (see separate calc.)

Sheet Flow: $Tt = 0.007(nL)^{0.8}/(P2)^{0.5}s^{0.4}$ = .13 hrs.

n = .06
L = ~~300~~ 50 ft.
P2 = ~~1.55~~ in. 1.65
s = .003 ft/ft

Concentrated Flow: Paved ____ Unpaved ✓

Use Fig. 3.1, p.3-2 TR-55
s = .003 ft/ft
L = 2900' ± v = .88 ft/sec

Tt = L/3600v = .92 hrs.

Channel Flow:
$V = 1.49\, r^{2/3} s^{1/2}/n$ = _____ ft/sec
r = a/p = _____
s = _____ ft/ft
n = _____

Tt = L/3600v = _____ hrs.

Total Tc = .13 hr. + .92 hr. + _____ hr. = 1.05 hrs.

Tlag = 0.6 Tc = 0.63 hrs.

Price Road Phase II 00173 039 044
Hydrology (South Mountain Freeway)

Computed EL Date 4/21/92
Sheet 3 of
Equations from TR-55

Subarea SM103 D.A. = .198 s.m. CN = _____ (see separate calc.)

Sheet Flow: $Tt = 0.007(nL)^{0.8}/(P2)^{0.5}s^{0.4}$ = .13 hrs.

n = .011
L = 300 ft.
P2 = ~~1.55~~ in. 1.05
s = .004 ft/ft

Concentrated Flow: Paved ✓ Unpaved ____

Use Fig. 3.1, p.3-2 TR-55
L = 5500' ± s = .004 ft/ft
v = 1.29 ft/sec

Tt = L/3600v = 1.18 hrs.

Channel Flow:
$V = 1.49\, r^{2/3} s^{1/2}/n$ = _____ ft/sec
r = a/p = _____
s = _____ ft/ft
n = _____

Tt = L/3600v = _____ hrs.

Total Tc = .13 hr. + 1.18 hr. + ? hr. = 1.31 hrs.

Tlag = 0.6 Tc = 0.79 hrs.

Subarea SM196 D.A. = .422 s.m. CN = 84.8 (see separate calc.)

Sheet Flow: $Tt = 0.007(nL)^{0.8}/(P2)^{0.5}s^{0.4}$ = .06 hrs.

n = .011
L = 100 ft.
P2 = ~~1.55~~ in. 1.05
s = .003 ft/ft

Concentrated Flow: Paved ____ Unpaved ✓

Use Fig. 3.1, p.3-2 TR-55
L = 5000' ± s = .003 ft/ft
v = .88 ft/sec

Tt = L/3600v = 1.58 hrs.

Channel Flow:
$V = 1.49\, r^{2/3} s^{1/2}/n$ = _____ ft/sec
r = a/p = _____
s = _____ ft/ft
n = _____

Tt = L/3600v = _____ hrs.

Total Tc = .06 hr. + 1.58 hr. + _____ hr. = 1.64 hrs.

Tlag = 0.6 Tc = 0.98 hrs.

Price Road Phase II 00173 039 044
Hydrology (South Mountain Freeway)

Computed EI Date 4/21/92
Sheet 4 of
Equations from TR-55

Subarea GM107 D.A. = .017 s.m. CN = 81 (see separate calc.)

Sheet Flow: $Tt = 0.007(nL)^{0.8}/(P2)^{0.5}s^{0.4}$ = .13 hrs.

n = .04
L = 50 ft.
P2 = ~~1.55~~ in. 1.65
s = .003 ft/ft

Concentrated Flow: Paved ____ Unpaved ✓

Use Fig. 3.1, p.3-2 TR-55
L=1600' ± s = .003 ft/ft
v = .88 ft/sec

Tt = L/3600v = .51 hrs.

Channel Flow:
V = 1.49 $r^{2/3}s^{1/2}/n$ = _____ ft/sec
r = a/p = _____
s = _____ ft/ft
n = _____

Tt = L/3600v = _____ hrs.

Total Tc = .13 hr. + .51 hr. + _____ hr. = .64 hrs.

Tlag = 0.6 Tc = .38 hrs.

Subarea GM108A D.A. = .106 s.m. CN = 81 (see separate calc.)

Sheet Flow: $Tt = 0.007(nL)^{0.8}/(P2)^{0.5}s^{0.4}$ = .13 hrs.

n = .06
L = 50 ft.
P2 = ~~1.55~~ in. 1.65
s = ~~.0033~~ .0033 ft/ft

Concentrated Flow: Paved ____ Unpaved ✓

Use Fig. 3.1, p.3-2 TR-55
L=~~7500'~~ 2000' s = .0033 ft/ft
v = .93 ft/sec

Tt = L/3600v = 0.60 hrs.

Channel Flow:
V = ~~1.49 $r^{2/3}s^{1/2}$~~/n = 6 ft/sec (est.)
r = a/p = _____
L=1500' s = _____ ft/ft
n = _____

Tt = L/3600v = .07 hrs.

Total Tc = .13 hr. + .60 hr. + .07 hr. = .80 hrs.

Tlag = 0.6 Tc = .48 hrs.

Price Road Phase II 00173 039 044
Hydrology (South Mountain Freeway)

Computed EL Date 4/21/92
Sheet 5 of
Equations from TR-55

Subarea SM108b D.A. = .14 s.m. CN = 81 (see separate calc.)

Sheet Flow: $Tt = 0.007(nL)^{0.8}/(P2)^{0.5}s^{0.4}$ = .13 hrs.

n = .06
L = 50 ft.
P2 = ~~1.55~~ in. 1.65
s = .0033 ft/ft

Concentrated Flow: Paved ____ Unpaved ✓

Use Fig. 3.1, p.3-2 TR-55
L=1500' s = .0033 ft/ft
v = .93 ft/sec

Tt = L/3600v = .44 hrs.

Channel Flow:
$V = 1.49 r^{2/3} s^{1/2}/n$ = 6 ft/sec (est., new channel)
r = a/p = ____
s = ____ ft/ft
n = ____ L=2500

Tt = L/3600v = .12 hrs.

Total Tc = .13 hr. + .44 hr. + .12 hr. = .69 hrs.

Tlag = 0.6 Tc = .41 hrs.

Subarea SM109 D.A. = .047 s.m. CN = 89 (see separate calc.)

Sheet Flow: $Tt = 0.007(nL)^{0.8}/(P2)^{0.5}s^{0.4}$ = .14 hrs.

n = .011
L = 300 ft.
P2 = ~~1.55~~ in. 1.65
s = .003 ft/ft

Concentrated Flow: Paved ____ Unpaved ✓

Use Fig. 3.1, p.3-2 TR-55
L=1800' s = .003 ft/ft
v = .88 ft/sec

Tt = L/3600v = .57 hrs.

Channel Flow:
$V = 1.49 r^{2/3} s^{1/2}/n$ = ____ ft/sec
r = a/p = ____
s = ____ ft/ft
n = ____

Tt = L/3600v = ____ hrs.

Total Tc = .14 hr. + .57 hr. + ____ hr. = .71 hrs.

Tlag = 0.6 Tc = .43 hrs.

Price Road Phase II 00173 039 044
Hydrology (South Mountain Freeway)

Computed EL Date 4/22/92
Sheet ____ of ____
Equations from TR-55

Subarea SM104 D.A. = .25 s.m. CN = 84.6 (see separate calc.)

Sheet Flow: $Tt = 0.007(nL)^{0.8}/(P2)^{0.5}s^{0.4}$ = .38 hrs.

n = .05
L = 300 ft.
P2 = ~~1.55~~ 1.65 in.
s = .004 ft/ft

Concentrated Flow: Paved ____ Unpaved ✓

Use Fig. 3.1, p.3-2 TR-55
L = 4500' ± s = .0023 ft/ft
v = .77 ft/sec

Tt = L/3600v = .163 hrs.

Channel Flow:
$V = 1.49\, r^{2/3} s^{1/2}/n$ = ____ ft/sec
r = a/p = ____
s = ____ ft/ft
n = ____

Tt = L/3600v = ____ hrs.

Total Tc = .38 hr. + .163 hr. + ____ hr. = 2.01 hrs.

Tlag = 0.6 Tc = 1.21 hrs.

Subarea SM105 D.A. = .130 s.m. CN = 86.7 (see separate calc.)

Sheet Flow: $Tt = 0.007(nL)^{0.8}/(P2)^{0.5}s^{0.4}$ = .12 hrs.

n = .011
L = 300 ft.
P2 = ~~1.55~~ 1.65 in.
s = .005 ft/ft

Concentrated Flow: Paved ✓ Unpaved ____

Use Fig. 3.1, p.3-2 TR-55
L = 2500' ± s = .0021 ft/ft
v = .93 ft/sec

Tt = L/3600v = .75 hrs.

Channel Flow:
$V = 1.49\, r^{2/3} s^{1/2}/n$ = ____ ft/sec
r = a/p = ____
s = ____ ft/ft
n = ____

Tt = L/3600v = ____ hrs.

Total Tc = .12 hr. + .75 hr. + ____ hr. = .89 hrs.

Tlag = 0.6 Tc = 0.53 hrs.

SEGMENT I
SCS CURVE NUMBER CALCULATIONS

Price Road Phase III 00173 042 044 Computed EL Date 4-17-92
Hydrology (South Mountain Freeway) Sheet 1 of

Subarea SM98 D.A. = 8.6 acres

Land use	Soil Group	Area	CN
3:1 DG		7.7	85.5
pavement		0.9	98
Composite			
CN =	86.80813		

Subarea SM99 D.A. = 5.4 acres

Land use	Soil Group	Area	CN
pavement		0.8	98
3:1 dg		4.6	85.5
Composite			
CN =	87.35185		

Subarea sm100 D.A. = 66.8 acres

Land use	Soil Group	Area	CN
ind.	B	33	88
fallow	B	33	83
pavement		0.8	98
Composite			
CN =	85.64970		

Subarea sm101 D.A. = 33.5 acres

Land use	Soil Group	Area	CN
ag, row	B	24	81
R.O.W.		9.5	98
Composite			
CN =	85.82089		

Subarea sm102a D.A. = 80 acres

Land use	Soil Group	Area	CN
ind.	B	80	88
ag, row	B	0	81
Composite			
CN =	88		

Subarea sm102b D.A. = 75 acres

Land use	Soil Group	Area	CN
ind.	B	0	88
ag, row	B	75	81
Composite			
CN =	81		

Subarea sm103 D.A. = 149 acres

Land use	Soil Group	Area	CN
ind	B	215	88
non-contrib		75	
ROW		9	98

Composite CN = 88.60402

Subarea SM104 D.A. = 160 acres

Land use	Soil Group	Area	CN
industrial	B	50	88
fallow	B	110	83

Composite CN = 84.5625

Subarea SM105 D.A. = 87 acres

Land use	Soil Group	Area	CN
industrial	B	65	88
fallow	B	22	83

Composite CN = 86.73563

Subarea SM105A D.A. = 8.5 acres

Land use	Soil Group	Area	CN
ROW		8.5	98

Composite CN = 98

Subarea SM106 D.A. = 284 acres

Land use	Soil Group	Area	CN
industrial	B	155	88
ag, row	B	100	81
school	B	15	77
ROW		14	98

Composite CN = 85.44718

Subarea SM107A D.A. = 53 acres

Land use	Soil Group	Area	CN
ag, row	B	25	81
pavement		12	98
industrial	B	7	88
3:1 dg		9	85.5

Composite
CN = 86.53773

Subarea SM108a D.A. = 84 acres

Land use	Soil Group	Area	CN
ag, row	B	~~66~~ 74	81
substation	B	10	88
~~fallow~~	~~B~~	~~8~~	~~83~~

Composite 87.8
CN = ~~82.02380~~

Subarea SM108b D.A. = 90 acres

Land use	Soil Group	Area	CN
ag, row	B	90	81

Composite
CN = 81

Subarea SM109 D.A. = 24 acres

Land use	Soil Group	Area	CN
industrial	B	24	88

Composite
CN = 88

SEGMENT I
HEC-1 ANALYSES
I-10 PAPAGO TO THE SALT RIVER

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*          SEPTEMBER 1990               *
*           VERSION 4.0                 *
*                                       *
*  RUN DATE  05/07/1992  TIME  10:17:02 *
*                                       *
*****************************************
```


```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*         609 SECOND STREET             *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
```


```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX  XXXXX          XXX
```

```
::::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::::
:::                                      :::
:::  Full Microcomputer Implementation   :::
:::                 by                   :::
:::         Haestad Methods, Inc.        :::
:::                                      :::
::::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::::
```

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
    1     ID        PRICE ROAD GEC HYDROLOGY
    2     ID        SOUTH MOUNTAIN FREEWAY NORTH OF THE SALT RIVER
    3     ID        100-YEAR 24-HOUR
          *DIAGRAM
    4     IT       5                   300
    5     IO       3

    6     KK     SM98  SW INFIELD AREA OF I-10/SMF TI
    7     PH              0    0.78    1.53    2.68    2.93    3.09    3.40    3.69    4.00
    8     BA     .013
    9     LS            86.8
   10     UD      .10

   11     KK     SM99  SE INFIELD AREA OF I-10/SMF TI
   12     BA     .008
   13     LS            87.4
   14     UD      .10

   15     KK    ADD99  ADD SM99 TO SM98 HYDROGRAPH
   16     HC        2

   17     KK     RTSE  STORAGE ROUTE TO OPEN CHANNEL ON EAST SIDE RAMP N-E - 24" OUTLET
   18     RS        1    STOR     0.0
   19     SV        0     .56    4.53
   20     SE     1061    1062    1063
   21     SQ        0       4      13

   22     KK    SM100  50% INDUSTRIAL DEVELOPMENT   PT NE 1/4 SECTION 5
   23     BA     .104
   24     LS     1.64    85.8
   25     UD     0.74

   26     KK    AD100
   27     HC        2

   28     KK    RT100
   29     RD     1300   .0033    .018           TRAP     8.0       2

   30     KK    SM101  AGRICULTURAL/ROW  PT SW 1/4 SECTION 5
   31     BA     .0523
   32     LS            85.0
   33     UD     0.68

   34     KK    AD101  ADD HYDROGRAPHS SM100 AND SM101 AT VAN BUREN STREET BASIN
   35     HC        2

   36     KK    RTVBN  STORAGE ROUTE INFLOW TO 48-INCH VAN BUREN STORM DRAIN
   37     KM           12-INCH OUTLET CONTROL STRUCTURE IN BASIN (MODELED AS INLET CONTROL)
   38     RS        1    STOR     0.0
   39     SV        0    0.13     0.90    4.07    9.39   16.00
   40     SE     1045  1045.5   1046.5  1048.5  1050.5  1052.5
   41     SQ        0       0      2.3     5.8     8.2    10.0
```

```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

   42         KK  SM102A  INDUSTRIAL  E1/2 SE 1/4 SECTION 5
   43         BA    .125
   44         LS   2.93      88
   45         UD    .47

   46         KK  RT102A  SIMULATED SECTION OF ROADSIDE SWALE
   47         RD    800   .0030    .025            TRAP     2.0       2

   48         KK  SM102B  AG  W1/2 SE 1/4 SECTION 5
   49         BA    .117
   50         LS             81
   51         UD    .63

   52         KK  AD102B  ADD HYDS. SM102A AND SM102B
   53         HC       2

   54         KK   RT102  KINEMATIC WAVE THRU TANK FARM TO SPRR
   55         RK    3600    .003    .018            TRAP      50      10

   56         KK   SM103  ROW/INDUSTRIAL (TANK FARM) 75 OF 215 ACRES IS NON-CONTRIBUTING
   57         BA    .233
   58         LS            88.6
   59         UD    0.79

   60         KK   AD103   ADD HYD. SM102A, SM102B AND SM103 AT SPRR
   61         HC       2

   62         KK   RT103   CHANNEL ROUTE FLOW TO RID CANAL AT 59TH AVE.
   63         RD    5200   .0030    .018            TRAP     8.0       2

   64         KK   SM104  INDUSTRIAL/FALLOW FREEPORT CENTER  S. PT SECT. 8 (100YR-2HR RET.)
   65         BA    .25
   66         LS   2.93    84.6
   67         UD   1.21

   68         KK   SM105  INDUSTRIAL/FALLOW FREEPORT CENTER  S. PT SECT. 8 (100YR-2HR RET.)
   69         BA    .136
   70         LS   2.93    86.7
   71         UD   0.53

   72         KK  SM105A  ROW BETWEEN SPRR AND BUCKEYE ROAD
   73         BA    .013
   74         LS             95
   75         UD    .10

   76         KK   SM106  ROW/INDUSTRIAL/AG/SCHOOL  N1/2 SECTION 17
   77         BA    .444
   78         LS   1.98    85.4
   79         UD    .98
```

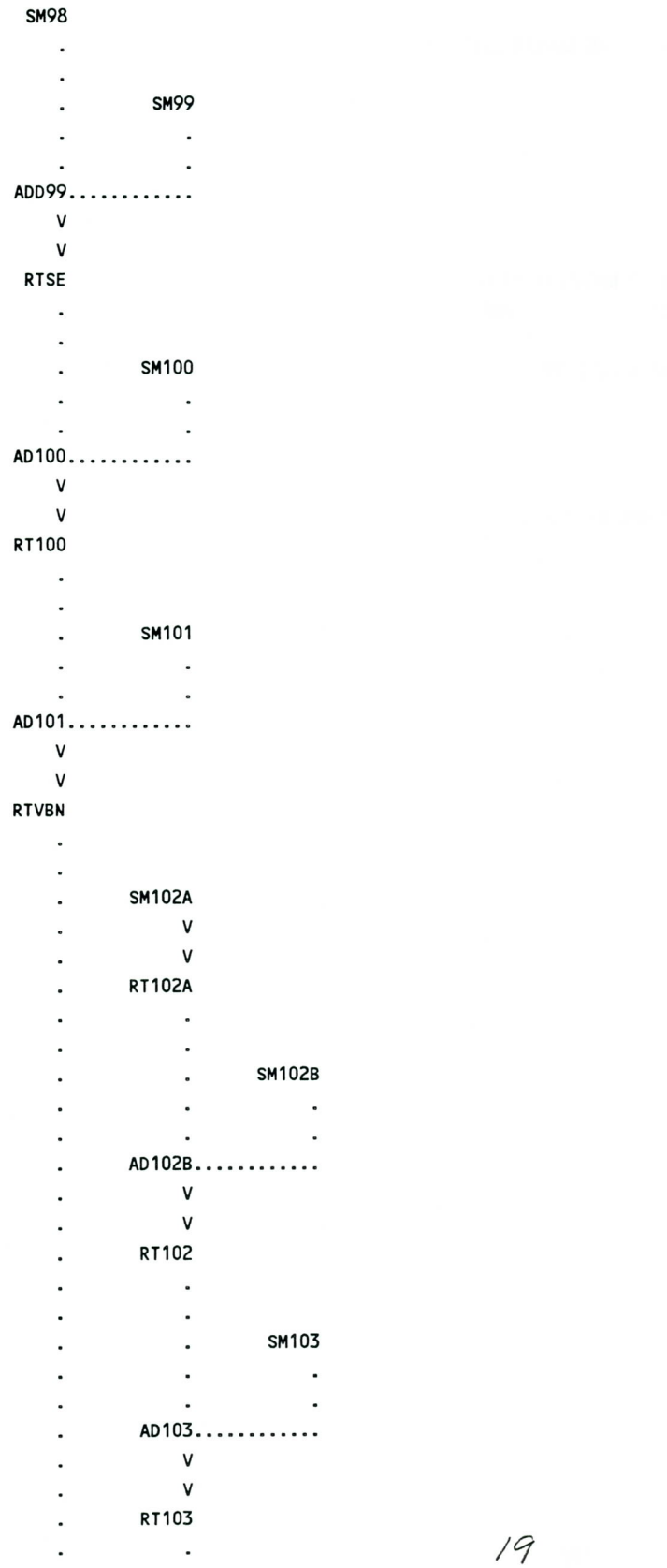
```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  80      KK   AD106  ADD ALL HYDS. FROM E. SIDE OF FREEWAY AT RID CANAL
  81      HC      5

  82      KK   RTRID  STORAGE ROUTE INFLOW BENEATH RID CANAL
  83      KM       3-60 INCH OUTLET CONTROL STRUCTURE IN BASIN
  84      RS      1    STOR     0.0
  85      SV      0    2.53    6.84   19.51   21.00
  86      SE   1025    1027    1028    1030  1030.2
  87      SQ      0      79     162     400     425

  88      KK   SM109  INDUSTRIAL, NO RETENTION ASSUMED, W. SIDE OF FREEWAY
  89      BA   .038
  90      LS             88
  91      UD    .43

  92      KK   AD109  ADD SM109 TO BASIN OUTFLOW
  93      HC      2

  94      KK   RT109  CHANNEL ROUTE FLOW TO LOWER BUCKEYE ROAD
  95      RD   2600   .0030    .018            TRAP     8.0       2

  96      KK  SM107A  AG  PT SE CORNER SECT 18
  97      BA   .083
  98      LS           86.5
  99      UD    .38
 100      IN     10                    144

 101      KK  SM107B  AG -SIMULATION OF POSSIBLE CONTRIBUTION OF 24-INCH TAILWATER CULVERT
 102      KM          CULVERT ASSUMED OPERATING AT 1.5D (20 CFS) FOR DURATION OF STORM
 103      KM          BUT NOT EXCEEDING TOTAL VOLUME OF AREA SM107B
 104      BA   0.25
 105      QI      0       0       0       0       0       0       0       0       0       0
 106      QI      0       0       0       0       0       0       0       0       0       0
 107      QI      0       0      20      20      20      20      20      20      20      20
 108      QI     20      20      20      20      20      20      20      20      20      20
 109      QI     20      20      20      20      20      20      20      20      20      20
 110      QI     20      20      20      20      20      20      20      20      20      20
 111      QI     20      20      20      20      20      20      20      20      20      20
 112      QI     20      20      20      20      20      20      20      20      20      20
 113      QI     20      20      20      20      20      20      20      20      20      20
 114      QI     20      20      20      20      20      20      20      20      20      20
 115      QI     20      20      20      20      20      20      20      20      20      20
 116      QI     20      20      20      20      20      20      20      20      20      20
 117      QI     20      20      20       0       0       0       0       0       0       0
 118      QI      0       0       0       0       0       0       0       0       0       0
 119      QI      0       0       0       0

 120      KK  AD107B  ADD CHANNEL FLOW TO 107 DRAINAGE AREAS
 121      HC      3
```

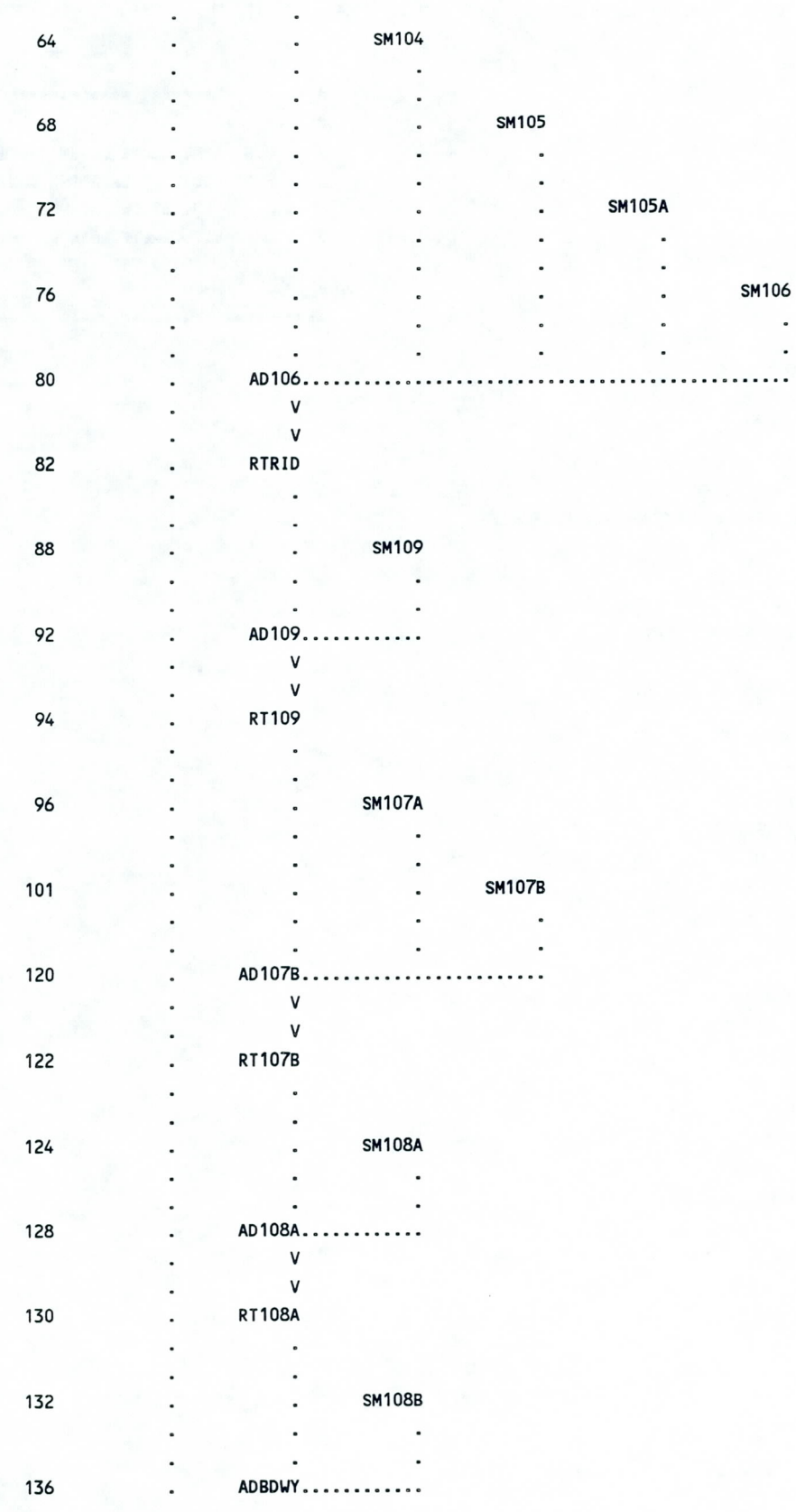
```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  122         KK  RT107B  CHANNEL ROUTE TO 1/2 SECTION LINE OF SECTION 19
  123         RD    2600   .0030    .018            TRAP       8       2

  124         KK  SM108A  AG/IND/FALLOW  PT NE CORNER SECT 19
  125         BA    .131
  126         LS            81.8
  127         UD     .53

  128         KK  AD108A
  129         HC       2

  130         KK  RT108A  CHANNEL ROUTE TO BROADWAY ROAD
  131         RD    2600   .0030    .018            TRAP       8       2

  132         KK  SM108B  AG  PT SE CORNER SECT 19
  133         BA    .14
  134         LS              81
  135         UD     .41

  136         KK  ADBDWY  TOTAL HYD. AT BROADWAY ROAD
  137         HC       2
  138         ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT LINE NO.

(V) ROUTING (.) CONNECTOR (---->) DIVERSION OR PUMP FLOW (<----) RETURN OF DIVERTED OR PUMPED FLOW





(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*           SEPTEMBER 1990              *
*            VERSION 4.0                *
*                                       *
*  RUN DATE  05/07/1992  TIME  10:17:02 *
*                                       *
*****************************************
```


```
*************************************
*                                   *
*    U.S. ARMY CORPS OF ENGINEERS   *
*    HYDROLOGIC ENGINEERING CENTER  *
*         609 SECOND STREET         *
*       DAVIS, CALIFORNIA 95616     *
*          (916) 756-1104           *
*                                   *
*************************************
```


PRICE ROAD GEC HYDROLOGY
SOUTH MOUNTAIN FREEWAY NORTH OF THE SALT RIVER
100-YEAR 24-HOUR

5 IO OUTPUT CONTROL VARIABLES

IPRNT	3	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

NMIN	5	MINUTES IN COMPUTATION INTERVAL
IDATE	1 0	STARTING DATE
ITIME	0000	STARTING TIME
NQ	300	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	2 0	ENDING DATE
NDTIME	0055	ENDING TIME
ICENT	19	CENTURY MARK

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 24.92 HOURS

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-FEET
SURFACE AREA	ACRES
TEMPERATURE	DEGREES FAHRENHEIT

*** ***

```
**************
*            *
*      SM98  *
*            *
**************
```

6 KK SW INFIELD AREA OF I-10/SMF TI

SUBBASIN RUNOFF DATA

8 BA SUBBASIN CHARACTERISTICS
TAREA .01 SUBBASIN AREA

PRECIPITATION DATA

7 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.78	1.53	2.68	2.93	3.09	3.40	3.69	4.00	.00	.00	.00	.00

STORM AREA = .01

9 LS SCS LOSS RATE
STRTL .30 INITIAL ABSTRACTION
CRVNBR 86.80 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

10 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .10 LAG

***

UNIT HYDROGRAPH
8 END-OF-PERIOD ORDINATES

28. 42. 19. 7. 3. 1. 0. 0.

*** *** *** *** ***

HYDROGRAPH AT STATION SM98

TOTAL RAINFALL = 4.00, TOTAL LOSS = 1.38, TOTAL EXCESS = 2.62

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
40.	12.17	(CFS)	3.	1.	1.	1.
		(INCHES)	2.411	2.618	2.618	2.618
		(AC-FT)	2.	2.	2.	2.

CUMULATIVE AREA = .01 SQ MI

*** ***

****
* *
11 KK * SM99 * SE INFIELD AREA OF I-10/SMF TI
* *
****

SUBBASIN RUNOFF DATA

12 BA SUBBASIN CHARACTERISTICS
TAREA .01 SUBBASIN AREA

PRECIPITATION DATA

7 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

```
          ..... HYDRO-35 ......   ................ TP-40 ................   ............ TP-49 ............
          5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
            .78    1.53    2.68    2.93    3.09    3.40    3.69    4.00     .00     .00     .00     .00

                                       STORM AREA =      .01

 13 LS          SCS LOSS RATE
                     STRTL         .29  INITIAL ABSTRACTION
                    CRVNBR       87.40  CURVE NUMBER
                     RTIMP         .00  PERCENT IMPERVIOUS AREA

 14 UD          SCS DIMENSIONLESS UNITGRAPH
                      TLAG         .10  LAG

                                                ***

                                           UNIT HYDROGRAPH
                                        8 END-OF-PERIOD ORDINATES
            18.         26.         11.          4.          2.          1.          0.          0.

      ***               ***               ***               ***               ***

                      HYDROGRAPH AT STATION      SM99

  TOTAL RAINFALL =     4.00, TOTAL LOSS =     1.33, TOTAL EXCESS =     2.67

PEAK FLOW    TIME                       MAXIMUM AVERAGE FLOW
  (CFS)      (HR)                 6-HR         24-HR        72-HR     24.92-HR
     25.    12.17      (CFS)        2.            1.           1.           1.
                    (INCHES)     2.460         2.673        2.673        2.673
                     (AC-FT)        1.            1.           1.           1.

                    CUMULATIVE AREA =      .01 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *


          ***************
          *             *
 15 KK    *    ADD99    *       ADD SM99 TO SM98 HYDROGRAPH
          *             *
          ***************

 16 HC          HYDROGRAPH COMBINATION
                     ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                ***

      ***               ***               ***               ***               ***

                      HYDROGRAPH AT STATION     ADD99

PEAK FLOW    TIME                       MAXIMUM AVERAGE FLOW
  (CFS)      (HR)                 6-HR         24-HR        72-HR     24.92-HR
     66.    12.17      (CFS)        5.            1.           1.           1.
                    (INCHES)     2.430         2.639        2.639        2.639
                     (AC-FT)        3.            3.           3.           3.
```

CUMULATIVE AREA = .02 SQ MI

*** ***

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          **************
          *            *
 17 KK    *      RTSE  *       STORAGE ROUTE TO OPEN CHANNEL ON EAST SIDE RAMP N-E - 24" OUTLET
          *            *
          **************
```

HYDROGRAPH ROUTING DATA

```
 18 RS          STORAGE ROUTING
                     NSTPS           1  NUMBER OF SUBREACHES
                      ITYP        STOR  TYPE OF INITIAL CONDITION
                     RSVRIC         .00  INITIAL CONDITION
                          X         .00 WORKING R AND D COEFFICIENT

 19 SV            STORAGE          .0        .6       4.5

 20 SE          ELEVATION     1061.00   1062.00   1063.00

 21 SQ          DISCHARGE          0.        4.       13.
```

***

*** *** *** *** ***

HYDROGRAPH AT STATION RTSE

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
7.	12.67	(CFS)	5.	1.	1.	1.
		(INCHES)	2.184	2.614	2.614	2.614
		(AC-FT)	2.	3.	3.	3.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.92-HR
2.	12.67	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.92-HR
1062.33	12.67	1062.07	1061.33	1061.32	1061.32

CUMULATIVE AREA = .02 SQ MI

*** ***

```
          **************
          *            *
 22 KK    *     SM100  *       50% INDUSTRIAL DEVELOPMENT   PT NE 1/4 SECTION 5
          *            *
          **************
```

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

             SUBBASIN RUNOFF DATA

 23 BA          SUBBASIN CHARACTERISTICS
                      TAREA         .10  SUBBASIN AREA

                PRECIPITATION DATA

  7 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .78    1.53    2.68    2.93    3.09    3.40    3.69    4.00     .00     .00     .00     .00

                                                STORM AREA =      .10

 24 LS          SCS LOSS RATE
                      STRTL        1.64  INITIAL ABSTRACTION
                     CRVNBR       85.80  CURVE NUMBER
                      RTIMP         .00  PERCENT IMPERVIOUS AREA

 25 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG         .74  LAG

                                                   ***

                                                UNIT HYDROGRAPH
                                             46 END-OF-PERIOD ORDINATES
                     2.       7.      14.      23.      34.      47.      56.      62.      64.      64.
                    61.      56.      51.      44.      36.      29.      25.      21.      17.      15.
                    13.      11.       9.       7.       6.       5.       4.       4.       3.       3.
                     2.       2.       2.       1.       1.       1.       1.       1.       1.       1.
                     0.       0.       0.       0.       0.       0.

    ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION    SM100

   TOTAL RAINFALL =    4.00, TOTAL LOSS =    2.61, TOTAL EXCESS =    1.39

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     24.92-HR
    53.     12.92        (CFS)       14.         4.          4.          4.
                         (INCHES)  1.230       1.383       1.383       1.383
                         (AC-FT)     7.          8.          8.          8.

                       CUMULATIVE AREA =     .10 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

          **************
          *           *
 26 KK    *     AD100 *
          *           *
          **************
```

27 HC HYDROGRAPH COMBINATION

ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

***

*** *** *** *** ***

HYDROGRAPH AT STATION AD100

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
60.	12.92	(CFS)	19.	5.	5.	5.
		(INCHES)	1.388	1.590	1.590	1.590
		(AC-FT)	9.	11.	11.	11.

CUMULATIVE AREA = .13 SQ MI

*** ***

****
* *
28 KK * RT100 *
* *
****

HYDROGRAPH ROUTING DATA

29 RD MUSKINGUM-CUNGE CHANNEL ROUTING

L	1300.	CHANNEL LENGTH
S	.0033	SLOPE
N	.018	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	8.00	BOTTOM WIDTH OR DIAMETER
Z	2.00	SIDE SLOPE

***

COMPUTED MUSKINGUM-CUNGE PARAMETERS

COMPUTATION TIME STEP

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	1.45	1.42	4.24	650.00	60.22	780.61	1.59	5.11

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	1.45	1.42	5.00		60.10	780.00	1.59

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1060E+02 EXCESS= .0000E+00 OUTFLOW= .1059E+02 BASIN STORAGE= .2107E-01 PERCENT ERROR= -.1

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

                         HYDROGRAPH AT STATION    RT100

  PEAK FLOW      TIME                              MAXIMUM AVERAGE FLOW
    (CFS)        (HR)                   6-HR         24-HR        72-HR      24.92-HR
       60.      13.00        (CFS)       19.            5.           5.            5.
                           (INCHES)    1.388         1.588        1.588         1.588
                            (AC-FT)       9.           11.          11.           11.

                        CUMULATIVE AREA =      .13 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *

            **************
            *            *
  30 KK     *    SM101   *        AGRICULTURAL/ROW  PT SW 1/4 SECTION 5
            *            *
            **************

               SUBBASIN RUNOFF DATA

  31 BA          SUBBASIN CHARACTERISTICS
                       TAREA           .05  SUBBASIN AREA

                 PRECIPITATION DATA

   7 PH                                  DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                 ..... HYDRO-35 ......   ................ TP-40 ................   ............ TP-49 ............
                 5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                   .78    1.53    2.68    2.93    3.09    3.40    3.69    4.00     .00     .00     .00     .00

                                                      STORM AREA =       .05

  32 LS          SCS LOSS RATE
                       STRTL           .35  INITIAL ABSTRACTION
                      CRVNBR         85.00  CURVE NUMBER
                       RTIMP           .00  PERCENT IMPERVIOUS AREA

  33 UD          SCS DIMENSIONLESS UNITGRAPH
                        TLAG           .68  LAG

                                                                ***

                                                         UNIT HYDROGRAPH
                                                    43 END-OF-PERIOD ORDINATES
                   1.          4.          9.         14.         22.         28.         33.         35.         35.         33.
                  31.         28.         24.         19.         15.         13.         10.          9.          7.          6.
                   5.          4.          3.          3.          2.          2.          2.          1.          1.          1.
                   1.          1.          1.          0.          0.          0.          0.          0.          0.          0.
                   0.          0.          0.

     ***              ***              ***              ***              ***

                         HYDROGRAPH AT STATION    SM101
```

27

TOTAL RAINFALL = 4.00, TOTAL LOSS = 1.54, TOTAL EXCESS = 2.46

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
58.	12.75	(CFS)	13.	3.	3.	3.
		(INCHES)	2.260	2.454	2.454	2.454
		(AC-FT)	6.	7.	7.	7.

CUMULATIVE AREA = .05 SQ MI

*** ***

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**************
*            *
*     AD101  *
*            *
**************
```

34 KK ADD HYDROGRAPHS SM100 AND SM101 AT VAN BUREN STREET BASIN

35 HC HYDROGRAPH COMBINATION

ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

*** *** *** *** ***

HYDROGRAPH AT STATION AD101

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
114.	12.92	(CFS)	31.	9.	8.	8.
		(INCHES)	1.638	1.844	1.844	1.844
		(AC-FT)	15.	17.	17.	17.

CUMULATIVE AREA = .18 SQ MI

*** ***

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*            *
*     RTVBN  *
*            *
**************
```

36 KK STORAGE ROUTE INFLOW TO 48-INCH VAN BUREN STORM DRAIN

12-INCH OUTLET CONTROL STRUCTURE IN BASIN (MODELED AS INLET CONTROL)

HYDROGRAPH ROUTING DATA

38 RS STORAGE ROUTING

NSTPS 1 NUMBER OF SUBREACHES

ITYP STOR TYPE OF INITIAL CONDITION

RSVRIC .00 INITIAL CONDITION

X .00 WORKING R AND D COEFFICIENT

39 SV	STORAGE	.0	.1	.9	4.1	9.4	16.0
40 SE	ELEVATION	1045.00	1045.50	1046.50	1048.50	1050.50	1052.50
41 SQ	DISCHARGE	0.	0.	2.	6.	8.	10.

***

*** *** *** *** ***

HYDROGRAPH AT STATION RTVBN

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
9.	16.50	(CFS)	9.	4.	4.	4.
		(INCHES)	.462	.914	.914	.914
		(AC-FT)	4.	9.	9.	9.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
(AC-FT)	(HR)	6-HR	24-HR	72-HR	24.92-HR
12.	16.67	12.	5.	5.	5.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
(FEET)	(HR)	6-HR	24-HR	72-HR	24.92-HR
1051.29	16.67	1051.19	1048.01	1047.90	1047.90

CUMULATIVE AREA = .18 SQ MI

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              ***************
              *             *
42 KK         *   SM102A    *      INDUSTRIAL  E1/2 SE 1/4 SECTION 5
              *             *
              ***************
```

SUBBASIN RUNOFF DATA

43 BA SUBBASIN CHARACTERISTICS
TAREA .13 SUBBASIN AREA

PRECIPITATION DATA

7 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			.... TP-40					.... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.78	1.53	2.68	2.93	3.09	3.40	3.69	4.00	.00	.00	.00	.00

STORM AREA = .13

44 LS SCS LOSS RATE
STRTL 2.93 INITIAL ABSTRACTION
CRVNBR 88.00 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

45 UD SCS DIMENSIONLESS UNITGRAPH

TLAG .47 LAG

***

UNIT HYDROGRAPH

30 END-OF-PERIOD ORDINATES

9.	26.	53.	88.	111.	118.	114.	101.	84.	63.
47.	36.	28.	22.	16.	13.	10.	7.	6.	4.
3.	3.	2.	2.	1.	1.	1.	1.	0.	0.

*** *** *** *** ***

HYDROGRAPH AT STATION SM102A

TOTAL RAINFALL = 4.00, TOTAL LOSS = 3.53, TOTAL EXCESS = .47

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
13.	13.00	(CFS)	5.	2.	2.	2.
		(INCHES)	.361	.469	.469	.469
		(AC-FT)	2.	3.	3.	3.

CUMULATIVE AREA = .13 SQ MI

*** ***

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*            *
46 KK  *  RT102A  *     SIMULATED SECTION OF ROADSIDE SWALE
*            *
**************
```

HYDROGRAPH ROUTING DATA

47 RD MUSKINGUM-CUNGE CHANNEL ROUTING

L	800.	CHANNEL LENGTH
S	.0030	SLOPE
N	.025	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	2.00	BOTTOM WIDTH OR DIAMETER
Z	2.00	SIDE SLOPE

***

COMPUTED MUSKINGUM-CUNGE PARAMETERS

COMPUTATION TIME STEP

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	1.42	1.35	2.50	266.67	13.13	782.50	.47	2.85

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

```
                    MAIN        1.42       1.35        5.00                13.07     780.00        .47

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3129E+01 EXCESS= .0000E+00 OUTFLOW= .3126E+01 BASIN STORAGE= .4970E-02 PERCENT ERROR=    -.1


     ***            ***             ***             ***             ***

                        HYDROGRAPH AT STATION   RT102A

 PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                    6-HR        24-HR        72-HR      24.92-HR
     13.      13.00          (CFS)        5.           2.           2.           2.
                           (INCHES)     .360         .469         .469         .469
                            (AC-FT)        2.           3.           3.           3.

                        CUMULATIVE AREA =      .13 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *

          **************
          *            *
 48 KK    *    SM102B  *       AG  W1/2 SE 1/4 SECTION 5
          *            *
          **************

             SUBBASIN RUNOFF DATA

 49 BA          SUBBASIN CHARACTERISTICS
                      TAREA         .12  SUBBASIN AREA

                PRECIPITATION DATA

  7 PH                                 DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .78    1.53    2.68    2.93    3.09    3.40    3.69    4.00     .00     .00     .00     .00

                                                STORM AREA =      .12

 50 LS          SCS LOSS RATE
                      STRTL         .47  INITIAL ABSTRACTION
                     CRVNBR       81.00  CURVE NUMBER
                      RTIMP         .00  PERCENT IMPERVIOUS AREA

 51 UD          SCS DIMENSIONLESS UNITGRAPH
                      TLAG         .63  LAG

                                                ***

                                                UNIT HYDROGRAPH
                                              40 END-OF-PERIOD ORDINATES
                    4.      12.      23.      39.      58.      73.      82.      84.      83.      76.
                   68.      58.      46.      37.      30.      24.      20.      17.      13.      11.
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```
          9.       7.       6.       5.       4.       3.       3.       2.       2.       1.
          1.       1.       1.       1.       1.       0.       0.       0.       0.       0.

   ***           ***           ***           ***           ***

                    HYDROGRAPH AT STATION   SM102B

  TOTAL RAINFALL =    4.00, TOTAL LOSS =    1.88, TOTAL EXCESS =    2.12

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR       72-HR     24.92-HR
   117.      12.75       (CFS)       25.         7.          6.          6.
                        (INCHES)   1.952       2.119       2.119       2.119
                        (AC-FT)      12.         13.         13.         13.

                    CUMULATIVE AREA =     .12 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


         **************
         *            *
 52 KK   *    AD102B  *       ADD HYDS. SM102A AND SM102B
         *            *
         **************

 53 HC          HYDROGRAPH COMBINATION
                     ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                  ***

   ***           ***           ***           ***           ***

                    HYDROGRAPH AT STATION   AD102B

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR       72-HR     24.92-HR
   126.      12.75       (CFS)       29.         8.          8.          8.
                        (INCHES)   1.122       1.266       1.266       1.266
                        (AC-FT)      14.         16.         16.         16.

                    CUMULATIVE AREA =     .24 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


         **************
         *            *
 54 KK   *     RT102  *       KINEMATIC WAVE THRU TANK FARM TO SPRR
         *            *
         **************

            HYDROGRAPH ROUTING DATA
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55 RK          KINEMATIC WAVE STREAM ROUTING
                        L       3600.  CHANNEL LENGTH
                        S       .0030  SLOPE
                        N        .018  CHANNEL ROUGHNESS COEFFICIENT
                       CA         .00  CONTRIBUTING AREA
                    SHAPE        TRAP  CHANNEL SHAPE
                       WD       50.00  BOTTOM WIDTH OR DIAMETER
                        Z       10.00  SIDE SLOPE
                   NDXMIN           2  MINIMUM NUMBER OF DX INTERVALS

                                                  ***
                                  COMPUTED KINEMATIC PARAMETERS
                                       VARIABLE TIME STEP
                                    (DT SHOWN IS A MINIMUM)

                  ELEMENT    ALPHA       M        DT        DX       PEAK    TIME TO     VOLUME    MAXIMUM
                                                                              PEAK                  CELERITY
                                                    (MIN)     (FT)     (CFS)    (MIN)       (IN)      (FPS)

                  MAIN           .60     1.46      4.41   1200.00    125.12   776.34       1.26      4.63

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1635E+02  EXCESS= .0000E+00 OUTFLOW= .1625E+02 BASIN STORAGE= .8325E-01 PERCENT ERROR=    .

                                       INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                  MAIN           .60     1.46      5.00               124.73   775.00       1.26

     ***            ***             ***            ***            ***

                        HYDROGRAPH AT STATION    RT102

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR     24.92-HR
    125.      12.92        (CFS)       29.         8.          8.          8.
                          (INCHES)   1.115       1.256       1.256       1.256
                          (AC-FT)       14.         16.         16.         16.

                        CUMULATIVE AREA =     .24 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
 56 KK    *     SM103  *       ROW/INDUSTRIAL (TANK FARM) 75 OF 215 ACRES IS NON-CONTRIBUTING
          *            *
          **************

             SUBBASIN RUNOFF DATA

 57 BA         SUBBASIN CHARACTERISTICS
                     TAREA         .23  SUBBASIN AREA

               PRECIPITATION DATA
```

7 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			.... TP-40					.... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.78	1.53	2.68	2.93	3.09	3.40	3.69	4.00	.00	.00	.00	.00

STORM AREA = .23

58 LS SCS LOSS RATE
STRTL .26 INITIAL ABSTRACTION
CRVNBR 88.60 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

59 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .79 LAG

***

UNIT HYDROGRAPH
49 END-OF-PERIOD ORDINATES

4.	14.	26.	42.	64.	90.	111.	126.	134.	135.
134.	126.	116.	105.	92.	75.	62.	52.	44.	38.
33.	28.	24.	20.	17.	14.	12.	10.	9.	7.
6.	5.	5.	4.	3.	3.	2.	2.	2.	1.
1.	1.	1.	1.	1.	1.	0.	0.	0.	

*** *** *** *** ***

HYDROGRAPH AT STATION SM103

TOTAL RAINFALL = 4.00, TOTAL LOSS = 1.21, TOTAL EXCESS = 2.78

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
261.	12.92	(CFS)	64.	17.	17.	17.
		(INCHES)	2.549	2.779	2.779	2.779
		(AC-FT)	32.	35.	35.	35.

CUMULATIVE AREA = .23 SQ MI

*** ***

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          **************
          *            *
60 KK     *    AD103   *        ADD HYD. SM102A, SM102B AND SM103 AT SPRR
          *            *
          **************
```

61 HC HYDROGRAPH COMBINATION
ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

***

*** *** *** *** ***

HYDROGRAPH AT STATION AD103

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
386.	12.92	(CFS)	92.	26.	25.	25.
		(INCHES)	1.810	2.003	2.003	2.003
		(AC-FT)	46.	51.	51.	51.

CUMULATIVE AREA = .47 SQ MI

*** ***

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         **************
         *            *
62 KK    *    RT103   *        CHANNEL ROUTE FLOW TO RID CANAL AT 59TH AVE.
         *            *
         **************
```

HYDROGRAPH ROUTING DATA

63 RD MUSKINGUM-CUNGE CHANNEL ROUTING

L	5200.	CHANNEL LENGTH
S	.0030	SLOPE
N	.018	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	8.00	BOTTOM WIDTH OR DIAMETER
Z	2.00	SIDE SLOPE

***

COMPUTED MUSKINGUM-CUNGE PARAMETERS

COMPUTATION TIME STEP

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	1.38	1.42	5.00	1733.33	383.42	780.00	2.00	8.59

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

ELEMENT	ALPHA	M	DT	DX	PEAK	TIME TO PEAK	VOLUME	MAXIMUM CELERITY
MAIN	1.38	1.42	5.00		383.42	780.00	2.00	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5075E+02 EXCESS= .0000E+00 OUTFLOW= .5063E+02 BASIN STORAGE= .2617E+00 PERCENT ERROR= -.3

*** *** *** *** ***

HYDROGRAPH AT STATION RT103

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
383.	13.00	(CFS)	92.	26.	25.	25.
		(INCHES)	1.809	1.998	1.998	1.998

(AC-FT) 46. 51. 51. 51.

CUMULATIVE AREA = .47 SQ MI

*** ***

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         ***************
         *             *
64 KK    *    SM104    *       INDUSTRIAL/FALLOW FREEPORT CENTER  S. PT SECT. 8 (100YR-2HR RET.)
         *             *
         ***************
```

SUBBASIN RUNOFF DATA

65 BA SUBBASIN CHARACTERISTICS
TAREA .25 SUBBASIN AREA

PRECIPITATION DATA

7 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			.... TP-40					.... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.78	1.53	2.68	2.93	3.09	3.40	3.69	4.00	.00	.00	.00	.00

STORM AREA = .25

66 LS SCS LOSS RATE
STRTL 2.93 INITIAL ABSTRACTION
CRVNBR 84.60 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

67 UD SCS DIMENSIONLESS UNITGRAPH
TLAG 1.21 LAG

***

UNIT HYDROGRAPH
75 END-OF-PERIOD ORDINATES

2.	5.	10.	15.	22.	30.	40.	51.	64.	74.
83.	90.	94.	96.	96.	96.	94.	90.	85.	81.
75.	69.	62.	54.	48.	42.	38.	34.	30.	27.
25.	22.	20.	18.	16.	14.	13.	12.	10.	9.
8.	7.	7.	6.	5.	5.	4.	4.	4.	3.
3.	3.	2.	2.	2.	2.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	0.	0.	0.
0.	0.	0.	0.	0.					

*** *** *** *** ***

HYDROGRAPH AT STATION SM104

TOTAL RAINFALL = 4.00, TOTAL LOSS = 3.60, TOTAL EXCESS = .40

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
13.	14.08	(CFS)	8.	3.	3.	3.

(INCHES)	.285	.386	.386	.386
(AC-FT)	4.	5.	5.	5.

CUMULATIVE AREA = .25 SQ MI

*** ***

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          **************
          *            *
68 KK     *   SM105    *      INDUSTRIAL/FALLOW FREEPORT CENTER  S. PT SECT. 8 (100YR-2HR RET.)
          *            *
          **************
```

SUBBASIN RUNOFF DATA

69 BA SUBBASIN CHARACTERISTICS

TAREA .14 SUBBASIN AREA

PRECIPITATION DATA

7 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			.... TP-40					.... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.78	1.53	2.68	2.93	3.09	3.40	3.69	4.00	.00	.00	.00	.00

STORM AREA = .14

70 LS SCS LOSS RATE

STRTL 2.93 INITIAL ABSTRACTION

CRVNBR 86.70 CURVE NUMBER

RTIMP .00 PERCENT IMPERVIOUS AREA

71 UD SCS DIMENSIONLESS UNITGRAPH

TLAG .53 LAG

***

UNIT HYDROGRAPH

34 END-OF-PERIOD ORDINATES

7.	21.	43.	72.	98.	112.	115.	109.	98.	83.
64.	49.	38.	30.	24.	19.	15.	12.	9.	7.
6.	5.	4.	3.	2.	2.	1.	1.	1.	1.
1.	0.	0.	0.						

*** *** *** *** ***

HYDROGRAPH AT STATION SM105

TOTAL RAINFALL = 4.00, TOTAL LOSS = 3.56, TOTAL EXCESS = .44

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
12.	13.08	(CFS)	5.	2.	2.	2.
		(INCHES)	.334	.438	.438	.438
		(AC-FT)	2.	3.	3.	3.

CUMULATIVE AREA = .14 SQ MI

*** ***

72 KK

****
* *
* SM105A *
* *
****

ROW BETWEEN SPRR AND BUCKEYE ROAD

SUBBASIN RUNOFF DATA

73 BA SUBBASIN CHARACTERISTICS

TAREA .01 SUBBASIN AREA

PRECIPITATION DATA

7 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.78	1.53	2.68	2.93	3.09	3.40	3.69	4.00	.00	.00	.00	.00

STORM AREA = .01

74 LS SCS LOSS RATE

STRTL .11 INITIAL ABSTRACTION
CRVNBR 95.00 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

75 UD SCS DIMENSIONLESS UNITGRAPH

TLAG .10 LAG

***

UNIT HYDROGRAPH
8 END-OF-PERIOD ORDINATES

28. 42. 19. 7. 3. 1. 0. 0.

*** *** *** *** ***

HYDROGRAPH AT STATION SM105A

TOTAL RAINFALL = 4.00, TOTAL LOSS = .57, TOTAL EXCESS = 3.43

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
49.	12.17	(CFS)	4.	1.	1.	1.
		(INCHES)	3.094	3.431	3.431	3.431
		(AC-FT)	2.	2.	2.	2.

CUMULATIVE AREA = .01 SQ MI

*** ***

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          **************
          *            *
76 KK     *     SM106  *       ROW/INDUSTRIAL/AG/SCHOOL  N1/2 SECTION 17
          *            *
          **************

             SUBBASIN RUNOFF DATA

77 BA           SUBBASIN CHARACTERISTICS
                      TAREA         .44  SUBBASIN AREA

                PRECIPITATION DATA

 7 PH                                 DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .78    1.53    2.68    2.93    3.09    3.40    3.69    4.00     .00     .00     .00     .00

                                                 STORM AREA =      .44

78 LS           SCS LOSS RATE
                      STRTL        1.98  INITIAL ABSTRACTION
                     CRVNBR       85.40  CURVE NUMBER
                      RTIMP         .00  PERCENT IMPERVIOUS AREA

79 UD           SCS DIMENSIONLESS UNITGRAPH
                      TLAG         .98  LAG

                                                      ***

                                                  UNIT HYDROGRAPH
                                               61 END-OF-PERIOD ORDINATES
                    5.      16.      29.      47.      68.      95.     127.     156.     180.     197.
                  208.     210.     209.     203.     192.     180.     166.     149.     130.     111.
                   95.      83.      72.      63.      56.      50.      43.      38.      33.      29.
                   25.      22.      20.      17.      15.      13.      11.      10.       9.       8.
                    7.       6.       5.       5.       4.       3.       3.       3.       2.       2.
                    2.       2.       1.       1.       1.       1.       1.       1.       0.       0.
                    0.

   ***             ***              ***              ***              ***

                        HYDROGRAPH AT STATION    SM106

   TOTAL RAINFALL =    4.00, TOTAL LOSS =    2.91, TOTAL EXCESS =    1.09

PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                    6-HR        24-HR        72-HR      24.92-HR
   132.      13.25        (CFS)         45.          13.          12.          12.
                         (INCHES)      .936        1.085        1.085        1.085
                         (AC-FT)       22.          26.          26.          26.

                        CUMULATIVE AREA =     .44 SQ MI
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          **************
          *            *
80 KK     *     AD106  *       ADD ALL HYDS. FROM E. SIDE OF FREEWAY AT RID CANAL
          *            *
          **************

81 HC          HYDROGRAPH COMBINATION
                    ICOMP          5  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***

     ***            ***            ***            ***            ***

                       HYDROGRAPH AT STATION    AD106

PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR        24-HR        72-HR      24.92-HR
    527.     13.08        (CFS)      152.          44.          42.          42.
                          (INCHES)  1.074        1.238        1.238        1.238
                          (AC-FT)     75.          87.          87.          87.

                       CUMULATIVE AREA =    1.32 SQ MI
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          **************
          *            *
82 KK     *     RTRID  *       STORAGE ROUTE INFLOW BENEATH RID CANAL
          *            *
          **************
                          3-60 INCH OUTLET CONTROL STRUCTURE IN BASIN

             HYDROGRAPH ROUTING DATA

84 RS          STORAGE ROUTING
                    NSTPS          1  NUMBER OF SUBREACHES
                     ITYP       STOR  TYPE OF INITIAL CONDITION
                   RSVRIC        .00  INITIAL CONDITION
                        X        .00 WORKING R AND D COEFFICIENT

85 SV            STORAGE          .0       2.5       6.8      19.5      21.0

86 SE          ELEVATION     1025.00   1027.00   1028.00   1030.00   1030.20

87 SQ          DISCHARGE          0.       79.      162.      400.      425.

                                                                  ***

     ***            ***            ***            ***            ***

                       HYDROGRAPH AT STATION    RTRID

PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR        24-HR        72-HR      24.92-HR
```

372.	13.58	(CFS)	151.	44.	42.	42.
		(INCHES)	1.068	1.233	1.233	1.233
		(AC-FT)	75.	87.	87.	87.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
(AC-FT)	(HR)	6-HR	24-HR	72-HR	24.92-HR
18.	13.58	7.	2.	2.	2.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
(FEET)	(HR)	6-HR	24-HR	72-HR	24.92-HR
1029.77	13.58	1027.53	1025.78	1025.75	1025.75

CUMULATIVE AREA = 1.32 SQ MI

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         **************
         *            *
88 KK    *     SM109  *       INDUSTRIAL, NO RETENTION ASSUMED, W. SIDE OF FREEWAY
         *            *
         **************
```

SUBBASIN RUNOFF DATA

89 BA SUBBASIN CHARACTERISTICS

TAREA	.04	SUBBASIN AREA

PRECIPITATION DATA

7 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.78	1.53	2.68	2.93	3.09	3.40	3.69	4.00	.00	.00	.00	.00

STORM AREA = .04

90 LS SCS LOSS RATE

STRTL	.27	INITIAL ABSTRACTION
CRVNBR	88.00	CURVE NUMBER
RTIMP	.00	PERCENT IMPERVIOUS AREA

91 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	.43	LAG

***

UNIT HYDROGRAPH
28 END-OF-PERIOD ORDINATES

3.	10.	21.	32.	38.	39.	35.	30.	22.	16.
12.	9.	7.	5.	4.	3.	2.	2.	1.	1.
1.	1.	0.	0.	0.	0.	0.	0.		

*** *** *** *** ***

HYDROGRAPH AT STATION SM109

TOTAL RAINFALL = 4.00, TOTAL LOSS = 1.27, TOTAL EXCESS = 2.73

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
63.	12.50	(CFS)	10.	3.	3.	3.
		(INCHES)	2.506	2.728	2.728	2.728
		(AC-FT)	5.	6.	6.	6.

CUMULATIVE AREA = .04 SQ MI

*** ***

92 KK * AD109 * ADD SM109 TO BASIN OUTFLOW

93 HC HYDROGRAPH COMBINATION
ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

*** *** *** *** ***

HYDROGRAPH AT STATION AD109

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
379.	13.58	(CFS)	161.	46.	45.	45.
		(INCHES)	1.104	1.274	1.274	1.274
		(AC-FT)	80.	92.	92.	92.

CUMULATIVE AREA = 1.36 SQ MI

*** ***

94 KK * RT109 * CHANNEL ROUTE FLOW TO LOWER BUCKEYE ROAD

HYDROGRAPH ROUTING DATA

95 RD MUSKINGUM-CUNGE CHANNEL ROUTING

L	2600.	CHANNEL LENGTH
S	.0030	SLOPE
N	.018	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	8.00	BOTTOM WIDTH OR DIAMETER

Z 2.00 SIDE SLOPE

***

COMPUTED MUSKINGUM-CUNGE PARAMETERS

COMPUTATION TIME STEP

ELEMENT	ALPHA	M	DT	DX	PEAK	TIME TO PEAK	VOLUME	MAXIMUM CELERITY
			(MIN)	(FT)	(CFS)	(MIN)	(IN)	(FPS)
MAIN	1.38	1.42	5.00	1300.00	378.72	820.00	1.27	8.55

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	1.38	1.42	5.00		378.72	820.00	1.27

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9221E+02 EXCESS= .0000E+00 OUTFLOW= .9201E+02 BASIN STORAGE= .2803E+00 PERCENT ERROR= -.1

*** *** *** *** ***

HYDROGRAPH AT STATION RT109

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
379.	13.67	(CFS)	161.	46.	45.	45.
		(INCHES)	1.104	1.272	1.272	1.272
		(AC-FT)	80.	92.	92.	92.

CUMULATIVE AREA = 1.36 SQ MI

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          ***************
          *             *
96 KK     *   SM107A    *     AG  PT SE CORNER SECT 18
          *             *
          ***************
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SUBBASIN RUNOFF DATA

97 BA SUBBASIN CHARACTERISTICS

TAREA .08 SUBBASIN AREA

PRECIPITATION DATA

7 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			.... TP-40					.... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.78	1.53	2.68	2.93	3.09	3.40	3.69	4.00	.00	.00	.00	.00

STORM AREA = .08

```
98 LS          SCS LOSS RATE
                    STRTL        .31  INITIAL ABSTRACTION
                   CRVNBR      86.50  CURVE NUMBER
                    RTIMP        .00  PERCENT IMPERVIOUS AREA

99 UD          SCS DIMENSIONLESS UNITGRAPH
                    TLAG        .38  LAG

                                                    ***

                                                UNIT HYDROGRAPH
                                            25 END-OF-PERIOD ORDINATES
              9.      29.      62.      88.      95.      89.      75.      55.      39.      28.
             21.      15.      11.       8.       6.       4.       3.       2.       2.       1.
              1.       1.       0.       0.       0.

   ***           ***           ***           ***           ***

                      HYDROGRAPH AT STATION   SM107A

   TOTAL RAINFALL =    4.00, TOTAL LOSS =    1.41, TOTAL EXCESS =    2.59

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     24.92-HR
   140.      12.42       (CFS)       21.         6.          6.          6.
                         (INCHES)   2.385       2.590       2.590       2.590
                         (AC-FT)     11.         11.         11.         11.

                      CUMULATIVE AREA =     .08 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
101 KK    *    SM107B  *       AG -SIMULATION OF POSSIBLE CONTRIBUTION OF 24-INCH TAILWATER CULVERT
          *            *
          **************
                           CULVERT ASSUMED OPERATING AT 1.5D (20 CFS) FOR DURATION OF STORM
                           BUT NOT EXCEEDING TOTAL VOLUME OF AREA SM107B

100 IN         TIME DATA FOR INPUT TIME SERIES
                    JXMIN          10  TIME INTERVAL IN MINUTES
                   JXDATE      1    0  STARTING DATE
                   JXTIME           0  STARTING TIME

             SUBBASIN RUNOFF DATA

104 BA         SUBBASIN CHARACTERISTICS
                   TAREA         .25  SUBBASIN AREA

                                                    ***

   ***           ***           ***           ***           ***

                      HYDROGRAPH AT STATION   SM107B
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PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
20.	3.67	(CFS)	20.	14.	14.	14.
		(INCHES)	.744	2.087	2.087	2.087
		(AC-FT)	10.	28.	28.	28.

CUMULATIVE AREA = .25 SQ MI

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          **************
          *            *
120 KK    *    AD107B  *       ADD CHANNEL FLOW TO 107 DRAINAGE AREAS
          *            *
          **************
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121 HC          HYDROGRAPH COMBINATION
                      ICOMP           3  NUMBER OF HYDROGRAPHS TO COMBINE
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*** *** *** *** ***

HYDROGRAPH AT STATION AD107B

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
411.	13.58	(CFS)	201.	66.	64.	64.
		(INCHES)	1.108	1.457	1.457	1.457
		(AC-FT)	100.	131.	131.	131.

CUMULATIVE AREA = 1.69 SQ MI

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          **************
          *            *
122 KK    *    RT107B  *       CHANNEL ROUTE TO 1/2 SECTION LINE OF SECTION 19
          *            *
          **************
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             HYDROGRAPH ROUTING DATA

123 RD          MUSKINGUM-CUNGE CHANNEL ROUTING
                          L       2600.  CHANNEL LENGTH
                          S       .0030  SLOPE
                          N        .018  CHANNEL ROUGHNESS COEFFICIENT
                         CA         .00  CONTRIBUTING AREA
                      SHAPE        TRAP  CHANNEL SHAPE
                         WD        8.00  BOTTOM WIDTH OR DIAMETER
                          Z        2.00  SIDE SLOPE
```

***

COMPUTED MUSKINGUM-CUNGE PARAMETERS
COMPUTATION TIME STEP

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	1.38	1.42	4.95	1300.00	410.13	821.67	1.45	8.75

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	1.38	1.42	5.00		409.88	820.00	1.45

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1313E+03 EXCESS= .0000E+00 OUTFLOW= .1311E+03 BASIN STORAGE= .2953E+00 PERCENT ERROR= -.1

*** *** *** *** ***

HYDROGRAPH AT STATION RT107B

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
410.	13.67	(CFS)	201.	66.	64.	64.
		(INCHES)	1.107	1.455	1.455	1.455
		(AC-FT)	100.	131.	131.	131.

CUMULATIVE AREA = 1.69 SQ MI

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**************
*            *
*    SM108A  *      AG/IND/FALLOW  PT NE CORNER SECT 19
*            *
**************
```

124 KK

SUBBASIN RUNOFF DATA

125 BA SUBBASIN CHARACTERISTICS

TAREA .13 SUBBASIN AREA

PRECIPITATION DATA

7 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.78	1.53	2.68	2.93	3.09	3.40	3.69	4.00	.00	.00	.00	.00

STORM AREA = .13

126 LS SCS LOSS RATE

STRTL .44 INITIAL ABSTRACTION 40

```
                CRVNBR        81.80  CURVE NUMBER
                 RTIMP          .00  PERCENT IMPERVIOUS AREA

127 UD        SCS DIMENSIONLESS UNITGRAPH
                 TLAG           .53  LAG

                                                ***

                                         UNIT HYDROGRAPH
                                     34 END-OF-PERIOD ORDINATES
          7.       20.       41.       70.       94.      108.      111.      105.       94.       80.
         62.       47.       37.       29.       23.       19.       15.       11.        9.        7.
          6.        4.        3.        3.        2.        2.        1.        1.        1.        1.
          1.        0.        0.        0.

    ***          ***          ***          ***          ***

                  HYDROGRAPH AT STATION   SM108A

  TOTAL RAINFALL =    4.00, TOTAL LOSS =    1.81, TOTAL EXCESS =    2.19

PEAK FLOW    TIME                     MAXIMUM AVERAGE FLOW
  (CFS)      (HR)              6-HR       24-HR      72-HR     24.92-HR
   151.      12.67    (CFS)     28.          8.         7.          7.
                    (INCHES)  2.015      2.185      2.185       2.185
                     (AC-FT)    14.         15.        15.         15.

                 CUMULATIVE AREA =     .13 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

          ***************
          *             *
128 KK    *   AD108A    *
          *             *
          ***************

129 HC        HYDROGRAPH COMBINATION
                 ICOMP            2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                ***

    ***          ***          ***          ***          ***

                  HYDROGRAPH AT STATION   AD108A

PEAK FLOW    TIME                     MAXIMUM AVERAGE FLOW
  (CFS)      (HR)              6-HR       24-HR      72-HR     24.92-HR
   438.      13.58    (CFS)    229.         74.        71.         71.
                    (INCHES)  1.171      1.507      1.507       1.507
                     (AC-FT)   114.        146.       146.        146.

                 CUMULATIVE AREA =    1.82 SQ MI
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* *
130 KK * RT108A * CHANNEL ROUTE TO BROADWAY ROAD
* *
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HYDROGRAPH ROUTING DATA

131 RD MUSKINGUM-CUNGE CHANNEL ROUTING

L	2600.	CHANNEL LENGTH
S	.0030	SLOPE
N	.018	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	8.00	BOTTOM WIDTH OR DIAMETER
Z	2.00	SIDE SLOPE

***

COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	M	COMPUTATION TIME STEP DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	1.38	1.42	4.86	1300.00	436.84	821.01	1.50	8.92

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	1.38	1.42	5.00		436.73	820.00	1.50

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1463E+03 EXCESS= .0000E+00 OUTFLOW= .1460E+03 BASIN STORAGE= .3184E+00 PERCENT ERROR= -.1

*** *** *** *** ***

HYDROGRAPH AT STATION RT108A

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
437.	13.67	(CFS)	229.	74.	71.	71.
		(INCHES)	1.170	1.505	1.505	1.505
		(AC-FT)	114.	146.	146.	146.

CUMULATIVE AREA = 1.82 SQ MI

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          *          *
132 KK    *   SM108B *      AG  PT SE CORNER SECT 19
          *          *
          **************

             SUBBASIN RUNOFF DATA

133 BA          SUBBASIN CHARACTERISTICS
                      TAREA         .14  SUBBASIN AREA

                PRECIPITATION DATA

  7 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .78    1.53    2.68    2.93    3.09    3.40    3.69    4.00     .00     .00     .00     .00

                                                  STORM AREA =      .14

134 LS          SCS LOSS RATE
                      STRTL         .47  INITIAL ABSTRACTION
                     CRVNBR       81.00  CURVE NUMBER
                      RTIMP         .00  PERCENT IMPERVIOUS AREA

135 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG         .41  LAG

                                                  ***

                                                        UNIT HYDROGRAPH
                                                  27 END-OF-PERIOD ORDINATES
                     13.      41.      86.     129.     149.     148.     130.     105.      75.      54.
                     40.      30.      22.      17.      12.       9.       7.       5.       4.       3.
                      2.       2.       1.       1.       1.       0.       0.

     ***           ***           ***           ***           ***

                          HYDROGRAPH AT STATION   SM108B

   TOTAL RAINFALL =    4.00, TOTAL LOSS =    1.88, TOTAL EXCESS =    2.12

PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                    6-HR       24-HR       72-HR     24.92-HR
   186.     12.50          (CFS)       29.         8.          8.          8.
                           (INCHES)  1.957       2.120       2.120       2.120
                           (AC-FT)     15.        16.         16.         16.

                          CUMULATIVE AREA =     .14 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *          *
136 KK    *   ADBDWY *      TOTAL HYD. AT BROADWAY ROAD
          *          *
          **************
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137 HC HYDROGRAPH COMBINATION

ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

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*** *** *** *** ***

HYDROGRAPH AT STATION ADBDWY

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
571.	12.67	(CFS)	258.	82.	79.	79.
		(INCHES)	1.224	1.549	1.549	1.549
		(AC-FT)	128.	162.	162.	162.

CUMULATIVE AREA = 1.96 SQ MI

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SM98	40.	12.17	3.	1.	1.	.01		
HYDROGRAPH AT	SM99	25.	12.17	2.	1.	1.	.01		
2 COMBINED AT	ADD99	66.	12.17	5.	1.	1.	.02		
ROUTED TO	RTSE	7.	12.67	5.	1.	1.	.02	1062.33	12.67
HYDROGRAPH AT	SM100	53.	12.92	14.	4.	4.	.10		
2 COMBINED AT	AD100	60.	12.92	19.	5.	5.	.13		
ROUTED TO	RT100	60.	13.00	19.	5.	5.	.13		
HYDROGRAPH AT	SM101	58.	12.75	13.	3.	3.	.05		
2 COMBINED AT	AD101	114.	12.92	31.	9.	8.	.18		
ROUTED TO	RTVBN	9.	16.50	9.	4.	4.	.18	1051.29	16.67
HYDROGRAPH AT	SM102A	13.	13.00	5.	2.	2.	.13		
ROUTED TO	RT102A	13.	13.00	5.	2.	2.	.13		
HYDROGRAPH AT	SM102B	117.	12.75	25.	7.	6.	.12		
2 COMBINED AT	AD102B	126.	12.75	29.	8.	8.	.24		
ROUTED TO	RT102	125.	12.92	29.	8.	8.	.24		
HYDROGRAPH AT	SM103	261.	12.92	64.	17.	17.	.23		
2 COMBINED AT	AD103	386.	12.92	92.	26.	25.	.47		
ROUTED TO	RT103	383.	13.00	92.	26.	25.	.47		
HYDROGRAPH AT	SM104	13.	14.08	8.	3.	3.	.25		
HYDROGRAPH AT	SM105	12.	13.08	5.	2.	2.	.14		
HYDROGRAPH AT	SM105A	49.	12.17	4.	1.	1.	.01		
HYDROGRAPH AT	SM106	132.	13.25	45.	13.	12.	.44		
5 COMBINED AT	AD106	527.	13.08	152.	44.	42.	1.32		
ROUTED TO	RTRID	372.	13.58	151.	44.	42.	1.32	1029.77	13.58
HYDROGRAPH AT	SM109	63.	12.50	10.	3.	3.	.04		
2 COMBINED AT	AD109	379.	13.58	161.	46.	45.	1.36		

ROUTED TO	RT109	379.	13.67	161.	46.	45.	1.36
HYDROGRAPH AT	SM107A	140.	12.42	21.	6.	6.	.08
HYDROGRAPH AT	SM107B	20.	3.67	20.	14.	14.	.25
3 COMBINED AT	AD107B	411.	13.58	201.	66.	64.	1.69
ROUTED TO	RT107B	410.	13.67	201.	66.	64.	1.69
HYDROGRAPH AT	SM108A	151.	12.67	28.	8.	7.	.13
2 COMBINED AT	AD108A	438.	13.58	229.	74.	71.	1.82
ROUTED TO	RT108A	437.	13.67	229.	74.	71.	1.82
HYDROGRAPH AT	SM108B	186.	12.50	29.	8.	8.	.14
2 COMBINED AT	ADBDWY	571.	12.67	258.	82.	79.	1.96

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	INTERPOLATED TO COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
RT100	MANE	4.24	60.22	780.61	1.59	5.00	60.10	780.00	1.59

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1060E+02 EXCESS= .0000E+00 OUTFLOW= .1059E+02 BASIN STORAGE= .2107E-01 PERCENT ERROR= -.1

RT102A	MANE	2.50	13.13	782.50	.47	5.00	13.07	780.00	.47

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3129E+01 EXCESS= .0000E+00 OUTFLOW= .3126E+01 BASIN STORAGE= .4970E-02 PERCENT ERROR= -.1

RT102	MANE	4.41	125.12	776.34	1.26	5.00	124.73	775.00	1.26

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1635E+02 EXCESS= .0000E+00 OUTFLOW= .1625E+02 BASIN STORAGE= .8325E-01 PERCENT ERROR= .1

RT103	MANE	5.00	383.42	780.00	2.00	5.00	383.42	780.00	2.00

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5075E+02 EXCESS= .0000E+00 OUTFLOW= .5063E+02 BASIN STORAGE= .2617E+00 PERCENT ERROR= -.3

RT109	MANE	5.00	378.72	820.00	1.27	5.00	378.72	820.00	1.27

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9221E+02 EXCESS= .0000E+00 OUTFLOW= .9201E+02 BASIN STORAGE= .2803E+00 PERCENT ERROR= -.1

RT107B	MANE	4.95	410.13	821.67	1.45	5.00	409.88	820.00	1.45

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1313E+03 EXCESS= .0000E+00 OUTFLOW= .1311E+03 BASIN STORAGE= .2953E+00 PERCENT ERROR= -.1

RT108A	MANE	4.86	436.84	821.01	1.50	5.00	436.73	820.00	1.50

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1463E+03 EXCESS= .0000E+00 OUTFLOW= .1460E+03 BASIN STORAGE= .3184E+00 PERCENT ERROR= -.1

*** NORMAL END OF HEC-1 ***
Elapsed Time - 00:01:13.16 (73.16 Seconds)
NORMAL END OF HEC-1

SEGMENT I
CULVERT DESIGN SHEETS

MINUMUM DISCHARGE (CFS) 0
DESIGN DISCHARGE (CFS) 60
MAXIMUM DISCHARGE (CFS) 72

C	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
U								
L	INLET	OUTLET	CULVERT	BARRELS	SPAN	RISE	MANN.	INLET
V	ELEV.	ELEV.	LENGTH	SHAPE			N	TYPE
#	(FT)	(FT)	(FT)	MATERIAL	(FT)	(FT)		
1	1055.31	1054.00	110.00	1 - RCP	3.50	3.50	.012	CONVENTIONAL
2								
3								
4								
5								
6								

CULVERT NUMBER: 1
INLET STATION (FT) 0.00
INLET ELEVATION (FT) 1055.31
OUTLET STATION (FT) 110.00
OUTLET ELEVATION (FT) 1054.00
NUMBER OF BARRELS 1.00
SLOPE (V-FT/H-FT) 0.0119
CULVERT LENGTH ALONG SLOPE (FT) 110.00

BARREL SHAPE: CIRCULAR 3.50 FT IN DIAMETER
BARREL MATERIAL:
WITH A MANNING'S N OF 0.012
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: GROOVED END IN HEADWALL
INLET DEPRESSION: NONE

DOWNSTREAM CHANNEL CROSS-SECTION
BOTTOM WIDTH (FT) 4.00
SIDE SLOPE H/V _:1 3.0
CHANNEL SLOPE V/H (FT/FT) 0.003
MANNING'S N (.01-0.1) 0.030
CHANNEL INVERT ELEVATION (FT) 1054.00

UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NO.	VEL. (FPS)	SHEAR (PSF)
0.00	1054.00	0.000	0.00	0.00
7.20	1054.68	0.000	1.77	0.14
14.40	1054.97	0.000	2.16	0.20
21.60	1055.19	0.000	2.41	0.24
28.80	1055.37	0.000	2.60	0.28
36.00	1055.52	0.000	2.76	0.31
43.20	1055.66	0.000	2.90	0.34
50.40	1055.79	0.000	3.02	0.37
57.60	1055.90	0.000	3.13	0.39
60.00	1055.94	0.000	3.16	0.40
72.00	1056.11	0.000	3.31	0.43

SELECTED OVERTOPPING CREST

ROADWAY SURFACE: PAVED
EMBANKMENT TOP WIDTH (FT): 100.00
CONSTANT ROADWAY ELEVATION PROFILE
CREST LENGTH (FT) 100.00
OVERTOPPING CREST ELEVATION (FT) 1062.00

SUMMARY OF CULVERT FLOWS (CFS) FILE: ROOSE DATE: 04-22-1992

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1055.31	0	0	0	0	0	0	0	0	0
1056.33	7	7	0	0	0	0	0	0	2
1056.85	14	14	0	0	0	0	0	0	2
1057.28	22	22	0	0	0	0	0	0	2
1057.64	29	29	0	0	0	0	0	0	2
1057.95	36	36	0	0	0	0	0	0	2
1058.24	43	43	0	0	0	0	0	0	2
1058.53	50	50	0	0	0	0	0	0	2
1058.82	58	58	0	0	0	0	0	0	2
1058.92	60	60	0	0	0	0	0	0	2
1059.45	72	72	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	1055.31	1054.00	0.00	-1.31	-1.31	1055.31	0.00	0.00
7	1056.33	1054.68	1.02	-0.16	-0.16	0.00	0.00	5.51
14	1056.85	1054.97	1.54	0.35	0.35	0.00	0.00	6.61
22	1057.28	1055.19	1.97	0.76	0.76	0.00	0.00	7.49
29	1057.64	1055.37	2.33	1.12	1.12	0.00	0.00	8.27
36	1057.95	1055.52	2.64	1.45	1.45	0.00	0.00	8.96
43	1058.24	1055.66	2.93	1.76	1.76	0.00	0.00	9.60
50	1058.53	1055.79	3.22	2.06	2.06	0.00	0.00	10.22
58	1058.82	1055.90	3.51	2.35	2.35	0.00	0.00	10.80
60	1058.92	1055.94	3.61	2.44	2.44	0.00	0.00	10.99
72	1059.45	1056.11	4.14	2.93	2.93	0.00	0.00	11.90

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: ROOSE DATE: 04-22-1992

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1055.31	0.00	0	0	0.00
1056.33	0.00	7	0	0.00
1056.85	0.00	14	0	0.00
1057.28	0.00	22	0	0.00
1057.64	0.00	29	0	0.00
1057.95	0.00	36	0	0.00
1058.24	0.00	43	0	0.00
1058.53	0.00	50	0	0.00
1058.82	0.00	58	0	0.00
1058.92	0.00	60	0	0.00
1059.45	0.00	72	0	0.00

MINUMUM DISCHARGE (CFS) 0
DESIGN DISCHARGE (CFS) 386
MAXIMUM DISCHARGE (CFS) 463

C	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
U	INLET	OUTLET	CULVERT	BARRELS	SPAN	RISE	MANN.	INLET
L	ELEV.	ELEV.	LENGTH	SHAPE			N	TYPE
V	(FT)	(FT)	(FT)	MATERIAL	(FT)	(FT)		
#								
1	1038.08	1037.37	180.00	4 - RCP	4.50	4.50	.012	CONVENTIONAL
2								
3								
4								
5								
6								

CULVERT NUMBER: 1

INLET STATION (FT)	15230.00
INLET ELEVATION (FT)	1038.08
OUTLET STATION (FT)	15410.00
OUTLET ELEVATION (FT)	1037.37
NUMBER OF BARRELS	4.00
SLOPE (V-FT/H-FT)	0.0039
CULVERT LENGTH ALONG SLOPE (FT)	180.00

BARREL SHAPE: CIRCULAR 4.50 FT IN DIAMETER
BARREL MATERIAL:
WITH A MANNING'S N OF 0.012
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: GROOVED END IN HEADWALL
INLET DEPRESSION: NONE

DOWNSTREAM CHANNEL CROSS-SECTION

BOTTOM WIDTH (FT)	8.00
SIDE SLOPE H/V _:1	2.0
CHANNEL SLOPE V/H (FT/FT)	0.002
MANNING'S N (.01-0.1)	0.018
CHANNEL INVERT ELEVATION (FT)	1037.07

UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NO.	VEL. (FPS)	SHEAR (PSF)
0.00	1037.07	0.000	0.16	82.00
46.30	1038.26	0.000	3.76	0.17
92.60	1038.81	0.000	4.63	0.25
138.90	1039.23	0.000	5.21	0.31
185.20	1039.59	0.000	5.65	0.36
231.50	1039.89	0.000	6.01	0.41
277.80	1040.17	0.000	6.31	0.44
324.10	1040.42	0.000	6.58	0.48
370.40	1040.65	0.000	6.82	0.51
386.00	1040.73	0.000	6.89	0.52
463.00	1041.07	0.000	7.24	0.57

SELECTED OVERTOPPING CREST

ROADWAY SURFACE: GRAVEL
EMBANKMENT TOP WIDTH (FT): 120.00
CONSTANT ROADWAY ELEVATION PROFILE
CREST LENGTH (FT) 100.00
OVERTOPPING CREST ELEVATION (FT) 1047.50

SUMMARY OF CULVERT FLOWS (CFS) FILE: SOUPAC DATE: 04-30-1992

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1038.08	0	0	0	0	0	0	0	0	0
1039.31	46	46	0	0	0	0	0	0	2
1039.90	93	93	0	0	0	0	0	0	2
1040.41	139	139	0	0	0	0	0	0	2
1040.83	185	185	0	0	0	0	0	0	2
1041.21	232	232	0	0	0	0	0	0	2
1041.73	278	278	0	0	0	0	0	0	2
1042.06	324	324	0	0	0	0	0	0	2
1042.37	370	370	0	0	0	0	0	0	2
1042.48	386	386	0	0	0	0	0	0	2
1042.99	463	463	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 4 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	1038.08	1037.07	0.00	-0.71	-0.71	1038.08	0.00	0.00
46	1039.31	1038.26	1.23	0.65	0.65	0.00	0.00	5.17
93	1039.90	1038.81	1.82	1.26	1.26	0.00	0.00	5.26
139	1040.41	1039.23	2.33	1.75	1.75	0.00	0.00	5.58
185	1040.83	1039.59	2.75	2.25	2.25	0.00	0.00	5.93
232	1041.21	1039.89	3.13	2.64	2.64	0.00	0.00	6.31
278	1041.73	1040.17	3.47	3.65	3.65	0.00	0.00	6.68
324	1042.06	1040.42	3.79	3.98	3.98	0.00	0.00	7.07
370	1042.37	1040.65	4.11	4.29	4.29	0.00	0.00	7.47
386	1042.48	1040.73	4.21	4.40	4.40	0.00	0.00	7.60
463	1042.99	1041.07	4.75	4.91	4.91	0.00	0.00	8.30

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: SOUPAC DATE: 04-30-1992

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1038.08	0.00	0	0	0.00
1039.31	0.00	46	0	0.00
1039.90	0.00	93	0	0.00
1040.41	0.00	139	0	0.00
1040.83	0.00	185	0	0.00
1041.21	0.00	232	0	0.00
1041.73	0.00	278	0	0.00
1042.06	0.00	324	0	0.00
1042.37	0.00	370	0	0.00
1042.48	0.00	386	0	0.00
1042.99	0.00	463	0	0.00

MINUMUM DISCHARGE (CFS) 0
DESIGN DISCHARGE (CFS) 386
MAXIMUM DISCHARGE (CFS) 463

C	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
U	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANN. N	INLET TYPE
1	1031.54	1031.14	200.00	3 - RCP	5.00	5.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

CULVERT NUMBER: 1
INLET STATION (FT) 17915.00
INLET ELEVATION (FT) 1031.54
OUTLET STATION (FT) 18115.00
OUTLET ELEVATION (FT) 1031.14
NUMBER OF BARRELS 3.00
SLOPE (V-FT/H-FT) 0.0020
CULVERT LENGTH ALONG SLOPE (FT) 200.00

BARREL SHAPE: CIRCULAR 5.00 FT IN DIAMETER
BARREL MATERIAL:
WITH A MANNING'S N OF 0.012
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: GROOVED END IN HEADWALL
INLET DEPRESSION: NONE

DOWNSTREAM CHANNEL CROSS-SECTION
BOTTOM WIDTH (FT) 8.00
SIDE SLOPE H/V _:1 2.0
CHANNEL SLOPE V/H (FT/FT) 0.002
MANNING'S N (.01-0.1) 0.018
CHANNEL INVERT ELEVATION (FT) 1031.14

UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NO.	VEL. (FPS)	SHEAR (PSF)
0.00	1031.14	0.000	0.14	82.00
46.30	1032.37	0.000	3.58	0.15
92.60	1032.95	0.000	4.41	0.23
138.90	1033.38	0.000	4.95	0.28
185.20	1033.75	0.000	5.37	0.33
231.50	1034.07	0.000	5.71	0.37
277.80	1034.35	0.000	6.00	0.40
324.10	1034.61	0.000	6.25	0.43
370.40	1034.85	0.000	6.48	0.46
386.00	1034.93	0.000	6.55	0.47
463.00	1035.28	0.000	6.88	0.52

SELECTED OVERTOPPING CREST

ROADWAY SURFACE: PAVED
EMBANKMENT TOP WIDTH (FT): 150.00
CONSTANT ROADWAY ELEVATION PROFILE
CREST LENGTH (FT) 100.00
OVERTOPPING CREST ELEVATION (FT) 1041.00

SUMMARY OF CULVERT FLOWS (CFS) FILE: BUCKEYE DATE: 04-30-1992

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1031.54	0	0	0	0	0	0	0	0	0
1033.07	46	46	0	0	0	0	0	0	2
1033.75	93	93	0	0	0	0	0	0	2
1034.30	139	139	0	0	0	0	0	0	2
1034.78	185	185	0	0	0	0	0	0	2
1035.23	232	232	0	0	0	0	0	0	2
1035.65	278	278	0	0	0	0	0	0	2
1036.01	324	324	0	0	0	0	0	0	2
1036.40	370	370	0	0	0	0	0	0	2
1036.53	386	386	0	0	0	0	0	0	2
1037.16	463	463	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 3 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	1031.54	1031.14	0.00	-0.40	-0.40	1031.54	0.00	0.00
46	1033.07	1032.37	1.38	1.53	1.53	0.00	0.00	4.05
93	1033.75	1032.95	2.06	2.21	2.21	0.00	0.00	4.81
139	1034.30	1033.38	2.63	2.76	2.76	0.00	0.00	5.42
185	1034.78	1033.75	3.11	3.24	3.24	0.00	0.00	5.96
232	1035.23	1034.07	3.53	3.69	3.69	0.00	0.00	6.46
278	1035.65	1034.35	3.91	4.11	4.11	0.00	0.00	6.96
324	1036.01	1034.61	4.28	4.47	4.47	0.00	0.00	7.43
370	1036.40	1034.85	4.64	4.86	4.86	0.00	0.00	7.92
386	1036.53	1034.93	4.76	4.99	4.99	0.00	0.00	8.09
463	1037.20	1035.28	5.38	5.66	5.66	0.00	0.00	8.91

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: BUCKEYE DATE: 04-30-1992

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1031.54	0.00	0	0	0.00
1033.07	0.00	46	0	0.00
1033.75	0.00	93	0	0.00
1034.30	0.00	139	0	0.00
1034.78	0.00	185	0	0.00
1035.23	0.00	232	0	0.00
1035.65	0.00	278	0	0.00
1036.01	0.00	324	0	0.00
1036.40	0.00	370	0	0.00
1036.53	0.00	386	0	0.00
1037.16	0.00	463	0	0.00

MINUMUM DISCHARGE (CFS) 0
DESIGN DISCHARGE (CFS) 52
MAXIMUM DISCHARGE (CFS) 63

C	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
U								
L	INLET	OUTLET	CULVERT	BARRELS	SPAN	RISE	MANN.	INLET
V	ELEV.	ELEV.	LENGTH	SHAPE			N	TYPE
#	(FT)	(FT)	(FT)	MATERIAL	(FT)	(FT)		
1	1026.00	1017.00	340.00	1 - RCP	3.00	3.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

CULVERT NUMBER: 1
INLET STATION (FT) 0.00
INLET ELEVATION (FT) 1026.00
OUTLET STATION (FT) 340.00
OUTLET ELEVATION (FT) 1017.00
NUMBER OF BARRELS 1.00
SLOPE (V-FT/H-FT) 0.0265
CULVERT LENGTH ALONG SLOPE (FT) 340.00

BARREL SHAPE: CIRCULAR 3.00 FT IN DIAMETER
BARREL MATERIAL:
WITH A MANNING'S N OF 0.012
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: GROOVED END IN HEADWALL
INLET DEPRESSION: NONE

CONSTANT WATER SURFACE ELEVATION
1027.20

SELECTED OVERTOPPING CREST

ROADWAY SURFACE: PAVED
EMBANKMENT TOP WIDTH (FT): 300.00
CONSTANT ROADWAY ELEVATION PROFILE
CREST LENGTH (FT) 100.00
OVERTOPPING CREST ELEVATION (FT) 1040.00

SUMMARY OF CULVERT FLOWS (CFS) FILE: SM109 DATE: 04-30-1992

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1026.00	0	0	0	0	0	0	0	0	0
1027.37	6	6	0	0	0	0	0	0	2
1027.52	13	13	0	0	0	0	0	0	2
1027.93	19	19	0	0	0	0	0	0	2
1028.28	25	25	0	0	0	0	0	0	2
1028.60	32	32	0	0	0	0	0	0	2
1028.91	38	38	0	0	0	0	0	0	2
1029.25	44	44	0	0	0	0	0	0	2
1029.87	50	50	0	0	0	0	0	0	2
1029.98	52	52	0	0	0	0	0	0	2
1031.25	63	63	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	1027.20	1027.20	0.00	1.20	1.20	1026.00	0.00	0.00
6	1027.37	1027.20	0.99	1.37	1.37	0.00	0.00	0.89
13	1027.52	1027.20	1.52	1.44	1.44	0.00	0.00	1.78
19	1027.93	1027.20	1.93	1.63	1.63	0.00	0.00	2.67
25	1028.28	1027.20	2.28	1.85	1.85	0.00	0.00	3.57
32	1028.60	1027.20	2.60	2.21	2.21	0.00	0.00	4.46
38	1028.91	1027.20	2.91	2.68	2.68	0.00	0.00	5.35
44	1029.25	1027.20	3.25	3.21	3.21	0.00	0.00	6.24
50	1029.87	1027.20	3.61	3.87	3.87	0.00	0.00	7.13
52	1029.98	1027.20	3.71	3.98	3.98	0.00	0.00	7.36
63	1031.25	1027.20	4.47	5.25	5.25	0.00	0.00	8.91

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: SM109 DATE: 04-30-1992

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1026.00	0.00	0	0	0.00
1027.37	0.00	6	0	0.00
1027.52	0.00	13	0	0.00
1027.93	0.00	19	0	0.00
1028.28	0.00	25	0	0.00
1028.60	0.00	32	0	0.00
1028.91	0.00	38	0	0.00
1029.25	0.00	44	0	0.00
1029.87	0.00	50	0	0.00
1029.98	0.00	52	0	0.00
1031.25	0.00	63	0	0.00

MINUMUM DISCHARGE (CFS) 0
DESIGN DISCHARGE (CFS) 372
MAXIMUM DISCHARGE (CFS) 446

C	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
U								
L	INLET	OUTLET	CULVERT	BARRELS	SPAN	RISE	MANN.	INLET
V	ELEV.	ELEV.	LENGTH	SHAPE			N	TYPE
#	(FT)	(FT)	(FT)	MATERIAL	(FT)	(FT)		
1	1025.17	1022.21	155.00	3 - RCP	5.00	5.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

CULVERT NUMBER: 1
INLET STATION (FT) 0.00
INLET ELEVATION (FT) 1025.17
OUTLET STATION (FT) 155.00
OUTLET ELEVATION (FT) 1022.21
NUMBER OF BARRELS 3.00
SLOPE (V-FT/H-FT) 0.0191
CULVERT LENGTH ALONG SLOPE (FT) 155.00

BARREL SHAPE: CIRCULAR 5.00 FT IN DIAMETER
BARREL MATERIAL:
WITH A MANNING'S N OF 0.012
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: GROOVED END IN HEADWALL
INLET DEPRESSION: NONE

DOWNSTREAM CHANNEL CROSS-SECTION
BOTTOM WIDTH (FT) 8.00
SIDE SLOPE H/V _:1 2.0
CHANNEL SLOPE V/H (FT/FT) 0.002
MANNING'S N (.01-0.1) 0.018
CHANNEL INVERT ELEVATION (FT) 1022.21

UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NO.	VEL. (FPS)	SHEAR (PSF)
0.00	1022.21	0.000	0.16	94.40
44.60	1023.42	0.000	3.54	0.15
89.20	1023.98	0.000	4.36	0.22
133.80	1024.41	0.000	4.90	0.27
178.40	1024.77	0.000	5.31	0.32
223.00	1025.08	0.000	5.65	0.36
267.60	1025.36	0.000	5.94	0.39
312.20	1025.62	0.000	6.19	0.43
356.80	1025.85	0.000	6.41	0.45
372.00	1025.93	0.000	6.49	0.46
446.00	1026.27	0.000	6.81	0.51

SELECTED OVERTOPPING CREST

ROADWAY SURFACE: GRAVEL
EMBANKMENT TOP WIDTH (FT): 120.00
CONSTANT ROADWAY ELEVATION PROFILE
CREST LENGTH (FT) 100.00
OVERTOPPING CREST ELEVATION (FT) 1033.00

SUMMARY OF CULVERT FLOWS (CFS) FILE: CANAL DATE: 05-07-1992

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1025.17	0	0	0	0	0	0	0	0	0
1026.48	45	45	0	0	0	0	0	0	2
1027.14	89	89	0	0	0	0	0	0	2
1027.70	134	134	0	0	0	0	0	0	2
1028.17	178	178	0	0	0	0	0	0	2
1028.58	223	223	0	0	0	0	0	0	2
1028.96	268	268	0	0	0	0	0	0	2
1029.31	312	312	0	0	0	0	0	0	2
1029.66	357	357	0	0	0	0	0	0	2
1029.78	372	372	0	0	0	0	0	0	2
1030.36	446	446	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 3 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	1025.17	1022.21	0.00	-2.96	-2.96	1025.17	0.00	0.00
45	1026.48	1023.42	1.31	-1.44	-1.44	0.00	0.00	4.02
89	1027.14	1023.98	1.97	-0.74	-0.74	0.00	0.00	4.76
134	1027.70	1024.41	2.53	-0.20	-0.20	0.00	0.00	5.35
178	1028.17	1024.77	3.00	0.28	0.28	0.00	0.00	5.88
223	1028.58	1025.08	3.41	0.71	0.71	0.00	0.00	6.37
268	1028.96	1025.36	3.79	1.11	1.11	0.00	0.00	6.85
312	1029.31	1025.62	4.14	1.49	1.49	0.00	0.00	7.31
357	1029.66	1025.85	4.49	1.86	1.86	0.00	0.00	7.78
372	1029.78	1025.93	4.60	1.99	1.99	0.00	0.00	7.94
446	1030.36	1026.27	5.19	2.56	2.56	0.00	0.00	8.71

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: CANAL DATE: 05-07-1992

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1025.17	0.00	0	0	0.00
1026.48	0.00	45	0	0.00
1027.14	0.00	89	0	0.00
1027.70	0.00	134	0	0.00
1028.17	0.00	178	0	0.00
1028.58	0.00	223	0	0.00
1028.96	0.00	268	0	0.00
1029.31	0.00	312	0	0.00
1029.66	0.00	357	0	0.00
1029.78	0.00	372	0	0.00
1030.36	0.00	446	0	0.00

RID Canal

05-29-1992 07:31:39 RID59 01-08-19

MINUMUM DISCHARGE (CFS) 0
DESIGN DISCHARGE (CFS) 100
MAXIMUM DISCHARGE (CFS) 220

C	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
U				BARRELS	SPAN	RISE	MANN.	INLET
L	INLET	OUTLET	CULVERT	SHAPE			N	TYPE
V	ELEV.	ELEV.	LENGTH	MATERIAL	(FT)	(FT)		
#	(FT)	(FT)	(FT)					
1	22.70	22.45	440.00	1 - RCB	12.00	10.00	.013	CONVENTIONAL
2								
3								
4								
5								
6								

CULVERT NUMBER: 1

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	22.70
OUTLET STATION (FT)	440.00
OUTLET ELEVATION (FT)	22.45
NUMBER OF BARRELS	1.00
SLOPE (V-FT/H-FT)	0.0006
CULVERT LENGTH ALONG SLOPE (FT)	440.00

BARREL SHAPE: 12.00 FT X 10.00 FT BOX
BARREL MATERIAL: CONCRETE
WITH A MANNING'S N OF 0.013
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: 1:1 BEVEL
INLET DEPRESSION: NONE

DOWNSTREAM CHANNEL CROSS-SECTION

BOTTOM WIDTH (FT)	8.00
SIDE SLOPE H/V _:1	1.0
CHANNEL SLOPE V/H (FT/FT)	0.000
MANNING'S N (.01-0.1)	0.025
CHANNEL INVERT ELEVATION (FT)	22.59

UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NO.	VEL. (FPS)	SHEAR (PSF)
0.00	22.59	0.000	0.00	0.00
22.00	24.61	0.000	1.09	0.03
44.00	25.59	0.000	1.33	0.04
66.00	26.34	0.000	1.50	0.05
88.00	26.98	0.000	1.62	0.05
100.00	27.30	0.000	1.67	0.06
132.00	28.04	0.000	1.80	0.07
154.00	28.50	0.000	1.87	0.07
176.00	28.92	0.000	1.94	0.08
198.00	29.32	0.000	2.00	0.08
220.00	29.69	0.000	2.05	0.09

SELECTED OVERTOPPING CREST

ROADWAY SURFACE: PAVED
EMBANKMENT TOP WIDTH (FT): 380.00

CONSTANT ROADWAY ELEVATION PROFILE
CREST LENGTH (FT) 100.00
OVERTOPPING CREST ELEVATION (FT) 34.20

SUMMARY OF CULVERT FLOWS (CFS) FILE: RID59 DATE: 01-08-1992

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
22.70	0	0	0	0	0	0	0	0	0
24.64	22	22	0	0	0	0	0	0	2
25.64	44	44	0	0	0	0	0	0	2
26.41	66	66	0	0	0	0	0	0	2
27.07	88	88	0	0	0	0	0	0	2
27.39	100	100	0	0	0	0	0	0	2
28.15	132	132	0	0	0	0	0	0	2
28.63	154	154	0	0	0	0	0	0	2
29.06	176	176	0	0	0	0	0	0	2
29.47	198	198	0	0	0	0	0	0	2
29.86	220	220	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	22.70	22.59	0.00	-0.11	-0.11	22.70	0.00	0.00
22	24.64	24.61	1.79	1.94	1.94	0.00	0.00	0.85
44	25.64	25.59	2.02	2.94	2.94	0.00	0.00	1.17
66	26.41	26.34	2.24	3.71	3.71	0.00	0.00	1.41
88	27.07	26.98	2.46	4.37	4.37	0.00	0.00	1.62
100	27.39	27.30	2.57	4.69	4.69	0.00	0.00	1.72
132	28.15	28.04	2.88	5.45	5.45	0.00	0.00	1.97
154	28.63	28.50	3.08	5.93	5.93	0.00	0.00	2.12
176	29.06	28.92	3.29	6.36	6.36	0.00	0.00	2.27
198	29.47	29.32	3.49	6.77	6.77	0.00	0.00	2.40
220	29.86	29.69	3.68	7.16	7.16	0.00	0.00	2.53

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: RID59 DATE: 01-08-1992

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
22.70	0.00	0	0	0.00
24.64	0.00	22	0	0.00
25.64	0.00	44	0	0.00
26.41	0.00	66	0	0.00
27.07	0.00	88	0	0.00
27.39	0.00	100	0	0.00
28.15	0.00	132	0	0.00
28.63	0.00	154	0	0.00
29.06	0.00	176	0	0.00
29.47	0.00	198	0	0.00
29.86	0.00	220	0	0.00

TECHNICAL MEMORANDUM NO. 4

WELL CONVERSION STUDY

CITY OF PHOENIX

23RD AVENUE/RID EXCHANGE PROJECT

Prepared for:

City of Phoenix
Water and Wastewater Department

Prepared by:

CH2M HILL, INC.
Phoenix, Arizona

February 1991

PHX26293.B4

RID Canal

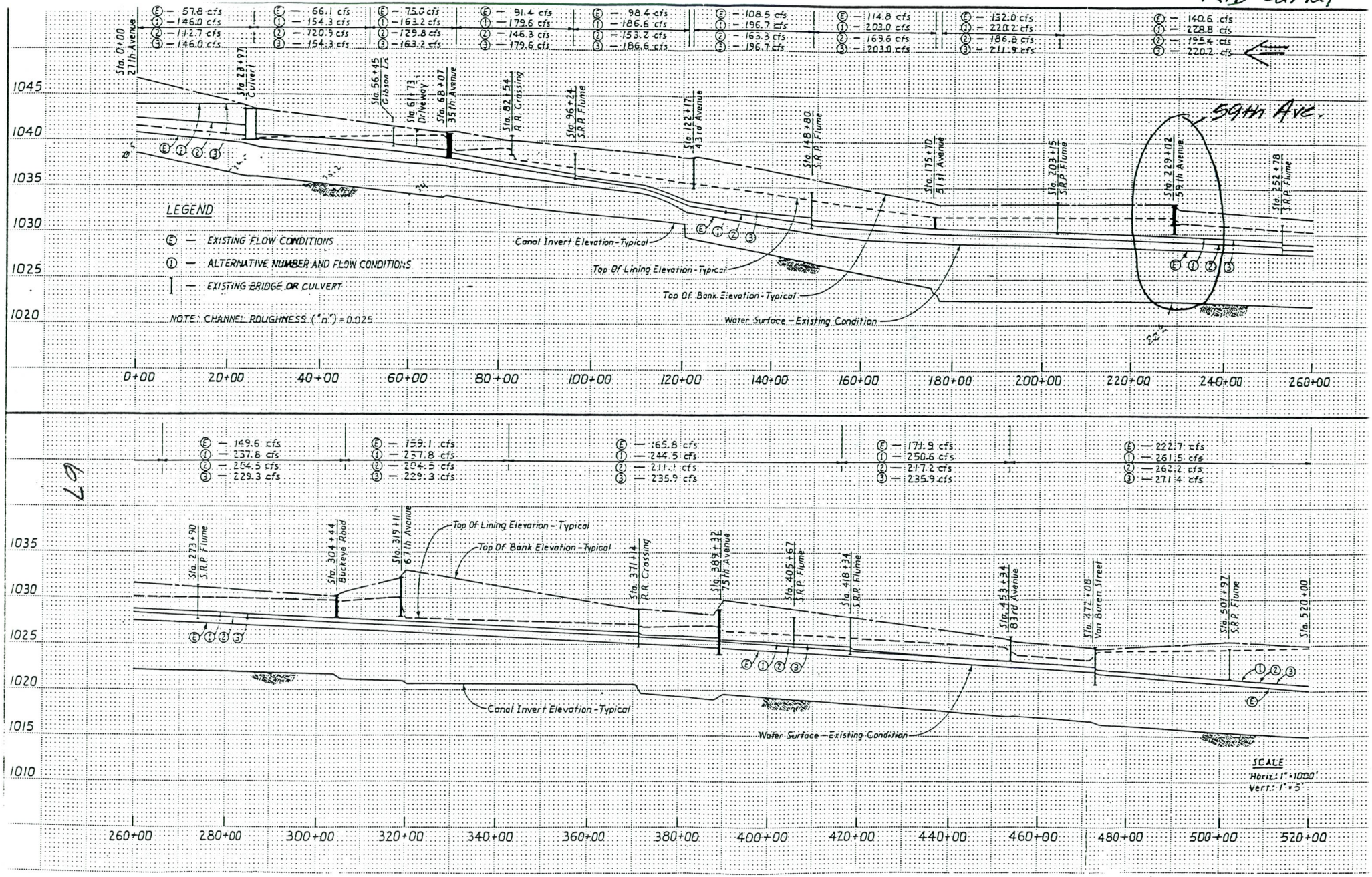


FIGURE 13

RID CC1 HYDRAULIC PROF

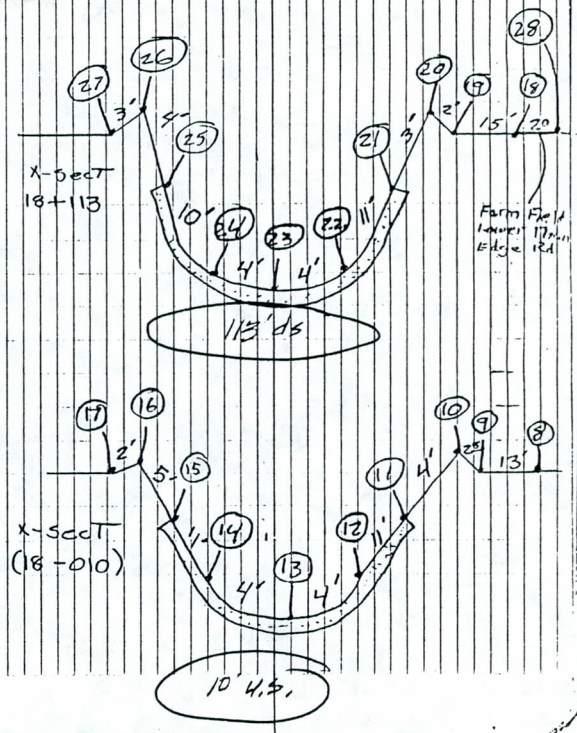
HILL

STA	+	HI	-	EL	Remarks
(8)			5 30	1033.57	Edge Rd
(9)			4 80	1034.07	Top DIRT
(10)			4 10	1034.77	Top DIRT
(11)			6 42	1032.45	Top CONC
(12)			15 60	1023.27	Top CONC
(13)			16 28	1022.59	℄ Ditch
(14)			15 62	1023.25	Top CONC
(15)			6 83	1032.04	Top CONC
(16)			3 60	1035.3	Top DIRT
(17)			4 40	1034.5	Top DIRT
(18)			5 80	1023.0	Edge RT
(19)			5 50	1033.4	Top DIRT
(20)			4 80	1034.1	Top DIRT
(21)			6 90	1031.97	Top CONC
(22)			15 57	1023.30	Top CONC
(23)			15 91	1022.96	℄ Ditch
(24)			15 51	1023.36	Top CONC
(25)			6 56	1032.01	Top CONC
(26)			4 90	1034.0	Top DIRT
(27)			5 70	1033.2	Top DIRT
(28)			7 30	1031.6	Farm Field

℄ 210' u.s.

STRUCT-18

RD Canal
59th Avenue



18

Sta	+	HI	-	EIEV	Remarks
Bm				1037.04	FIRC Top Jersey Barrier N-W Cor Barrier
	183				
(1)			4 56	1034.31	Top Pier
(2)			4 56	1034.31	" "
(3)			15 70	1023.17	℄ Ditch
(4)			5 93	1032.94	Top 42" Pipe
(5)			10 60	1028.27	High Water
(6)			4 66	1034.21	Top Pier
(7)			4 64	1034.23	" "

4W chord = 34.2' - 31
= 3.2

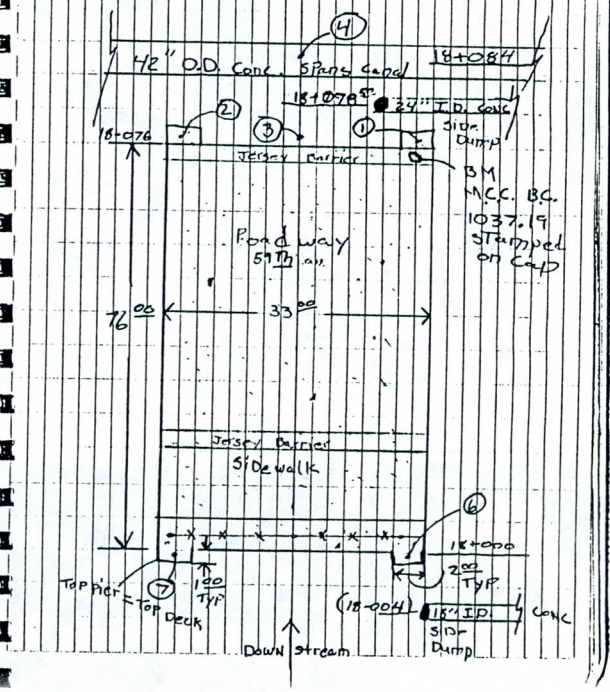
All circled notes are ETL's comments, not part of original survey.

68

2

STRUC-18

Deck 0.25 Thick with I-Beam support 2.35 Tall 10 Beams 7.25 on center with support ETrucks between each Beam, in the center of Bridge. First Beam ℄ @ 18+003.65 (STA on pipes to ℄) 3.10 Top Deck to Bottom Beam



MINUMUM DISCHARGE (CFS) 0
DESIGN DISCHARGE (CFS) 379
MAXIMUM DISCHARGE (CFS) 455

C	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
U								
L	INLET	OUTLET	CULVERT	BARRELS	SPAN	RISE	MANN.	INLET
V	ELEV.	ELEV.	LENGTH	SHAPE			N	TYPE
#	(FT)	(FT)	(FT)	MATERIAL	(FT)	(FT)		
1	1020.91	1020.57	170.00	3 - RCP	5.00	5.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

CULVERT NUMBER: 1
INLET STATION (FT) 0.00
INLET ELEVATION (FT) 1020.91
OUTLET STATION (FT) 170.00
OUTLET ELEVATION (FT) 1020.57
NUMBER OF BARRELS 3.00
SLOPE (V-FT/H-FT) 0.0020
CULVERT LENGTH ALONG SLOPE (FT) 170.00

BARREL SHAPE: CIRCULAR 5.00 FT IN DIAMETER
BARREL MATERIAL:
WITH A MANNING'S N OF 0.012
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: GROOVED END IN HEADWALL
INLET DEPRESSION: NONE

DOWNSTREAM CHANNEL CROSS-SECTION
BOTTOM WIDTH (FT) 8.00
SIDE SLOPE H/V _:1 2.0
CHANNEL SLOPE V/H (FT/FT) 0.002
MANNING'S N (.01-0.1) 0.018
CHANNEL INVERT ELEVATION (FT) 1020.57

UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NO.	VEL. (FPS)	SHEAR (PSF)
0.00	1020.57	0.000	0.16	94.40
45.50	1021.79	0.000	3.56	0.15
91.00	1022.36	0.000	4.39	0.22
136.50	1022.79	0.000	4.93	0.28
182.00	1023.16	0.000	5.34	0.32
227.50	1023.47	0.000	5.68	0.36
273.00	1023.75	0.000	5.97	0.40
318.50	1024.01	0.000	6.22	0.43
364.00	1024.25	0.000	6.45	0.46
379.00	1024.32	0.000	6.52	0.47
455.00	1024.67	0.000	6.84	0.51

SELECTED OVERTOPPING CREST

ROADWAY SURFACE: PAVED
EMBANKMENT TOP WIDTH (FT): 140.00
CONSTANT ROADWAY ELEVATION PROFILE
CREST LENGTH (FT) 100.00
OVERTOPPING CREST ELEVATION (FT) 1031.00

SUMMARY OF CULVERT FLOWS (CFS) FILE: 59AVE DATE: 05-07-1992

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1020.91	0	0	0	0	0	0	0	0	0
1022.42	46	46	0	0	0	0	0	0	2
1023.10	91	91	0	0	0	0	0	0	2
1023.64	137	137	0	0	0	0	0	0	2
1024.12	182	182	0	0	0	0	0	0	2
1024.56	228	228	0	0	0	0	0	0	2
1024.98	273	273	0	0	0	0	0	0	2
1025.33	319	319	0	0	0	0	0	0	2
1025.69	364	364	0	0	0	0	0	0	2
1025.84	379	379	0	0	0	0	0	0	2
1026.46	455	455	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 3 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	1020.91	1020.57	0.00	-0.34	-0.34	1020.91	0.00	0.00
46	1022.42	1021.79	1.37	1.51	1.51	0.00	0.00	4.04
91	1023.10	1022.36	2.04	2.19	2.19	0.00	0.00	4.79
137	1023.64	1022.79	2.60	2.73	2.73	0.00	0.00	5.39
182	1024.12	1023.16	3.08	3.21	3.21	0.00	0.00	5.92
228	1024.56	1023.47	3.50	3.65	3.65	0.00	0.00	6.42
273	1024.98	1023.75	3.88	4.07	4.07	0.00	0.00	6.91
319	1025.33	1024.01	4.23	4.42	4.42	0.00	0.00	7.38
364	1025.69	1024.25	4.59	4.78	4.78	0.00	0.00	7.86
379	1025.84	1024.32	4.70	4.93	4.93	0.00	0.00	8.01
455	1026.47	1024.67	5.31	5.56	5.56	0.00	0.00	8.82

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: 59AVE DATE: 05-07-1992

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1020.91	0.00	0	0	0.00
1022.42	0.00	46	0	0.00
1023.10	0.00	91	0	0.00
1023.64	0.00	137	0	0.00
1024.12	0.00	182	0	0.00
1024.56	0.00	228	0	0.00
1024.98	0.00	273	0	0.00
1025.33	0.00	319	0	0.00
1025.69	0.00	364	0	0.00
1025.84	0.00	379	0	0.00
1026.46	0.00	455	0	0.00

MINUMUM DISCHARGE (CFS) 0
DESIGN DISCHARGE (CFS) 391
MAXIMUM DISCHARGE (CFS) 469

C	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
U								
L	INLET	OUTLET	CULVERT	BARRELS	SPAN	RISE	MANN.	INLET
V	ELEV.	ELEV.	LENGTH	SHAPE			N	TYPE
#	(FT)	(FT)	(FT)	MATERIAL	(FT)	(FT)		
1	1013.70	1013.20	75.00	1 - RCB	8.00	6.00	.013	CONVENTIONAL
2								
3								
4								
5								
6								

CULVERT NUMBER: 1
INLET STATION (FT) 0.00
INLET ELEVATION (FT) 1013.70
OUTLET STATION (FT) 75.00
OUTLET ELEVATION (FT) 1013.20
NUMBER OF BARRELS 1.00
SLOPE (V-FT/H-FT) 0.0067
CULVERT LENGTH ALONG SLOPE (FT) 75.00

BARREL SHAPE: 8.00 FT X 6.00 FT BOX
BARREL MATERIAL: CONCRETE
WITH A MANNING'S N OF 0.013
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: 1.5:1 BEVEL (90 DEG.)
INLET DEPRESSION: NONE

DOWNSTREAM CHANNEL CROSS-SECTION
BOTTOM WIDTH (FT) 10.00
SIDE SLOPE H/V _:1 2.0
CHANNEL SLOPE V/H (FT/FT) 0.002
MANNING'S N (.01-0.1) 0.018
CHANNEL INVERT ELEVATION (FT) 1013.20

UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NO.	VEL. (FPS)	SHEAR (PSF)
0.00	1013.20	0.000	0.00	0.00
46.90	1014.31	0.000	3.46	0.14
93.80	1014.84	0.000	4.30	0.20
140.70	1015.25	0.000	4.86	0.26
187.60	1015.60	0.000	5.29	0.30
234.50	1015.90	0.000	5.63	0.34
281.40	1016.17	0.000	5.93	0.37
328.30	1016.42	0.000	6.19	0.40
375.20	1016.65	0.000	6.42	0.43
391.00	1016.73	0.000	6.50	0.44
469.00	1017.07	0.000	6.83	0.48

SELECTED OVERTOPPING CREST

ROADWAY SURFACE: PAVED
EMBANKMENT TOP WIDTH (FT): 150.00
CONSTANT ROADWAY ELEVATION PROFILE
CREST LENGTH (FT) 100.00
OVERTOPPING CREST ELEVATION (FT) 1024.00

SUMMARY OF CULVERT FLOWS (CFS) FILE: LBUCKEYE DATE: 05-07-1992

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1013.70	0	0	0	0	0	0	0	0	0
1015.28	47	47	0	0	0	0	0	0	2
1016.16	94	94	0	0	0	0	0	0	2
1016.95	141	141	0	0	0	0	0	0	2
1017.65	188	188	0	0	0	0	0	0	2
1018.28	235	235	0	0	0	0	0	0	2
1018.88	281	281	0	0	0	0	0	0	2
1019.44	328	328	0	0	0	0	0	0	2
1019.99	375	375	0	0	0	0	0	0	2
1020.17	391	391	0	0	0	0	0	0	2
1021.08	469	469	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	1013.70	1013.20	0.00	-0.50	-0.50	1013.70	0.00	0.00
47	1015.28	1014.31	1.58	1.14	1.14	0.00	0.00	5.28
94	1016.16	1014.84	2.46	2.09	2.09	0.00	0.00	7.14
141	1016.95	1015.25	3.25	2.90	2.90	0.00	0.00	8.57
188	1017.65	1015.60	3.95	3.62	3.62	0.00	0.00	9.78
235	1018.28	1015.90	4.58	4.28	4.28	0.00	0.00	10.85
281	1018.88	1016.17	5.18	4.90	4.90	0.00	0.00	11.83
328	1019.44	1016.42	5.74	5.48	5.48	0.00	0.00	12.65
375	1019.99	1016.65	6.29	6.04	6.04	0.00	0.00	13.11
391	1020.17	1016.73	6.47	6.22	6.22	0.00	0.00	13.25
469	1021.08	1017.07	7.38	7.09	7.09	0.00	0.00	13.92

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: LBUCKEYE DATE: 05-07-1992

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1013.70	0.00	0	0	0.00
1015.28	0.00	47	0	0.00
1016.16	0.00	94	0	0.00
1016.95	0.00	141	0	0.00
1017.65	0.00	188	0	0.00
1018.28	0.00	235	0	0.00
1018.88	0.00	281	0	0.00
1019.44	0.00	328	0	0.00
1019.99	0.00	375	0	0.00
1020.17	0.00	391	0	0.00
1021.08	0.00	469	0	0.00

MINUMUM DISCHARGE (CFS) 0
DESIGN DISCHARGE (CFS) 571
MAXIMUM DISCHARGE (CFS) 685

C	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
U								
L	INLET	OUTLET	CULVERT	BARRELS	SPAN	RISE	MANN.	INLET
V	ELEV.	ELEV.	LENGTH	SHAPE			N	TYPE
#	(FT)	(FT)	(FT)	MATERIAL	(FT)	(FT)		
1	1001.46	1000.76	135.00	4 - RCP	5.00	5.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

CULVERT NUMBER: 1
INLET STATION (FT) 0.00
INLET ELEVATION (FT) 1001.46
OUTLET STATION (FT) 135.00
OUTLET ELEVATION (FT) 1000.76
NUMBER OF BARRELS 4.00
SLOPE (V-FT/H-FT) 0.0052
CULVERT LENGTH ALONG SLOPE (FT) 135.00

BARREL SHAPE: CIRCULAR 5.00 FT IN DIAMETER
BARREL MATERIAL:
WITH A MANNING'S N OF 0.012
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: GROOVED END IN HEADWALL
INLET DEPRESSION: NONE

DOWNSTREAM CHANNEL CROSS-SECTION
BOTTOM WIDTH (FT) 10.00
SIDE SLOPE H/V _:1 2.0
CHANNEL SLOPE V/H (FT/FT) 0.003
MANNING'S N (.01-0.1) 0.018
CHANNEL INVERT ELEVATION (FT) 1000.76

UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NO.	VEL. (FPS)	SHEAR (PSF)
0.00	1000.76	0.000	0.21	%128.80
68.50	1002.02	0.000	4.32	0.21
137.00	1002.62	0.000	5.36	0.31
205.50	1003.08	0.000	6.04	0.39
274.00	1003.47	0.000	6.56	0.46
342.50	1003.81	0.000	6.98	0.51
411.00	1004.11	0.000	7.34	0.56
479.50	1004.39	0.000	7.66	0.61
548.00	1004.64	0.000	7.95	0.65
571.00	1004.72	0.000	8.03	0.67
685.00	1005.10	0.000	8.44	0.73

SELECTED OVERTOPPING CREST

ROADWAY SURFACE: PAVED
EMBANKMENT TOP WIDTH (FT): 100.00
CONSTANT ROADWAY ELEVATION PROFILE
CREST LENGTH (FT) 100.00
OVERTOPPING CREST ELEVATION (FT) 1010.00

SUMMARY OF CULVERT FLOWS (CFS) FILE: BROADWAY DATE: 05-01-1992

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1001.46	0	0	0	0	0	0	0	0	0
1002.92	69	69	0	0	0	0	0	0	2
1003.65	137	137	0	0	0	0	0	0	2
1004.24	206	206	0	0	0	0	0	0	2
1004.75	274	274	0	0	0	0	0	0	2
1005.20	343	343	0	0	0	0	0	0	2
1005.61	411	411	0	0	0	0	0	0	2
1006.00	480	480	0	0	0	0	0	0	2
1006.41	548	548	0	0	0	0	0	0	2
1006.54	571	571	0	0	0	0	0	0	2
1007.27	685	685	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 4 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	1001.46	1000.76	0.00	-0.70	-0.70	1001.46	0.00	0.00
69	1002.92	1002.02	1.46	0.93	0.93	0.00	0.00	4.35
137	1003.65	1002.62	2.19	1.69	1.69	0.00	0.00	5.12
206	1004.24	1003.08	2.78	2.29	2.29	0.00	0.00	5.74
274	1004.75	1003.47	3.29	2.83	2.83	0.00	0.00	6.31
343	1005.20	1003.81	3.74	3.33	3.33	0.00	0.00	6.83
411	1005.61	1004.11	4.15	3.80	3.80	0.00	0.00	7.36
480	1006.00	1004.39	4.54	4.19	4.19	0.00	0.00	7.87
548	1006.41	1004.64	4.95	4.63	4.63	0.00	0.00	8.39
571	1006.54	1004.72	5.08	4.77	4.77	0.00	0.00	8.56
685	1007.27	1005.10	5.81	5.74	5.74	0.00	0.00	9.48

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: BROADWAY DATE: 05-01-1992

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1001.46	0.00	0	0	0.00
1002.92	0.00	69	0	0.00
1003.65	0.00	137	0	0.00
1004.24	0.00	206	0	0.00
1004.75	0.00	274	0	0.00
1005.20	0.00	343	0	0.00
1005.61	0.00	411	0	0.00
1006.00	0.00	480	0	0.00
1006.41	0.00	548	0	0.00
1006.54	0.00	571	0	0.00
1007.27	0.00	685	0	0.00

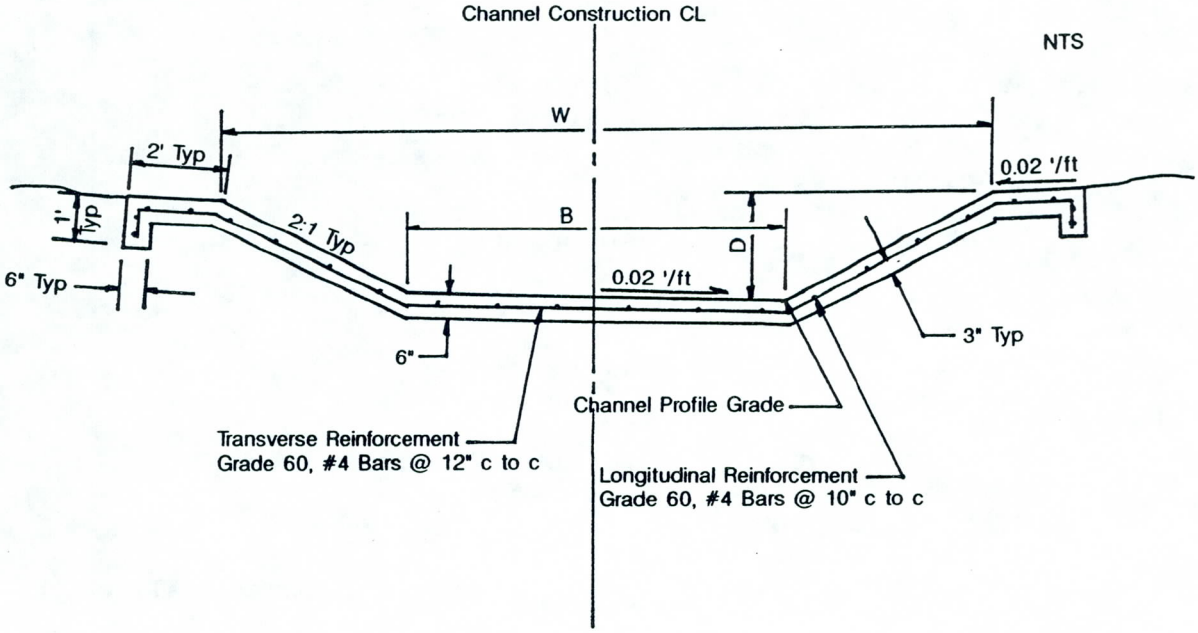
SEGMENT I
CHANNEL DESIGN SHEETS

Job No. | No.

Computation

HDR

Project SOUTH MOUNTAIN FREEWAY	Computed EL	Date 6-1-92
Subject CHANNEL CONSTRUCTION DETAIL (SUGGESTED)	Checked	Date
Task	Sheet	Of



NOTES :

1. Concrete fc=3000 psi.
2. Channel Lining Shall be Cast-in-Place Concrete with Reinforcing as Shown.
3. Reinforcing Shall be Continuous.

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: LATHAM

Comment: LATHAM ST. TO ROOSEVELT ST. (ROCK)

Solve For Depth

Given Input Data:

Bottom Width.....	4.00 ft
Left Side Slope..	3.00:1 (H:V)
Right Side Slope.	3.00:1 (H:V)
Manning's n.....	0.030
Channel Slope....	0.0060 ft/ft
Discharge.....	60.00 cfs

Computed Results:

Depth.....	1.68 ft
Velocity.....	3.94 fps
Flow Area.....	15.23 sf
Flow Top Width...	14.10 ft
Wetted Perimeter.	14.65 ft
Critical Depth...	1.37 ft
Critical Slope...	0.0142 ft/ft
Froude Number....	0.67 (flow is Subcritical)

Open Channel Flow Module, Version 3.16 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: ROOSEVELT

Comment: ROOSEVELT ST. TO VAN BUREN

Solve For Depth

Given Input Data:

Bottom Width.....	4.00 ft
Left Side Slope..	3.00:1 (H:V)
Right Side Slope.	3.00:1 (H:V)
Manning's n.....	0.030
Channel Slope....	0.0033 ft/ft
Discharge.....	60.00 cfs

Computed Results:

Depth.....	1.94 ft
Velocity.....	3.16 fps
Flow Area.....	19.00 sf
Flow Top Width...	15.62 ft
Wetted Perimeter.	16.25 ft
Critical Depth...	1.37 ft
Critical Slope...	0.0142 ft/ft
Froude Number....	0.50 (flow is Subcritical)

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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: VANBUREN

Comment: STA. 145+00 TO SPRR

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0030 ft/ft
Discharge.....	386.00 cfs

Computed Results:

Depth.....	3.42 ft
Velocity.....	7.60 fps
Flow Area.....	50.78 sf
Flow Top Width...	21.69 ft
Wetted Perimeter.	23.30 ft
Critical Depth...	3.19 ft
Critical Slope...	0.0040 ft/ft
Froude Number....	0.88 (flow is Subcritical)

Open Channel Flow Module, Version 3.16 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: SPRR

Comment: SPRR TO BUCKEYE ROAD

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0023 ft/ft
Discharge.....	386.00 cfs

Computed Results:

Depth.....	3.66 ft
Velocity.....	6.90 fps
Flow Area.....	55.97 sf
Flow Top Width...	22.62 ft
Wetted Perimeter.	24.35 ft
Critical Depth...	3.19 ft
Critical Slope...	0.0040 ft/ft
Froude Number....	0.77 (flow is Subcritical)

Open Channel Flow Module, Version 3.16 (c) 1990
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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: BUCKEYE

Comment: BUCKEYE TO RID CANAL

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0020 ft/ft
Discharge.....	386.00 cfs

Computed Results:

Depth.....	3.78 ft
Velocity.....	6.55 fps
Flow Area.....	58.92 sf
Flow Top Width...	23.14 ft
Wetted Perimeter.	24.92 ft
Critical Depth...	3.19 ft
Critical Slope...	0.0040 ft/ft
Froude Number....	0.72 (flow is Subcritical)

Open Channel Flow Module, Version 3.16 (c) 1990
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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: CANAL

Comment: RID CANAL TO 59TH AVENUE

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0020 ft/ft
Discharge.....	379.00 cfs

Computed Results:

Depth.....	3.75 ft
Velocity.....	6.52 fps
Flow Area.....	58.13 sf
Flow Top Width...	23.00 ft
Wetted Perimeter.	24.77 ft
Critical Depth...	3.15 ft
Critical Slope...	0.0040 ft/ft
Froude Number....	0.72 (flow is Subcritical)

Open Channel Flow Module, Version 3.16 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: 59AVENUE

Comment: STA 231+00 TO LOWER BUCKEYE

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0025 ft/ft
Discharge.....	391.00 cfs

Computed Results:

Depth.....	3.60 ft
Velocity.....	7.13 fps
Flow Area.....	54.80 sf
Flow Top Width...	22.41 ft
Wetted Perimeter.	24.12 ft
Critical Depth...	3.21 ft
Critical Slope...	0.0040 ft/ft
Froude Number....	0.80 (flow is Subcritical)

Open Channel Flow Module, Version 3.16 (c) 1990
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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: LBUCKEYE

Comment: LOWER BUCKEYE ROAD TO 266+00

Solve For Depth

Given Input Data:

Bottom Width.....	10.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0020 ft/ft
Discharge.....	391.00 cfs

Computed Results:

Depth.....	3.53 ft
Velocity.....	6.50 fps
Flow Area.....	60.18 sf
Flow Top Width...	24.11 ft
Wetted Perimeter.	25.78 ft
Critical Depth...	2.95 ft
Critical Slope...	0.0040 ft/ft
Froude Number....	0.72 (flow is Subcritical)

Open Channel Flow Module, Version 3.16 (c) 1990
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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: HALF19

Comment: 1/2 SECT LINE OF SECT 19 TO BROADWAY ROAD

Solve For Depth

Given Input Data:

Bottom Width.....	10.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0020 ft/ft
Discharge.....	438.00 cfs

Computed Results:

Depth.....	3.74 ft
Velocity.....	6.70 fps
Flow Area.....	65.35 sf
Flow Top Width...	24.96 ft
Wetted Perimeter.	26.72 ft
Critical Depth...	3.15 ft
Critical Slope...	0.0039 ft/ft
Froude Number....	0.73 (flow is Subcritical)

Open Channel Flow Module, Version 3.16 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: BROADWAY

Comment: BROADWAY SOUTH TO SALT RIVER

Solve For Depth

Given Input Data:

Bottom Width.....	10.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0027 ft/ft
Discharge.....	571.00 cfs

Computed Results:

Depth.....	3.96 ft
Velocity.....	8.03 fps
Flow Area.....	71.07 sf
Flow Top Width...	25.86 ft
Wetted Perimeter.	27.73 ft
Critical Depth...	3.64 ft
Critical Slope...	0.0038 ft/ft
Froude Number....	0.85 (flow is Subcritical)

Open Channel Flow Module, Version 3.16 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

SOUTH MOUNTAIN FREEWAY
SEGMENT II
TECHNICAL APPENDIX

SEGMENT II
PRECIPITATION CALCULATIONS

HDR

Project: Price Rd. Ph. II hydrology		Computed: EL	Date: 3/12/91
Subject: hydrology		Checked	Date
Task: Rainfall depths (For Segments II & III)		Sht.	Of

2yr-1hr precip., $4_2 = -0.011 + 0.942\left(1.20^2/1.55\right)$
$= 0.86''$

100yr-1hr precip., $4_{100} = 0.494 + 0.755\left(3.45^2/4.05\right)$
$= 2.71''$

Need 50 yr & 100 yr.	50	100	(Rick's 100)
for 5 min	0.69	0.79	(.77)
15 min	1.35	1.55	(1.52)
60 min	2.37	2.72	(2.46) ✓ Reasonably close check
2 hr.	2.60	2.97	(2.82)
3 hr.	2.76	3.14	(2.97)
6 hr.	3.05	3.45	(3.35)
12 hr.	3.32	3.74	(3.69)
24 hr.	3.60 (USC)	4.05 (USC)	(4.04)

50 yr.-2 hr. = 0.341 (3.05) + .659 (2.37) = 2.60"
50 yr.-3 hr = 0.569 (3.05) + .431 (2.37) = 2.76"
100 yr-2 hr = 0.341 (3.45) + .659 (2.72) = 2.97"
100 yr-3 hr = 0.569 (3.45) + .431 (2.72) = 3.14"
50 yr-12 hr = 3.60 − .51 (3.60 − 3.05) = 3.32"
100 yr-12 hr = 4.05 − .51 (4.05 − 3.45) = 3.74"
50 yr-5 min = .29 (2.37) = 0.69"
-15 min = .57 (2.37) = 1.35"
100 yr-5 min = .29 (2.72) = 0.79"
.57 (2.72) = 1.55"

ADDENDUM to "HYDROLOGIC DESIGN FOR HIGHWAY DRAINAGE IN ARIZONA" April 1975

Steps to be used to determine precipitation values for various durations and return periods.

STEP 1. From the precipitation maps in the manual "Hydrologic Design for Highway Drainage in Arizona", determine the precipitation values for the 6 and 24 hour duration storms for return periods of 2, 5, 10, 25, 50 and 100 years. Tabulate these values in Table 1 in the column headed 'Map Values'

TABLE 1

Price Rd. Pln II

Return Period (Years)	Precipitation Values (inches)			
	6 hour duration		24 hour duration	
	Map Value	Corrected Value	Map Value	Corrected Value
2	1.2	1.20	1.5	1.55
5	1.7	1.75	2.1	2.15
10	2.1	2.10	2.6	2.55
25	2.6	2.60	3.2	3.10
50	3.0	3.05	3.6	3.60
100	3.4	3.45	4.0	4.05

NOTE: There is a possibility of making an error while reading the maps because, (1) a site is not easy to locate precisely on a series of 12 maps, (2) there may be some slight registration differences in printing, and (3) precise interpolation between isolines is difficult. In order to minimize any errors in reading the maps, these values should be plotted on the diagram "Precipitation Depth versus Return Period" Fig. 1.

Project No. Price Rd PH II Station _____

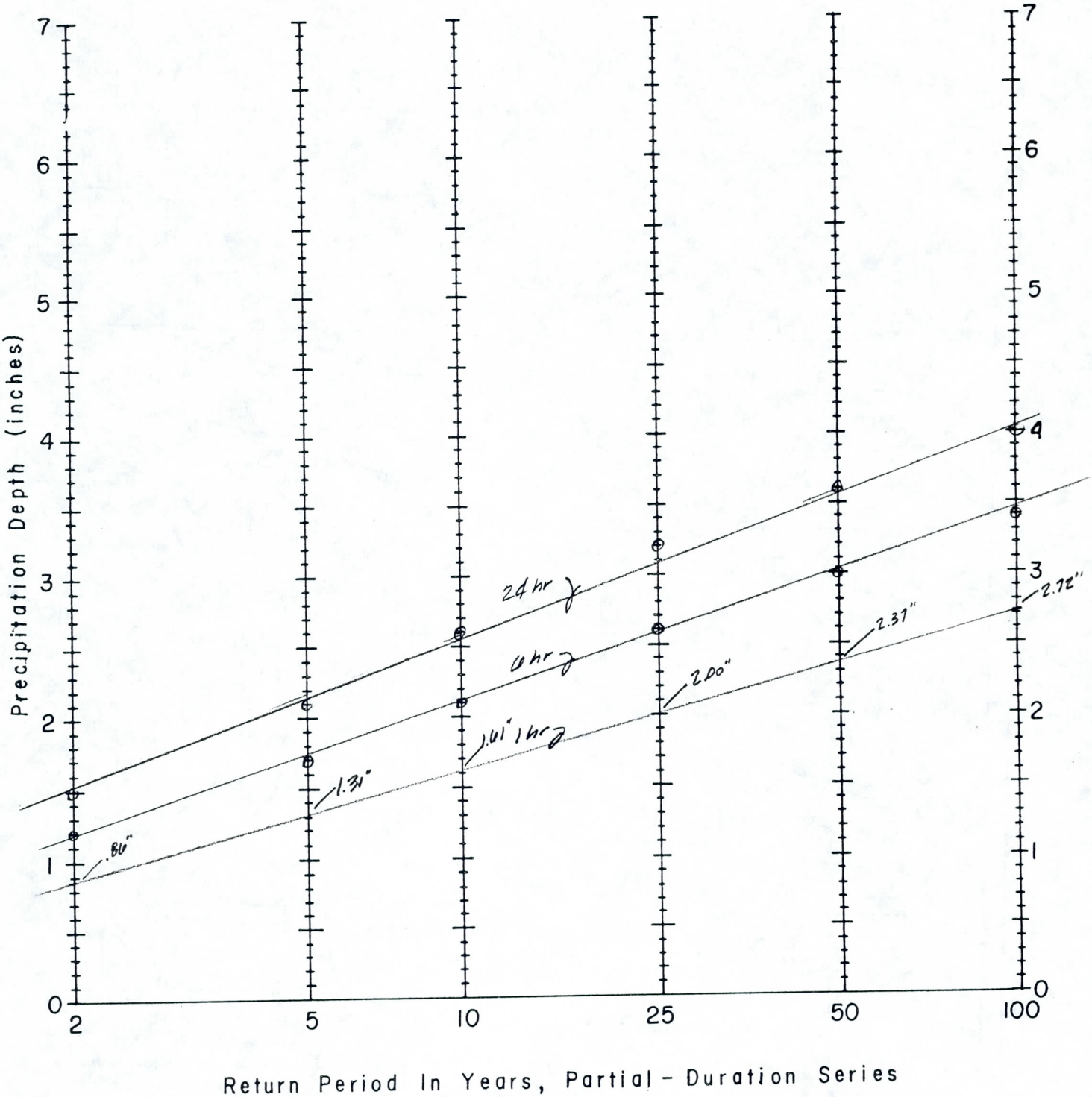
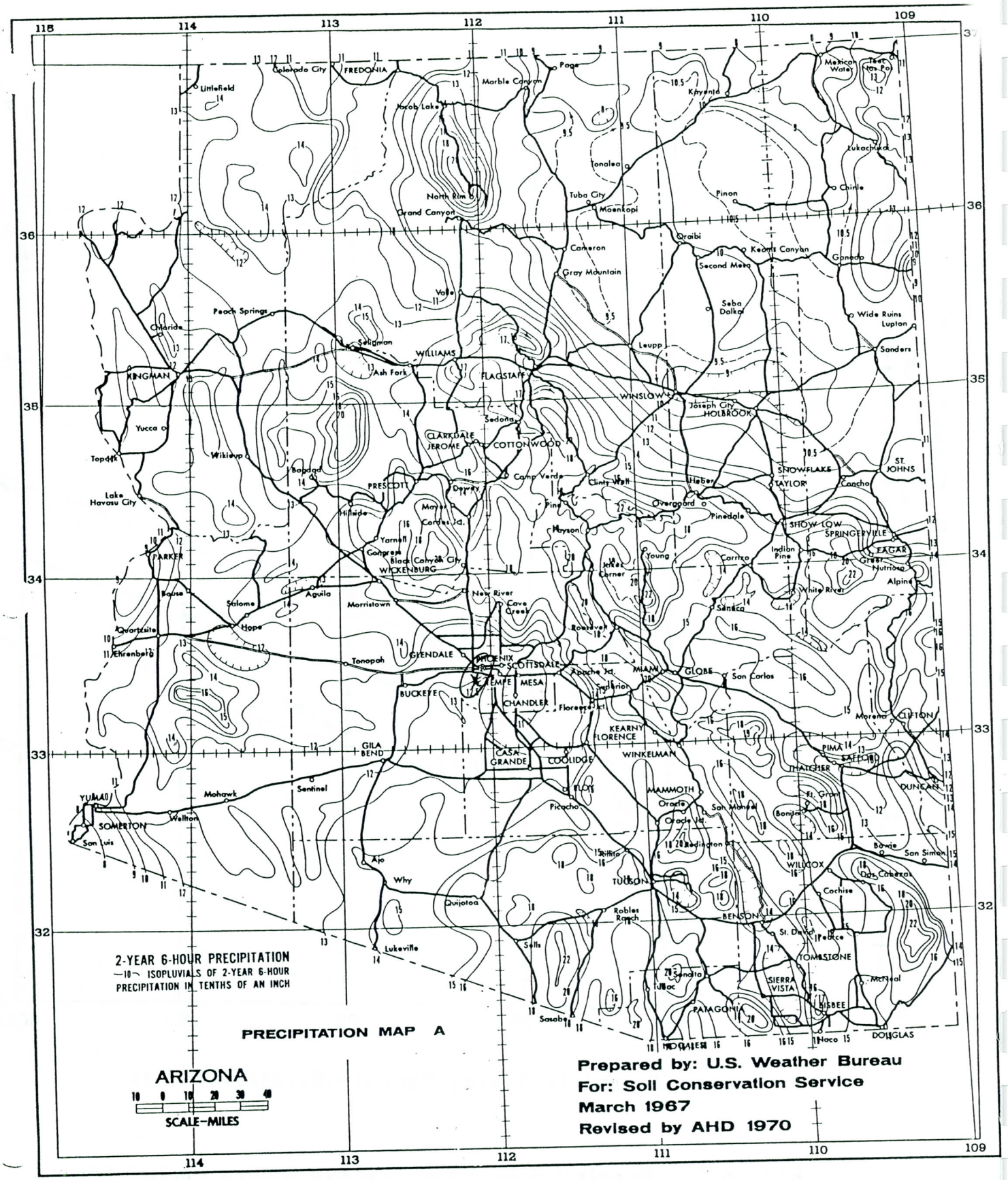
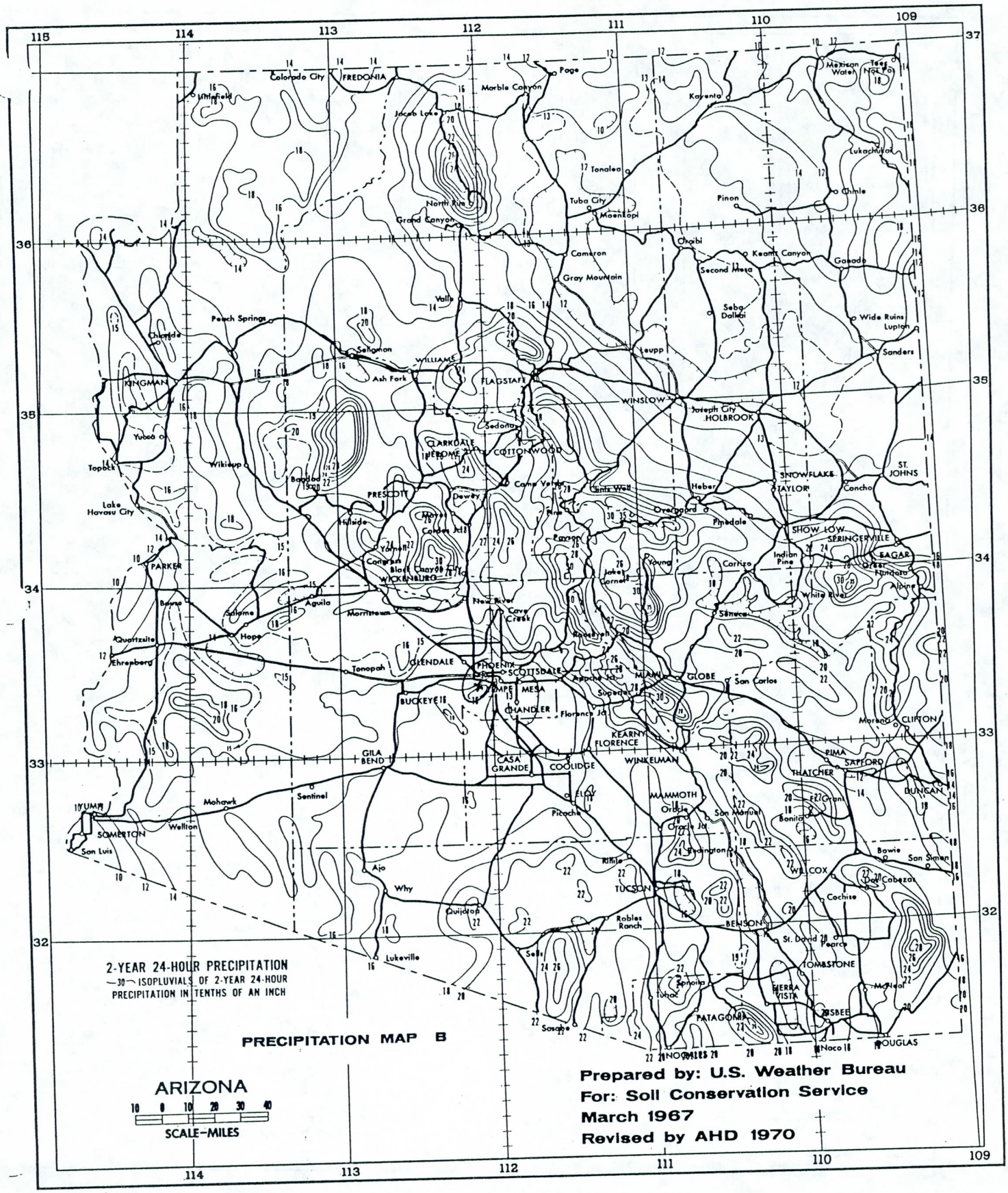
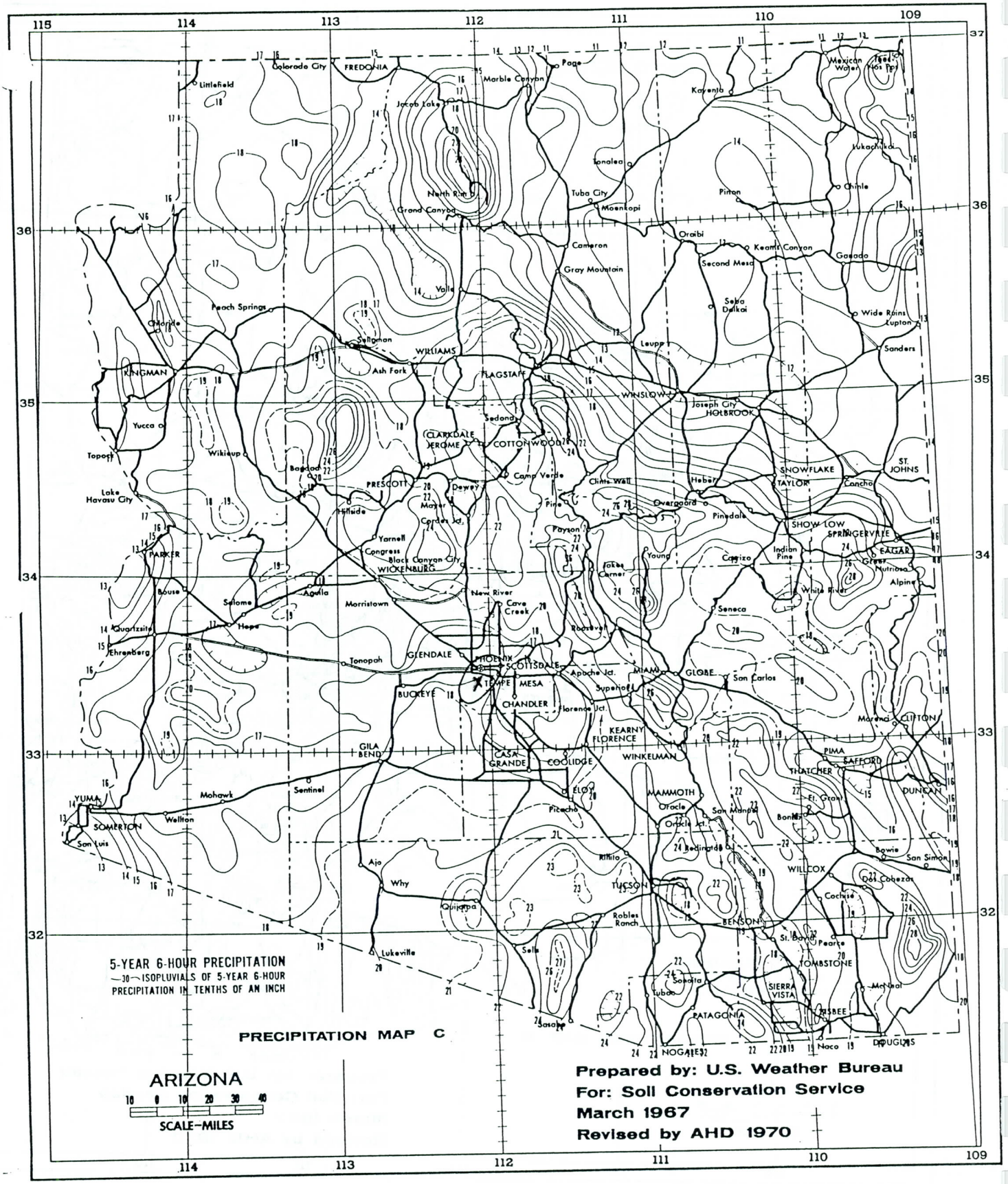


Figure 1 Precipitation Depth Versus Return Period for Partial – Duration Series


2-YEAR 6-HOUR PRECIPITATION
—10— ISOPLUVIALS OF 2-YEAR 6-HOUR PRECIPITATION IN TENTHS OF AN INCH
PRECIPITATION MAP A
ARIZONA
SCALE-MILES
Prepared by: U.S. Weather Bureau
For: Soil Conservation Service
March 1967
Revised by AHD 1970


2-YEAR 24-HOUR PRECIPITATION
—30— ISOPLUVIALS OF 2-YEAR 24-HOUR PRECIPITATION IN TENTHS OF AN INCH
PRECIPITATION MAP B
ARIZONA
10 0 10 20 30 40
SCALE-MILES
Prepared by: U.S. Weather Bureau
For: Soil Conservation Service
March 1967
Revised by AHD 1970
Colorado City
FREDONIA
Page
Marble Canyon
Kayenta
Tonalea
Tuba City
Moenkopi
Pinon
Chinle
Grand Canyon
Cameron
Gray Mountain
Second Mesa
Keams Canyon
Ganado
Wide Ruins
Leupp
Sanders
Peach Springs
Seligman
WILLIAMS
Ash Fork
FLAGSTAFF
WINSLOW
Joseph City
HOLBROOK
KINGMAN
Yucca
Topock
Wikieup
Sedona
JEROME
COTTONWOOD
Camp Verde
Santa Wolf
Heber
SNOWFLAKE
TAYLOR
ST. JOHNS
Concho
Lake Havasu City
PRESCOTT
Dewey
Stillside
Overgaard
Pinedale
SHOW LOW
SPRINGERVILLE
EAGAR
PARKER
Parker
Young
Carrizo
Indian Pine
Alpine
White River
Seneca
Aguila
Morristown
New River
Cave Creek
Quartzsite
Hope
Ehrenberg
Tonopah
GLENDALE
PHOENIX
SCOTTSDALE
MIAMI
GLOBE
San Carlos
BUCKEYE
MESA
CHANDLER
Florence Jct
Morenci
CLIFTON
KEARNY
FLORENCE
GILA BEND
CASA GRANDE
COOLIDGE
WINKELMAN
PIMA
SAFFORD
THATCHER
BUNSAN
YUMA
Mohawk
Sentinel
Pitaches
MAMMOTH
Oracle
San Manuel
Bonita
SOMERTON
San Luis
Wellton
Ajo
Why
Quijotoa
Ruthie
TUCSON
Bowie
San Simon
WILCOX
Cochise
Dos Cabezas
Robles Ranch
BENSON
St. David
Pearce
Lukeville
Sells
Tucson
TOMBSTONE
SIERRA VISTA
McNeal
PATAGONIA
NOGALES
Naco
DOUGLAS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Littlefield
Colorado City
FREDONIA
Page
Marble Canyon
Jacob Lake
Kayenta
Mexican Water
Tees-Nos-Pos
Tonalea
Tuba City
Moenkopi
North Rim
Grand Canyon
Pinon
Chinle
Lukachukai
Cameron
Oraibi
Keams Canyon
Second Mesa
Gray Mountain
Gasado
Valle
Peach Springs
Seba Dalkai
Wide Ruins
Supai
Sanders
Seligman
WILLIAMS
Ash Fork
FLAGSTAFF
Leupp
KINGMAN
WINSLOW
Joseph City
HOLBROOK
Yucca
Sedona
CLARKDALE
JEROME
COTTONWOOD
Topock
Wikieup
Camp Verde
Clints Well
Heber
SNOWFLAKE
TAYLOR
ST. JOHNS
Concho
Lake Havasu City
PRESCOTT
Dewey
Mayer
Pine
Overgaard
Pinedale
Hillside
Yarnell
Congress
Black Canyon City
WICKENBURG
Payson
SHOW LOW
SPRINGERVILLE
EAGAR
PARKER
Young
Canyon
Indian Pine
Greer
Nutrioso
Alpine
Bouse
Salome
Aguila
Morristown
New River
Cave Creek
Lakes Corner
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Seneca
Quartzsite
Hope
Roosevelt
Ehrenberg
Tonopah
GLENDALE
PHOENIX
SCOTTSDALE
Apache Jct.
MIAMI
GLOBE
San Carlos
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CHANDLER
Florence Jct.
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Oracle
Oracle Jct.
San Manuel
Ft. Grant
DUNCAN
SOMERTON
Wellton
Picacho
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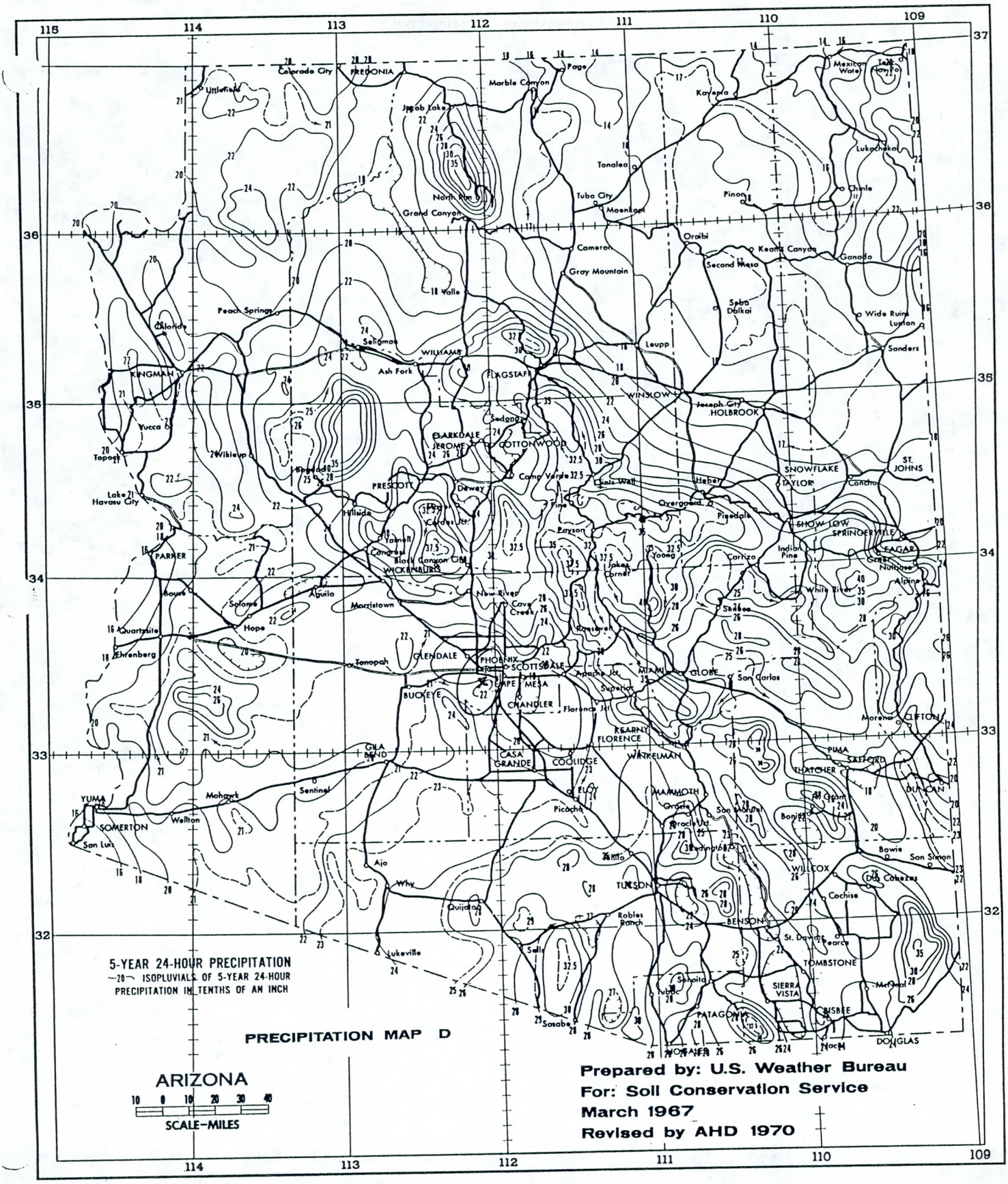
Cochise
Dos Cabezas
Quijotoa
Robles Ranch
BENSON
St. David
Pearce
Lukeville
Sells
TOMBSTONE
Sonoita
SIERRA VISTA
McNeal
Tubac
PATAGONIA
ISBEE
Sasabe
NOGALES
Naco
DOUGLAS
5-YEAR 6-HOUR PRECIPITATION
—30— ISOPLUVIALS OF 5-YEAR 6-HOUR PRECIPITATION IN TENTHS OF AN INCH
PRECIPITATION MAP C
ARIZONA
10 0 10 20 30 40
SCALE—MILES
Prepared by: U.S. Weather Bureau
For: Soil Conservation Service
March 1967
Revised by AHD 1970


5-YEAR 24-HOUR PRECIPITATION
—20— ISOPLUVIALS OF 5-YEAR 24-HOUR PRECIPITATION IN TENTHS OF AN INCH
PRECIPITATION MAP D
ARIZONA
10 0 10 20 30 40
SCALE-MILES
Prepared by: U.S. Weather Bureau
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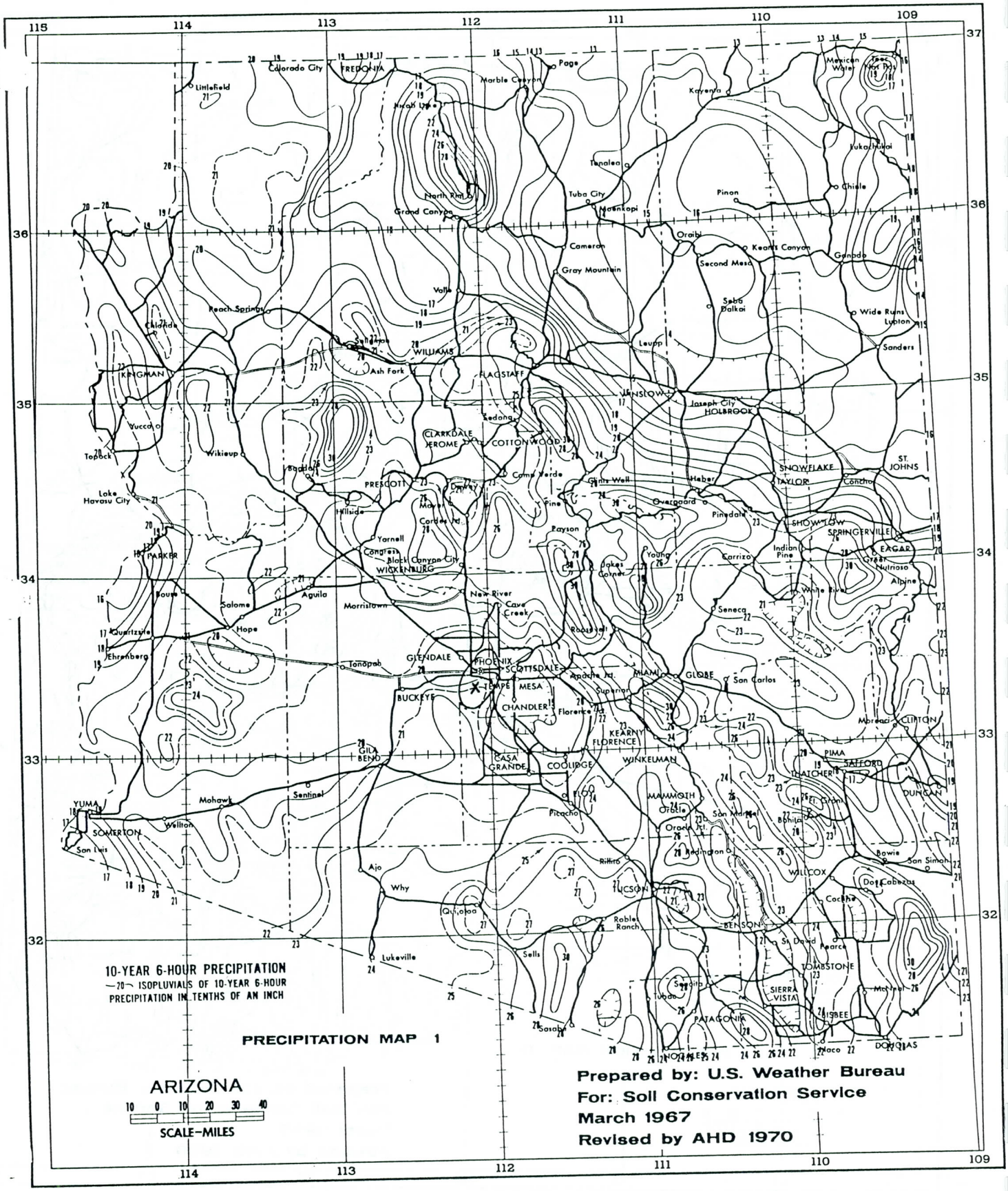
10-YEAR 6-HOUR PRECIPITATION
—20— ISOPLUVIALS OF 10-YEAR 6-HOUR PRECIPITATION IN TENTHS OF AN INCH
PRECIPITATION MAP 1
ARIZONA
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SCALE—MILES
Prepared by: U.S. Weather Bureau
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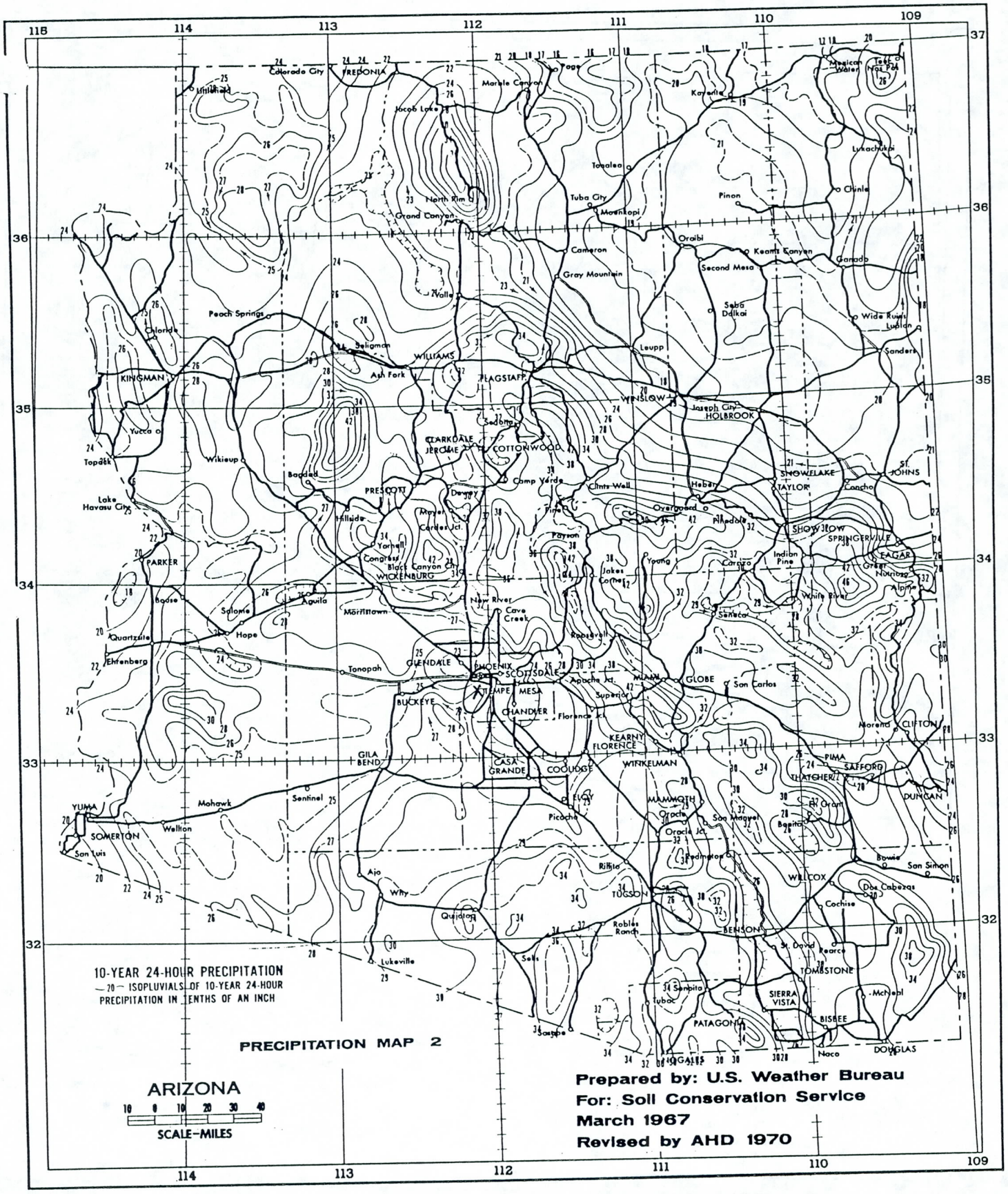
10-YEAR 24-HOUR PRECIPITATION
—20— ISOPLUVIALS OF 10-YEAR 24-HOUR PRECIPITATION IN TENTHS OF AN INCH
PRECIPITATION MAP 2
ARIZONA
10 0 10 20 30 40
SCALE—MILES
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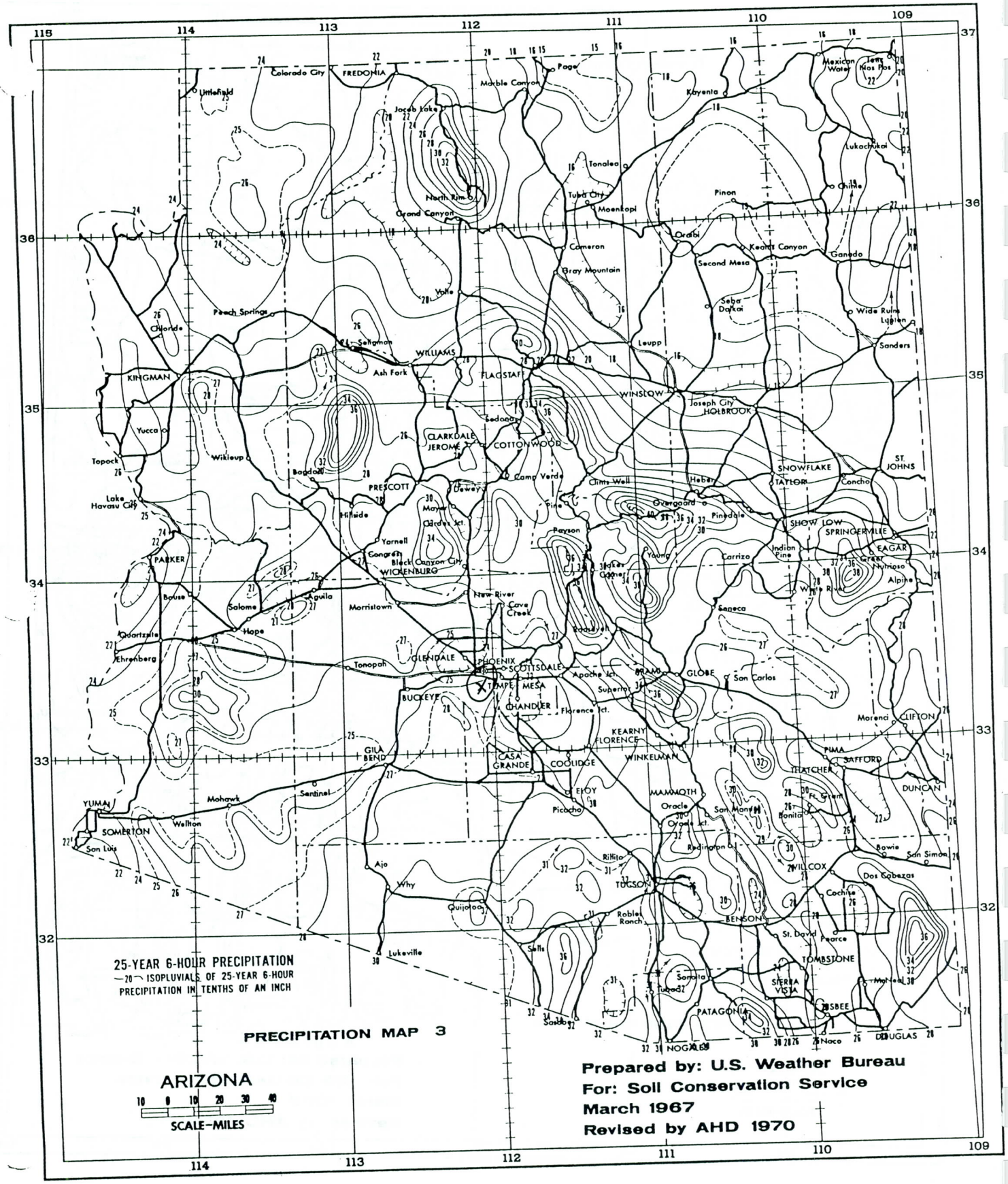
25-YEAR 6-HOUR PRECIPITATION
—20— ISOPLUVIALS OF 25-YEAR 6-HOUR PRECIPITATION IN TENTHS OF AN INCH
PRECIPITATION MAP 3
ARIZONA
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SCALE-MILES
Prepared by: U.S. Weather Bureau
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March 1967
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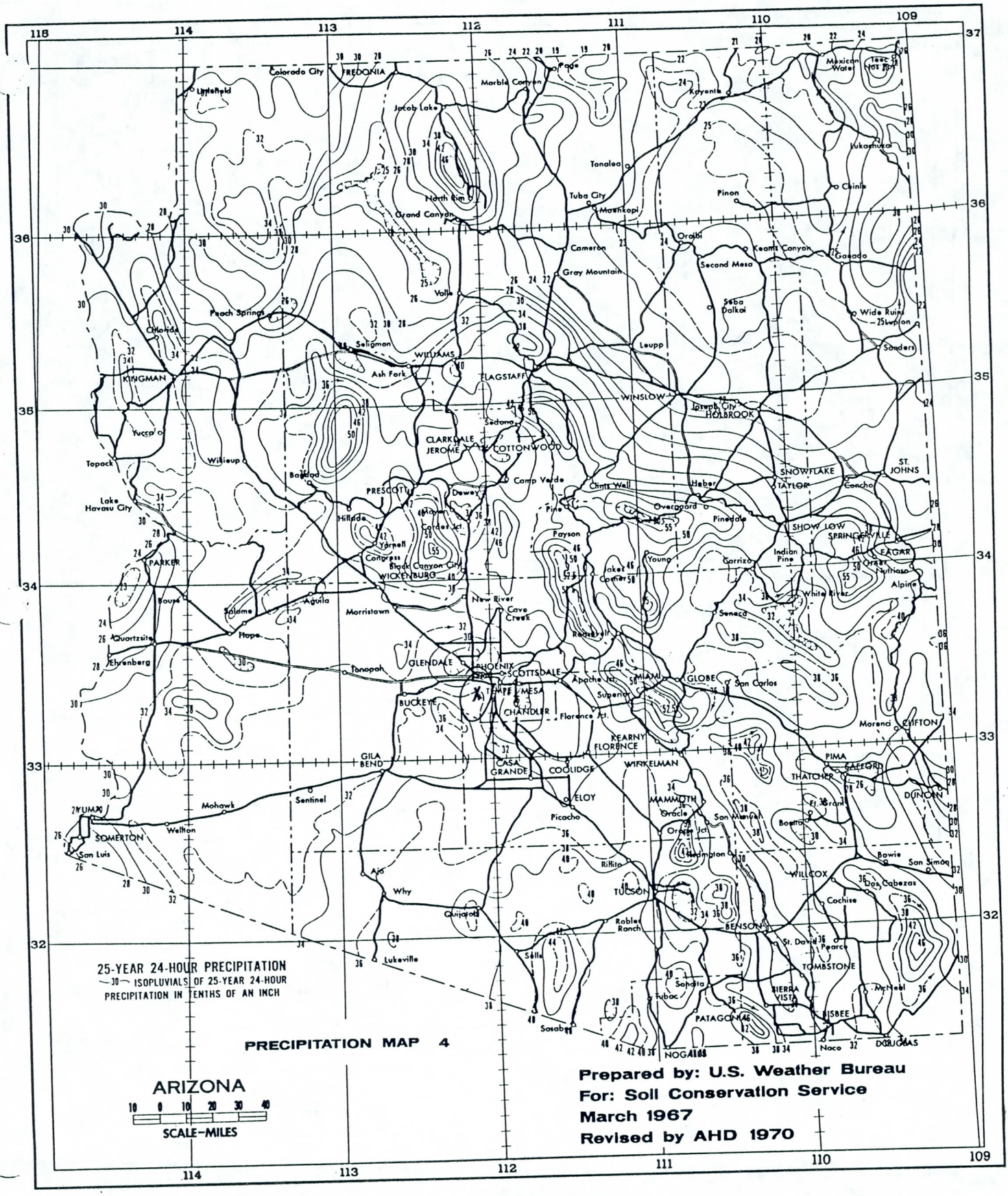
25-YEAR 24-HOUR PRECIPITATION
—30— ISOPLUVIALS OF 25-YEAR 24-HOUR PRECIPITATION IN TENTHS OF AN INCH
PRECIPITATION MAP 4
ARIZONA
10 0 10 20 30 40
SCALE-MILES
Prepared by: U.S. Weather Bureau
For: Soil Conservation Service
March 1967
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Colorado City
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Marble Canyon
Kayenta
Mexican Water
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Chinle
North Rim
Grand Canyon
Cameron
Oraibi
Keams Canyon
Ganado
Second Mesa
Gray Mountain
Valle
Seba Dalkai
Wide Ruins
Sanders
Peach Springs
Chloride
Seligman
WILLIAMS
Ash Fork
FLAGSTAFF
Leupp
KINGMAN
WINSLOW
Joseph City
HOLBROOK
Yucca
Sedona
CLARKDALE
JEROME
COTTONWOOD
Topock
Williamson
Bagdad
Camp Verde
Clints Well
Heber
SNOWFLAKE
TAYLOR
ST. JOHNS
Concho
Lake Havasu City
PRESCOTT
Dewey
Hillside
Mayer
Cordes Jct.
Pine
Overgaard
Pinedale
Payson
SHOW LOW
SPRINGERVILLE
EAGAR
Young
Carrizo
Indian Pine
Nutrioso
Alpine
PARKER
Yarnell
Congress
Black Canyon City
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Lakes Corner
White River
Bouse
Salome
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Hope
Rock Hill
Ehrenberg
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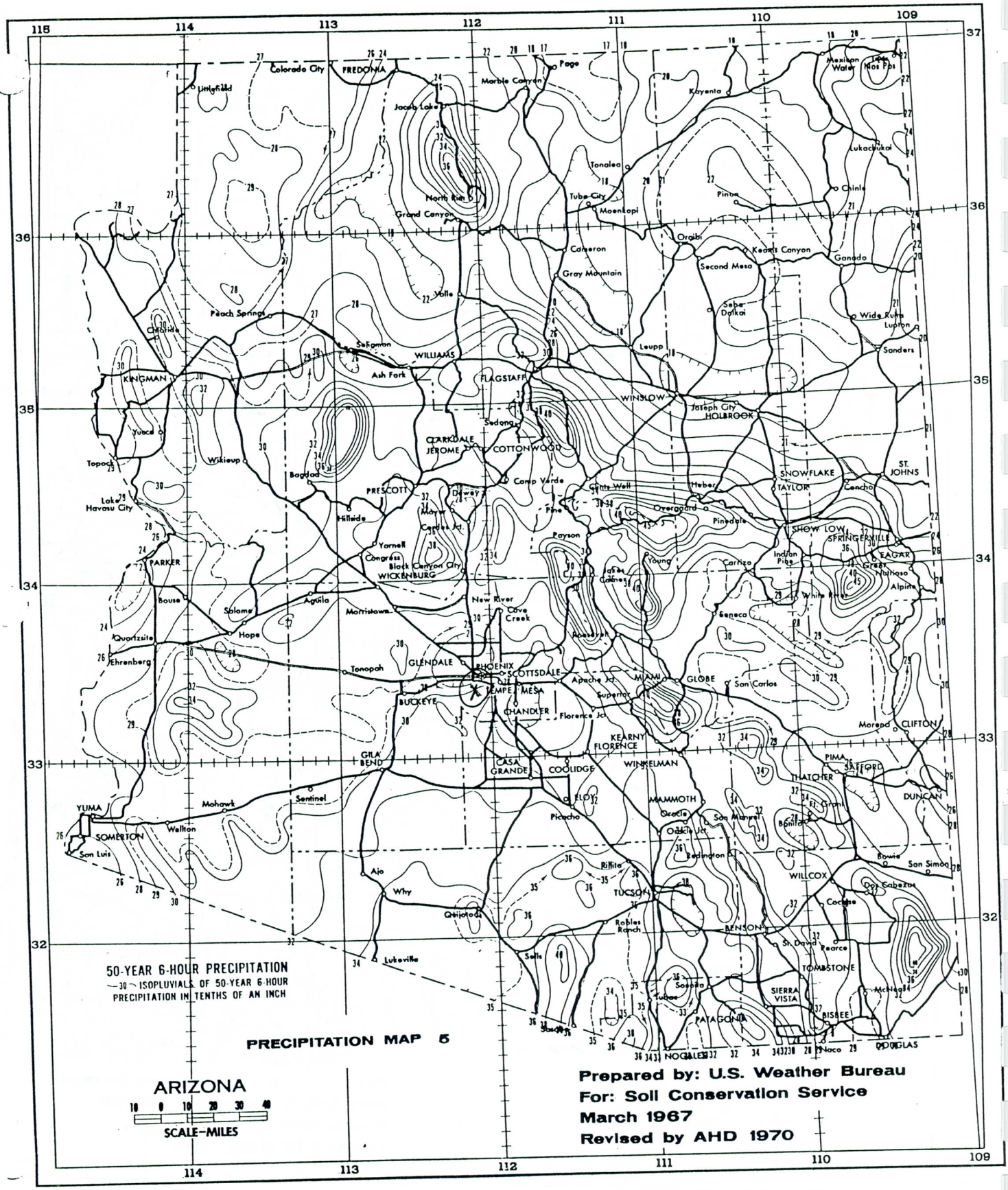
50-YEAR 6-HOUR PRECIPITATION
—30— ISOPLUVIALS OF 50-YEAR 6-HOUR PRECIPITATION IN TENTHS OF AN INCH
PRECIPITATION MAP 5
ARIZONA
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SCALE—MILES
Prepared by: U.S. Weather Bureau
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March 1967
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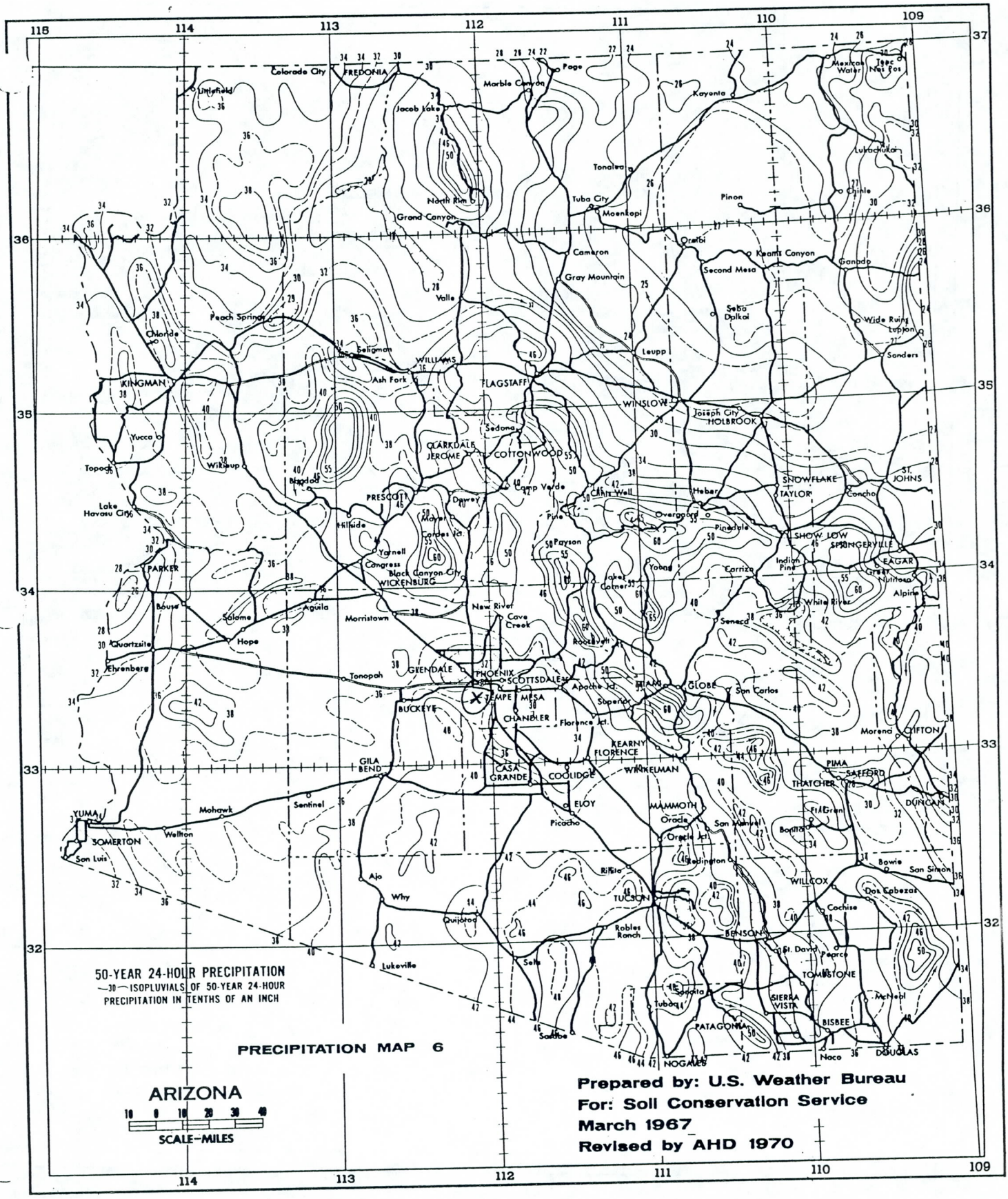
50-YEAR 24-HOUR PRECIPITATION
—30— ISOPLUVIALS OF 50-YEAR 24-HOUR PRECIPITATION IN TENTHS OF AN INCH
PRECIPITATION MAP 6
ARIZONA
10 0 10 20 30 40
SCALE—MILES
Prepared by: U.S. Weather Bureau
For: Soil Conservation Service
March 1967
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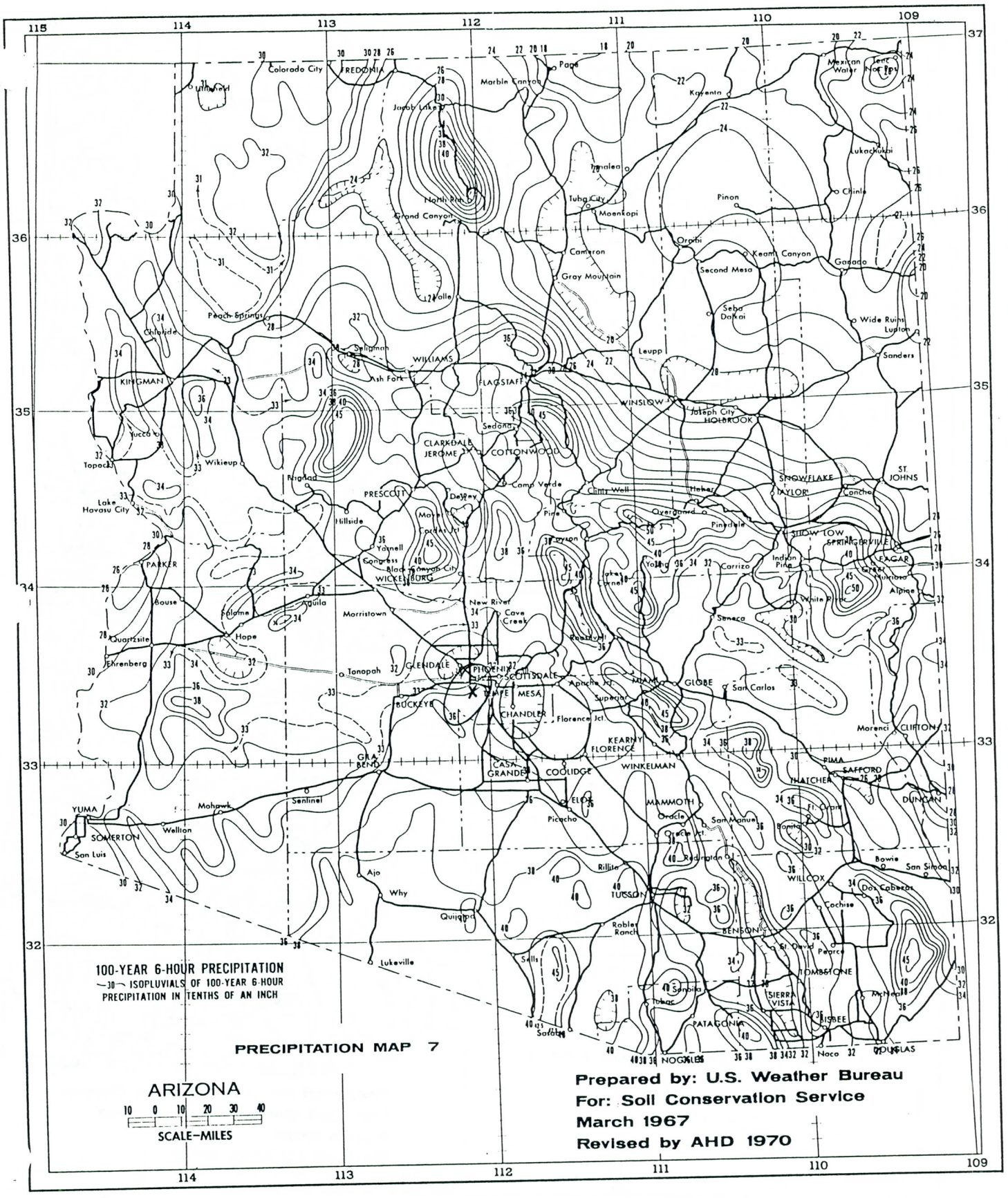
100-YEAR 6-HOUR PRECIPITATION
—30— ISOPLUVIALS OF 100-YEAR 6-HOUR PRECIPITATION IN TENTHS OF AN INCH
PRECIPITATION MAP 7
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SCALE—MILES
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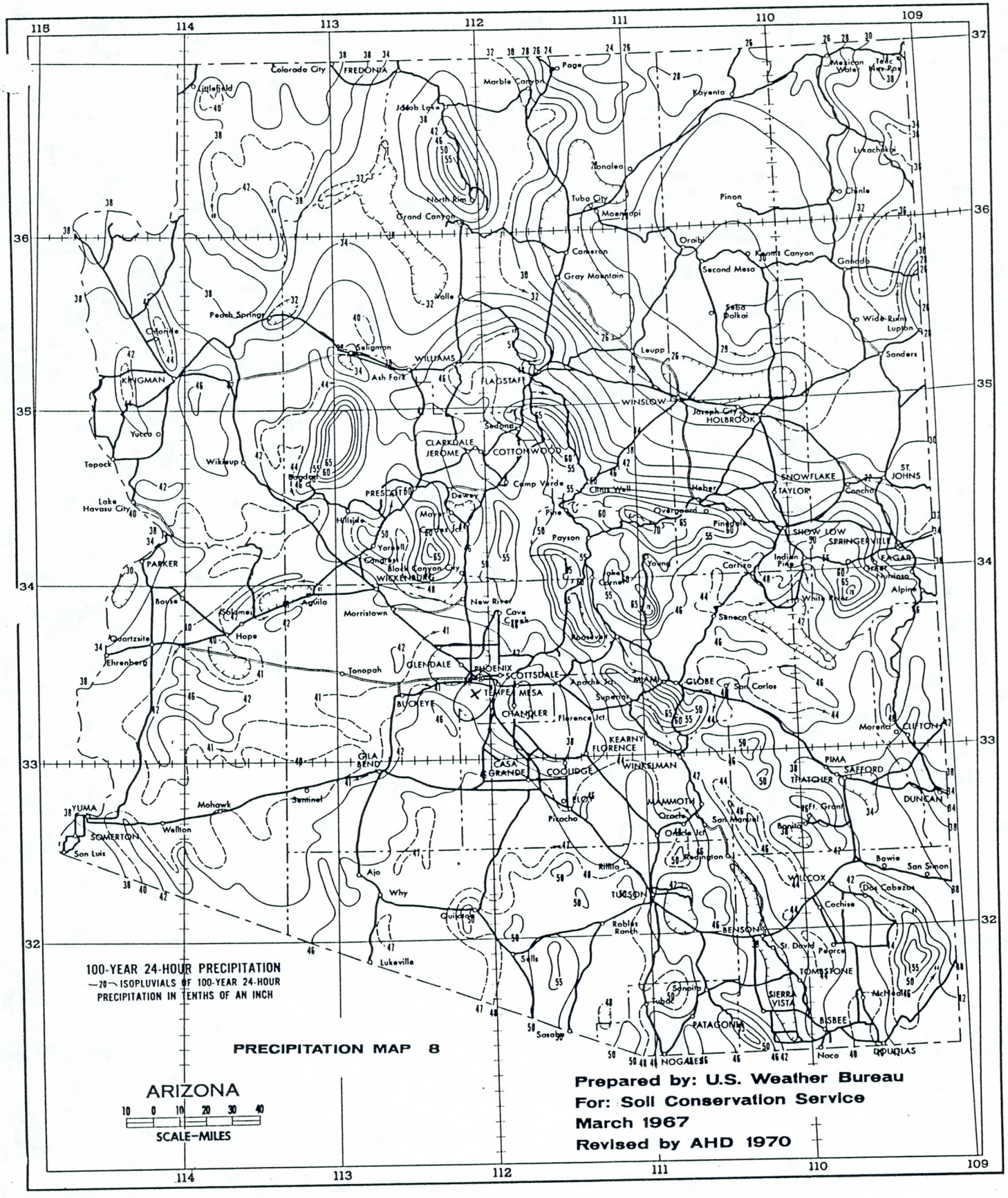
100-YEAR 24-HOUR PRECIPITATION
—20— ISOPLUVIALS OF 100-YEAR 24-HOUR PRECIPITATION IN TENTHS OF AN INCH
PRECIPITATION MAP 8
ARIZONA
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SIERRA VISTA
Nicholas
PATAGONIA
BISBEE
Sasabe
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Naco
DOUGLAS

SEGMENT II
SUBAREA PARAMETER SHEETS
(TIME OF CONCENTRATION CALCULATIONS)

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: CD160

Drainage Area: 0.97 Square Miles

Time of Concentration:

Overland Flow Length	300	feet
N Value	0.3	
2-Year Precipitation	1.55	inches
Upstream Elevation		feet
Downstream Elevation		feet
Overland Flow Slope	0.5	ft/ft
Overland Flow Velocity		fps
Overland Travel Time	0.27	hours
Shallow Concentrated Flow Length	5044	feet
Upstream Elevation	1300	feet
Downstream Elevation	1070	feet
Slope	0.046	ft/ft
Velocity	3.4	fps
Conc. Flow Travel Time	0.41	hours
Channel Flow Length	5238	feet
Upstream Elevation	1070	feet
Downstream Elevation	1036	feet
Channel Slope	0.0065	ft/ft
Channel Velocity	7.9	fps
Channel Travel Time	0.18	hours
TOTAL TRAVEL TIME	0.86	hours
Tlag	0.52	hours

Curve Number: 85.3

Routing Through Downstream Waterway:

Routing Length	feet
Upstream Elevation	feet
Downstream Elevation	feet
Routing Slope	ft/ft
Manning N Value	
Bottom Width	feet
Side Slope	h/v
Method Used	Modified Puls - New Detention Area

SUBAREA PARAMETERS

Subarea Number: CD170

Drainage Area: 1.99 Square Miles (excludes non-contributing areas)

Time of Concentration:

Overland Flow Length	300	feet
N Value	0.3	
2-Year Precipitation	1.55	inches
Upstream Elevation		feet
Downstream Elevation		feet
Overland Flow Slope	0.5	ft/ft
Overland Flow Velocity		fps
Overland Travel Time	0.27	hours
Shallow Concentrated Flow Length	10800	feet
Upstream Elevation	2400	feet
Downstream Elevation	1104	feet
Slope	0.12	ft/ft
Velocity	5.5	fps
Conc. Flow Travel Time	0.55	hours
Channel Flow Length		feet
Upstream Elevation		feet
Downstream Elevation		feet
Channel Slope		ft/ft
Channel Velocity		fps
Channel Travel Time		hours
TOTAL TRAVEL TIME	0.82	hours
Tlag	0.49	hours

Curve Number: 84.2

Routing Through Downstream Waterway:

Routing Length	10800	feet
Upstream Elevation	1104	feet
Downstream Elevation	1024	feet
Routing Slope	0.0078	ft/ft
Manning N Value	0.025	
Bottom Width		feet
Side Slope		h/v
Method Used	Normal Depth-8pt X-Section	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: CD171

Drainage Area: 0.65 Square Miles (excludes non-contributing areas)

Time of Concentration:

Overland Flow Length	300	feet
N Value	0.13	
2-Year Precipitation	1.55	inches
Upstream Elevation		feet
Downstream Elevation		feet
Overland Flow Slope	0.02	ft/ft
Overland Flow Velocity		fps
Overland Travel Time	0.5	hours
Shallow Concentrated Flow Length	10800	feet
Upstream Elevation	1096	feet
Downstream Elevation	1024	feet
Slope	0.007	ft/ft
Velocity	1.4	fps
Conc. Flow Travel Time	2.14	hours
Channel Flow Length		feet
Upstream Elevation		feet
Downstream Elevation		feet
Channel Slope		ft/ft
Channel Velocity		fps
Channel Travel Time		hours
TOTAL TRAVEL TIME	2.64	hours
Tlag	1.58	hours

Curve Number: 81

Routing Through Downstream Waterway:

Routing Length	3100	feet
Upstream Elevation		feet
Downstream Elevation		feet
Routing Slope	0.002	ft/ft
Manning N Value	0.025	
Bottom Width	20	feet
Side Slope	3	h/v
Method Used	Muskingum-Cunge	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: CD180

Drainage Area: 1.56 Square Miles

Time of Concentration:

Overland Flow Length		300	feet
N Value		0.3	
2-Year Precipitation		1.55	inches
Upstream Elevation			feet
Downstream Elevation			feet
Overland Flow Slope		0.083	ft/ft
Overland Flow Velocity			fps
Overland Travel Time		0.56	hours
Shallow Concentrated Flow Length	4270	8260	feet
Upstream Elevation	1198	1080	feet
Downstream Elevation	1080	1040	feet
Slope	0.028	0.0048	ft/ft
Velocity	2.7	1.4	fps
Conc. Flow Travel Time		2.75	hours
Channel Flow Length			feet
Upstream Elevation			feet
Downstream Elevation			feet
Channel Slope			ft/ft
Channel Velocity			fps
Channel Travel Time			hours
TOTAL TRAVEL TIME		3.31	hours
Tlag		1.99	hours

Curve Number: 86.1

Routing Through Downstream Waterway:

Routing Length		feet
Upstream Elevation		feet
Downstream Elevation		feet
Routing Slope		ft/ft
Manning N Value		
Bottom Width		feet
Side Slope		h/v
Method Used	Modified Puls - Natural Detention Area	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: CD190

Drainage Area: 1.26 Square Miles (excludes non-contributing areas)

Time of Concentration:

Overland Flow Length	300	feet
N Value	0.3	
2-Year Precipitation	1.55	inches
Upstream Elevation		feet
Downstream Elevation		feet
Overland Flow Slope	0.43	ft/ft
Overland Flow Velocity		fps
Overland Travel Time	0.29	hours
Shallow Concentrated Flow Length	3400	feet
Upstream Elevation	1364	feet
Downstream Elevation	1036	feet
Slope	0.096	ft/ft
Velocity	5	fps
Conc. Flow Travel Time	0.18	hours
Channel Flow Length	6200	feet
Upstream Elevation	1036	feet
Downstream Elevation	1020	feet
Channel Slope	0.0026	ft/ft
Channel Velocity	5	fps
Channel Travel Time	0.34	hours
TOTAL TRAVEL TIME	0.81	hours
Tlag	0.49	hours

Curve Number: 81

Routing Through Downstream Waterway:

Routing Length	feet
Upstream Elevation	feet
Downstream Elevation	feet
Routing Slope	ft/ft
Manning N Value	
Bottom Width	feet
Side Slope	h/v
Method Used	Modified Puls - New Detention Area

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: CD200

Drainage Area: 1.99 Square Miles (excludes non-contributing areas)

Time of Concentration:

Overland Flow Length	300	feet
N Value	0.011	
2-Year Precipitation	1.55	inches
Upstream Elevation		feet
Downstream Elevation		feet
Overland Flow Slope	0.028	ft/ft
Overland Flow Velocity		fps
Overland Travel Time	0.06	hours
Shallow Concentrated Flow Length	8730	feet
Upstream Elevation	1290	feet
Downstream Elevation	1164	feet
Slope	0.014	ft/ft
Velocity	2.4	fps
Conc. Flow Travel Time	1.01	hours
Channel Flow Length		feet
Upstream Elevation		feet
Downstream Elevation		feet
Channel Slope		ft/ft
Channel Velocity		fps
Channel Travel Time		hours
TOTAL TRAVEL TIME	1.07	hours
Tlag	0.64	hours

Curve Number: 82.9

Routing Through Downstream Waterway:

Routing Length	9990	feet
Upstream Elevation	1164	feet
Downstream Elevation	1084	feet
Routing Slope	0.008	ft/ft
Manning N Value	0.02	
Bottom Width	40	feet
Side Slope	25	h/v
Method Used	Normal Depth and Kinematic Wave	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: CD 201

Drainage Area: 1.58 Square Miles (excludes non-contributing areas)

Time of Concentration:

Overland Flow Length	300	feet
N Value	0.011	
2-Year Precipitation	1.55	inches
Upstream Elevation		feet
Downstream Elevation		feet
Overland Flow Slope	0.007	ft/ft
Overland Flow Velocity		fps
Overland Travel Time	0.11	hours
Shallow Concentrated Flow Length	11060	feet
Upstream Elevation	1162	feet
Downstream Elevation	1084	feet
Slope	0.007	ft/ft
Velocity	1.7	fps
Conc. Flow Travel Time	1.81	hours
Channel Flow Length		feet
Upstream Elevation		feet
Downstream Elevation		feet
Channel Slope		ft/ft
Channel Velocity		fps
Channel Travel Time		hours
TOTAL TRAVEL TIME	1.92	hours
Tlag	1.08	hours

Curve Number: 82.8

Routing Through Downstream Waterway:

Routing Length	10500	feet
Upstream Elevation	1084	feet
Downstream Elevation	1034	feet
Routing Slope	0.0042	ft/ft
Manning N Value	0.02	
Bottom Width	40	feet
Side Slope	25	h/v
Method Used	Kinematic Wave	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: CD 202

Drainage Area: 1.4 Square Miles (excludes non-contributing areas)

Time of Concentration:

Overland Flow Length	300	feet
N Value	0.06	
2-Year Precipitation	1.55	inches
Upstream Elevation		feet
Downstream Elevation		feet
Overland Flow Slope	0.01	ft/ft
Overland Flow Velocity		fps
Overland Travel Time	0.36	hours
Shallow Concentrated Flow Length	15000	feet
Upstream Elevation	1116	feet
Downstream Elevation	1034	feet
Slope	0.0055	ft/ft
Velocity	1.2	fps
Conc. Flow Travel Time	3.47	hours
Channel Flow Length		feet
Upstream Elevation		feet
Downstream Elevation		feet
Channel Slope		ft/ft
Channel Velocity		fps
Channel Travel Time		hours
TOTAL TRAVEL TIME	3.83	hours
Tlag	2.3	hours

Curve Number: 81.6

Routing Through Downstream Waterway:

Routing Length	6300	feet
Upstream Elevation		feet
Downstream Elevation		feet
Routing Slope	0.0016	ft/ft
Manning N Value	.03/.07	
Bottom Width		feet
Side Slope		h/v
Method Used	Muskingum-Cunge	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: CD203

Drainage Area: 2.03 Square Miles (excludes non-contributing areas)

Time of Concentration:

Overland Flow Length	300	feet
N Value	0.1	
2-Year Precipitation	1.55	inches
Upstream Elevation		feet
Downstream Elevation		feet
Overland Flow Slope	0.004	ft/ft
Overland Flow Velocity		fps
Overland Travel Time	0.78	hours
Shallow Concentrated Flow Length	10700	feet
Upstream Elevation	1057	feet
Downstream Elevation	1030	feet
Slope	0.0025	ft/ft
Velocity	0.8	fps
Conc. Flow Travel Time	3.72	hours
Channel Flow Length		feet
Upstream Elevation		feet
Downstream Elevation		feet
Channel Slope		ft/ft
Channel Velocity		fps
Channel Travel Time		hours
TOTAL TRAVEL TIME	4.5	hours
Tlag	2.7	hours

Curve Number: 82

Routing Through Downstream Waterway:

Routing Length	6300	feet
Upstream Elevation		feet
Downstream Elevation		feet
Routing Slope	0.0016	ft/ft
Manning N Value	.03/.07	
Bottom Width		feet
Side Slope		h/v
Method Used	Muskingum-Cunge	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: CD 210

Drainage Area: 1.97 Square Miles (excludes non-contributing areas)

Time of Concentration:

Overland Flow Length	300	feet
N Value	0.3	
2-Year Precipitation	1.55	inches
Upstream Elevation		feet
Downstream Elevation		feet
Overland Flow Slope	0.5	ft/ft
Overland Flow Velocity		fps
Overland Travel Time	0.27	hours
Shallow Concentrated Flow Length	4270	feet
Upstream Elevation	2150	feet
Downstream Elevation	1550	feet
Slope	0.14	ft/ft
Velocity	6	fps
Conc. Flow Travel Time	0.2	hours
Channel Flow Length	6200	feet
Upstream Elevation		feet
Downstream Elevation		feet
Channel Slope	0.019	ft/ft
Channel Velocity	10.2	fps
Channel Travel Time	0.17	hours
TOTAL TRAVEL TIME	0.64	hours
Tlag	0.38	hours

Curve Number: 94.9

Routing Through Downstream Waterway:

Routing Length	4850	feet
Upstream Elevation	1410	feet
Downstream Elevation	1330	feet
Routing Slope	0.016	ft/ft
Manning N Value	0.05	
Bottom Width	200	feet
Side Slope	5	h/v
Method Used	Muskingum-Cunge	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: CD 211

Drainage Area: 1.35 Square Miles (excludes non-contributing areas)

Time of Concentration:

Overland Flow Length	300	feet
N Value	0.3	
2-Year Precipitation	1.55	inches
Upstream Elevation		feet
Downstream Elevation		feet
Overland Flow Slope	0.33	ft/ft
Overland Flow Velocity		fps
Overland Travel Time	0.32	hours
Shallow Concentrated Flow Length	4590	feet
Upstream Elevation	2550	feet
Downstream Elevation	1750	feet
Slope	0.17	ft/ft
Velocity	6.6	fps
Conc. Flow Travel Time	0.19	hours
Channel Flow Length	3630	feet
Upstream Elevation		feet
Downstream Elevation		feet
Channel Slope	0.18	ft/ft
Channel Velocity	20	fps
Channel Travel Time	0.05	hours
TOTAL TRAVEL TIME	0.56	hours
Tlag	0.34	hours

Curve Number: 94.9

Routing Through Downstream Waterway:

Routing Length	feet
Upstream Elevation	feet
Downstream Elevation	feet
Routing Slope	ft/ft
Manning N Value	
Bottom Width	feet
Side Slope	h/v
Method Used	Modified Puls - Exist. Detention Basin

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: CD 212

Drainage Area: 1.35 Square Miles (excludes non-contributing areas)

Time of Concentration:

Overland Flow Length	300	feet
N Value	0.3	
2-Year Precipitation	1.55	inches
Upstream Elevation		feet
Downstream Elevation		feet
Overland Flow Slope	0.125	ft/ft
Overland Flow Velocity		fps
Overland Travel Time	0.47	hours
Shallow Concentrated Flow Length	4900	feet
Upstream Elevation	2390	feet
Downstream Elevation	2000	feet
Slope	0.08	ft/ft
Velocity	4.5	fps
Conc. Flow Travel Time	0.3	hours
Channel Flow Length	3840	feet
Upstream Elevation		feet
Downstream Elevation		feet
Channel Slope	0.17	ft/ft
Channel Velocity	14	fps
Channel Travel Time	0.08	hours
TOTAL TRAVEL TIME	0.85	hours
Tlag	0.51	hours

Curve Number: 94.9

Routing Through Downstream Waterway:

Routing Length		feet
Upstream Elevation		feet
Downstream Elevation		feet
Routing Slope		ft/ft
Manning N Value		
Bottom Width		feet
Side Slope		h/v
Method Used	Modified Puls - Exist. Detention Basin	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: CD 220

Drainage Area: 1.48 Square Miles (excludes non-contributing areas)

Time of Concentration:

Overland Flow Length	300	feet
N Value	0.3	
2-Year Precipitation	1.55	inches
Upstream Elevation		feet
Downstream Elevation		feet
Overland Flow Slope	0.5	ft/ft
Overland Flow Velocity		fps
Overland Travel Time	0.27	hours
Shallow Concentrated Flow Length	7150	feet
Upstream Elevation	1450	feet
Downstream Elevation	1158	feet
Slope	0.041	ft/ft
Velocity	3.2	fps
Conc. Flow Travel Time	0.62	hours
Channel Flow Length		feet
Upstream Elevation		feet
Downstream Elevation		feet
Channel Slope		ft/ft
Channel Velocity		fps
Channel Travel Time		hours
TOTAL TRAVEL TIME	0.89	hours
Tlag	0.53	hours

Curve Number: 88.1

Routing Through Downstream Waterway:

Routing Length	5800	feet
Upstream Elevation	1158	feet
Downstream Elevation	1112	feet
Routing Slope	0.0079	ft/ft
Manning N Value	0.02	
Bottom Width	40	feet
Side Slope	25	h/v
Method Used	Kinematic Wave	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: CD221

Drainage Area: 1.68 Square Miles (excludes non-contributing areas)

Time of Concentration:

Overland Flow Length	300	feet
N Value	0.3	
2-Year Precipitation	1.55	inches
Upstream Elevation		feet
Downstream Elevation		feet
Overland Flow Slope	0.5	ft/ft
Overland Flow Velocity		fps
Overland Travel Time	0.27	hours
Shallow Concentrated Flow Length	11420	feet
Upstream Elevation		feet
Downstream Elevation		feet
Slope	0.095	ft/ft
Velocity	5	fps
Conc. Flow Travel Time	0.63	hours
Channel Flow Length		feet
Upstream Elevation		feet
Downstream Elevation		feet
Channel Slope		ft/ft
Channel Velocity		fps
Channel Travel Time		hours
TOTAL TRAVEL TIME	0.9	hours
Tlag	0.54	hours

Curve Number: 84

Routing Through Downstream Waterway:

Routing Length	5140	feet
Upstream Elevation	1111	feet
Downstream Elevation	1083	feet
Routing Slope	0.0054	ft/ft
Manning N Value	0.03	
Bottom Width	40	feet
Side Slope	50	h/v
Method Used	Kinematic Wave	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: CD 222

Drainage Area: 1.23 Square Miles (excludes non-contributing areas)

Time of Concentration:

Overland Flow Length	300	feet
N Value	0.13	
2-Year Precipitation	1.55	inches
Upstream Elevation		feet
Downstream Elevation		feet
Overland Flow Slope	0.011	ft/ft
Overland Flow Velocity		fps
Overland Travel Time	0.64	hours
Shallow Concentrated Flow Length	10500	feet
Upstream Elevation	1157	feet
Downstream Elevation	1082	feet
Slope	0.007	ft/ft
Velocity	1.4	fps
Conc. Flow Travel Time	2.08	hours
Channel Flow Length		feet
Upstream Elevation		feet
Downstream Elevation		feet
Channel Slope		ft/ft
Channel Velocity		fps
Channel Travel Time		hours
TOTAL TRAVEL TIME	2.72	hours
Tlag	1.63	hours

Curve Number: 81

Routing Through Downstream Waterway:

Routing Length	5600	feet
Upstream Elevation	1084	feet
Downstream Elevation	1058	feet
Routing Slope	0.0046	ft/ft
Manning N Value	0.03	
Bottom Width	40	feet
Side Slope	50	h/v
Method Used	Kinematic Wave	

SUBAREA PARAMETERS

Subarea Number: CD223

Drainage Area: 1.99 Square Miles (excludes non-contributing areas)

Time of Concentration:

Overland Flow Length	300	feet
N Value	0.13	
2-Year Precipitation	1.55	inches
Upstream Elevation		feet
Downstream Elevation		feet
Overland Flow Slope	0.014	ft/ft
Overland Flow Velocity		fps
Overland Travel Time	0.58	hours
Shallow Concentrated Flow Length	9500	feet
Upstream Elevation	1108	feet
Downstream Elevation	1058	feet
Slope	0.0052	ft/ft
Velocity	1.2	fps
Conc. Flow Travel Time	2.2	hours
Channel Flow Length		feet
Upstream Elevation		feet
Downstream Elevation		feet
Channel Slope		ft/ft
Channel Velocity		fps
Channel Travel Time		hours
TOTAL TRAVEL TIME	2.78	hours
Tlag	1.67	hours

Curve Number: 81.7

Routing Through Downstream Waterway:

Routing Length	7800	feet
Upstream Elevation		feet
Downstream Elevation		feet
Routing Slope		ft/ft
Manning N Value		
Bottom Width		feet
Side Slope		h/v
Method Used	Normal Depth and Muskingum-Cunge	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: CD224

Drainage Area: 1.52 Square Miles (excludes non-contributing areas)

Time of Concentration:

Overland Flow Length	300	feet
N Value	0.13	
2-Year Precipitation	1.55	inches
Upstream Elevation		feet
Downstream Elevation		feet
Overland Flow Slope	0.013	ft/ft
Overland Flow Velocity		fps
Overland Travel Time	0.59	hours
Shallow Concentrated Flow Length	8440	feet
Upstream Elevation	1058	feet
Downstream Elevation	1019	feet
Slope	0.0046	ft/ft
Velocity	1.2	fps
Conc. Flow Travel Time	1.95	hours
Channel Flow Length		feet
Upstream Elevation		feet
Downstream Elevation		feet
Channel Slope		ft/ft
Channel Velocity		fps
Channel Travel Time		hours
TOTAL TRAVEL TIME	2.54	hours
Tlag	1.53	hours

Curve Number: 82.3

Routing Through Downstream Waterway:

Routing Length	feet
Upstream Elevation	feet
Downstream Elevation	feet
Routing Slope	ft/ft
Manning N Value	
Bottom Width	feet
Side Slope	h/v
Method Used	Modified Puls - via Champion Drain

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: CD 230

Drainage Area: 1.93 Square Miles (excludes non-contributing areas)

Time of Concentration:

Overland Flow Length	300	feet
N Value	0.3	
2-Year Precipitation	1.55	inches
Upstream Elevation		feet
Downstream Elevation		feet
Overland Flow Slope	0.5	ft/ft
Overland Flow Velocity		fps
Overland Travel Time	0.27	hours
Shallow Concentrated Flow Length	11500	feet
Upstream Elevation	2250	feet
Downstream Elevation	1096	feet
Slope	0.1	ft/ft
Velocity	5.2	fps
Conc. Flow Travel Time	0.61	hours
Channel Flow Length		feet
Upstream Elevation		feet
Downstream Elevation		feet
Channel Slope		ft/ft
Channel Velocity		fps
Channel Travel Time		hours
TOTAL TRAVEL TIME	0.88	hours
Tlag	0.53	hours

Curve Number: 83.6

Routing Through Downstream Waterway:

Routing Length	11800	feet
Upstream Elevation	1090	feet
Downstream Elevation	1036	feet
Routing Slope	0.0046	ft/ft
Manning N Value	0.03	
Bottom Width	30	feet
Side Slope	50	h/v
Method Used	Kinematic Wave	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: CD 231

Drainage Area: 1.45 Square Miles (excludes non-contributing areas)

Time of Concentration:

Overland Flow Length	300	feet
N Value	0.13	
2-Year Precipitation	1.55	inches
Upstream Elevation		feet
Downstream Elevation		feet
Overland Flow Slope	0.01	ft/ft
Overland Flow Velocity		fps
Overland Travel Time	0.66	hours
Shallow Concentrated Flow Length	13000	feet
Upstream Elevation	1116	feet
Downstream Elevation	1045	feet
Slope	0.0055	ft/ft
Velocity	1.2	fps
Conc. Flow Travel Time	3.01	hours
Channel Flow Length		feet
Upstream Elevation		feet
Downstream Elevation		feet
Channel Slope		ft/ft
Channel Velocity		fps
Channel Travel Time		hours
TOTAL TRAVEL TIME	3.67	hours
Tlag	2.2	hours

Curve Number: 81.5

Routing Through Downstream Waterway:

Routing Length	4950	feet
Upstream Elevation	1036	feet
Downstream Elevation	1010	feet
Routing Slope	0.0053	ft/ft
Manning N Value	0.03	
Bottom Width	10	feet
Side Slope	50	h/v
Method Used	Kinematic Wave	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: CD232

Drainage Area: 2.15 Square Miles (excludes non-contributing areas)

Time of Concentration:

Overland Flow Length	300	feet
N Value	0.13	
2-Year Precipitation	1.55	inches
Upstream Elevation		feet
Downstream Elevation		feet
Overland Flow Slope	0.003	ft/ft
Overland Flow Velocity		fps
Overland Travel Time	1.07	hours
Shallow Concentrated Flow Length	11800	feet
Upstream Elevation	1024	feet
Downstream Elevation	1008	feet
Slope	0.0014	ft/ft
Velocity	1	fps
Conc. Flow Travel Time	3.28	hours
Channel Flow Length		feet
Upstream Elevation		feet
Downstream Elevation		feet
Channel Slope		ft/ft
Channel Velocity		fps
Channel Travel Time		hours
TOTAL TRAVEL TIME	4.35	hours
Tlag	2.61	hours

Curve Number: 81.1

Routing Through Downstream Waterway:

Routing Length		feet
Upstream Elevation		feet
Downstream Elevation		feet
Routing Slope		ft/ft
Manning N Value		
Bottom Width		feet
Side Slope		h/v
Method Used	Modified Puls - via Champion Drain	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: CD 240

Drainage Area: 0.29 Square Miles (excludes non-contributing areas)

Time of Concentration:

Overland Flow Length	300	feet
N Value	0.12	
2-Year Precipitation	1.55	inches
Upstream Elevation		feet
Downstream Elevation		feet
Overland Flow Slope	0.0076	ft/ft
Overland Flow Velocity		fps
Overland Travel Time	0.69	hours
Shallow Concentrated Flow Length	3000	feet
Upstream Elevation		feet
Downstream Elevation		feet
Slope	0.0018	ft/ft
Velocity	1	fps
Conc. Flow Travel Time	0.83	hours
Channel Flow Length		feet
Upstream Elevation		feet
Downstream Elevation		feet
Channel Slope		ft/ft
Channel Velocity		fps
Channel Travel Time		hours
TOTAL TRAVEL TIME	1.52	hours
Tlag	0.91	hours

Curve Number: 81

Routing Through Downstream Waterway:

Routing Length	feet
Upstream Elevation	feet
Downstream Elevation	feet
Routing Slope	ft/ft
Manning N Value	
Bottom Width	feet
Side Slope	h/v
Method Used	Muskingum-Cunge

SUBAREA PARAMETERS

Subarea Number: CD 250

Drainage Area: 1.99 Square Miles (excludes non-contributing areas)

Time of Concentration:

Overland Flow Length	300	feet
N Value	0.06	
2-Year Precipitation	1.55	inches
Upstream Elevation		feet
Downstream Elevation		feet
Overland Flow Slope	0.002	ft/ft
Overland Flow Velocity		fps
Overland Travel Time	0.67	hours
Shallow Concentrated Flow Length	12000	feet
Upstream Elevation	1016	feet
Downstream Elevation	996	feet
Slope	0.0017	ft/ft
Velocity	1	fps
Conc. Flow Travel Time	3.33	hours
Channel Flow Length		feet
Upstream Elevation		feet
Downstream Elevation		feet
Channel Slope		ft/ft
Channel Velocity		fps
Channel Travel Time		hours
TOTAL TRAVEL TIME	4	hours
Tlag	2.4	hours

Curve Number: 81.5

Routing Through Downstream Waterway:

Routing Length	feet
Upstream Elevation	feet
Downstream Elevation	feet
Routing Slope	ft/ft
Manning N Value	
Bottom Width	feet
Side Slope	h/v
Method Used	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: CD260

Drainage Area: 0.18 Square Miles (excludes non-contributing areas)

Time of Concentration:

Overland Flow Length	300	feet
N Value	0.06	
2-Year Precipitation	1.55	inches
Upstream Elevation		feet
Downstream Elevation		feet
Overland Flow Slope	0.0016	ft/ft
Overland Flow Velocity		fps
Overland Travel Time	0.74	hours
Shallow Concentrated Flow Length	5240	feet
Upstream Elevation	1024	feet
Downstream Elevation	996	feet
Slope	0.0053	ft/ft
Velocity	3.7	fps
Conc. Flow Travel Time	0.39	hours
Channel Flow Length		feet
Upstream Elevation		feet
Downstream Elevation		feet
Channel Slope		ft/ft
Channel Velocity		fps
Channel Travel Time		hours
TOTAL TRAVEL TIME	1.13	hours
Tlag	0.68	hours

Curve Number: 81

Routing Through Downstream Waterway:

Routing Length	feet
Upstream Elevation	feet
Downstream Elevation	feet
Routing Slope	ft/ft
Manning N Value	
Bottom Width	feet
Side Slope	h/v
Method Used	

SUBAREA PARAMETERS

Subarea Number: CD270

Drainage Area: 0.22 Square Miles (excludes non-contributing areas)

Time of Concentration:

Overland Flow Length	300	feet
N Value	0.06	
2-Year Precipitation	1.55	inches
Upstream Elevation		feet
Downstream Elevation		feet
Overland Flow Slope	0.0019	ft/ft
Overland Flow Velocity		fps
Overland Travel Time	0.7	hours
Shallow Concentrated Flow Length	5240	feet
Upstream Elevation	1006	feet
Downstream Elevation	996	feet
Slope	0.0019	ft/ft
Velocity	0.7	fps
Conc. Flow Travel Time	2.08	hours
Channel Flow Length		feet
Upstream Elevation		feet
Downstream Elevation		feet
Channel Slope		ft/ft
Channel Velocity		fps
Channel Travel Time		hours
TOTAL TRAVEL TIME	2.78	hours
Tlag	1.67	hours

Curve Number: 81

Routing Through Downstream Waterway:

Routing Length	feet
Upstream Elevation	feet
Downstream Elevation	feet
Routing Slope	ft/ft
Manning N Value	
Bottom Width	feet
Side Slope	h/v
Method Used	

SEGMENT II
SCS CURVE NUMBER CALCULATIONS

Price Road Phase II 00173 039 044
Hydrology (South Mountain Freeway)

Computed EL Date 3-14-91
Sheet 1 of

Subarea CD160 G D.A. = 622 acres

Land use acreage values approx. from aerial photography (6-90)

Land use	Soil Group	Area	CN
mtn.	D	172	98
desert shrub	A	52	63
desert shrub	C	85	85
ag, row	B	292	81
sf res.	B	21	84

Composite CN = 84.84405

Subarea CD170 H D.A. = 1107 acres

Land use	Soil Group	Area	CN
mtn.	D	420	98
desert shrub	A	286	63
desert shrub	B	0	77
desert shrub	C	286	85
ag, row	B	0	81
non-contrib		115	

Composite CN = 84.16129

Subarea CD171 H D.A. = 416 acres

Land use	Soil Group	Area	CN
mtn.	D	0	98
desert shrub	A	0	63
desert shrub	B	0	77
desert shrub	C	0	85
ag, row	B	416	81
non-contrib		0	

Composite CN = 81

Subarea CD180 D.A. = 1232 acres

Land use	Soil Group	Area	CN
mtn.	D	252	98
ag, row	B	540	81
desert shrub	C	207	85
non-contrib		233	

Composite CN = 86.11711

Subarea CD190 D.A. = 862 acres

Land use acreage values approx. from aerial photography (6-90)

Land use	Soil Group	Area	CN
non-contrib		54	
ag, row	B	783	81

Composite
CN = 81

Subarea CD240 D.A. = 291 acres

Land use	Soil Group	Area	CN
mtn.	D	0	98
desert shrub	C	0	85
ag, row	B	184	81
non-contrib		107	

Composite
CN = 81

Subarea CD210 L D.A. = 2651 acres

Land use	Soil Group	Area	CN
mtn.	D	2389	98
desert shrub	A	205	63
desert shrub	B	32	77
desert shrub	C	25	85

Composite
CN = 94.91738 (used for CD211 and CD212)

Subarea CD200 D.A. = 375 acres

Land use acreage values approx. from aerial photography (6-90)

Land use	Soil Group	Area	CN
ag, row	B	140	81
fallow	B	0	83
non-contrib		0	
industrial	B	0	88
mf	B	0	85
school	B	0	77
sf	B	235	84
desert shrub	B	0	77

Composite CN = 82.88

Subarea CD201 D.A. = 1014 acres

Land use	Soil Group	Area	CN
ag, row	B	360	81
fallow	B	188	83
non-contrib		0	
industrial	B	35	88
mf	B	20	85
school	B	15	77
sf	B	396	84
desert shrub	B	0	77

Composite CN = 82.80374

Subarea CD202 D.A. = 933 acres

Land use	Soil Group	Area	CN
ag, row	B	786	81
fallow	B	42	83
non-contrib		37	
industrial	B	68	88
mf	B	0	85
school	B	0	77
sf	B	0	84
desert shrub	B	0	77

Composite CN = 81.625

Price Road Phase II 00173 039 044 Computed EL Date 3-14-91
Hydrology (South Mountain Freeway) Sheet 4 of

Subarea CD203 D.A. = 1341 acres

Land use acreage values approx. from aerial photography (6-90)

Land use	Soil Group	Area	CN
ag, row	B	816	81
fallow	B	163	83
non-contrib		42	
industrial	B	45	88
mf	B	0	85
school	B	0	77
sf	B	245	84
desert shrub	B	30	77

Composite CN = 81.96689

Subarea CD220 N D.A. = 950 acres

Land use	Soil Group	Area	CN
ag, row	B	155	81
fallow	B	0	83
non-contrib		0	
industrial	B	0	88
desert shrub	B	0	77
desert shrub	A/C	169	77
mtn	D	396	98
sf	B	230	84

Composite CN = 88.10105

Subarea CD221 N D.A. = 1074 acres

Land use	Soil Group	Area	CN
ag, row	B	0	81
fallow	B	0	83
non-contrib		0	
industrial	B	0	88
desert shrub	B	0	77
desert shrub	A/C	718	77
mtn	D	356	98
sf	B	0	84

Composite CN = 83.96089

Subarea CD222 N D.A. = 793 acres

Land use acreage values approx. from aerial photography (6-90)

Land use	Soil Group	Area	CN
ag, row	B	793	81
fallow	B	0	83
non-contrib		0	
industrial	B	0	88
desert shrub	B	0	77
desert shrub	A/C	0	77
mtn	D	0	98
sf	B	0	84

Composite CN = 81

Subarea CD223 N D.A. = 708 acres

Land use	Soil Group	Area	CN
ag, row	B	560	81
fallow	B	0	83
non-contrib		0	
industrial	B	20	88
desert shrub	B	0	77
desert shrub	A/C	0	77
mtn	D	0	98
sf	B	128	84

Composite CN = 81.74011

Subarea CD224 N D.A. = 1133 acres

Land use	Soil Group	Area	CN
ag, row	B	420	81
fallow	B	48	83
non-contrib		160	
industrial	B	34	88
desert shrub	B	70	77
desert shrub	A/C	0	77
mtn	D	0	98
sf	B	401	84

Composite CN = 82.29188

Subarea CD230 O D.A. = 1233 acres

Land use acreage values approx. from aerial photography (6-90)

Land use	Soil Group	Area	CN
ag, row	B	0	81
fallow	B	0	83
non-contrib		0	
industrial	B	0	88
desert shrub	A/C	804	77
mtn	D	363	98
sf	B	66	84

Composite CN = 83.55717

Subarea CD231 O D.A. = 930 acres

Land use	Soil Group	Area	CN
ag, row	B	870	81
fallow	B	0	83
non-contrib		0	
industrial	B	60	88
desert shrub	A/C	0	77
mtn	D	0	98
sf	B	0	84

Composite CN = 81.45161

Subarea CD232 O D.A. = 1442 acres

Land use	Soil Group	Area	CN
ag, row	B	1350	81
fallow	B	0	83
non-contrib		68	
industrial	B	24	88
desert shrub	A/C	0	77
mtn	D	0	98
sf	B	0	84

Composite CN = 81.12227

Subarea CD250 P D.A. = 1342 acres

Land use	Soil Group	Area	CN
ag, row	B	1187	81
non-contrib		70	
industrial	B	85	88

Composite CN = 81.46776

Subarea CD260 Q D.A.= 113 acres

Land use acreage values approx. from aerial photography (6-90)

Land use	Soil Group	Area	CN
ag, row	B	113	81

Composite CN = 81

Subarea CD270 R D.A. = 142 acres

Land use	Soil Group	Area	CN
ag, row	B	142	81

Composite CN = 81

SEGMENT II
HEC-1 ANALYSES
SALT RIVER TO 51ST AVENUE

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             SEPTEMBER 1990            *
*              VERSION 4.0              *
*                                       *
*  RUN DATE  02/21/1992  TIME  11:11:56 *
*                                       *
*****************************************
```


```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*        DAVIS, CALIFORNIA 95616        *
*           (916) 756-1104              *
*                                       *
*****************************************
```


100 YR-24 HR HYDROLOGY
SALT RIVER TO 51ST AVE
CHAMPION DRAIN AREA

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X       XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX  XXXXX          XXX
```

```
::::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::::
:::                                      :::
:::  Full Microcomputer Implementation   :::
:::                 by                   :::
:::         Haestad Methods, Inc.        :::
:::                                      :::
::::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::::
```

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  1       ID        PRICE ROAD PHASE II HYDROLOGY CHECK
  2       ID        SOUTH MOUNTAIN FREEWAY (51ST AVE TO SALT RIVER)
  3       ID        100-YEAR 24-HOUR STORM EVENT
          *DIAGRAM
  4       IT      5                   300
  5       IO      3

  6       KK   CD160  (G)
  7       PH           6.68    0.79    1.55    2.72    2.97    3.14    3.45    3.74    4.05
  8       BA   0.97
  9       LS           85.3
 10       UD   0.52

 11       KK   ESTREL  DIVERSION OF NATURAL DRAINAGE THRU ALIGN. AT ESTRELLA AVE.
 12       DT   ESTREL
 13       DI      0     255    2000
 14       DQ      0     255     255

 15       KK   RT160  NORMAL DEPTH ROUTING THRU A LINED CHANNEL
 16       RS      1    FLOW      -1
 17       RC    .05    .018     .05    3500  .00250
 18       RX      0      99     100     110     126     136     137     200
 19       RY   1035    1035    1035    1030    1030    1035    1035    1035

 20       KK   CD170  (H)
 21       BA   1.55
 22       LS           84.2
 23       UD   0.49

 24       KK   RT170  NORMAL DEPTH ROUTING TO S. MTN. ALIGNMENT
 25       RS      9    FLOW      -1
 26       RC    .05    .025     .05   10800  0.0078
 27       RX      0     999    1000    1001    1049    1050    1699    1700
 28       RY   1038    1038  1038.5  1037.5  1037.5  1038.5    1036    1040

 29       KK   CD171
 30       BA   0.65
 31       LS           81.0
 32       UD   1.58

 33       KK   AD171  ADD HYDS. 160, 170 AND 171
 34       HC      3

 35       KK   RT171  MUSKINGUM-CUNGE ROUTING HALFWAY THRU CD180
 36       RD   3100   0.002   0.025           TRAP      20       3

 37       KK   CD180
 38       BA   1.56
 39       LS           86.1
 40       UD   1.99
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  41      KK  RT180A  MODIFIED PULS ROUTING TO CD190  (STREET WEIR)
  42      RS       1    STOR       0
  43      SV       0       6      19      52     102
  44      SE  1032.9  1033.7  1034.0  1034.5  1035.0
  45      SQ       0       0     102    1178    3960
  46      KO       1

  47      KK  RT180B  NORMAL DEPTH ROUTING THRU CD190
  48      RS      14    FLOW      -1
  49      RC     .05     .03     .05    8800  0.0016
  50      RX     600     950    1000    1001    1049    1050    1200    1500
  51      RY  1030.7  1029.8    1030  1029.8  1029.8    1030  1028.9  1029.9

  52      KK   CD190
  53      BA    1.26
  54      LS              81
  55      UD    0.49

  56      KK   AD190  ADD HYDS. 180 AND 190
  57      HC       2

  58      KK   AD190  ADD HYDS. 160 THRU 190
  59      KO       1
  60      HC       2

  61      KK   DET08  MODIFIED PULS ROUTING THRU DETENTION AREA 08 - 2-8X6
  62      RS       1    STOR     0.0
  63      SV       0      45     123     251
  64      SE    1007    1010    1015    1018
  65      SQ       0     210     973    1340
  66      KO       1       2

  67      KK    RT06  MUSKINGUM-CUNGE ROUTING CD160+CD170+CD180+CD190 THRU CD240
  68      RD    2000   0.002   0.025            TRAP      20       3

  69      KK   CD240  (K)
  70      BA    0.29
  71      LS            81.0
  72      UD    0.91

  73      KK   AD240  COMBINE HYDS. CD160+CD170+CD180+CD190+CD240
  74      HC       2

  75      KK   RT240  MUSKINGUM-CUNGE ROUTING COMBINED HYDS. THRU CD260 to BASIN 07
  76      RD    3000   0.002   0.025            TRAP      20       3

  77      KK   CD260  (Q)
  78      BA    0.18
  79      LS              81
  80      UD    0.68
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  81      KK   AD260  COMBINE HYDS. CD160+CD170+CD180+CD190+CD240+CD260
  82      KO       1
  83      HC       2

  84      KK   CD270  (R)
  85      BA    0.22
  86      LS             81
  87      UD    1.67

  88      KK   AD270  ADD CD270 TO COMBINED HYDROGRAPHS
  89      HC       2
  90      KO       1

  91      KK   CD200 (M)
  92      PH           24.31    0.79    1.55    2.72    2.97    3.14    3.45    3.74    4.05
  93      BA    0.59
  94      LS           82.9
  95      UD    0.64

  96      KK  RT200A  NORMAL DEPTH ROUTING TO 19TH AND BASELINE
  97      RS       4    FLOW      -1
  98      RC     .05    .025     .05    5000  0.0087    1144
  99      RX     500     800    1000    1001    1020    1040    1150    1151
 100      RY    1146    1144    1142    1141    1140    1140    1142    1146

 101      KK  RT200B  KINEMATIC WAVE ROUTING TO 19TH AND SOUTHERN
 102      RK    5280  0.0070    0.05            TRAP      40      25

 103      KK   CD201
 104      BA    1.58
 105      LS           82.8
 106      UD    1.08

 107      KK   AD201  ADD HYDS. 200 AND 201
 108      HC       2

 109      KK   RT201  KINEMATIC WAVE ROUTING TO 35TH AND SOUTHERN
 110      RK   10500  0.0048    0.02            TRAP      40      25

 111      KK   CD202
 112      BA    1.40
 113      LS           81.6
 114      UD    2.30

 115      KK   CD203
 116      BA    2.03
 117      LS           82.0
 118      UD    2.70
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  119     KK   AD203  ADD HYDS. 200 THRU 203 AT CHAMPION DRAIN
  120     HC      3

  121     KK   RT203  MUSKINGUM-CUNGE ROUTING VIA CHAMPION DRAIN TO 43RD AVE
  122     RD
  123     RC   0.07   0.030   0.07   6300  0.0016
  124     RX   1300    1600   1980   2000    2010   2050   2350   2650
  125     RY   1030    1028   1028   1023    1023 1027.4   1025 1026.5

  126     KK   CD210  (L)  SOUTH MOUNTAIN PARK
  127     BA   1.97
  128     LS          94.9
  129     UD   0.38

  130     KK   RT210  MUSKINGUM-CUNGE ROUTING TO S. MTN. DETENTION AREA
  131     RD   4850   0.016   0.05            TRAP    200      5

  132     KK   CD211  SOUTH MOUNTAIN PARK
  133     BA   1.35
  134     LS          94.9
  135     UD   0.34

  136     KK   CD212  SOUTH MOUNTAIN PARK
  137     BA   0.81
  138     LS          94.9
  139     UD   0.51

  140     KK   AD212  ADD HYDS. 210 THRU 212
  141     HC      3

  142     KK   RT212A  Route (MODIFIED PULS) Thru South Mountain Detention Basin.
  143     KM         Volumes and rating curve modified 1-15-92
  144     RS      1    STOR     0.0
  145     SV      0      28      82     281     495     510     525     540     556     572
  146     SE   1292    1296    1300    1310    1318  1318.5    1319  1319.5    1320  1320.5
  147     SQ      0       0       0      73     102     222     433     710    1037    1408
  148     KO      1

  149     KK   RT212B  Route DA CD210 (Ignore 36" pipe in routing) to Central Ave.
  150     RD
  151     RC   0.07   0.040   0.07    600  0.0025
  152     RX      0       1     300     308     318     326     525     526
  153     RY   1310    1310    1305    1301    1301    1305    1310    1310

  154     KK   RT212C  Route DA CD210 Between Central and 7th Ave.
  155     RD
  156     RC   0.07   0.050   0.07   2000   0.019
  157     RX      0     100     300     323     343     346     745     746
  158     RY   1280    1270    1265    1262    1262    1265    1270    1270
```
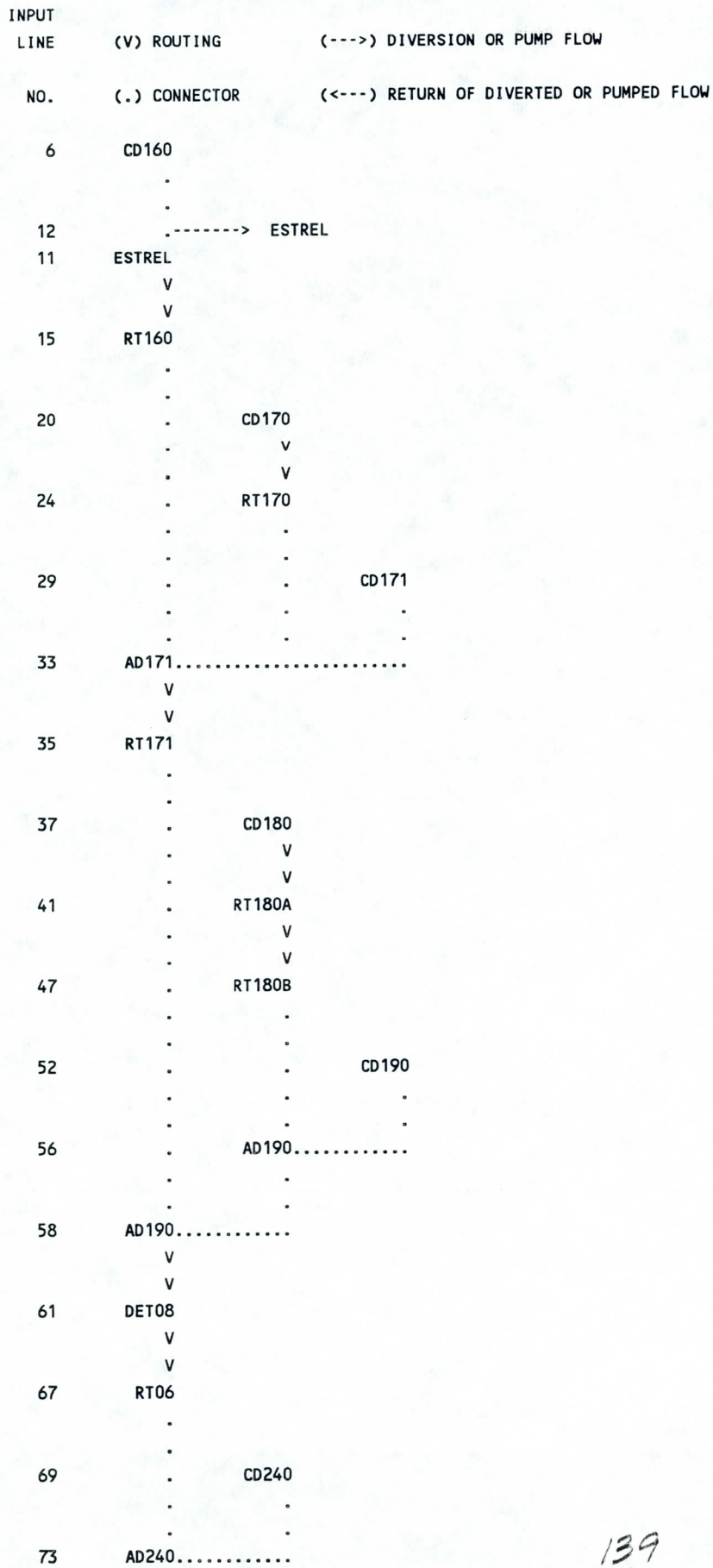
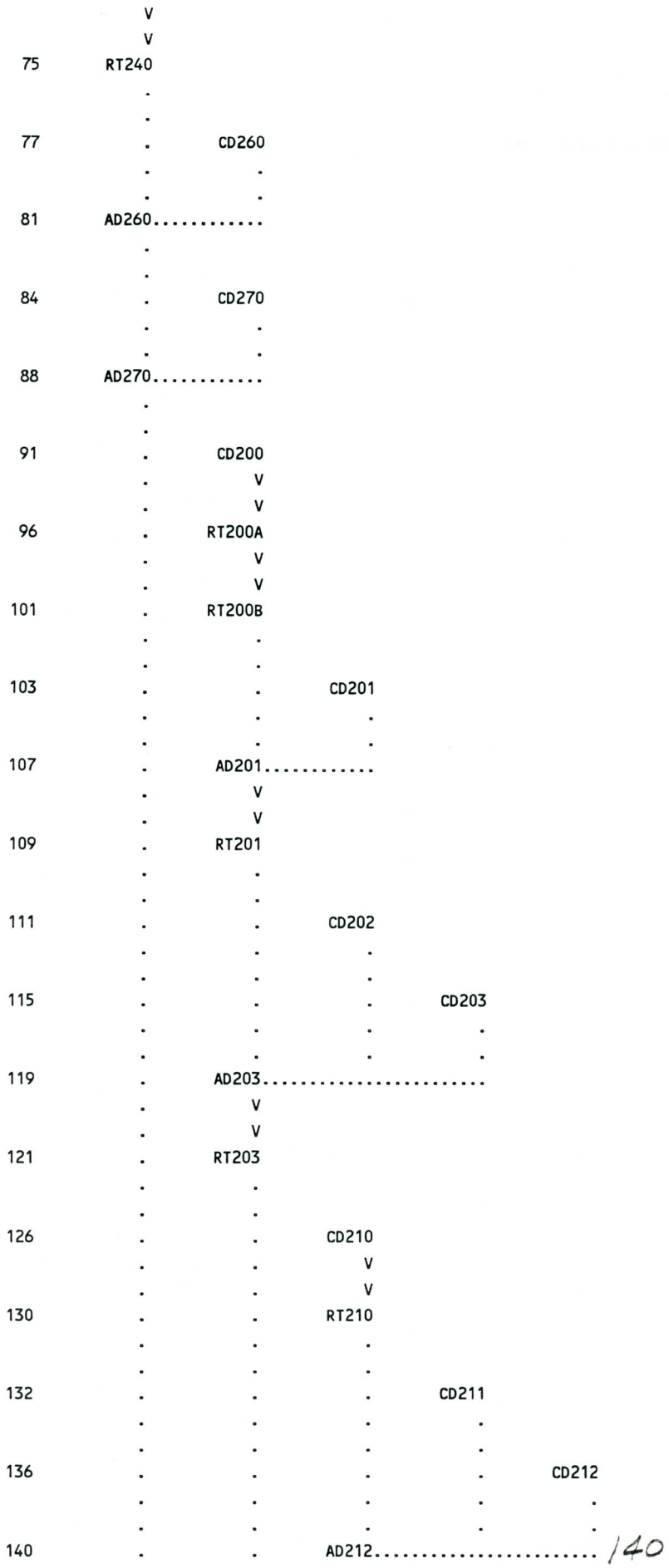

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  159     KK  RT212D  Route DA CD210 Overland flow to point N.
  160     RD
  161     RC    0.07    0.07    0.07   26050   0.008    1205
  162     RX       0       1     400     420     421     440     839     840
  163     RY    1200    1200    1198  1197.9  1197.9    1198    1200    1200

  164     KK   CD220  (N)
  165     BA    1.48
  166     LS           88.1
  167     UD    0.53

  168     KK   RT220  KINEMATIC WAVE ROUTING TO 27TH AND DOBBINS
  169     RK    5800  0.0079    0.04            TRAP      40      25

  170     KK   CD221
  171     BA    1.68
  172     LS           84.0
  173     UD    0.54

  174     KK   AD221  ADD HYDS. 220 AND 221
  175     HC       2

  176     KK   RT221  KINEMATIC WAVE ROUTING TO 27TH AND BASELINE
  177     RK    5140  0.0054    0.04            TRAP      40      50

  178     KK   CD222
  179     BA    1.23
  180     LS           81.0
  181     UD    1.63

  182     KK   AD222  ADD HYDS. 220 THRU 222
  183     HC       2

  184     KK   RT222  KINEMATIC WAVE DEPTH ROUTING TO 35TH AND BASELINE
  185     RK    5600  0.0046    0.04            TRAP      40      50

  186     KK   CD223
  187     BA    1.10
  188     LS           81.7
  189     UD    1.67

  190     KK   AD223  ADD HYDS. 220 THRU 223
  191     HC       2

  192     KK  RT223A  NORMAL DEPTH ROUTING TO 35TH AND SOUTHERN
  193     RS       3    FLOW      -1
  194     RC     .05     .03     .05    2600  0.0032
  195     RX     999    1000    1001    1050    1055    1060    1280    1650
  196     RY    1059    1056    1056    1055    1055  1055.8    1056    1058
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  197     KK  RT223B  MUSKINGUM-CUNGE ROUTING TO 43RD VIA CHAMPION DRAIN
  198     RC     .05     .03     .05    5200  0.0054
  199     RX    1300    1600    1980    2000    2010    2050    2350    2650
  200     RY    1030    1028    1028    1023    1023  1027.4    1025  1026.5

  201     KK  CD224
  202     BA    1.52
  203     LS            82.3
  204     UD    1.53

  205     KK  AD224  ADD HYDS. 220 THRU 224 PLUS 200 THRU 203 PLUS 210 THRU 212
  206     HC       4

  207     KK  RT224A  MODIFIED PULS ROUTING (STREET WEIR AT 43RD AVE.)
  208     RS       1    STOR       0
  209     SV       0     1.0     2.4    10.0    17.4    41.0    63.9
  210     SE  1019.4  1019.7    1020  1020.5    1021  1021.5    1022
  211     SQ       0       0      33     299     938    2546    6103

  212     KK  RT224B MODIFIED PULS ROUTING VIA CHAMPION DRAIN TO 51ST AND BASELINE
  213     RS       5    FLOW      -1       0
  214     SV       0      27      48      79     106     142     154
  215     SQ       0     500    1000    2000    3000    4500    5000

  216     KK  RT224C
  217     RS       3    FLOW      -1       0
  218     SV       0      34      50      79     104     138     149
  219     SQ       0     500    1000    2000    3000    4500    5000

  220     KK  RT224D
  221     RS       5    FLOW      -1       0
  222     SV       0      40      68     107     141     186     201
  223     SQ       0     500    1000    2000    3000    4500    5000

  224     KK  CD230
  225     BA    1.93
  226     LS            83.6
  227     UD    0.53

  228     KK  RT230  KINEMATIC WAVE ROUTING TO 43RD AND BASELINE
  229     RK   11800  0.0046    0.04            TRAP      30      50

  230     KK  CD231
  231     BA    1.45
  232     LS            81.5
  233     UD    2.20

  234     KK  AD231  ADD HYDS. 230 AND 231
  235     HC       2
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  236     KK   RT231  KINEMATIC WAVE ROUTING TO 51ST AND BASELINE
  237     RK    4950  0.0053    0.04           TRAP      10      50

  238     KK   CD232
  239     BA    2.15
  240     LS           81.1
  241     UD    2.61

  242     KK   AD232  ADD HYDS. 230 THRU 232
  243     HC       2

  244     KK   AD232  ADD HYDS 200 THRU 232
  245     HC       2

  246     KK  RT232A  MODIFIED PULS ROUTING VIA CHAMPION DRAIN TO S. MTN. ALIGNMENT
  247     RS       3    FLOW      -1       0
  248     SV       0      25      36      55      68     116     164
  249     SQ       0     500    1000    2000    3000    4500    6000

  250     KK  RT232B
  251     RS      11    FLOW      -1       0
  252     SV       0     110     169     264     343     438     533
  253     SQ       0     500    1000    2000    3000    4500    6000

  254     KK   CD250  (P)
  255     BA    1.99
  256     LS           81.5
  257     UD    2.40

  258     KK   AD250  ADD ALL HYDS. FROM TRADITIONAL CHAMPION DRAIN DRAINAGE AREA
  259     HC       2

  260     KK   ADTOT  ADD ALL HYDS.
  261     HC       2
  262     ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

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96 RT200A
101 RT200B
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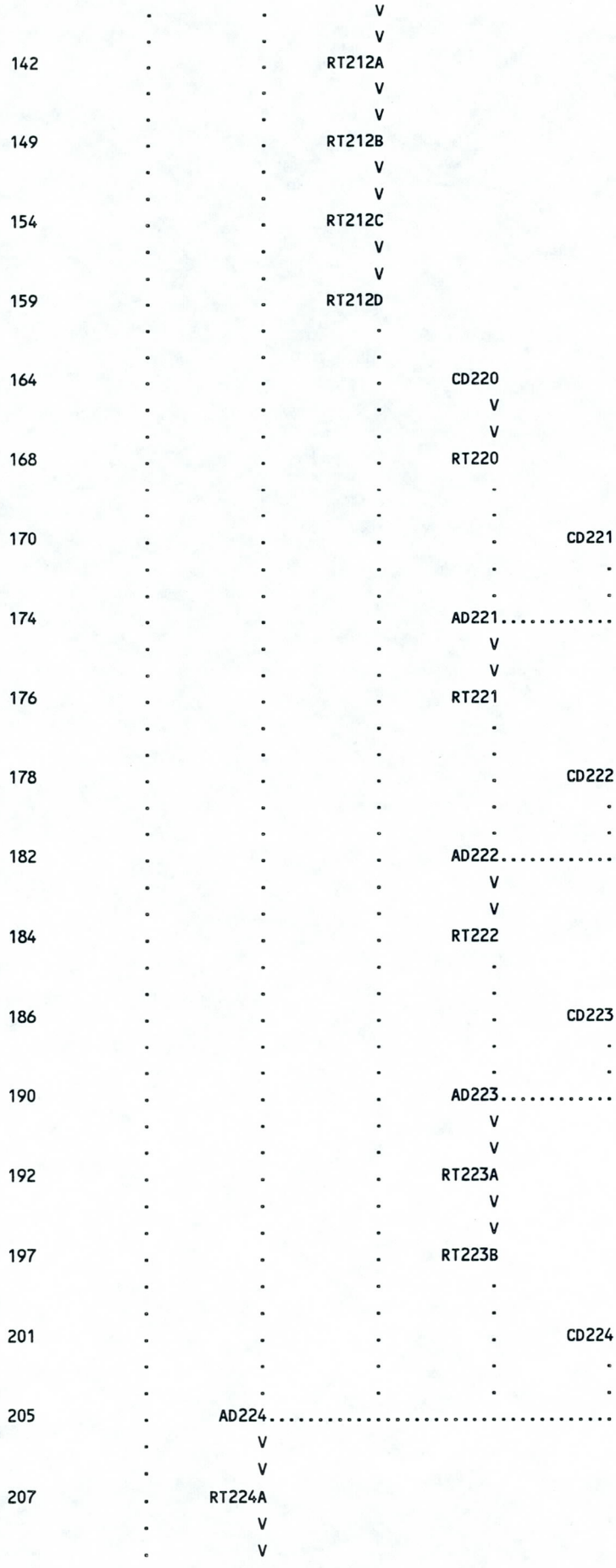
115 CD203
119 AD203
121 RT203
126 CD210
130 RT210
132 CD211
136 CD212
140 AD212
140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RT212B
RT212C
RT212D
CD220
RT220
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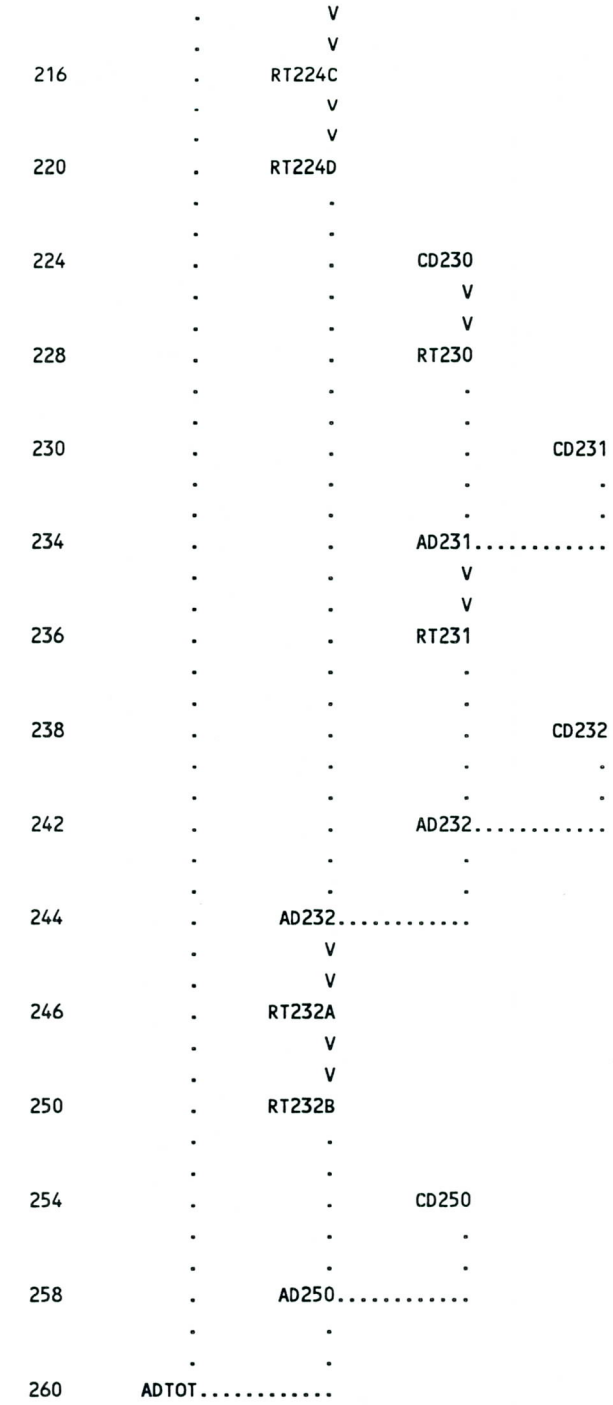

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*            SEPTEMBER 1990             *
*             VERSION 4.0               *
*                                       *
*  RUN DATE  02/21/1992  TIME  11:11:56 *
*                                       *
*****************************************
```


```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*        DAVIS, CALIFORNIA 95616        *
*           (916) 756-1104              *
*                                       *
*****************************************
```


PRICE ROAD PHASE II HYDROLOGY CHECK
SOUTH MOUNTAIN FREEWAY (51ST AVE TO SALT RIVER)
100-YEAR 24-HOUR STORM EVENT

5 IO OUTPUT CONTROL VARIABLES

IPRNT	3	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

NMIN		5	MINUTES IN COMPUTATION INTERVAL
IDATE	1	0	STARTING DATE
ITIME		0000	STARTING TIME
NQ		300	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	2	0	ENDING DATE
NDTIME		0055	ENDING TIME
ICENT		19	CENTURY MARK

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 24.92 HOURS

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-FEET
SURFACE AREA	ACRES
TEMPERATURE	DEGREES FAHRENHEIT

*** ***

```
**************
*            *
6 KK  *     CD160  *       (G)
*            *
**************
```

SUBBASIN RUNOFF DATA

```
 8 BA          SUBBASIN CHARACTERISTICS
                    TAREA          .97  SUBBASIN AREA

               PRECIPITATION DATA

 7 PH                              DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
               ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
               5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                 .79    1.55    2.72    2.97    3.14    3.45    3.74    4.05     .00     .00     .00     .00

                                                 STORM AREA =    6.68

 9 LS          SCS LOSS RATE
                    STRTL          .34  INITIAL ABSTRACTION
                   CRVNBR        85.30  CURVE NUMBER
                    RTIMP          .00  PERCENT IMPERVIOUS AREA

10 UD          SCS DIMENSIONLESS UNITGRAPH
                    TLAG          .52  LAG

                                                  ***

                                                 UNIT HYDROGRAPH
                                              33 END-OF-PERIOD ORDINATES
                  53.     156.     319.     540.     722.     821.     831.     782.     694.     581.
                 440.     337.     263.     210.     166.     129.     102.      80.      62.      49.
                  39.      30.      24.      19.      15.      12.       9.       8.       6.       5.
                   3.       2.       1.

    ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION    CD160

   TOTAL RAINFALL =    4.02, TOTAL LOSS =    1.52, TOTAL EXCESS =    2.50

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     24.92-HR
  1274.      12.58       (CFS)      239.         65.         63.         63.
                         (INCHES)  2.291       2.497       2.497       2.497
                         (AC-FT)    119.        129.        129.        129.

                        CUMULATIVE AREA =     .97 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
 11 KK      *    ESTREL  *       DIVERSION OF NATURAL DRAINAGE THRU ALIGN. AT ESTRELLA AVE.
            *            *
            **************

    DT          DIVERSION
                    ISTAD      ESTREL  DIVERSION HYDROGRAPH IDENTIFICATION

    DI             INFLOW         .00    255.00   2000.00
```

```
 DQ      DIVERTED FLOW          .00    255.00    255.00

                                                  ***

  ***           ***            ***           ***           ***

                    DIVERSION HYDROGRAPH   ESTREL

PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                    6-HR       24-HR       72-HR     24.92-HR
   255.      12.08          (CFS)      114.         34.         33.         33.
                           (INCHES)   1.090       1.296       1.296       1.296
                            (AC-FT)     56.         67.         67.         67.

                    CUMULATIVE AREA =     .97 SQ MI


  ***           ***            ***           ***           ***

                    HYDROGRAPH AT STATION   ESTREL

PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                    6-HR       24-HR       72-HR     24.92-HR
  1019.      12.58          (CFS)      125.         31.         30.         30.
                           (INCHES)   1.201       1.201       1.201       1.201
                            (AC-FT)     62.         62.         62.         62.

                    CUMULATIVE AREA =     .97 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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          *            *
 15 KK    *     RT160  *       NORMAL DEPTH ROUTING THRU A LINED CHANNEL
          *            *
          **************

             HYDROGRAPH ROUTING DATA

 16 RS         STORAGE ROUTING
                    NSTPS           1  NUMBER OF SUBREACHES
                     ITYP        FLOW  TYPE OF INITIAL CONDITION
                   RSVRIC       -1.00  INITIAL CONDITION
                        X         .00 WORKING R AND D COEFFICIENT

 17 RC         NORMAL DEPTH CHANNEL
                     ANL        .050  LEFT OVERBANK N-VALUE
                    ANCH        .018  MAIN CHANNEL N-VALUE
                     ANR        .050  RIGHT OVERBANK N-VALUE
                   RLNTH       3500.  REACH LENGTH
                     SEL       .0025  ENERGY SLOPE
                   ELMAX          .0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

                                  CROSS-SECTION DATA
                         --- LEFT OVERBANK --- + ------ MAIN CHANNEL ------- + --- RIGHT OVERBANK ---
 19 RY       ELEVATION   1035.00   1035.00   1035.00   1030.00   1030.00   1035.00   1035.00   1035.00
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18 RX DISTANCE .00 99.00 100.00 110.00 126.00 136.00 137.00 200.00

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COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	.00	.35	.72	1.12	1.53	1.97	2.43	2.91	3.42	3.95
OUTFLOW	.00	7.21	23.06	45.75	74.65	109.46	150.05	196.34	248.34	306.05
ELEVATION	1030.00	1030.26	1030.53	1030.79	1031.05	1031.32	1031.58	1031.84	1032.11	1032.37
STORAGE	4.50	5.07	5.66	6.28	6.92	7.58	8.26	8.97	9.70	10.45
OUTFLOW	369.54	438.87	514.10	595.34	682.67	776.18	875.98	982.18	1094.87	1214.22
ELEVATION	1032.63	1032.90	1033.16	1033.42	1033.68	1033.95	1034.21	1034.47	1034.74	1035.00

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HYDROGRAPH AT STATION RT160

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
982.	12.67	(CFS)	125.	31.	30.	30.
		(INCHES)	1.201	1.201	1.201	1.201
		(AC-FT)	62.	62.	62.	62.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.92-HR
9.	12.67	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.92-HR
1034.47	12.67	1030.77	1030.19	1030.19	1030.19

CUMULATIVE AREA = .97 SQ MI

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*            *
*     CD170  *       (H)
*            *
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20 KK

SUBBASIN RUNOFF DATA

21 BA SUBBASIN CHARACTERISTICS

TAREA 1.55 SUBBASIN AREA

PRECIPITATION DATA

7 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.79	1.55	2.72	2.97	3.14	3.45	3.74	4.05	.00	.00	.00	.00

STORM AREA = 6.68

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22 LS          SCS LOSS RATE
                     STRTL         .38  INITIAL ABSTRACTION
                    CRVNBR       84.20  CURVE NUMBER
                     RTIMP         .00  PERCENT IMPERVIOUS AREA

23 UD          SCS DIMENSIONLESS UNITGRAPH
                     TLAG         .49  LAG

                                                  ***

                                                UNIT HYDROGRAPH
                                            31 END-OF-PERIOD ORDINATES
              98.      290.      595.      990.     1284.     1400.     1394.     1256.     1083.      844.
             624.      481.      375.      294.      228.      177.      137.      105.       81.       63.
              49.       38.       29.       23.       18.       14.       12.        9.        6.        4.
               2.

    ***           ***           ***           ***           ***

                        HYDROGRAPH AT STATION    CD170

   TOTAL RAINFALL =    4.02, TOTAL LOSS =    1.61, TOTAL EXCESS =    2.40

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR       72-HR     24.92-HR
  2040.      12.58       (CFS)      368.        100.         96.         96.
                         (INCHES)  2.205       2.401       2.401       2.401
                         (AC-FT)    182.        198.        198.        198.

                        CUMULATIVE AREA =    1.55 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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          *             *
24 KK     *     RT170   *       NORMAL DEPTH ROUTING TO S. MTN. ALIGNMENT
          *             *
          ***************

             HYDROGRAPH ROUTING DATA

25 RS          STORAGE ROUTING
                     NSTPS          9  NUMBER OF SUBREACHES
                      ITYP       FLOW  TYPE OF INITIAL CONDITION
                     RSVRIC      -1.00  INITIAL CONDITION
                         X        .00 WORKING R AND D COEFFICIENT

26 RC          NORMAL DEPTH CHANNEL
                       ANL        .050  LEFT OVERBANK N-VALUE
                      ANCH        .025  MAIN CHANNEL N-VALUE
                       ANR        .050  RIGHT OVERBANK N-VALUE
                     RLNTH      10800.  REACH LENGTH
                       SEL       .0078  ENERGY SLOPE
                     ELMAX          .0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION
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CROSS-SECTION DATA

		--- LEFT OVERBANK ---		+ ------ MAIN CHANNEL		------- + ---	RIGHT OVERBANK ---		
28 RY	ELEVATION	1038.00	1038.00	1038.50	1037.50	1037.50	1038.50	1036.00	1040.00
27 RX	DISTANCE	.00	999.00	1000.00	1001.00	1049.00	1050.00	1699.00	1700.00

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COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	.00	1.43	5.71	12.85	22.85	35.71	51.42	69.99	93.62	120.44
OUTFLOW	.00	3.37	21.42	63.16	136.03	246.63	401.05	604.96	878.82	1236.10
ELEVATION	1036.00	1036.21	1036.42	1036.63	1036.84	1037.05	1037.26	1037.47	1037.68	1037.90
STORAGE	176.32	261.07	348.70	437.44	526.17	614.91	703.66	792.40	881.15	969.91
OUTFLOW	1737.45	2584.80	3731.20	5250.78	6999.77	8962.58	11127.34	13484.51	16026.21	18745.72
ELEVATION	1038.11	1038.32	1038.53	1038.74	1038.95	1039.16	1039.37	1039.58	1039.79	1040.00

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HYDROGRAPH AT STATION RT170

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
1377.	13.75	(CFS)	360.	98.	94.	94.
		(INCHES)	2.157	2.343	2.343	2.343
		(AC-FT)	178.	194.	194.	194.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
(AC-FT)	(HR)	6-HR	24-HR	72-HR	24.92-HR
15.	13.75	5.	1.	1.	1.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
(FEET)	(HR)	6-HR	24-HR	72-HR	24.92-HR
1037.95	13.75	1037.03	1036.38	1036.37	1036.37

CUMULATIVE AREA = 1.55 SQ MI

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          *             *
29 KK     *    CD171    *
          *             *
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SUBBASIN RUNOFF DATA

30 BA SUBBASIN CHARACTERISTICS

TAREA .65 SUBBASIN AREA

PRECIPITATION DATA

7 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			.... TP-40					.... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY

.79 1.55 2.72 2.97 3.14 3.45 3.74 4.05 .00 .00 .00 .00

STORM AREA = 6.68

31 LS SCS LOSS RATE

STRTL	.47	INITIAL ABSTRACTION
CRVNBR	81.00	CURVE NUMBER
RTIMP	.00	PERCENT IMPERVIOUS AREA

32 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	1.58	LAG

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UNIT HYDROGRAPH
97 END-OF-PERIOD ORDINATES

3.	6.	13.	20.	29.	39.	51.	63.	79.	96.
115.	133.	149.	163.	174.	183.	189.	192.	193.	193.
192.	188.	182.	176.	169.	161.	153.	144.	134.	122.
110.	100.	90.	83.	76.	70.	64.	59.	54.	50.
47.	43.	40.	37.	34.	31.	28.	26.	24.	22.
20.	19.	17.	16.	14.	13.	12.	11.	10.	9.
9.	8.	7.	7.	6.	6.	5.	5.	4.	4.
4.	3.	3.	3.	3.	2.	2.	2.	2.	2.
2.	2.	2.	1.	1.	1.	1.	1.	1.	1.
1.	1.	0.	0.	0.	0.	0.			

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HYDROGRAPH AT STATION CD171

TOTAL RAINFALL = 4.02, TOTAL LOSS = 1.88, TOTAL EXCESS = 2.13

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
312.	13.75	(CFS)	133.	37.	36.	36.
		(INCHES)	1.906	2.113	2.113	2.113
		(AC-FT)	66.	73.	73.	73.

CUMULATIVE AREA = .65 SQ MI

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*            *
*     AD171  *
*            *
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33 KK ADD HYDS. 160, 170 AND 171

34 HC HYDROGRAPH COMBINATION

ICOMP	3	NUMBER OF HYDROGRAPHS TO COMBINE

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*** *** *** *** ***

HYDROGRAPH AT STATION AD171

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
1718.	13.75	(CFS)	612.	166.	160.	160.
		(INCHES)	1.796	1.946	1.946	1.946
		(AC-FT)	304.	329.	329.	329.

CUMULATIVE AREA = 3.17 SQ MI

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35 KK RT171 MUSKINGUM-CUNGE ROUTING HALFWAY THRU CD180

HYDROGRAPH ROUTING DATA

36 RD MUSKINGUM-CUNGE CHANNEL ROUTING

L	3100.	CHANNEL LENGTH
S	.0020	SLOPE
N	.025	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	20.00	BOTTOM WIDTH OR DIAMETER
Z	3.00	SIDE SLOPE

***

COMPUTED MUSKINGUM-CUNGE PARAMETERS

COMPUTATION TIME STEP

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.52	1.48	5.00	1550.00	1712.19	830.00	1.94	8.31

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	.52	1.48	5.00	1712.19	830.00	1.94	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3291E+03 EXCESS= .0000E+00 OUTFLOW= .3285E+03 BASIN STORAGE= .1085E+01 PERCENT ERROR= -.1

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HYDROGRAPH AT STATION RT171

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
1712.	13.83	(CFS)	612.	166.	159.	159.

(INCHES)	1.794	1.942	1.942	1.942
(AC-FT)	303.	328.	328.	328.

CUMULATIVE AREA = 3.17 SQ MI

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*            *
*            *
*     CD180  *
*            *
*            *
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37 KK

SUBBASIN RUNOFF DATA

38 BA SUBBASIN CHARACTERISTICS

TAREA	1.56	SUBBASIN AREA

PRECIPITATION DATA

7 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.79	1.55	2.72	2.97	3.14	3.45	3.74	4.05	.00	.00	.00	.00

STORM AREA = 6.68

39 LS SCS LOSS RATE

STRTL	.32	INITIAL ABSTRACTION
CRVNBR	86.10	CURVE NUMBER
RTIMP	.00	PERCENT IMPERVIOUS AREA

40 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	1.99	LAG

***

UNIT HYDROGRAPH
121 END-OF-PERIOD ORDINATES

5.	9.	17.	28.	39.	52.	66.	83.	101.	121.
145.	170.	198.	227.	254.	278.	303.	320.	337.	349.
359.	367.	369.	370.	370.	368.	366.	356.	347.	337.
326.	315.	303.	291.	276.	261.	244.	226.	208.	193.
177.	165.	154.	144.	134.	125.	117.	110.	103.	97.
91.	86.	80.	75.	71.	66.	61.	57.	53.	50.
47.	44.	41.	38.	36.	34.	31.	29.	27.	26.
24.	22.	21.	19.	18.	17.	16.	15.	14.	13.
12.	12.	11.	10.	9.	9.	8.	8.	7.	7.
6.	6.	5.	5.	5.	5.	4.	4.	4.	4.
3.	3.	3.	3.	3.	3.	2.	2.	2.	2.
2.	2.	1.	1.	1.	1.	1.	1.	0.	0.
0.									

*** *** *** *** ***

HYDROGRAPH AT STATION CD180

TOTAL RAINFALL = 4.02, TOTAL LOSS = 1.45, TOTAL EXCESS = 2.57

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
751.	14.17	(CFS)	378.	106.	102.	102.
		(INCHES)	2.252	2.535	2.535	2.535
		(AC-FT)	187.	211.	211.	211.

CUMULATIVE AREA = 1.56 SQ MI

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          *            *
41 KK     *    RT180A  *       MODIFIED PULS ROUTING TO CD190  (STREET WEIR)
          *            *
          **************
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46 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

HYDROGRAPH ROUTING DATA

42 RS STORAGE ROUTING

NSTPS	1	NUMBER OF SUBREACHES
ITYP	STOR	TYPE OF INITIAL CONDITION
RSVRIC	.00	INITIAL CONDITION
X	.00	WORKING R AND D COEFFICIENT

43 SV	STORAGE	.0	6.0	19.0	52.0	102.0
44 SE	ELEVATION	1032.90	1033.70	1034.00	1034.50	1035.00
45 SQ	DISCHARGE	0.	0.	102.	1178.	3960.

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HYDROGRAPH AT STATION RT180A

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DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	1032.9	1		0820	101	0.	.0	1032.9	1		1640	201	273.	24.2	1034.1
1		0005	2	0.	.0	1032.9	1		0825	102	0.	.0	1032.9	1		1645	202	260.	23.8	1034.1
1		0010	3	0.	.0	1032.9	1		0830	103	0.	.0	1032.9	1		1650	203	248.	23.5	1034.1
1		0015	4	0.	.0	1032.9	1		0835	104	0.	.0	1032.9	1		1655	204	236.	23.1	1034.1
1		0020	5	0.	.0	1032.9	1		0840	105	0.	.0	1032.9	1		1700	205	225.	22.8	1034.1
1		0025	6	0.	.0	1032.9	1		0845	106	0.	.0	1032.9	1		1705	206	215.	22.5	1034.1
1		0030	7	0.	.0	1032.9	1		0850	107	0.	.0	1032.9	1		1710	207	205.	22.2	1034.0
1		0035	8	0.	.0	1032.9	1		0855	108	0.	.0	1032.9	1		1715	208	196.	21.9	1034.0

1	0040	9	0.	.0	1032.9	*	1	0900	109	0.	.0	1032.9	*	1	1720	209	187.	21.6	1034.0
1	0045	10	0.	.0	1032.9	*	1	0905	110	0.	.0	1032.9	*	1	1725	210	179.	21.4	1034.0
1	0050	11	0.	.0	1032.9	*	1	0910	111	0.	.0	1032.9	*	1	1730	211	171.	21.1	1034.0
1	0055	12	0.	.0	1032.9	*	1	0915	112	0.	.0	1032.9	*	1	1735	212	163.	20.9	1034.0
1	0100	13	0.	.0	1032.9	*	1	0920	113	0.	.0	1032.9	*	1	1740	213	156.	20.7	1034.0
1	0105	14	0.	.0	1032.9	*	1	0925	114	0.	.0	1032.9	*	1	1745	214	149.	20.5	1034.0
1	0110	15	0.	.0	1032.9	*	1	0930	115	0.	.0	1032.9	*	1	1750	215	143.	20.3	1034.0
1	0115	16	0.	.0	1032.9	*	1	0935	116	0.	.0	1032.9	*	1	1755	216	137.	20.1	1034.0
1	0120	17	0.	.0	1032.9	*	1	0940	117	0.	.0	1032.9	*	1	1800	217	131.	19.9	1034.0
1	0125	18	0.	.0	1032.9	*	1	0945	118	0.	.0	1032.9	*	1	1805	218	126.	19.7	1034.0
1	0130	19	0.	.0	1032.9	*	1	0950	119	0.	.0	1032.9	*	1	1810	219	121.	19.6	1034.0
1	0135	20	0.	.0	1032.9	*	1	0955	120	0.	.0	1032.9	*	1	1815	220	116.	19.4	1034.0
1	0140	21	0.	.0	1032.9	*	1	1000	121	0.	.0	1032.9	*	1	1820	221	111.	19.3	1034.0
1	0145	22	0.	.0	1032.9	*	1	1005	122	0.	.0	1032.9	*	1	1825	222	107.	19.1	1034.0
1	0150	23	0.	.0	1032.9	*	1	1010	123	0.	.0	1032.9	*	1	1830	223	103.	19.0	1034.0
1	0155	24	0.	.0	1032.9	*	1	1015	124	0.	.0	1032.9	*	1	1835	224	101.	18.9	1034.0
1	0200	25	0.	.0	1032.9	*	1	1020	125	0.	.0	1032.9	*	1	1840	225	100.	18.8	1034.0
1	0205	26	0.	.0	1032.9	*	1	1025	126	0.	.0	1032.9	*	1	1845	226	99.	18.6	1034.0
1	0210	27	0.	.0	1032.9	*	1	1030	127	0.	.0	1032.9	*	1	1850	227	98.	18.4	1034.0
1	0215	28	0.	.0	1032.9	*	1	1035	128	0.	.0	1032.9	*	1	1855	228	96.	18.3	1034.0
1	0220	29	0.	.0	1032.9	*	1	1040	129	0.	.0	1032.9	*	1	1900	229	95.	18.1	1034.0
1	0225	30	0.	.0	1032.9	*	1	1045	130	0.	.0	1032.9	*	1	1905	230	94.	17.9	1034.0
1	0230	31	0.	.0	1032.9	*	1	1050	131	0.	.0	1032.9	*	1	1910	231	92.	17.7	1034.0
1	0235	32	0.	.0	1032.9	*	1	1055	132	0.	.1	1032.9	*	1	1915	232	91.	17.6	1034.0
1	0240	33	0.	.0	1032.9	*	1	1100	133	0.	.1	1032.9	*	1	1920	233	89.	17.4	1034.0
1	0245	34	0.	.0	1032.9	*	1	1105	134	0.	.1	1032.9	*	1	1925	234	88.	17.2	1034.0
1	0250	35	0.	.0	1032.9	*	1	1110	135	0.	.1	1032.9	*	1	1930	235	86.	17.0	1034.0
1	0255	36	0.	.0	1032.9	*	1	1115	136	0.	.1	1032.9	*	1	1935	236	85.	16.8	1033.9
1	0300	37	0.	.0	1032.9	*	1	1120	137	0.	.2	1032.9	*	1	1940	237	83.	16.6	1033.9
1	0305	38	0.	.0	1032.9	*	1	1125	138	0.	.2	1032.9	*	1	1945	238	82.	16.4	1033.9
1	0310	39	0.	.0	1032.9	*	1	1130	139	0.	.2	1032.9	*	1	1950	239	80.	16.2	1033.9
1	0315	40	0.	.0	1032.9	*	1	1135	140	0.	.3	1032.9	*	1	1955	240	79.	16.0	1033.9
1	0320	41	0.	.0	1032.9	*	1	1140	141	0.	.3	1032.9	*	1	2000	241	77.	15.8	1033.9
1	0325	42	0.	.0	1032.9	*	1	1145	142	0.	.4	1033.0	*	1	2005	242	76.	15.6	1033.9
1	0330	43	0.	.0	1032.9	*	1	1150	143	0.	.5	1033.0	*	1	2010	243	74.	15.4	1033.9
1	0335	44	0.	.0	1032.9	*	1	1155	144	0.	.6	1033.0	*	1	2015	244	73.	15.3	1033.9
1	0340	45	0.	.0	1032.9	*	1	1200	145	0.	.7	1033.0	*	1	2020	245	71.	15.1	1033.9
1	0345	46	0.	.0	1032.9	*	1	1205	146	0.	.9	1033.0	*	1	2025	246	70.	14.9	1033.9
1	0350	47	0.	.0	1032.9	*	1	1210	147	0.	1.1	1033.0	*	1	2030	247	69.	14.7	1033.9
1	0355	48	0.	.0	1032.9	*	1	1215	148	0.	1.5	1033.1	*	1	2035	248	67.	14.6	1033.9
1	0400	49	0.	.0	1032.9	*	1	1220	149	0.	1.9	1033.2	*	1	2040	249	66.	14.4	1033.9
1	0405	50	0.	.0	1032.9	*	1	1225	150	0.	2.5	1033.2	*	1	2045	250	65.	14.2	1033.9
1	0410	51	0.	.0	1032.9	*	1	1230	151	0.	3.3	1033.3	*	1	2050	251	63.	14.1	1033.9
1	0415	52	0.	.0	1032.9	*	1	1235	152	0.	4.2	1033.5	*	1	2055	252	62.	13.9	1033.9
1	0420	53	0.	.0	1032.9	*	1	1240	153	0.	5.3	1033.6	*	1	2100	253	61.	13.7	1033.9
1	0425	54	0.	.0	1032.9	*	1	1245	154	5.	6.7	1033.7	*	1	2105	254	60.	13.6	1033.9
1	0430	55	0.	.0	1032.9	*	1	1250	155	18.	8.3	1033.8	*	1	2110	255	58.	13.4	1033.9
1	0435	56	0.	.0	1032.9	*	1	1255	156	31.	10.0	1033.8	*	1	2115	256	57.	13.3	1033.9
1	0440	57	0.	.0	1032.9	*	1	1300	157	47.	12.0	1033.8	*	1	2120	257	56.	13.2	1033.9
1	0445	58	0.	.0	1032.9	*	1	1305	158	64.	14.1	1033.9	*	1	2125	258	55.	13.0	1033.9
1	0450	59	0.	.0	1032.9	*	1	1310	159	82.	16.5	1033.9	*	1	2130	259	54.	12.9	1033.9
1	0455	60	0.	.0	1032.9	*	1	1315	160	105.	19.1	1034.0	*	1	2135	260	53.	12.7	1033.9
1	0500	61	0.	.0	1032.9	*	1	1320	161	188.	21.6	1034.0	*	1	2140	261	52.	12.6	1033.9
1	0505	62	0.	.0	1032.9	*	1	1325	162	263.	23.9	1034.1	*	1	2145	262	51.	12.5	1033.8
1	0510	63	0.	.0	1032.9	*	1	1330	163	331.	26.0	1034.1	*	1	2150	263	50.	12.3	1033.8
1	0515	64	0.	.0	1032.9	*	1	1335	164	393.	27.9	1034.1	*	1	2155	264	49.	12.2	1033.8
1	0520	65	0.	.0	1032.9	*	1	1340	165	449.	29.6	1034.2	*	1	2200	265	48.	12.1	1033.8
1	0525	66	0.	.0	1032.9	*	1	1345	166	498.	31.1	1034.2	*	1	2205	266	47.	12.0	1033.8
1	0530	67	0.	.0	1032.9	*	1	1350	167	542.	32.5	1034.2	*	1	2210	267	46.	11.9	1033.8
1	0535	68	0.	.0	1032.9	*	1	1355	168	580.	33.7	1034.2	*	1	2215	268	45.	11.7	1033.8

1	0540	69	0.	.0	1032.9	*	1	1400	169	612.	34.7	1034.2	*	1	2220	269	44.	11.6	1033.8
1	0545	70	0.	.0	1032.9	*	1	1405	170	640.	35.5	1034.2	*	1	2225	270	43.	11.5	1033.8
1	0550	71	0.	.0	1032.9	*	1	1410	171	662.	36.2	1034.3	*	1	2230	271	42.	11.4	1033.8
1	0555	72	0.	.0	1032.9	*	1	1415	172	680.	36.7	1034.3	*	1	2235	272	42.	11.3	1033.8
1	0600	73	0.	.0	1032.9	*	1	1420	173	692.	37.1	1034.3	*	1	2240	273	41.	11.2	1033.8
1	0605	74	0.	.0	1032.9	*	1	1425	174	701.	37.4	1034.3	*	1	2245	274	40.	11.1	1033.8
1	0610	75	0.	.0	1032.9	*	1	1430	175	705.	37.5	1034.3	*	1	2250	275	39.	11.0	1033.8
1	0615	76	0.	.0	1032.9	*	1	1435	176	705.	37.5	1034.3	*	1	2255	276	39.	10.9	1033.8
1	0620	77	0.	.0	1032.9	*	1	1440	177	702.	37.4	1034.3	*	1	2300	277	38.	10.9	1033.8
1	0625	78	0.	.0	1032.9	*	1	1445	178	696.	37.2	1034.3	*	1	2305	278	37.	10.8	1033.8
1	0630	79	0.	.0	1032.9	*	1	1450	179	687.	36.9	1034.3	*	1	2310	279	37.	10.7	1033.8
1	0635	80	0.	.0	1032.9	*	1	1455	180	675.	36.6	1034.3	*	1	2315	280	36.	10.6	1033.8
1	0640	81	0.	.0	1032.9	*	1	1500	181	660.	36.1	1034.3	*	1	2320	281	36.	10.5	1033.8
1	0645	82	0.	.0	1032.9	*	1	1505	182	643.	35.6	1034.3	*	1	2325	282	35.	10.5	1033.8
1	0650	83	0.	.0	1032.9	*	1	1510	183	624.	35.0	1034.2	*	1	2330	283	35.	10.4	1033.8
1	0655	84	0.	.0	1032.9	*	1	1515	184	603.	34.4	1034.2	*	1	2335	284	34.	10.3	1033.8
1	0700	85	0.	.0	1032.9	*	1	1520	185	580.	33.7	1034.2	*	1	2340	285	33.	10.3	1033.8
1	0705	86	0.	.0	1032.9	*	1	1525	186	557.	32.9	1034.2	*	1	2345	286	33.	10.2	1033.8
1	0710	87	0.	.0	1032.9	*	1	1530	187	533.	32.2	1034.2	*	1	2350	287	32.	10.1	1033.8
1	0715	88	0.	.0	1032.9	*	1	1535	188	509.	31.5	1034.2	*	1	2355	288	32.	10.1	1033.8
1	0720	89	0.	.0	1032.9	*	1	1540	189	486.	30.8	1034.2	*	2	0000	289	32.	10.0	1033.8
1	0725	90	0.	.0	1032.9	*	1	1545	190	463.	30.1	1034.2	*	2	0005	290	31.	10.0	1033.8
1	0730	91	0.	.0	1032.9	*	1	1550	191	441.	29.4	1034.2	*	2	0010	291	31.	9.9	1033.8
1	0735	92	0.	.0	1032.9	*	1	1555	192	420.	28.8	1034.1	*	2	0015	292	30.	9.9	1033.8
1	0740	93	0.	.0	1032.9	*	1	1600	193	400.	28.1	1034.1	*	2	0020	293	30.	9.8	1033.8
1	0745	94	0.	.0	1032.9	*	1	1605	194	381.	27.6	1034.1	*	2	0025	294	29.	9.8	1033.8
1	0750	95	0.	.0	1032.9	*	1	1610	195	363.	27.0	1034.1	*	2	0030	295	29.	9.7	1033.8
1	0755	96	0.	.0	1032.9	*	1	1615	196	346.	26.5	1034.1	*	2	0035	296	29.	9.7	1033.8
1	0800	97	0.	.0	1032.9	*	1	1620	197	330.	26.0	1034.1	*	2	0040	297	28.	9.6	1033.8
1	0805	98	0.	.0	1032.9	*	1	1625	198	314.	25.5	1034.1	*	2	0045	298	28.	9.6	1033.8
1	0810	99	0.	.0	1032.9	*	1	1630	199	300.	25.1	1034.1	*	2	0050	299	28.	9.5	1033.8
1	0815	100	0.	.0	1032.9	*	1	1635	200	286.	24.6	1034.1	*	2	0055	300	27.	9.5	1033.8
						*							*						

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PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
705.	14.58	(CFS)	354.	102.	98.	98.
		(INCHES)	2.108	2.421	2.421	2.421
		(AC-FT)	175.	201.	201.	201.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.92-HR
38.	14.58	27.	10.	10.	10.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.92-HR
1034.28	14.58	1034.12	1033.46	1033.44	1033.44

CUMULATIVE AREA = 1.56 SQ MI

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* *
47 KK * RT180B * NORMAL DEPTH ROUTING THRU CD190

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HYDROGRAPH ROUTING DATA

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48 RS          STORAGE ROUTING
                    NSTPS          14  NUMBER OF SUBREACHES
                    ITYP         FLOW  TYPE OF INITIAL CONDITION
                   RSVRIC       -1.00  INITIAL CONDITION
                        X         .00 WORKING R AND D COEFFICIENT

49 RC          NORMAL DEPTH CHANNEL
                     ANL         .050  LEFT OVERBANK N-VALUE
                    ANCH         .030  MAIN CHANNEL N-VALUE
                     ANR         .050  RIGHT OVERBANK N-VALUE
                   RLNTH        8800.  REACH LENGTH
                     SEL        .0016  ENERGY SLOPE
                   ELMAX           .0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION
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CROSS-SECTION DATA

		--- LEFT OVERBANK ---		+ ------ MAIN CHANNEL -------			+ --- RIGHT OVERBANK ---		
51 RY	ELEVATION	1030.70	1029.80	1030.00	1029.80	1029.80	1030.00	1028.90	1029.90
50 RX	DISTANCE	600.00	950.00	1000.00	1001.00	1049.00	1050.00	1200.00	1500.00

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COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	.00	.40	1.58	3.56	6.33	9.89	14.24	19.38	25.31	32.04
OUTFLOW	.00	.31	1.94	5.72	12.32	22.33	36.31	54.78	78.21	107.06
ELEVATION	1028.90	1028.99	1029.09	1029.18	1029.28	1029.37	1029.47	1029.56	1029.66	1029.75
STORAGE	40.16	50.50	62.30	74.94	88.28	102.33	117.09	132.55	148.71	165.58
OUTFLOW	142.46	190.96	255.86	334.65	424.46	525.34	637.40	760.81	895.73	1042.36
ELEVATION	1029.85	1029.94	1030.04	1030.13	1030.23	1030.32	1030.42	1030.51	1030.61	1030.70

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HYDROGRAPH AT STATION RT180B

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
645.	16.33	(CFS)	330.	94.	91.	91.
		(INCHES)	1.967	2.241	2.241	2.241
		(AC-FT)	164.	186.	186.	186.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.92-HR
8.	16.33	5.	2.	1.	1.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.92-HR
1030.42	16.33	1030.09	1029.31	1029.30	1029.30

CUMULATIVE AREA = 1.56 SQ MI

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          *            *
52 KK     *     CD190  *
          *            *
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SUBBASIN RUNOFF DATA

53 BA SUBBASIN CHARACTERISTICS

TAREA	1.26	SUBBASIN AREA

PRECIPITATION DATA

7 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.79	1.55	2.72	2.97	3.14	3.45	3.74	4.05	.00	.00	.00	.00

STORM AREA = 6.68

54 LS SCS LOSS RATE

STRTL	.47	INITIAL ABSTRACTION
CRVNBR	81.00	CURVE NUMBER
RTIMP	.00	PERCENT IMPERVIOUS AREA

55 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	.49	LAG

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UNIT HYDROGRAPH
31 END-OF-PERIOD ORDINATES

80.	236.	483.	805.	1044.	1138.	1133.	1021.	881.	686.
507.	391.	305.	239.	185.	144.	111.	85.	66.	51.
40.	31.	24.	18.	14.	12.	9.	7.	5.	3.
2.									

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HYDROGRAPH AT STATION CD190

TOTAL RAINFALL = 4.02, TOTAL LOSS = 1.88, TOTAL EXCESS = 2.13

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
1469.	12.58	(CFS)	266.	72.	70.	70.
		(INCHES)	1.961	2.133	2.133	2.133
		(AC-FT)	132.	143.	143.	143.

CUMULATIVE AREA = 1.26 SQ MI

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          *            *
56 KK     *    AD190   *       ADD HYDS. 180 AND 190
          *            *
          **************

57 HC          HYDROGRAPH COMBINATION
                    ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                        ***

    ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION    AD190

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR       72-HR      24.92-HR
  1469.      12.58       (CFS)      481.        166.        160.         160.
                        (INCHES)   1.586       2.193       2.193        2.193
                        (AC-FT)    239.        330.        330.         330.

                     CUMULATIVE AREA =    2.82 SQ MI


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          *            *
58 KK     *    AD190   *       ADD HYDS. 160 THRU 190
          *            *
          **************

59 KO          OUTPUT CONTROL VARIABLES
                    IPRNT          1  PRINT CONTROL
                    IPLOT          0  PLOT CONTROL
                    QSCAL          0.  HYDROGRAPH PLOT SCALE

60 HC          HYDROGRAPH COMBINATION
                    ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                        ***

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                                     HYDROGRAPH AT STATION    AD190
                                   SUM OF  2 HYDROGRAPHS

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                          *                          *                          *                          *
 DA MON HRMN  ORD   FLOW  *  DA MON HRMN  ORD   FLOW  *  DA MON HRMN  ORD   FLOW  *  DA MON HRMN  ORD   FLOW
                          *                          *                          *                          *
  1    0000    1     0.   *   1    0615   76     0.   *   1    1230   151   1867.  *   1    1845   226   366.
  1    0005    2     0.   *   1    0620   77     0.   *   1    1235   152   2212.  *   1    1850   227   355.
  1    0010    3     0.   *   1    0625   78     0.   *   1    1240   153   2376.  *   1    1855   228   346.
  1    0015    4     0.   *   1    0630   79     0.   *   1    1245   154   2380.  *   1    1900   229   337.
  1    0020    5     0.   *   1    0635   80     0.   *   1    1250   155   2252.  *   1    1905   230   328.
  1    0025    6     0.   *   1    0640   81     0.   *   1    1255   156   2067.  *   1    1910   231   320.
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1	0030	7	0.	*	1	0645	82	0.	*	1	1300	157	1894.	*	1	1915	232	311.
1	0035	8	0.	*	1	0650	83	0.	*	1	1305	158	1776.	*	1	1920	233	303.
1	0040	9	0.	*	1	0655	84	0.	*	1	1310	159	1737.	*	1	1925	234	294.
1	0045	10	0.	*	1	0700	85	0.	*	1	1315	160	1769.	*	1	1930	235	287.
1	0050	11	0.	*	1	0705	86	0.	*	1	1320	161	1838.	*	1	1935	236	280.
1	0055	12	0.	*	1	0710	87	0.	*	1	1325	162	1904.	*	1	1940	237	273.
1	0100	13	0.	*	1	0715	88	0.	*	1	1330	163	1938.	*	1	1945	238	267.
1	0105	14	0.	*	1	0720	89	0.	*	1	1335	164	1938.	*	1	1950	239	261.
1	0110	15	0.	*	1	0725	90	0.	*	1	1340	165	1925.	*	1	1955	240	255.
1	0115	16	0.	*	1	0730	91	0.	*	1	1345	166	1911.	*	1	2000	241	249.
1	0120	17	0.	*	1	0735	92	0.	*	1	1350	167	1889.	*	1	2005	242	243.
1	0125	18	0.	*	1	0740	93	0.	*	1	1355	168	1848.	*	1	2010	243	238.
1	0130	19	0.	*	1	0745	94	0.	*	1	1400	169	1776.	*	1	2015	244	232.
1	0135	20	0.	*	1	0750	95	0.	*	1	1405	170	1661.	*	1	2020	245	226.
1	0140	21	0.	*	1	0755	96	0.	*	1	1410	171	1511.	*	1	2025	246	221.
1	0145	22	0.	*	1	0800	97	0.	*	1	1415	172	1360.	*	1	2030	247	216.
1	0150	23	0.	*	1	0805	98	0.	*	1	1420	173	1230.	*	1	2035	248	211.
1	0155	24	0.	*	1	0810	99	0.	*	1	1425	174	1118.	*	1	2040	249	206.
1	0200	25	0.	*	1	0815	100	0.	*	1	1430	175	1017.	*	1	2045	250	202.
1	0205	26	0.	*	1	0820	101	0.	*	1	1435	176	925.	*	1	2050	251	197.
1	0210	27	0.	*	1	0825	102	0.	*	1	1440	177	843.	*	1	2055	252	193.
1	0215	28	0.	*	1	0830	103	0.	*	1	1445	178	770.	*	1	2100	253	189.
1	0220	29	0.	*	1	0835	104	0.	*	1	1450	179	706.	*	1	2105	254	185.
1	0225	30	0.	*	1	0840	105	0.	*	1	1455	180	651.	*	1	2110	255	181.
1	0230	31	0.	*	1	0845	106	0.	*	1	1500	181	603.	*	1	2115	256	178.
1	0235	32	0.	*	1	0850	107	0.	*	1	1505	182	561.	*	1	2120	257	174.
1	0240	33	0.	*	1	0855	108	0.	*	1	1510	183	525.	*	1	2125	258	171.
1	0245	34	0.	*	1	0900	109	0.	*	1	1515	184	501.	*	1	2130	259	168.
1	0250	35	0.	*	1	0905	110	0.	*	1	1520	185	493.	*	1	2135	260	164.
1	0255	36	0.	*	1	0910	111	0.	*	1	1525	186	508.	*	1	2140	261	162.
1	0300	37	0.	*	1	0915	112	0.	*	1	1530	187	547.	*	1	2145	262	159.
1	0305	38	0.	*	1	0920	113	0.	*	1	1535	188	607.	*	1	2150	263	156.
1	0310	39	0.	*	1	0925	114	0.	*	1	1540	189	683.	*	1	2155	264	153.
1	0315	40	0.	*	1	0930	115	0.	*	1	1545	190	755.	*	1	2200	265	151.
1	0320	41	0.	*	1	0935	116	0.	*	1	1550	191	812.	*	1	2205	266	148.
1	0325	42	0.	*	1	0940	117	0.	*	1	1555	192	853.	*	1	2210	267	146.
1	0330	43	0.	*	1	0945	118	0.	*	1	1600	193	878.	*	1	2215	268	144.
1	0335	44	0.	*	1	0950	119	0.	*	1	1605	194	890.	*	1	2220	269	142.
1	0340	45	0.	*	1	0955	120	0.	*	1	1610	195	894.	*	1	2225	270	140.
1	0345	46	0.	*	1	1000	121	0.	*	1	1615	196	890.	*	1	2230	271	138.
1	0350	47	0.	*	1	1005	122	0.	*	1	1620	197	881.	*	1	2235	272	136.
1	0355	48	0.	*	1	1010	123	0.	*	1	1625	198	868.	*	1	2240	273	134.
1	0400	49	0.	*	1	1015	124	0.	*	1	1630	199	852.	*	1	2245	274	132.
1	0405	50	0.	*	1	1020	125	0.	*	1	1635	200	833.	*	1	2250	275	130.
1	0410	51	0.	*	1	1025	126	0.	*	1	1640	201	813.	*	1	2255	276	129.
1	0415	52	0.	*	1	1030	127	0.	*	1	1645	202	792.	*	1	2300	277	127.
1	0420	53	0.	*	1	1035	128	0.	*	1	1650	203	769.	*	1	2305	278	125.
1	0425	54	0.	*	1	1040	129	0.	*	1	1655	204	746.	*	1	2310	279	124.
1	0430	55	0.	*	1	1045	130	0.	*	1	1700	205	723.	*	1	2315	280	122.
1	0435	56	0.	*	1	1050	131	0.	*	1	1705	206	700.	*	1	2320	281	121.
1	0440	57	0.	*	1	1055	132	1.	*	1	1710	207	678.	*	1	2325	282	119.
1	0445	58	0.	*	1	1100	133	1.	*	1	1715	208	656.	*	1	2330	283	118.
1	0450	59	0.	*	1	1105	134	2.	*	1	1720	209	634.	*	1	2335	284	116.
1	0455	60	0.	*	1	1110	135	3.	*	1	1725	210	613.	*	1	2340	285	114.
1	0500	61	0.	*	1	1115	136	4.	*	1	1730	211	592.	*	1	2345	286	113.
1	0505	62	0.	*	1	1120	137	6.	*	1	1735	212	572.	*	1	2350	287	111.
1	0510	63	0.	*	1	1125	138	8.	*	1	1740	213	553.	*	1	2355	288	110.
1	0515	64	0.	*	1	1130	139	10.	*	1	1745	214	535.	*	2	0000	289	108.
1	0520	65	0.	*	1	1135	140	14.	*	1	1750	215	518.	*	2	0005	290	107.
1	0525	66	0.	*	1	1140	141	21.	*	1	1755	216	501.	*	2	0010	291	105.

1	0530	67	0.	*	1	1145	142	33.	*	1	1800	217	485.	*	2	0015	292	103.
1	0535	68	0.	*	1	1150	143	54.	*	1	1805	218	469.	*	2	0020	293	101.
1	0540	69	0.	*	1	1155	144	89.	*	1	1810	219	454.	*	2	0025	294	98.
1	0545	70	0.	*	1	1200	145	151.	*	1	1815	220	440.	*	2	0030	295	95.
1	0550	71	0.	*	1	1205	146	276.	*	1	1820	221	427.	*	2	0035	296	93.
1	0555	72	0.	*	1	1210	147	470.	*	1	1825	222	414.	*	2	0040	297	90.
1	0600	73	0.	*	1	1215	148	734.	*	1	1830	223	401.	*	2	0045	298	88.
1	0605	74	0.	*	1	1220	149	1041.	*	1	1835	224	389.	*	2	0050	299	86.
1	0610	75	0.	*	1	1225	150	1423.	*	1	1840	225	377.	*	2	0055	300	84.
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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
2380.	12.75	(CFS)	1091.	332.	320.	320.
		(INCHES)	1.693	2.060	2.060	2.060
		(AC-FT)	541.	658.	658.	658.

CUMULATIVE AREA = 5.99 SQ MI

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          *            *
61 KK     *     DET08  *       MODIFIED PULS ROUTING THRU DETENTION AREA 08 - 2-8X6
          *            *
          **************

66 KO          OUTPUT CONTROL VARIABLES
                    IPRNT          1  PRINT CONTROL
                    IPLOT          2  PLOT CONTROL
                    QSCAL          0.  HYDROGRAPH PLOT SCALE

               HYDROGRAPH ROUTING DATA

62 RS          STORAGE ROUTING
                    NSTPS          1  NUMBER OF SUBREACHES
                     ITYP       STOR  TYPE OF INITIAL CONDITION
                   RSVRIC        .00  INITIAL CONDITION
                        X        .00 WORKING R AND D COEFFICIENT

63 SV            STORAGE          .0      45.0     123.0     251.0

64 SE          ELEVATION     1007.00   1010.00   1015.00   1018.00

65 SQ          DISCHARGE          0.      210.      973.     1340.

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HYDROGRAPH AT STATION DET08

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DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
							*								*							

						*								*					
1	0000	1	0.	.0	1007.0	*	1	0820	101	0.	.0	1007.0	*	1	1640	201	989.	128.5	1015.1
1	0005	2	0.	.0	1007.0	*	1	0825	102	0.	.0	1007.0	*	1	1645	202	985.	127.3	1015.1
1	0010	3	0.	.0	1007.0	*	1	0830	103	0.	.0	1007.0	*	1	1650	203	981.	125.9	1015.1
1	0015	4	0.	.0	1007.0	*	1	0835	104	0.	.0	1007.0	*	1	1655	204	977.	124.3	1015.0
1	0020	5	0.	.0	1007.0	*	1	0840	105	0.	.0	1007.0	*	1	1700	205	970.	122.7	1015.0
1	0025	6	0.	.0	1007.0	*	1	0845	106	0.	.0	1007.0	*	1	1705	206	953.	121.0	1014.9
1	0030	7	0.	.0	1007.0	*	1	0850	107	0.	.0	1007.0	*	1	1710	207	936.	119.2	1014.8
1	0035	8	0.	.0	1007.0	*	1	0855	108	0.	.0	1007.0	*	1	1715	208	918.	117.4	1014.6
1	0040	9	0.	.0	1007.0	*	1	0900	109	0.	.0	1007.0	*	1	1720	209	900.	115.6	1014.5
1	0045	10	0.	.0	1007.0	*	1	0905	110	0.	.0	1007.0	*	1	1725	210	882.	113.7	1014.4
1	0050	11	0.	.0	1007.0	*	1	0910	111	0.	.0	1007.0	*	1	1730	211	864.	111.9	1014.3
1	0055	12	0.	.0	1007.0	*	1	0915	112	0.	.0	1007.0	*	1	1735	212	846.	110.0	1014.2
1	0100	13	0.	.0	1007.0	*	1	0920	113	0.	.0	1007.0	*	1	1740	213	827.	108.1	1014.0
1	0105	14	0.	.0	1007.0	*	1	0925	114	0.	.0	1007.0	*	1	1745	214	809.	106.2	1013.9
1	0110	15	0.	.0	1007.0	*	1	0930	115	0.	.0	1007.0	*	1	1750	215	790.	104.3	1013.8
1	0115	16	0.	.0	1007.0	*	1	0935	116	0.	.0	1007.0	*	1	1755	216	772.	102.5	1013.7
1	0120	17	0.	.0	1007.0	*	1	0940	117	0.	.0	1007.0	*	1	1800	217	754.	100.6	1013.6
1	0125	18	0.	.0	1007.0	*	1	0945	118	0.	.0	1007.0	*	1	1805	218	736.	98.8	1013.4
1	0130	19	0.	.0	1007.0	*	1	0950	119	0.	.0	1007.0	*	1	1810	219	718.	96.9	1013.3
1	0135	20	0.	.0	1007.0	*	1	0955	120	0.	.0	1007.0	*	1	1815	220	700.	95.1	1013.2
1	0140	21	0.	.0	1007.0	*	1	1000	121	0.	.0	1007.0	*	1	1820	221	683.	93.3	1013.1
1	0145	22	0.	.0	1007.0	*	1	1005	122	0.	.0	1007.0	*	1	1825	222	666.	91.6	1013.0
1	0150	23	0.	.0	1007.0	*	1	1010	123	0.	.0	1007.0	*	1	1830	223	649.	89.9	1012.9
1	0155	24	0.	.0	1007.0	*	1	1015	124	0.	.0	1007.0	*	1	1835	224	632.	88.2	1012.8
1	0200	25	0.	.0	1007.0	*	1	1020	125	0.	.0	1007.0	*	1	1840	225	616.	86.5	1012.7
1	0205	26	0.	.0	1007.0	*	1	1025	126	0.	.0	1007.0	*	1	1845	226	600.	84.9	1012.6
1	0210	27	0.	.0	1007.0	*	1	1030	127	0.	.0	1007.0	*	1	1850	227	585.	83.3	1012.5
1	0215	28	0.	.0	1007.0	*	1	1035	128	0.	.0	1007.0	*	1	1855	228	569.	81.7	1012.4
1	0220	29	0.	.0	1007.0	*	1	1040	129	0.	.0	1007.0	*	1	1900	229	555.	80.2	1012.3
1	0225	30	0.	.0	1007.0	*	1	1045	130	0.	.0	1007.0	*	1	1905	230	540.	78.7	1012.2
1	0230	31	0.	.0	1007.0	*	1	1050	131	0.	.0	1007.0	*	1	1910	231	526.	77.3	1012.1
1	0235	32	0.	.0	1007.0	*	1	1055	132	0.	.0	1007.0	*	1	1915	232	512.	75.9	1012.0
1	0240	33	0.	.0	1007.0	*	1	1100	133	0.	.0	1007.0	*	1	1920	233	499.	74.5	1011.9
1	0245	34	0.	.0	1007.0	*	1	1105	134	0.	.0	1007.0	*	1	1925	234	486.	73.2	1011.8
1	0250	35	0.	.0	1007.0	*	1	1110	135	0.	.0	1007.0	*	1	1930	235	473.	71.9	1011.7
1	0255	36	0.	.0	1007.0	*	1	1115	136	0.	.1	1007.0	*	1	1935	236	461.	70.6	1011.6
1	0300	37	0.	.0	1007.0	*	1	1120	137	0.	.1	1007.0	*	1	1940	237	449.	69.4	1011.6
1	0305	38	0.	.0	1007.0	*	1	1125	138	1.	.1	1007.0	*	1	1945	238	437.	68.2	1011.5
1	0310	39	0.	.0	1007.0	*	1	1130	139	1.	.2	1007.0	*	1	1950	239	426.	67.1	1011.4
1	0315	40	0.	.0	1007.0	*	1	1135	140	1.	.3	1007.0	*	1	1955	240	415.	65.9	1011.3
1	0320	41	0.	.0	1007.0	*	1	1140	141	2.	.4	1007.0	*	1	2000	241	404.	64.9	1011.3
1	0325	42	0.	.0	1007.0	*	1	1145	142	3.	.6	1007.0	*	1	2005	242	394.	63.8	1011.2
1	0330	43	0.	.0	1007.0	*	1	1150	143	4.	.8	1007.1	*	1	2010	243	384.	62.8	1011.1
1	0335	44	0.	.0	1007.0	*	1	1155	144	6.	1.3	1007.1	*	1	2015	244	374.	61.8	1011.1
1	0340	45	0.	.0	1007.0	*	1	1200	145	10.	2.1	1007.1	*	1	2020	245	365.	60.8	1011.0
1	0345	46	0.	.0	1007.0	*	1	1205	146	16.	3.4	1007.2	*	1	2025	246	356.	59.9	1011.0
1	0350	47	0.	.0	1007.0	*	1	1210	147	27.	5.9	1007.4	*	1	2030	247	347.	59.0	1010.9
1	0355	48	0.	.0	1007.0	*	1	1215	148	46.	9.8	1007.7	*	1	2035	248	338.	58.1	1010.8
1	0400	49	0.	.0	1007.0	*	1	1220	149	72.	15.5	1008.0	*	1	2040	249	329.	57.2	1010.8
1	0405	50	0.	.0	1007.0	*	1	1225	150	109.	23.3	1008.6	*	1	2045	250	321.	56.4	1010.7
1	0410	51	0.	.0	1007.0	*	1	1230	151	157.	33.7	1009.2	*	1	2050	251	313.	55.6	1010.7
1	0415	52	0.	.0	1007.0	*	1	1235	152	224.	46.5	1010.1	*	1	2055	252	306.	54.8	1010.6
1	0420	53	0.	.0	1007.0	*	1	1240	153	359.	60.3	1011.0	*	1	2100	253	298.	54.0	1010.6
1	0425	54	0.	.0	1007.0	*	1	1245	154	491.	73.7	1011.8	*	1	2105	254	291.	53.3	1010.5
1	0430	55	0.	.0	1007.0	*	1	1250	155	610.	85.9	1012.6	*	1	2110	255	284.	52.6	1010.5
1	0435	56	0.	.0	1007.0	*	1	1255	156	711.	96.2	1013.3	*	1	2115	256	277.	51.9	1010.4
1	0440	57	0.	.0	1007.0	*	1	1300	157	794.	104.7	1013.8	*	1	2120	257	271.	51.2	1010.4
1	0445	58	0.	.0	1007.0	*	1	1305	158	861.	111.6	1014.3	*	1	2125	258	264.	50.5	1010.4
1	0450	59	0.	.0	1007.0	*	1	1310	159	920.	117.6	1014.7	*	1	2130	259	258.	49.9	1010.3

1	0455	60	0.	.0	1007.0	*	1	1315	160	973.	123.1	1015.0	*	1	2135	260	252.	49.3	1010.3
1	0500	61	0.	.0	1007.0	*	1	1320	161	990.	128.8	1015.1	*	1	2140	261	246.	48.7	1010.2
1	0505	62	0.	.0	1007.0	*	1	1325	162	1007.	134.8	1015.3	*	1	2145	262	241.	48.1	1010.2
1	0510	63	0.	.0	1007.0	*	1	1330	163	1025.	141.0	1015.4	*	1	2150	263	235.	47.6	1010.2
1	0515	64	0.	.0	1007.0	*	1	1335	164	1043.	147.2	1015.6	*	1	2155	264	230.	47.0	1010.1
1	0520	65	0.	.0	1007.0	*	1	1340	165	1060.	153.3	1015.7	*	1	2200	265	225.	46.5	1010.1
1	0525	66	0.	.0	1007.0	*	1	1345	166	1077.	159.2	1015.8	*	1	2205	266	220.	46.0	1010.1
1	0530	67	0.	.0	1007.0	*	1	1350	167	1093.	164.8	1016.0	*	1	2210	267	215.	45.5	1010.0
1	0535	68	0.	.0	1007.0	*	1	1355	168	1108.	170.1	1016.1	*	1	2215	268	211.	45.1	1010.0
1	0540	69	0.	.0	1007.0	*	1	1400	169	1122.	174.9	1016.2	*	1	2220	269	208.	44.6	1010.0
1	0545	70	0.	.0	1007.0	*	1	1405	170	1133.	178.9	1016.3	*	1	2225	270	206.	44.1	1009.9
1	0550	71	0.	.0	1007.0	*	1	1410	171	1142.	182.0	1016.4	*	1	2230	271	204.	43.7	1009.9
1	0555	72	0.	.0	1007.0	*	1	1415	172	1148.	184.0	1016.4	*	1	2235	272	202.	43.2	1009.9
1	0600	73	0.	.0	1007.0	*	1	1420	173	1151.	185.0	1016.5	*	1	2240	273	200.	42.8	1009.9
1	0605	74	0.	.0	1007.0	*	1	1425	174	1151.	185.2	1016.5	*	1	2245	274	198.	42.3	1009.8
1	0610	75	0.	.0	1007.0	*	1	1430	175	1150.	184.6	1016.4	*	1	2250	275	195.	41.9	1009.8
1	0615	76	0.	.0	1007.0	*	1	1435	176	1146.	183.4	1016.4	*	1	2255	276	193.	41.4	1009.8
1	0620	77	0.	.0	1007.0	*	1	1440	177	1141.	181.6	1016.4	*	1	2300	277	191.	41.0	1009.7
1	0625	78	0.	.0	1007.0	*	1	1445	178	1134.	179.3	1016.3	*	1	2305	278	189.	40.5	1009.7
1	0630	79	0.	.0	1007.0	*	1	1450	179	1127.	176.6	1016.3	*	1	2310	279	187.	40.1	1009.7
1	0635	80	0.	.0	1007.0	*	1	1455	180	1118.	173.6	1016.2	*	1	2315	280	185.	39.7	1009.6
1	0640	81	0.	.0	1007.0	*	1	1500	181	1108.	170.2	1016.1	*	1	2320	281	183.	39.2	1009.6
1	0645	82	0.	.0	1007.0	*	1	1505	182	1098.	166.6	1016.0	*	1	2325	282	181.	38.8	1009.6
1	0650	83	0.	.0	1007.0	*	1	1510	183	1087.	162.8	1015.9	*	1	2330	283	179.	38.4	1009.6
1	0655	84	0.	.0	1007.0	*	1	1515	184	1076.	158.9	1015.8	*	1	2335	284	177.	38.0	1009.5
1	0700	85	0.	.0	1007.0	*	1	1520	185	1065.	155.0	1015.7	*	1	2340	285	175.	37.5	1009.5
1	0705	86	0.	.0	1007.0	*	1	1525	186	1054.	151.1	1015.7	*	1	2345	286	173.	37.1	1009.5
1	0710	87	0.	.0	1007.0	*	1	1530	187	1043.	147.5	1015.6	*	1	2350	287	171.	36.7	1009.4
1	0715	88	0.	.0	1007.0	*	1	1535	188	1034.	144.4	1015.5	*	1	2355	288	169.	36.3	1009.4
1	0720	89	0.	.0	1007.0	*	1	1540	189	1027.	141.7	1015.4	*	2	0000	289	168.	35.9	1009.4
1	0725	90	0.	.0	1007.0	*	1	1545	190	1021.	139.6	1015.4	*	2	0005	290	166.	35.5	1009.4
1	0730	91	0.	.0	1007.0	*	1	1550	191	1016.	138.0	1015.4	*	2	0010	291	164.	35.1	1009.3
1	0735	92	0.	.0	1007.0	*	1	1555	192	1012.	136.7	1015.3	*	2	0015	292	162.	34.7	1009.3
1	0740	93	0.	.0	1007.0	*	1	1600	193	1009.	135.7	1015.3	*	2	0020	293	160.	34.3	1009.3
1	0745	94	0.	.0	1007.0	*	1	1605	194	1007.	134.9	1015.3	*	2	0025	294	158.	33.9	1009.3
1	0750	95	0.	.0	1007.0	*	1	1610	195	1005.	134.1	1015.3	*	2	0030	295	156.	33.5	1009.2
1	0755	96	0.	.0	1007.0	*	1	1615	196	1003.	133.3	1015.2	*	2	0035	296	154.	33.0	1009.2
1	0800	97	0.	.0	1007.0	*	1	1620	197	1000.	132.5	1015.2	*	2	0040	297	152.	32.6	1009.2
1	0805	98	0.	.0	1007.0	*	1	1625	198	998.	131.7	1015.2	*	2	0045	298	150.	32.2	1009.1
1	0810	99	0.	.0	1007.0	*	1	1630	199	995.	130.7	1015.2	*	2	0050	299	148.	31.7	1009.1
1	0815	100	0.	.0	1007.0	*	1	1635	200	992.	129.7	1015.2	*	2	0055	300	146.	31.3	1009.1
						*							*						

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
1151.	14.42	(CFS)	955.	316.	304.	304.
		(INCHES)	1.482	1.962	1.962	1.962
		(AC-FT)	473.	627.	627.	627.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
(AC-FT)	(HR)	6-HR	24-HR	72-HR	24.92-HR
185.	14.42	134.	48.	46.	46.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
(FEET)	(HR)	6-HR	24-HR	72-HR	24.92-HR
1016.46	14.42	1014.97	1009.91	1009.81	1009.81

CUMULATIVE AREA = 5.99 SQ MI

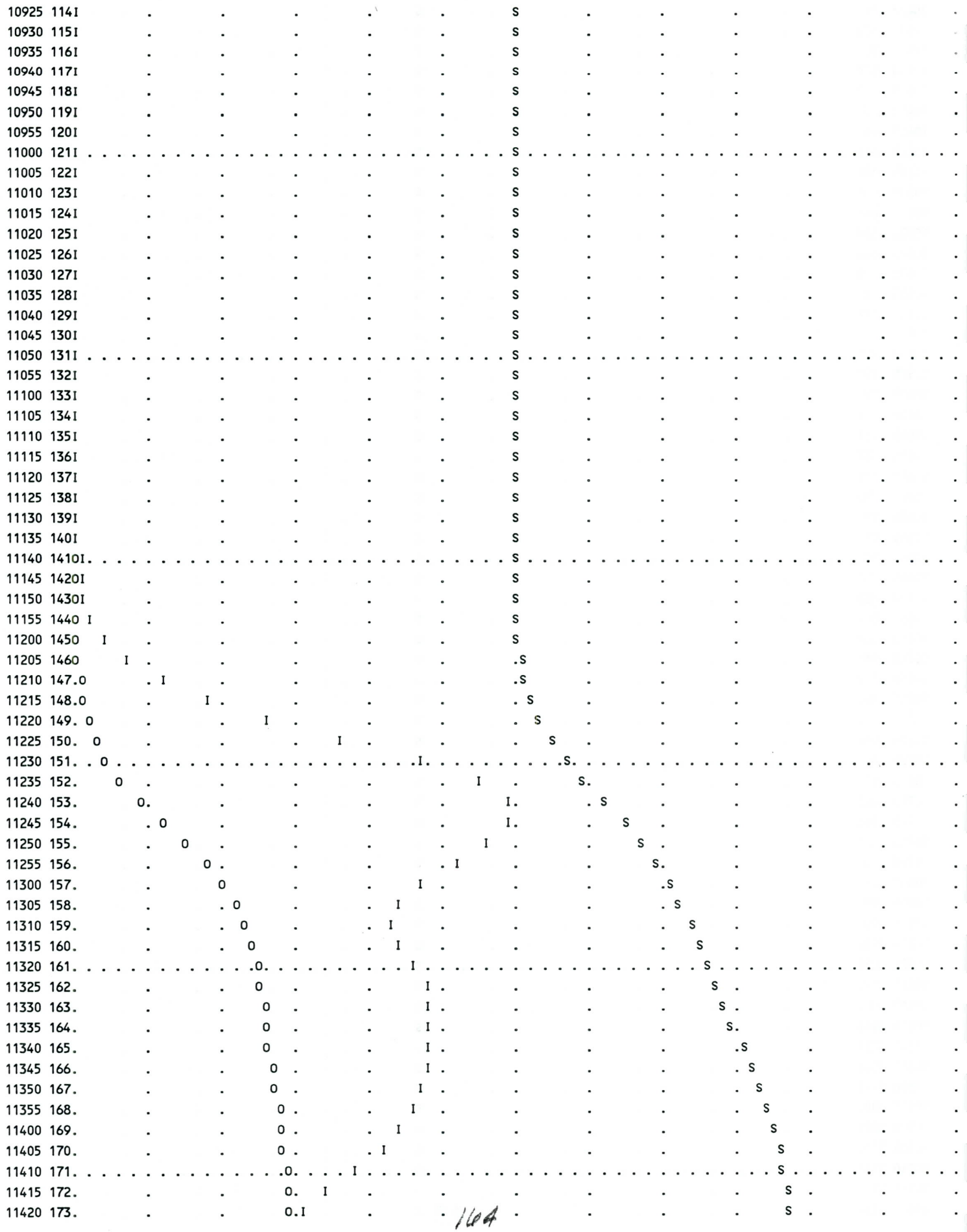
STATION DET08

(I) INFLOW, (O) OUTFLOW

	0.	400.	800.	1200.	1600.	2000.	2400.	0.	0.	0.	0.	0.	
									(S) STORAGE				
	0.	0.	0.	0.	0.	0.	0.	50.	100.	150.	200.	0.	0.

DAHRMN	PER													
10000	1I							S						
10005	2I							S						
10010	3I							S						
10015	4I							S						
10020	5I							S						
10025	6I							S						
10030	7I							S						
10035	8I							S						
10040	9I							S						
10045	10I							S						
10050	11I							S						
10055	12I							S						
10100	13I							S						
10105	14I							S						
10110	15I							S						
10115	16I							S						
10120	17I							S						
10125	18I							S						
10130	19I							S						
10135	20I							S						
10140	21I							S						
10145	22I							S						
10150	23I							S						
10155	24I							S						
10200	25I							S						
10205	26I							S						
10210	27I							S						
10215	28I							S						
10220	29I							S						
10225	30I							S						
10230	31I							S						
10235	32I							S						
10240	33I							S						
10245	34I							S						
10250	35I							S						
10255	36I							S						
10300	37I							S						
10305	38I							S						
10310	39I							S						
10315	40I							S						
10320	41I							S						
10325	42I							S						
10330	43I							S						
10335	44I							S						
10340	45I							S						
10345	46I							S						
10350	47I							S						
10355	48I							S						
10400	49I							S						
10405	50I							S						
10410	51I							S						
10415	52I							S						
10420	53I							S						

10425 541 S
10430 551 S
10435 561 S
10440 571 S
10445 581 S
10450 591 S
10455 601 S
10500 611 S
10505 621 S
10510 631 S
10515 641 S
10520 651 S
10525 661 S
10530 671 S
10535 681 S
10540 691 S
10545 701 S
10550 711 S
10555 721 S
10600 731 S
10605 741 S
10610 751 S
10615 761 S
10620 771 S
10625 781 S
10630 791 S
10635 801 S
10640 811 S
10645 821 S
10650 831 S
10655 841 S
10700 851 S
10705 861 S
10710 871 S
10715 881 S
10720 891 S
10725 901 S
10730 911 S
10735 921 S
10740 931 S
10745 941 S
10750 951 S
10755 961 S
10800 971 S
10805 981 S
10810 991 S
10815 1001 S
10820 1011 S
10825 1021 S
10830 1031 S
10835 1041 S
10840 1051 S
10845 1061 S
10850 1071 S
10855 1081 S
10900 1091 S
10905 1101 S
10910 1111 S
10915 1121 S
10920 1131 S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11030 127
11035 128
11040 129
11045 130
11050 131
11055 132
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11115 136
11120 137
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11140 1410
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11150 1430
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11205 1460
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11230 151. 0
11235 152. 0
11240 153. 0
11245 154. 0
11250 155. 0
11255 156. 0
11300 157. 0
11305 158. 0
11310 159. 0
11315 160. 0
11320 161. 0
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11330 163. 0
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11355 168. 0
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11405 170. 0
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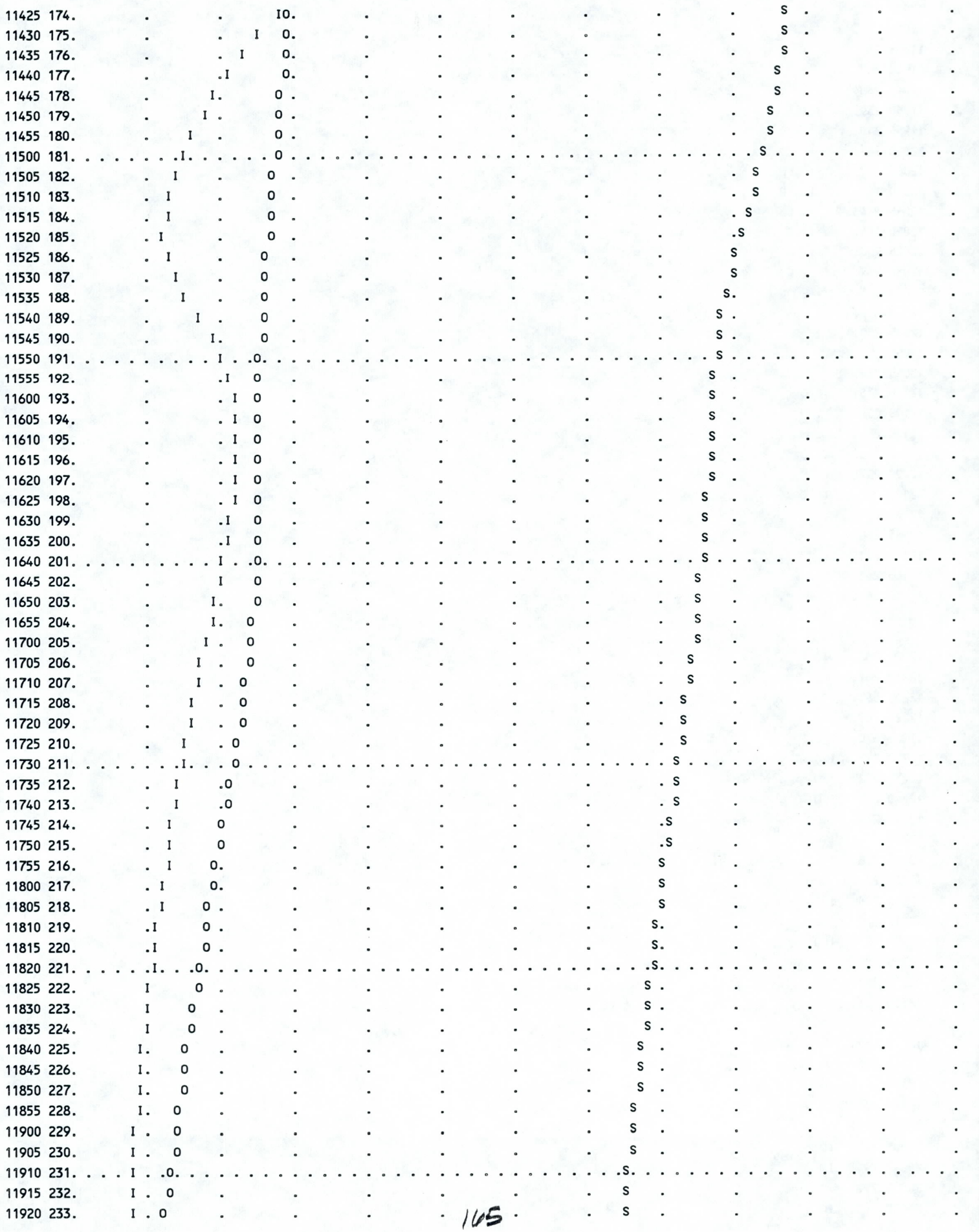
11415 172. 0
11420 173. 0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11520 185.
11525 186.
11530 187.
11535 188.
11540 189.
11545 190.
11550 191.
11555 192.
11600 193.
11605 194.
11610 195.
11615 196.
11620 197.
11625 198.
11630 199.
11635 200.
11640 201.
11645 202.
11650 203.
11655 204.
11700 205.
11705 206.
11710 207.
11715 208.
11720 209.
11725 210.
11730 211.
11735 212.
11740 213.
11745 214.
11750 215.
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11800 217.
11805 218.
11810 219.
11815 220.
11820 221.
11825 222.
11830 223.
11835 224.
11840 225.
11845 226.
11850 227.
11855 228.
11900 229.
11905 230.
11910 231.
11915 232.
11920 233.

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11925 234.      I  . O      .  .  .  .  .  .  .  S  .  .  .  .
11930 235.      I  . O      .  .  .  .  .  .  .  S  .  .  .  .
11935 236.      I  . O      .  .  .  .  .  .  .  S  .  .  .  .
11940 237.      I  .O       .  .  .  .  .  .  .  S  .  .  .  .
11945 238.      I  .O       .  .  .  .  .  .  .  S  .  .  .  .
11950 239.      I  .O       .  .  .  .  .  .  .  S  .  .  .  .
11955 240.     I   O        .  .  .  .  .  .  .  S  .  .  .  .
12000 241. . . I . O . . . . . .  .  .  .  .  .  .  .S. . . . . .
12005 242.      I   O       .  .  .  .  .  .  .  S  .  .  .  .
12010 243.      I   O       .  .  .  .  .  .  .  S  .  .  .  .
12015 244.      I  O.       .  .  .  .  .  .  .  S  .  .  .  .
12020 245.      I  O.       .  .  .  .  .  .  .  S  .  .  .  .
12025 246.      I  O.       .  .  .  .  .  .  .  S  .  .  .  .
12030 247.     I   O.       .  .  .  .  .  .  .  S  .  .  .  .
12035 248.     I  O .       .  .  .  .  .  .  .  S  .  .  .  .
12040 249.     I  O .       .  .  .  .  .  .  .  .S .  .  .  .
12045 250.     I  O .       .  .  .  .  .  .  .  .S .  .  .  .
12050 251. . .I. O . . . . . .  .  .  .  .  .  .  .S. . . . . .
12055 252.     I  O .       .  .  .  .  .  .  .  .S .  .  .  .
12100 253.     I O  .       .  .  .  .  .  .  .  .S .  .  .  .
12105 254.     I O  .       .  .  .  .  .  .  .  .S .  .  .  .
12110 255.     I O  .       .  .  .  .  .  .  .  .S .  .  .  .
12115 256.    I  O  .       .  .  .  .  .  .  .  S  .  .  .  .
12120 257.    I  O  .       .  .  .  .  .  .  .  S  .  .  .  .
12125 258.    I  O  .       .  .  .  .  .  .  .  S  .  .  .  .
12130 259.    I O   .       .  .  .  .  .  .  .  S  .  .  .  .
12135 260.    I O   .       .  .  .  .  .  .  .  S  .  .  .  .
12140 261. . I O . . . . . .  .  .  .  .  .  .  .S. . . . . .
12145 262.    I O   .       .  .  .  .  .  .  .  S  .  .  .  .
12150 263.    I O   .       .  .  .  .  .  .  .  S  .  .  .  .
12155 264.    I O   .       .  .  .  .  .  .  .  S. .  .  .  .
12200 265.    I O   .       .  .  .  .  .  .  .  S. .  .  .  .
12205 266.    IO    .       .  .  .  .  .  .  .  S. .  .  .  .
12210 267.    IO    .       .  .  .  .  .  .  .  S. .  .  .  .
12215 268.    IO    .       .  .  .  .  .  .  .  S. .  .  .  .
12220 269.    IO    .       .  .  .  .  .  .  .  S. .  .  .  .
12225 270.   I O    .       .  .  .  .  .  .  .  S. .  .  .  .
12230 271. .I.O. . . . . .  .  .  .  .  .  .  .S. . . . . .
12235 272.   I O    .       .  .  .  .  .  .  .  S. .  .  .  .
12240 273.   I O    .       .  .  .  .  .  .  .  S. .  .  .  .
12245 274.   I O    .       .  .  .  .  .  .  .  S  .  .  .  .
12250 275.   I O    .       .  .  .  .  .  .  .  S  .  .  .  .
12255 276.   I O    .       .  .  .  .  .  .  .  S  .  .  .  .
12300 277.   I O    .       .  .  .  .  .  .  .  S  .  .  .  .
12305 278.   I O    .       .  .  .  .  .  .  .  S  .  .  .  .
12310 279.   I O    .       .  .  .  .  .  .  .  S  .  .  .  .
12315 280.   I O    .       .  .  .  .  .  .  .  S  .  .  .  .
12320 281. .I.O. . . . . .  .  .  .  .  .  .  .S. . . . . .
12325 282.   I O    .       .  .  .  .  .  .  .  S  .  .  .  .
12330 283.   IO     .       .  .  .  .  .  .  .  S  .  .  .  .
12335 284.   IO     .       .  .  .  .  .  .  .  S  .  .  .  .
12340 285.   IO     .       .  .  .  .  .  .  .  S  .  .  .  .
12345 286.   IO     .       .  .  .  .  .  .  .  S  .  .  .  .
12350 287.   IO     .       .  .  .  .  .  .  .  S  .  .  .  .
12355 288.   IO     .       .  .  .  .  .  .  .  S  .  .  .  .
20000 289.   IO     .       .  .  .  .  .  .  .  S  .  .  .  .
20005 290.   IO     .       .  .  .  .  .  .  .  S  .  .  .  .
20010 291. .IO . . . . . .  .  .  .  .  .  .  .S. . . . . .
20015 292.   IO     .       .  .  .  .  .  .  .  S  .  .  .  .
20020 293.   IO     .       .  .  .  .  .  .  .  S  .  .  .  .
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20025 294. I O     .         .         .         .         .         .         S .         .         .         .         .         .         .
20030 295. I O     .         .         .         .         .         .         S .         .         .         .         .         .         .
20035 296. I O     .         .         .         .         .         .         S .         .         .         .         .         .         .
20040 297. I O     .         .         .         .         .         .         S .         .         .         .         .         .         .
20045 298. I O     .         .         .         .         .         .         S .         .         .         .         .         .         .
20050 299. I O     .         .         .         .         .         .         S .         .         .         .         .         .         .
20055 300.-I-O-----.---------.---------.---------.---------.---------.-------S---.---------.---------.---------.---------.---------.---------.
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          *            *
 67 KK    *      RT06  *       MUSKINGUM-CUNGE ROUTING CD160+CD170+CD180+CD190 THRU CD240
          *            *
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HYDROGRAPH ROUTING DATA

68 RD MUSKINGUM-CUNGE CHANNEL ROUTING

L	2000.	CHANNEL LENGTH
S	.0020	SLOPE
N	.025	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	20.00	BOTTOM WIDTH OR DIAMETER
Z	3.00	SIDE SLOPE

***

COMPUTED MUSKINGUM-CUNGE PARAMETERS

COMPUTATION TIME STEP

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.52	1.48	4.56	2000.00	1150.72	866.96	1.96	7.31

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	.52	1.48	5.00		1150.25	870.00	1.96

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6268E+03 EXCESS= .0000E+00 OUTFLOW= .6254E+03 BASIN STORAGE= .2137E+01 PERCENT ERROR= -.1

*** *** *** *** ***

HYDROGRAPH AT STATION RT06

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
1150.	14.50	(CFS)	954.	315.	304.	304.
		(INCHES)	1.481	1.958	1.958	1.958
		(AC-FT)	473.	626.	626.	626.

CUMULATIVE AREA = 5.99 SQ MI

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          **************
          *            *
69 KK     *     CD240  *       (K)
          *            *
          **************

             SUBBASIN RUNOFF DATA

70 BA          SUBBASIN CHARACTERISTICS
                    TAREA         .29  SUBBASIN AREA

               PRECIPITATION DATA

 7 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
               ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
               5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                 .79    1.55    2.72    2.97    3.14    3.45    3.74    4.05     .00     .00     .00     .00

                                                 STORM AREA =    6.68

71 LS          SCS LOSS RATE
                    STRTL         .47  INITIAL ABSTRACTION
                   CRVNBR       81.00  CURVE NUMBER
                    RTIMP         .00  PERCENT IMPERVIOUS AREA

72 UD          SCS DIMENSIONLESS UNITGRAPH
                    TLAG         .91  LAG

                                                  ***

                                                UNIT HYDROGRAPH
                                            57 END-OF-PERIOD ORDINATES
                    4.      12.     23.     37.     55.     76.    100.    121.    135.    144.
                  147.     146.    142.    134.    125.    115.    102.     87.     73.     62.
                   54.      47.     40.     36.     31.     27.     23.     20.     18.     15.
                   13.      11.     10.      8.      7.      6.      6.      5.      4.      4.
                    3.       3.      2.      2.      2.      2.      1.      1.      1.      1.
                    1.       1.      1.      0.      0.      0.      0.

   ***           ***           ***           ***           ***

                       HYDROGRAPH AT STATION    CD240

   TOTAL RAINFALL =    4.02, TOTAL LOSS =    1.88, TOTAL EXCESS =    2.13

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR      24-HR      72-HR     24.92-HR
   218.     13.00        (CFS)       61.        17.        16.        16.
                         (INCHES)  1.948      2.128      2.128      2.128
                         (AC-FT)     30.        33.        33.        33.

                       CUMULATIVE AREA =     .29 SQ MI

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          **************
          *            *
 73 KK    *     AD240  *       COMBINE HYDS. CD160+CD170+CD180+CD190+CD240
          *            *
          **************

 74 HC          HYDROGRAPH COMBINATION
                     ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                    ***

     ***            ***            ***            ***            ***

                       HYDROGRAPH AT STATION    AD240

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR       72-HR     24.92-HR
  1206.      14.25       (CFS)     1002.        332.        320.        320.
                        (INCHES)   1.483       1.966       1.966       1.966
                        (AC-FT)     497.        658.        658.        658.

                       CUMULATIVE AREA =    6.28 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
 75 KK    *     RT240  *       MUSKINGUM-CUNGE ROUTING COMBINED HYDS. THRU CD260 to BASIN 07
          *            *
          **************

             HYDROGRAPH ROUTING DATA

 76 RD          MUSKINGUM-CUNGE CHANNEL ROUTING
                          L       3000.  CHANNEL LENGTH
                          S       .0020  SLOPE
                          N        .025  CHANNEL ROUGHNESS COEFFICIENT
                         CA         .00  CONTRIBUTING AREA
                      SHAPE        TRAP  CHANNEL SHAPE
                         WD       20.00  BOTTOM WIDTH OR DIAMETER
                          Z        3.00  SIDE SLOPE

                                                    ***
                                COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                      COMPUTATION TIME STEP
                   ELEMENT    ALPHA       M         DT        DX       PEAK    TIME TO      VOLUME    MAXIMUM
                                                                                  PEAK                   CELERITY
                                                     (MIN)     (FT)     (CFS)    (MIN)       (IN)      (FPS)

                    MAIN        .52      1.48        5.00   1500.00   1205.72   860.00        1.96       7.42

                                      INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL
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                MAIN        .52      1.48      5.00           1205.72    860.00      1.96

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6590E+03 EXCESS= .0000E+00 OUTFLOW= .6563E+03 BASIN STORAGE= .3280E+01 PERCENT ERROR=    -.1


   ***          ***          ***          ***          ***

                HYDROGRAPH AT STATION    RT240

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                6-HR       24-HR       72-HR     24.92-HR
  1206.      14.33      (CFS)     1001.       331.        318.        318.
                       (INCHES)   1.483      1.958       1.958       1.958
                       (AC-FT)     497.       656.        656.        656.

                CUMULATIVE AREA =    6.28 SQ MI


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      *            *
77 KK *     CD260  *       (Q)
      *            *
      **************

         SUBBASIN RUNOFF DATA

78 BA       SUBBASIN CHARACTERISTICS
               TAREA          .18  SUBBASIN AREA

            PRECIPITATION DATA

 7 PH                          DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
            ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
            5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
              .79    1.55    2.72    2.97    3.14    3.45    3.74    4.05     .00     .00     .00     .00

                                          STORM AREA =    6.68

79 LS       SCS LOSS RATE
               STRTL          .47  INITIAL ABSTRACTION
              CRVNBR        81.00  CURVE NUMBER
               RTIMP          .00  PERCENT IMPERVIOUS AREA

80 UD       SCS DIMENSIONLESS UNITGRAPH
               TLAG          .68  LAG

                                          ***

                                          UNIT HYDROGRAPH
                                      43 END-OF-PERIOD ORDINATES
              5.      15.      30.      49.      74.      97.     113.     119.     120.     115.
            106.      95.      82.      65.      53.      44.      36.      30.      25.      21.
             17.      14.      12.      10.       8.       7.       6.       5.       4.       3.
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              3.       2.       2.       2.       1.       1.       1.       1.       1.       0.
              0.       0.       0.

    ***           ***           ***           ***           ***

                        HYDROGRAPH AT STATION    CD260

   TOTAL RAINFALL =    4.02, TOTAL LOSS =    1.88, TOTAL EXCESS =    2.13

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR       72-HR     24.92-HR
   167.     12.75       (CFS)       38.         10.         10.         10.
                        (INCHES)   1.956       2.131       2.131       2.131
                        (AC-FT)     19.         20.         20.         20.

                        CUMULATIVE AREA =     .18 SQ MI


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         **************
         *            *
 81 KK   *     AD260  *       COMBINE HYDS. CD160+CD170+CD180+CD190+CD240+CD260
         *            *
         **************

 82 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE

 83 HC          HYDROGRAPH COMBINATION
                     ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                ***

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                                        HYDROGRAPH AT STATION    AD260
                                          SUM OF  2 HYDROGRAPHS

*****************************************************************************************************************************

                          *                        *                        *                        *
 DA MON HRMN   ORD   FLOW  *  DA MON HRMN   ORD   FLOW  *  DA MON HRMN   ORD   FLOW  *  DA MON HRMN   ORD   FLOW
                          *                        *                        *                        *
  1     0000    1     0.  *   1     0615   76     0.  *   1     1230   151   218.  *   1     1845   226   646.
  1     0005    2     0.  *   1     0620   77     0.  *   1     1235   152   297.  *   1     1850   227   630.
  1     0010    3     0.  *   1     0625   78     0.  *   1     1240   153   388.  *   1     1855   228   614.
  1     0015    4     0.  *   1     0630   79     0.  *   1     1245   154   499.  *   1     1900   229   599.
  1     0020    5     0.  *   1     0635   80     0.  *   1     1250   155   640.  *   1     1905   230   583.
  1     0025    6     0.  *   1     0640   81     0.  *   1     1255   156   797.  *   1     1910   231   569.
  1     0030    7     0.  *   1     0645   82     0.  *   1     1300   157   938.  *   1     1915   232   554.
  1     0035    8     0.  *   1     0650   83     0.  *   1     1305   158  1047.  *   1     1920   233   540.
  1     0040    9     0.  *   1     0655   84     0.  *   1     1310   159  1124.  *   1     1925   234   526.
  1     0045   10     0.  *   1     0700   85     0.  *   1     1315   160  1177.  *   1     1930   235   513.
  1     0050   11     0.  *   1     0705   86     0.  *   1     1320   161  1214.  *   1     1935   236   500.
  1     0055   12     0.  *   1     0710   87     0.  *   1     1325   162  1233.  *   1     1940   237   487.
```

1	0100	13	0.	*	1	0715	88	0.	*	1	1330	163	1237.	*	1	1945	238	475.
1	0105	14	0.	*	1	0720	89	0.	*	1	1335	164	1232.	*	1	1950	239	463.
1	0110	15	0.	*	1	0725	90	0.	*	1	1340	165	1226.	*	1	1955	240	451.
1	0115	16	0.	*	1	0730	91	0.	*	1	1345	166	1223.	*	1	2000	241	440.
1	0120	17	0.	*	1	0735	92	0.	*	1	1350	167	1221.	*	1	2005	242	429.
1	0125	18	0.	*	1	0740	93	0.	*	1	1355	168	1222.	*	1	2010	243	418.
1	0130	19	0.	*	1	0745	94	0.	*	1	1400	169	1223.	*	1	2015	244	408.
1	0135	20	0.	*	1	0750	95	0.	*	1	1405	170	1225.	*	1	2020	245	398.
1	0140	21	0.	*	1	0755	96	0.	*	1	1410	171	1227.	*	1	2025	246	388.
1	0145	22	0.	*	1	0800	97	0.	*	1	1415	172	1229.	*	1	2030	247	379.
1	0150	23	0.	*	1	0805	98	0.	*	1	1420	173	1228.	*	1	2035	248	369.
1	0155	24	0.	*	1	0810	99	0.	*	1	1425	174	1226.	*	1	2040	249	360.
1	0200	25	0.	*	1	0815	100	0.	*	1	1430	175	1222.	*	1	2045	250	352.
1	0205	26	0.	*	1	0820	101	0.	*	1	1435	176	1216.	*	1	2050	251	343.
1	0210	27	0.	*	1	0825	102	0.	*	1	1440	177	1209.	*	1	2055	252	335.
1	0215	28	0.	*	1	0830	103	0.	*	1	1445	178	1201.	*	1	2100	253	327.
1	0220	29	0.	*	1	0835	104	0.	*	1	1450	179	1192.	*	1	2105	254	319.
1	0225	30	0.	*	1	0840	105	0.	*	1	1455	180	1181.	*	1	2110	255	312.
1	0230	31	0.	*	1	0845	106	0.	*	1	1500	181	1170.	*	1	2115	256	304.
1	0235	32	0.	*	1	0850	107	0.	*	1	1505	182	1158.	*	1	2120	257	297.
1	0240	33	0.	*	1	0855	108	0.	*	1	1510	183	1146.	*	1	2125	258	290.
1	0245	34	0.	*	1	0900	109	0.	*	1	1515	184	1134.	*	1	2130	259	284.
1	0250	35	0.	*	1	0905	110	0.	*	1	1520	185	1121.	*	1	2135	260	277.
1	0255	36	0.	*	1	0910	111	0.	*	1	1525	186	1108.	*	1	2140	261	271.
1	0300	37	0.	*	1	0915	112	0.	*	1	1530	187	1095.	*	1	2145	262	265.
1	0305	38	0.	*	1	0920	113	0.	*	1	1535	188	1082.	*	1	2150	263	259.
1	0310	39	0.	*	1	0925	114	0.	*	1	1540	189	1071.	*	1	2155	264	253.
1	0315	40	0.	*	1	0930	115	0.	*	1	1545	190	1061.	*	1	2200	265	247.
1	0320	41	0.	*	1	0935	116	0.	*	1	1550	191	1052.	*	1	2205	266	242.
1	0325	42	0.	*	1	0940	117	0.	*	1	1555	192	1045.	*	1	2210	267	237.
1	0330	43	0.	*	1	0945	118	0.	*	1	1600	193	1039.	*	1	2215	268	232.
1	0335	44	0.	*	1	0950	119	0.	*	1	1605	194	1035.	*	1	2220	269	227.
1	0340	45	0.	*	1	0955	120	0.	*	1	1610	195	1031.	*	1	2225	270	222.
1	0345	46	0.	*	1	1000	121	0.	*	1	1615	196	1027.	*	1	2230	271	219.
1	0350	47	0.	*	1	1005	122	0.	*	1	1620	197	1024.	*	1	2235	272	215.
1	0355	48	0.	*	1	1010	123	0.	*	1	1625	198	1021.	*	1	2240	273	213.
1	0400	49	0.	*	1	1015	124	0.	*	1	1630	199	1018.	*	1	2245	274	211.
1	0405	50	0.	*	1	1020	125	0.	*	1	1635	200	1015.	*	1	2250	275	208.
1	0410	51	0.	*	1	1025	126	0.	*	1	1640	201	1011.	*	1	2255	276	206.
1	0415	52	0.	*	1	1030	127	0.	*	1	1645	202	1008.	*	1	2300	277	204.
1	0420	53	0.	*	1	1035	128	0.	*	1	1650	203	1004.	*	1	2305	278	202.
1	0425	54	0.	*	1	1040	129	0.	*	1	1655	204	1000.	*	1	2310	279	200.
1	0430	55	0.	*	1	1045	130	0.	*	1	1700	205	995.	*	1	2315	280	198.
1	0435	56	0.	*	1	1050	131	0.	*	1	1705	206	989.	*	1	2320	281	196.
1	0440	57	0.	*	1	1055	132	0.	*	1	1710	207	979.	*	1	2325	282	194.
1	0445	58	0.	*	1	1100	133	0.	*	1	1715	208	965.	*	1	2330	283	192.
1	0450	59	0.	*	1	1105	134	0.	*	1	1720	209	948.	*	1	2335	284	189.
1	0455	60	0.	*	1	1110	135	0.	*	1	1725	210	931.	*	1	2340	285	187.
1	0500	61	0.	*	1	1115	136	0.	*	1	1730	211	913.	*	1	2345	286	185.
1	0505	62	0.	*	1	1120	137	1.	*	1	1735	212	895.	*	1	2350	287	183.
1	0510	63	0.	*	1	1125	138	1.	*	1	1740	213	877.	*	1	2355	288	181.
1	0515	64	0.	*	1	1130	139	1.	*	1	1745	214	858.	*	2	0000	289	179.
1	0520	65	0.	*	1	1135	140	2.	*	1	1750	215	840.	*	2	0005	290	177.
1	0525	66	0.	*	1	1140	141	3.	*	1	1755	216	821.	*	2	0010	291	176.
1	0530	67	0.	*	1	1145	142	4.	*	1	1800	217	803.	*	2	0015	292	174.
1	0535	68	0.	*	1	1150	143	6.	*	1	1805	218	785.	*	2	0020	293	172.
1	0540	69	0.	*	1	1155	144	10.	*	1	1810	219	767.	*	2	0025	294	169.
1	0545	70	0.	*	1	1200	145	16.	*	1	1815	220	749.	*	2	0030	295	167.
1	0550	71	0.	*	1	1205	146	27.	*	1	1820	221	731.	*	2	0035	296	165.
1	0555	72	0.	*	1	1210	147	45.	*	1	1825	222	714.	*	2	0040	297	163.

1	0600	73	0.	*	1	1215	148	71.	*	1	1830	223	696.	*	2	0045	298	161.
1	0605	74	0.	*	1	1220	149	108.	*	1	1835	224	679.	*	2	0050	299	159.
1	0610	75	0.	*	1	1225	150	155.	*	1	1840	225	663.	*	2	0055	300	156.
				*					*					*					

****

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
1237.	13.50	(CFS)	1025.	341.	328.	328.
		(INCHES)	1.476	1.963	1.963	1.963
		(AC-FT)	508.	676.	676.	676.

CUMULATIVE AREA = 6.46 SQ MI

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          **************
          *            *
84 KK     *     CD270  *       (R)
          *            *
          **************
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SUBBASIN RUNOFF DATA

85 BA SUBBASIN CHARACTERISTICS

TAREA .22 SUBBASIN AREA

PRECIPITATION DATA

7 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.79	1.55	2.72	2.97	3.14	3.45	3.74	4.05	.00	.00	.00	.00

STORM AREA = 6.68

86 LS SCS LOSS RATE

STRTL .47 INITIAL ABSTRACTION

CRVNBR 81.00 CURVE NUMBER

RTIMP .00 PERCENT IMPERVIOUS AREA

87 UD SCS DIMENSIONLESS UNITGRAPH

TLAG 1.67 LAG

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UNIT HYDROGRAPH

102 END-OF-PERIOD ORDINATES

1.	2.	4.	6.	9.	11.	15.	18.	23.	28.
33.	39.	44.	49.	53.	56.	59.	61.	62.	62.
62.	62.	61.	59.	57.	55.	53.	50.	48.	45.
42.	38.	34.	31.	28.	26.	24.	22.	21.	19.
18.	16.	15.	14.	13.	12.	11.	10.	9.	9.
8.	7.	7.	6.	6.	5.	5.	5.	4.	4.
4.	3.	3.	3.	3.	2.	2.	2.	2.	2.
2.	2.	1.	1.	1.	1.	1.	1.	1.	1.

```
          1.      1.      1.      1.      1.      1.      1.      0.      0.      0.
          0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
          0.      0.

   ***           ***           ***           ***           ***

                    HYDROGRAPH AT STATION    CD270

   TOTAL RAINFALL =    4.02, TOTAL LOSS =    1.88, TOTAL EXCESS =    2.13

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR       72-HR      24.92-HR
   101.      13.83       (CFS)       45.         12.         12.         12.
                         (INCHES)  1.897       2.111       2.111       2.111
                         (AC-FT)     22.         25.         25.         25.

                    CUMULATIVE AREA =     .22 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


         **************
         *            *
 88 KK   *     AD270  *       ADD CD270 TO COMBINED HYDROGRAPHS
         *            *
         **************

 90 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE

 89 HC          HYDROGRAPH COMBINATION
                     ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                  ***

**********************************************************************************************************************************

                                    HYDROGRAPH AT STATION    AD270
                                  SUM OF  2 HYDROGRAPHS

**********************************************************************************************************************************

                                *                               *                               *                               *
 DA MON HRMN   ORD     FLOW     *  DA MON HRMN   ORD     FLOW     *  DA MON HRMN   ORD     FLOW     *  DA MON HRMN   ORD     FLOW
                                *                               *                               *
  1     0000    1       0.     *   1     0615   76       0.     *   1     1230   151     237.     *   1     1845   226     654.
  1     0005    2       0.     *   1     0620   77       0.     *   1     1235   152     321.     *   1     1850   227     637.
  1     0010    3       0.     *   1     0625   78       0.     *   1     1240   153     418.     *   1     1855   228     621.
  1     0015    4       0.     *   1     0630   79       0.     *   1     1245   154     535.     *   1     1900   229     605.
  1     0020    5       0.     *   1     0635   80       0.     *   1     1250   155     683.     *   1     1905   230     590.
  1     0025    6       0.     *   1     0640   81       0.     *   1     1255   156     848.     *   1     1910   231     575.
  1     0030    7       0.     *   1     0645   82       0.     *   1     1300   157     997.     *   1     1915   232     561.
  1     0035    8       0.     *   1     0650   83       0.     *   1     1305   158    1113.     *   1     1920   233     546.
  1     0040    9       0.     *   1     0655   84       0.     *   1     1310   159    1197.     *   1     1925   234     532.
  1     0045   10       0.     *   1     0700   85       0.     *   1     1315   160    1257.     *   1     1930   235     519.
  1     0050   11       0.     *   1     0705   86       0.     *   1     1320   161    1300.     *   1     1935   236     506.
```

1	0055	12	0.	*	1	0710	87	0.	*	1	1325	162	1324.	*	1	1940	237	493.
1	0100	13	0.	*	1	0715	88	0.	*	1	1330	163	1331.	*	1	1945	238	480.
1	0105	14	0.	*	1	0720	89	0.	*	1	1335	164	1329.	*	1	1950	239	468.
1	0110	15	0.	*	1	0725	90	0.	*	1	1340	165	1325.	*	1	1955	240	457.
1	0115	16	0.	*	1	0730	91	0.	*	1	1345	166	1323.	*	1	2000	241	445.
1	0120	17	0.	*	1	0735	92	0.	*	1	1350	167	1322.	*	1	2005	242	434.
1	0125	18	0.	*	1	0740	93	0.	*	1	1355	168	1322.	*	1	2010	243	423.
1	0130	19	0.	*	1	0745	94	0.	*	1	1400	169	1322.	*	1	2015	244	413.
1	0135	20	0.	*	1	0750	95	0.	*	1	1405	170	1323.	*	1	2020	245	403.
1	0140	21	0.	*	1	0755	96	0.	*	1	1410	171	1323.	*	1	2025	246	393.
1	0145	22	0.	*	1	0800	97	0.	*	1	1415	172	1321.	*	1	2030	247	383.
1	0150	23	0.	*	1	0805	98	0.	*	1	1420	173	1318.	*	1	2035	248	374.
1	0155	24	0.	*	1	0810	99	0.	*	1	1425	174	1312.	*	1	2040	249	365.
1	0200	25	0.	*	1	0815	100	0.	*	1	1430	175	1304.	*	1	2045	250	356.
1	0205	26	0.	*	1	0820	101	0.	*	1	1435	176	1294.	*	1	2050	251	347.
1	0210	27	0.	*	1	0825	102	0.	*	1	1440	177	1283.	*	1	2055	252	339.
1	0215	28	0.	*	1	0830	103	0.	*	1	1445	178	1270.	*	1	2100	253	331.
1	0220	29	0.	*	1	0835	104	0.	*	1	1450	179	1256.	*	1	2105	254	323.
1	0225	30	0.	*	1	0840	105	0.	*	1	1455	180	1242.	*	1	2110	255	316.
1	0230	31	0.	*	1	0845	106	0.	*	1	1500	181	1227.	*	1	2115	256	308.
1	0235	32	0.	*	1	0850	107	0.	*	1	1505	182	1212.	*	1	2120	257	301.
1	0240	33	0.	*	1	0855	108	0.	*	1	1510	183	1197.	*	1	2125	258	294.
1	0245	34	0.	*	1	0900	109	0.	*	1	1515	184	1181.	*	1	2130	259	287.
1	0250	35	0.	*	1	0905	110	0.	*	1	1520	185	1166.	*	1	2135	260	281.
1	0255	36	0.	*	1	0910	111	0.	*	1	1525	186	1150.	*	1	2140	261	274.
1	0300	37	0.	*	1	0915	112	0.	*	1	1530	187	1135.	*	1	2145	262	268.
1	0305	38	0.	*	1	0920	113	0.	*	1	1535	188	1121.	*	1	2150	263	262.
1	0310	39	0.	*	1	0925	114	0.	*	1	1540	189	1107.	*	1	2155	264	257.
1	0315	40	0.	*	1	0930	115	0.	*	1	1545	190	1095.	*	1	2200	265	251.
1	0320	41	0.	*	1	0935	116	0.	*	1	1550	191	1085.	*	1	2205	266	246.
1	0325	42	0.	*	1	0940	117	0.	*	1	1555	192	1076.	*	1	2210	267	240.
1	0330	43	0.	*	1	0945	118	0.	*	1	1600	193	1068.	*	1	2215	268	235.
1	0335	44	0.	*	1	0950	119	0.	*	1	1605	194	1062.	*	1	2220	269	230.
1	0340	45	0.	*	1	0955	120	0.	*	1	1610	195	1057.	*	1	2225	270	226.
1	0345	46	0.	*	1	1000	121	0.	*	1	1615	196	1052.	*	1	2230	271	222.
1	0350	47	0.	*	1	1005	122	0.	*	1	1620	197	1048.	*	1	2235	272	219.
1	0355	48	0.	*	1	1010	123	0.	*	1	1625	198	1044.	*	1	2240	273	216.
1	0400	49	0.	*	1	1015	124	0.	*	1	1630	199	1039.	*	1	2245	274	214.
1	0405	50	0.	*	1	1020	125	0.	*	1	1635	200	1035.	*	1	2250	275	212.
1	0410	51	0.	*	1	1025	126	0.	*	1	1640	201	1031.	*	1	2255	276	209.
1	0415	52	0.	*	1	1030	127	0.	*	1	1645	202	1026.	*	1	2300	277	207.
1	0420	53	0.	*	1	1035	128	0.	*	1	1650	203	1022.	*	1	2305	278	205.
1	0425	54	0.	*	1	1040	129	0.	*	1	1655	204	1017.	*	1	2310	279	203.
1	0430	55	0.	*	1	1045	130	0.	*	1	1700	205	1011.	*	1	2315	280	201.
1	0435	56	0.	*	1	1050	131	0.	*	1	1705	206	1004.	*	1	2320	281	199.
1	0440	57	0.	*	1	1055	132	0.	*	1	1710	207	993.	*	1	2325	282	197.
1	0445	58	0.	*	1	1100	133	0.	*	1	1715	208	979.	*	1	2330	283	195.
1	0450	59	0.	*	1	1105	134	0.	*	1	1720	209	962.	*	1	2335	284	192.
1	0455	60	0.	*	1	1110	135	0.	*	1	1725	210	944.	*	1	2340	285	190.
1	0500	61	0.	*	1	1115	136	0.	*	1	1730	211	925.	*	1	2345	286	188.
1	0505	62	0.	*	1	1120	137	1.	*	1	1735	212	907.	*	1	2350	287	186.
1	0510	63	0.	*	1	1125	138	1.	*	1	1740	213	888.	*	1	2355	288	184.
1	0515	64	0.	*	1	1130	139	1.	*	1	1745	214	869.	*	2	0000	289	182.
1	0520	65	0.	*	1	1135	140	2.	*	1	1750	215	850.	*	2	0005	290	180.
1	0525	66	0.	*	1	1140	141	3.	*	1	1755	216	832.	*	2	0010	291	178.
1	0530	67	0.	*	1	1145	142	4.	*	1	1800	217	813.	*	2	0015	292	176.
1	0535	68	0.	*	1	1150	143	7.	*	1	1805	218	794.	*	2	0020	293	174.
1	0540	69	0.	*	1	1155	144	11.	*	1	1810	219	776.	*	2	0025	294	172.
1	0545	70	0.	*	1	1200	145	17.	*	1	1815	220	758.	*	2	0030	295	170.
1	0550	71	0.	*	1	1205	146	30.	*	1	1820	221	740.	*	2	0035	296	168.

1	0555	72	0.	*	1	1210	147	50.	*	1	1825	222	722.	*	2	0040	297	166.
1	0600	73	0.	*	1	1215	148	79.	*	1	1830	223	704.	*	2	0045	298	163.
1	0605	74	0.	*	1	1220	149	119.	*	1	1835	224	687.	*	2	0050	299	161.
1	0610	75	0.	*	1	1225	150	170.	*	1	1840	225	670.	*	2	0055	300	159.
				*					*					*				

****

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
1331.	13.50	(CFS)	1069.	353.	340.	340.
		(INCHES)	1.488	1.968	1.968	1.968
		(AC-FT)	530.	701.	701.	701.

CUMULATIVE AREA = 6.68 SQ MI

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          *            *
91 KK     *     CD200  *      (M)
          *            *
          **************
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SUBBASIN RUNOFF DATA

93 BA SUBBASIN CHARACTERISTICS

TAREA	.59	SUBBASIN AREA

PRECIPITATION DATA

92 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.79	1.55	2.72	2.97	3.14	3.45	3.74	4.05	.00	.00	.00	.00

STORM AREA = 24.31

94 LS SCS LOSS RATE

STRTL	.41	INITIAL ABSTRACTION
CRVNBR	82.90	CURVE NUMBER
RTIMP	.00	PERCENT IMPERVIOUS AREA

95 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	.64	LAG

***

UNIT HYDROGRAPH
40 END-OF-PERIOD ORDINATES

19.	59.	113.	189.	284.	358.	403.	417.	414.	382.
345.	298.	240.	189.	155.	126.	105.	87.	71.	58.
47.	39.	32.	26.	21.	17.	14.	12.	10.	8.
6.	5.	4.	4.	3.	3.	2.	1.	1.	0.

*** *** *** *** ***

HYDROGRAPH AT STATION CD200

TOTAL RAINFALL = 3.94, TOTAL LOSS = 1.71, TOTAL EXCESS = 2.22

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
567.	12.75	(CFS)	128.	35.	34.	34.
		(INCHES)	2.017	2.222	2.222	2.222
		(AC-FT)	63.	70.	70.	70.

CUMULATIVE AREA = .59 SQ MI

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          **************
          *            *
96 KK     *    RT200A  *       NORMAL DEPTH ROUTING TO 19TH AND BASELINE
          *            *
          **************
```

HYDROGRAPH ROUTING DATA

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97 RS          STORAGE ROUTING
                    NSTPS           4  NUMBER OF SUBREACHES
                    ITYP         FLOW  TYPE OF INITIAL CONDITION
                   RSVRIC       -1.00  INITIAL CONDITION
                        X         .00 WORKING R AND D COEFFICIENT

98 RC          NORMAL DEPTH CHANNEL
                     ANL        .050  LEFT OVERBANK N-VALUE
                    ANCH        .025  MAIN CHANNEL N-VALUE
                     ANR        .050  RIGHT OVERBANK N-VALUE
                   RLNTH       5000.  REACH LENGTH
                     SEL       .0087  ENERGY SLOPE
                   ELMAX      1144.0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION
```

CROSS-SECTION DATA

		--- LEFT OVERBANK ---		+ ------ MAIN CHANNEL -------			+ --- RIGHT OVERBANK ---		
100 RY	ELEVATION	1146.00	1144.00	1142.00	1141.00	1140.00	1140.00	1142.00	1146.00
99 RX	DISTANCE	500.00	800.00	1000.00	1001.00	1020.00	1040.00	1150.00	1151.00

***

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	.00	.67	1.72	3.15	4.95	7.12	9.61	12.38	15.44	18.78
OUTFLOW	.00	9.36	33.28	72.66	129.32	207.35	312.65	439.38	588.10	759.44
ELEVATION	1140.00	1140.21	1140.42	1140.63	1140.84	1141.05	1141.26	1141.47	1141.68	1141.90
STORAGE	22.43	26.57	31.21	36.37	42.04	48.22	54.91	62.10	69.81	78.03
OUTFLOW	966.22	1211.61	1486.99	1794.66	2136.65	2514.79	2930.86	3386.54	3883.44	4423.08
ELEVATION	1142.11	1142.32	1142.53	1142.74	1142.95	1143.16	1143.37	1143.58	1143.79	1144.00

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HYDROGRAPH AT STATION RT200A

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
542.	13.00	(CFS)	128.	35.	34.	34.
		(INCHES)	2.011	2.209	2.209	2.209
		(AC-FT)	63.	70.	70.	70.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.92-HR
4.	13.00	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.92-HR
1141.62	13.00	1140.68	1140.24	1140.23	1140.23

CUMULATIVE AREA = .59 SQ MI

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          **************
          *            *
101 KK    *    RT200B  *       KINEMATIC WAVE ROUTING TO 19TH AND SOUTHERN
          *            *
          **************
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HYDROGRAPH ROUTING DATA

102 RK KINEMATIC WAVE STREAM ROUTING

L	5280.	CHANNEL LENGTH
S	.0070	SLOPE
N	.050	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	40.00	BOTTOM WIDTH OR DIAMETER
Z	25.00	SIDE SLOPE
NDXMIN	2	MINIMUM NUMBER OF DX INTERVALS

***

COMPUTED KINEMATIC PARAMETERS
VARIABLE TIME STEP
(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.40	1.38	5.00	1320.00	541.92	796.83	2.19	3.95

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6951E+02 EXCESS= .0000E+00 OUTFLOW= .6880E+02 BASIN STORAGE= .7188E+00 PERCENT ERROR= .0

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

```
                MAIN          .40      1.38      5.00           535.39    800.00      2.18

   ***           ***           ***           ***           ***

                    HYDROGRAPH AT STATION   RT200B

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                6-HR       24-HR       72-HR      24.92-HR
   535.      13.33      (CFS)      127.         35.         33.          33.
                       (INCHES)   1.998       2.183       2.183        2.183
                       (AC-FT)     63.         69.         69.          69.

                    CUMULATIVE AREA =     .59 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


        **************
        *            *
103 KK  *     CD201  *
        *            *
        **************

           SUBBASIN RUNOFF DATA

104 BA        SUBBASIN CHARACTERISTICS
                   TAREA        1.58  SUBBASIN AREA

              PRECIPITATION DATA

 92 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
              ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
              5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                .79    1.55    2.72    2.97    3.14    3.45    3.74    4.05     .00     .00     .00     .00

                                              STORM AREA =   24.31

105 LS        SCS LOSS RATE
                   STRTL         .42  INITIAL ABSTRACTION
                  CRVNBR       82.80  CURVE NUMBER
                   RTIMP         .00  PERCENT IMPERVIOUS AREA

106 UD        SCS DIMENSIONLESS UNITGRAPH
                   TLAG        1.08  LAG

                                              ***

                                                  UNIT HYDROGRAPH
                                              67 END-OF-PERIOD ORDINATES
                 15.      44.      82.     128.     188.     261.     346.     442.     524.     590.
                640.     670.     678.     678.     668.     637.     603.     565.     523.     472.
                414.     358.     309.     273.     242.     214.     189.     171.     152.     135.
                120.     105.      93.      83.      73.      65.      58.      51.      45.      40.
                 35.      31.      27.      25.      22.      19.      17.      15.      13.      12.
                 10.       9.       8.       7.       7.       6.       6.       5.       4.       4.
                  3.       3.       2.       2.       1.       1.       0.
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HYDROGRAPH AT STATION CD201

TOTAL RAINFALL = 3.94, TOTAL LOSS = 1.72, TOTAL EXCESS = 2.22

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
1034.	13.25	(CFS)	339.	94.	90.	90.
		(INCHES)	1.995	2.205	2.205	2.205
		(AC-FT)	168.	186.	186.	186.

CUMULATIVE AREA = 1.58 SQ MI

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*            *
107 KK  *  AD201  *    ADD HYDS. 200 AND 201
*            *
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108 HC HYDROGRAPH COMBINATION
ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

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*** *** *** *** ***

HYDROGRAPH AT STATION AD201

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
1569.	13.25	(CFS)	464.	128.	124.	124.
		(INCHES)	1.987	2.199	2.199	2.199
		(AC-FT)	230.	255.	255.	255.

CUMULATIVE AREA = 2.17 SQ MI

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*            *
109 KK  *  RT201  *    KINEMATIC WAVE ROUTING TO 35TH AND SOUTHERN
*            *
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HYDROGRAPH ROUTING DATA

110 RK KINEMATIC WAVE STREAM ROUTING
L 10500. CHANNEL LENGTH
S .0048 SLOPE

N	.020	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	40.00	BOTTOM WIDTH OR DIAMETER
Z	25.00	SIDE SLOPE
NDXMIN	2	MINIMUM NUMBER OF DX INTERVALS

***

COMPUTED KINEMATIC PARAMETERS
VARIABLE TIME STEP
(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.82	1.38	4.93	2625.00	1559.53	812.40	2.18	8.97

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2545E+03 EXCESS= .0000E+00 OUTFLOW= .2521E+03 BASIN STORAGE= .2104E+01 PERCENT ERROR= .1

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	.82	1.38	5.00	1557.60	810.00	2.18

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HYDROGRAPH AT STATION RT201

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
1558.	13.50	(CFS)	462.	127.	122.	122.
		(INCHES)	1.979	2.176	2.176	2.176
		(AC-FT)	229.	252.	252.	252.

CUMULATIVE AREA = 2.17 SQ MI

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*            *
*     CD202  *
*            *
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111 KK

SUBBASIN RUNOFF DATA

112 BA SUBBASIN CHARACTERISTICS

TAREA 1.40 SUBBASIN AREA

PRECIPITATION DATA

92 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35 .... TP-40 .... TP-49 .....

5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.79	1.55	2.72	2.97	3.14	3.45	3.74	4.05	.00	.00	.00	.00

STORM AREA = 24.31

113 LS SCS LOSS RATE

STRTL	.45	INITIAL ABSTRACTION
CRVNBR	81.60	CURVE NUMBER
RTIMP	.00	PERCENT IMPERVIOUS AREA

114 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	2.30	LAG

***

UNIT HYDROGRAPH
140 END-OF-PERIOD ORDINATES

3.	6.	10.	17.	24.	32.	42.	51.	62.	74.
87.	102.	118.	135.	154.	174.	193.	209.	226.	241.
252.	263.	272.	278.	284.	287.	288.	289.	288.	287.
285.	279.	273.	267.	259.	252.	245.	236.	228.	218.
208.	198.	186.	174.	161.	151.	141.	131.	124.	117.
110.	104.	98.	92.	87.	82.	78.	74.	70.	67.
63.	59.	56.	53.	50.	47.	44.	41.	39.	37.
35.	33.	31.	29.	28.	26.	25.	23.	22.	21.
20.	18.	17.	16.	15.	15.	14.	13.	12.	12.
11.	10.	10.	9.	9.	8.	8.	7.	7.	7.
6.	6.	5.	5.	5.	5.	4.	4.	4.	4.
3.	3.	3.	3.	3.	3.	3.	2.	2.	2.
2.	2.	2.	2.	2.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	0.	0.	0.	0.	0.

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HYDROGRAPH AT STATION CD202

TOTAL RAINFALL = 3.94, TOTAL LOSS = 1.82, TOTAL EXCESS = 2.12

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
472.	14.50	(CFS)	268.	78.	75.	75.
		(INCHES)	1.780	2.075	2.075	2.075
		(AC-FT)	133.	155.	155.	155.

CUMULATIVE AREA = 1.40 SQ MI

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115 KK

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*            *
*     CD203  *
*            *
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SUBBASIN RUNOFF DATA

116 BA SUBBASIN CHARACTERISTICS

TAREA 2.03 SUBBASIN AREA

PRECIPITATION DATA

92 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.79	1.55	2.72	2.97	3.14	3.45	3.74	4.05	.00	.00	.00	.00

STORM AREA = 24.31

117 LS SCS LOSS RATE

STRTL .44 INITIAL ABSTRACTION

CRVNBR 82.00 CURVE NUMBER

RTIMP .00 PERCENT IMPERVIOUS AREA

118 UD SCS DIMENSIONLESS UNITGRAPH

TLAG 2.70 LAG

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UNIT HYDROGRAPH

164 END-OF-PERIOD ORDINATES

3.	7.	10.	16.	24.	31.	40.	50.	59.	70.
83.	96.	109.	125.	143.	160.	179.	200.	221.	241.
258.	275.	293.	305.	317.	329.	337.	344.	350.	355.
356.	357.	358.	356.	355.	354.	349.	342.	336.	329.
321.	313.	306.	297.	288.	280.	269.	258.	247.	235.
222.	209.	196.	186.	175.	164.	156.	149.	141.	134.
128.	121.	115.	110.	104.	99.	95.	91.	87.	83.
80.	76.	72.	69.	65.	62.	59.	56.	52.	50.
48.	46.	44.	42.	39.	38.	36.	34.	33.	31.
29.	28.	26.	25.	24.	23.	22.	21.	19.	19.
18.	17.	16.	15.	15.	14.	13.	13.	12.	11.
11.	10.	10.	9.	9.	9.	8.	8.	7.	7.
7.	6.	6.	6.	5.	5.	5.	5.	4.	4.
4.	4.	4.	4.	3.	3.	3.	3.	3.	3.
3.	3.	2.	2.	2.	2.	2.	2.	2.	2.
1.	1.	1.	1.	1.	1.	1.	1.	1.	0.
0.	0.	0.	0.						

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HYDROGRAPH AT STATION CD203

TOTAL RAINFALL = 3.94, TOTAL LOSS = 1.79, TOTAL EXCESS = 2.15

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
607.	15.00	(CFS)	381.	114.	110.	110.
		(INCHES)	1.744	2.093	2.093	2.093
		(AC-FT)	189.	227.	227.	227.

CUMULATIVE AREA = 2.03 SQ MI

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          **************
          *            *
119 KK    *     AD203  *       ADD HYDS. 200 THRU 203 AT CHAMPION DRAIN
          *            *
          **************

120 HC          HYDROGRAPH COMBINATION
                     ICOMP          3  NUMBER OF HYDROGRAPHS TO COMBINE

                                                          ***

     ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION    AD203

PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                    6-HR        24-HR        72-HR      24.92-HR
   2229.      13.67          (CFS)    1108.         319.         308.         308.
                             (INCHES) 1.840        2.120        2.120        2.120
                             (AC-FT)   550.         633.         633.         633.

                       CUMULATIVE AREA =    5.60 SQ MI


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          **************
          *            *
121 KK    *     RT203  *       MUSKINGUM-CUNGE ROUTING VIA CHAMPION DRAIN TO 43RD AVE
          *            *
          **************

             HYDROGRAPH ROUTING DATA

122 RD          MUSKINGUM-CUNGE CHANNEL ROUTING

123 RC          NORMAL DEPTH CHANNEL
                      ANL        .070  LEFT OVERBANK N-VALUE
                     ANCH        .030  MAIN CHANNEL N-VALUE
                      ANR        .070  RIGHT OVERBANK N-VALUE
                    RLNTH       6300.  REACH LENGTH
                      SEL       .0016  ENERGY SLOPE
                    ELMAX          .0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

                                  CROSS-SECTION DATA
                          --- LEFT OVERBANK --- + ------ MAIN CHANNEL ------- + --- RIGHT OVERBANK ---
125 RY       ELEVATION  1030.00  1028.00  1028.00  1023.00  1023.00  1027.40  1025.00  1026.50
124 RX       DISTANCE   1300.00  1600.00  1980.00  2000.00  2010.00  2050.00  2350.00  2650.00

                                                  ***

                            COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

          STORAGE      .00      .66     1.58     2.75     4.19     5.88     8.86    17.90    33.57    55.88
          OUTFLOW      .00     4.14    14.61    31.85    56.73    90.12   134.24   206.13   325.25   506.73
```

ELEVATION	1023.00	1023.37	1023.74	1024.11	1024.47	1024.84	1025.21	1025.58	1025.95	1026.32
STORAGE	84.34	116.00	150.37	185.98	230.60	289.28	350.91	415.47	482.99	553.44
OUTFLOW	775.95	1135.62	1576.74	2161.18	2843.00	3690.63	4680.70	5805.54	7062.57	8451.13
ELEVATION	1026.68	1027.05	1027.42	1027.79	1028.16	1028.53	1028.89	1029.26	1029.63	1030.00

COMPUTED MUSKINGUM-CUNGE PARAMETERS

COMPUTATION TIME STEP

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN			5.00	484.62	2045.64	880.00	2.11	1.63

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	5.00	2045.64	880.00	2.11	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6336E+03 EXCESS= .0000E+00 OUTFLOW= .6296E+03 BASIN STORAGE= .5618E+01 PERCENT ERROR= -.3

*** *** *** *** ***

HYDROGRAPH AT STATION RT203

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
2046.	14.67	(CFS)	1099.	317.	306.	306.
		(INCHES)	1.824	2.107	2.107	2.107
		(AC-FT)	545.	629.	629.	629.

CUMULATIVE AREA = 5.60 SQ MI

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126 KK

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* *
* CD210 * (L) SOUTH MOUNTAIN PARK
* *
****

SUBBASIN RUNOFF DATA

127 BA SUBBASIN CHARACTERISTICS

TAREA 1.97 SUBBASIN AREA

PRECIPITATION DATA

92 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.79	1.55	2.72	2.97	3.14	3.45	3.74	4.05	.00	.00	.00	.00

STORM AREA = 24.31

128 LS SCS LOSS RATE

STRTL	.11	INITIAL ABSTRACTION
CRVNBR	94.90	CURVE NUMBER
RTIMP	.00	PERCENT IMPERVIOUS AREA

129 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	.38	LAG

***

UNIT HYDROGRAPH
25 END-OF-PERIOD ORDINATES

222.	687.	1460.	2077.	2256.	2120.	1792.	1316.	915.	659.
489.	351.	256.	185.	133.	97.	71.	51.	37.	27.
21.	15.	10.	6.	1.					

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HYDROGRAPH AT STATION CD210

TOTAL RAINFALL = 3.94, TOTAL LOSS = .58, TOTAL EXCESS = 3.36

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
3735.	12.42	(CFS)	630.	178.	171.	171.
		(INCHES)	2.972	3.359	3.359	3.359
		(AC-FT)	312.	353.	353.	353.

CUMULATIVE AREA = 1.97 SQ MI

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*            *
*     RT210  *
*            *
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130 KK MUSKINGUM-CUNGE ROUTING TO S. MTN. DETENTION AREA

HYDROGRAPH ROUTING DATA

131 RD MUSKINGUM-CUNGE CHANNEL ROUTING

L	4850.	CHANNEL LENGTH
S	.0160	SLOPE
N	.050	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	200.00	BOTTOM WIDTH OR DIAMETER
Z	5.00	SIDE SLOPE

***

COMPUTED MUSKINGUM-CUNGE PARAMETERS
COMPUTATION TIME STEP

ELEMENT	ALPHA	M	DT	DX	PEAK	TIME TO	VOLUME	MAXIMUM

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                                                                    PEAK                CELERITY
                                          (MIN)      (FT)      (CFS)    (MIN)      (IN)      (FPS)

                MAIN        .14       1.61       5.00    1212.50   3736.10    755.00      3.36      8.28

                                  INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                MAIN        .14       1.61       5.00              3736.10    755.00      3.36

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3530E+03 EXCESS= .0000E+00 OUTFLOW= .3528E+03 BASIN STORAGE= .1317E+01 PERCENT ERROR=    -.3


   ***          ***          ***          ***          ***

                    HYDROGRAPH AT STATION    RT210

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                6-HR       24-HR       72-HR     24.92-HR
  3736.      12.58      (CFS)      630.        178.        171.        171.
                       (INCHES)   2.973       3.357       3.357       3.357
                       (AC-FT)    312.        353.        353.        353.

                    CUMULATIVE AREA =    1.97 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


         **************
         *            *
132 KK   *     CD211  *       SOUTH MOUNTAIN PARK
         *            *
         **************

            SUBBASIN RUNOFF DATA

133 BA          SUBBASIN CHARACTERISTICS
                     TAREA         1.35  SUBBASIN AREA

                PRECIPITATION DATA

 92 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .79    1.55    2.72    2.97    3.14    3.45    3.74    4.05     .00     .00     .00     .00

                                              STORM AREA =   24.31

134 LS          SCS LOSS RATE
                     STRTL          .11  INITIAL ABSTRACTION
                     CRVNBR       94.90  CURVE NUMBER
                     RTIMP          .00  PERCENT IMPERVIOUS AREA

135 UD          SCS DIMENSIONLESS UNITGRAPH
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TLAG .34 LAG

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UNIT HYDROGRAPH
22 END-OF-PERIOD ORDINATES

199.	630.	1278.	1664.	1692.	1455.	1103.	730.	508.	364.
250.	178.	124.	87.	61.	43.	30.	21.	16.	11.
7.	3.								

*** *** *** *** ***

HYDROGRAPH AT STATION CD211

TOTAL RAINFALL = 3.94, TOTAL LOSS = .58, TOTAL EXCESS = 3.36

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
2711.	12.42	(CFS)	432.	122.	117.	117.
		(INCHES)	2.973	3.360	3.360	3.360
		(AC-FT)	214.	242.	242.	242.

CUMULATIVE AREA = 1.35 SQ MI

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          *             *
136 KK    *    CD212    *      SOUTH MOUNTAIN PARK
          *             *
          ***************
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SUBBASIN RUNOFF DATA

137 BA SUBBASIN CHARACTERISTICS
TAREA .81 SUBBASIN AREA

PRECIPITATION DATA

92 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			.... TP-40					.... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.79	1.55	2.72	2.97	3.14	3.45	3.74	4.05	.00	.00	.00	.00

STORM AREA = 24.31

138 LS SCS LOSS RATE
STRTL .11 INITIAL ABSTRACTION
CRVNBR 94.90 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

139 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .51 LAG

***

UNIT HYDROGRAPH
33 END-OF-PERIOD ORDINATES

47.	137.	280.	473.	625.	702.	705.	655.	576.	473.
353.	271.	211.	169.	133.	102.	80.	63.	49.	38.
30.	24.	18.	14.	11.	9.	7.	6.	5.	3.
2.	1.	0.							

*** *** *** *** ***

HYDROGRAPH AT STATION CD212

TOTAL RAINFALL = 3.94, TOTAL LOSS = .58, TOTAL EXCESS = 3.36

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
1303.	12.58	(CFS)	259.	73.	70.	70.
		(INCHES)	2.971	3.358	3.358	3.358
		(AC-FT)	128.	145.	145.	145.

CUMULATIVE AREA = .81 SQ MI

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          *            *
140 KK    *     AD212  *       ADD HYDS. 210 THRU 212
          *            *
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141 HC HYDROGRAPH COMBINATION
ICOMP 3 NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION AD212

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
7472.	12.50	(CFS)	1320.	373.	359.	359.
		(INCHES)	2.972	3.358	3.358	3.358
		(AC-FT)	655.	740.	740.	740.

CUMULATIVE AREA = 4.13 SQ MI

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          *            *
142 KK    *    RT212A  *       Route (MODIFIED PULS) Thru South Mountain Detention Basin.
          *            *
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Volumes and rating curve modified 1-15-92

148 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

HYDROGRAPH ROUTING DATA

144 RS STORAGE ROUTING

NSTPS	1	NUMBER OF SUBREACHES
ITYP	STOR	TYPE OF INITIAL CONDITION
RSVRIC	.00	INITIAL CONDITION
X	.00	WORKING R AND D COEFFICIENT

145 SV	STORAGE	.0	28.0	82.0	281.0	495.0	510.0	525.0	540.0	556.0	572.0
146 SE	ELEVATION	1292.00	1296.00	1300.00	1310.00	1318.00	1318.50	1319.00	1319.50	1320.00	1320.50
147 SQ	DISCHARGE	0.	0.	0.	73.	102.	222.	433.	710.	1037.	1408.

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HYDROGRAPH AT STATION RT212A

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DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	1292.0	1		0820	101	0.	6.2	1292.9	1		1640	201	230.	510.6	1318.5
1		0005	2	0.	.0	1292.0	1		0825	102	0.	6.6	1292.9	1		1645	202	223.	510.1	1318.5
1		0010	3	0.	.0	1292.0	1		0830	103	0.	7.0	1293.0	1		1650	203	219.	509.6	1318.5
1		0015	4	0.	.0	1292.0	1		0835	104	0.	7.4	1293.1	1		1655	204	215.	509.2	1318.5
1		0020	5	0.	.0	1292.0	1		0840	105	0.	7.8	1293.1	1		1700	205	212.	508.7	1318.5
1		0025	6	0.	.0	1292.0	1		0845	106	0.	8.3	1293.2	1		1705	206	208.	508.3	1318.4
1		0030	7	0.	.0	1292.0	1		0850	107	0.	8.7	1293.2	1		1710	207	205.	507.8	1318.4
1		0035	8	0.	.0	1292.0	1		0855	108	0.	9.2	1293.3	1		1715	208	201.	507.4	1318.4
1		0040	9	0.	.0	1292.0	1		0900	109	0.	9.7	1293.4	1		1720	209	198.	507.0	1318.4
1		0045	10	0.	.0	1292.0	1		0905	110	0.	10.2	1293.5	1		1725	210	194.	506.5	1318.4
1		0050	11	0.	.0	1292.0	1		0910	111	0.	10.7	1293.5	1		1730	211	191.	506.1	1318.4
1		0055	12	0.	.0	1292.0	1		0915	112	0.	11.3	1293.6	1		1735	212	188.	505.7	1318.4
1		0100	13	0.	.0	1292.0	1		0920	113	0.	11.9	1293.7	1		1740	213	185.	505.3	1318.3
1		0105	14	0.	.0	1292.0	1		0925	114	0.	12.5	1293.8	1		1745	214	182.	505.0	1318.3
1		0110	15	0.	.0	1292.0	1		0930	115	0.	13.2	1293.9	1		1750	215	179.	504.6	1318.3
1		0115	16	0.	.0	1292.0	1		0935	116	0.	13.8	1294.0	1		1755	216	176.	504.2	1318.3
1		0120	17	0.	.0	1292.0	1		0940	117	0.	14.6	1294.1	1		1800	217	173.	503.9	1318.3
1		0125	18	0.	.0	1292.0	1		0945	118	0.	15.3	1294.2	1		1805	218	170.	503.5	1318.3
1		0130	19	0.	.0	1292.0	1		0950	119	0.	16.2	1294.3	1		1810	219	167.	503.2	1318.3
1		0135	20	0.	.0	1292.0	1		0955	120	0.	17.0	1294.4	1		1815	220	165.	502.8	1318.3
1		0140	21	0.	.0	1292.0	1		1000	121	0.	17.9	1294.6	1		1820	221	162.	502.5	1318.3
1		0145	22	0.	.0	1292.0	1		1005	122	0.	18.9	1294.7	1		1825	222	159.	502.2	1318.2
1		0150	23	0.	.0	1292.0	1		1010	123	0.	19.9	1294.8	1		1830	223	157.	501.9	1318.2
1		0155	24	0.	.0	1292.0	1		1015	124	0.	20.9	1295.0	1		1835	224	154.	501.5	1318.2
1		0200	25	0.	.0	1292.0	1		1020	125	0.	22.0	1295.1	1		1840	225	152.	501.2	1318.2

1	0205	26	0.	.0	1292.0	*	1	1025	126	0.	23.2	1295.3	*	1	1845	226	149.	500.9	1318.2
1	0210	27	0.	.0	1292.0	*	1	1030	127	0.	24.4	1295.5	*	1	1850	227	147.	500.6	1318.
1	0215	28	0.	.0	1292.0	*	1	1035	128	0.	25.7	1295.7	*	1	1855	228	145.	500.3	1318.
1	0220	29	0.	.0	1292.0	*	1	1040	129	0.	27.0	1295.9	*	1	1900	229	142.	500.0	1318.
1	0225	30	0.	.0	1292.0	*	1	1045	130	0.	28.4	1296.0	*	1	1905	230	140.	499.7	1318.2
1	0230	31	0.	.0	1292.0	*	1	1050	131	0.	29.9	1296.1	*	1	1910	231	138.	499.5	1318.1
1	0235	32	0.	.0	1292.0	*	1	1055	132	0.	31.5	1296.3	*	1	1915	232	135.	499.2	1318.1
1	0240	33	0.	.0	1292.0	*	1	1100	133	0.	33.2	1296.4	*	1	1920	233	133.	498.9	1318.1
1	0245	34	0.	.0	1292.0	*	1	1105	134	0.	35.1	1296.5	*	1	1925	234	131.	498.7	1318.1
1	0250	35	0.	.0	1292.0	*	1	1110	135	0.	37.0	1296.7	*	1	1930	235	129.	498.4	1318.1
1	0255	36	0.	.0	1292.0	*	1	1115	136	0.	39.1	1296.8	*	1	1935	236	127.	498.1	1318.1
1	0300	37	0.	.0	1292.0	*	1	1120	137	0.	41.4	1297.0	*	1	1940	237	125.	497.9	1318.1
1	0305	38	0.	.0	1292.0	*	1	1125	138	0.	43.8	1297.2	*	1	1945	238	123.	497.7	1318.1
1	0310	39	0.	.0	1292.0	*	1	1130	139	0.	46.4	1297.4	*	1	1950	239	122.	497.4	1318.1
1	0315	40	0.	.0	1292.0	*	1	1135	140	0.	49.4	1297.6	*	1	1955	240	120.	497.2	1318.1
1	0320	41	0.	.0	1292.0	*	1	1140	141	0.	52.7	1297.8	*	1	2000	241	118.	497.0	1318.1
1	0325	42	0.	.0	1292.0	*	1	1145	142	0.	56.7	1298.1	*	1	2005	242	116.	496.8	1318.1
1	0330	43	0.	.0	1292.0	*	1	1150	143	0.	61.8	1298.5	*	1	2010	243	115.	496.6	1318.1
1	0335	44	0.	.0	1292.0	*	1	1155	144	0.	68.2	1299.0	*	1	2015	244	113.	496.4	1318.0
1	0340	45	0.	.0	1292.0	*	1	1200	145	0.	76.9	1299.6	*	1	2020	245	112.	496.2	1318.0
1	0345	46	0.	.0	1292.0	*	1	1205	146	3.	89.2	1300.4	*	1	2025	246	110.	496.0	1318.0
1	0350	47	0.	.0	1292.0	*	1	1210	147	9.	107.4	1301.3	*	1	2030	247	109.	495.8	1318.0
1	0355	48	0.	.0	1292.0	*	1	1215	148	19.	133.6	1302.6	*	1	2035	248	107.	495.6	1318.0
1	0400	49	0.	.0	1292.0	*	1	1220	149	32.	169.3	1304.4	*	1	2040	249	106.	495.5	1318.0
1	0405	50	0.	.0	1292.0	*	1	1225	150	48.	213.6	1306.6	*	1	2045	250	104.	495.3	1318.0
1	0410	51	0.	.0	1292.0	*	1	1230	151	66.	263.3	1309.1	*	1	2050	251	103.	495.1	1318.0
1	0415	52	0.	.0	1292.0	*	1	1235	152	77.	313.4	1311.2	*	1	2055	252	102.	495.0	1318.0
1	0420	53	0.	.0	1292.0	*	1	1240	153	84.	360.3	1313.0	*	1	2100	253	102.	494.8	1318.0
1	0425	54	0.	.0	1292.0	*	1	1245	154	89.	402.3	1314.5	*	1	2105	254	102.	494.6	1318.0
1	0430	55	0.	.0	1292.0	*	1	1250	155	94.	438.6	1315.9	*	1	2110	255	102.	494.4	1318.0
1	0435	56	0.	.0	1292.0	*	1	1255	156	98.	469.0	1317.0	*	1	2115	256	102.	494.3	1318.0
1	0440	57	0.	.0	1292.0	*	1	1300	157	102.	494.0	1318.0	*	1	2120	257	102.	494.1	1318.0
1	0445	58	0.	.0	1292.0	*	1	1305	158	279.	514.0	1318.6	*	1	2125	258	102.	493.9	1318.0
1	0450	59	0.	.0	1292.0	*	1	1310	159	507.	529.0	1319.1	*	1	2130	259	102.	493.7	1318.0
1	0455	60	0.	.0	1292.0	*	1	1315	160	702.	539.6	1319.5	*	1	2135	260	102.	493.5	1317.9
1	0500	61	0.	.0	1292.0	*	1	1320	161	844.	546.6	1319.7	*	1	2140	261	102.	493.3	1317.9
1	0505	62	0.	.0	1292.0	*	1	1325	162	932.	550.8	1319.8	*	1	2145	262	102.	493.1	1317.9
1	0510	63	0.	.1	1292.0	*	1	1330	163	979.	553.2	1319.9	*	1	2150	263	102.	492.9	1317.9
1	0515	64	0.	.1	1292.0	*	1	1335	164	997.	554.1	1319.9	*	1	2155	264	102.	492.7	1317.9
1	0520	65	0.	.1	1292.0	*	1	1340	165	995.	553.9	1319.9	*	1	2200	265	102.	492.5	1317.9
1	0525	66	0.	.1	1292.0	*	1	1345	166	978.	553.1	1319.9	*	1	2205	266	102.	492.3	1317.9
1	0530	67	0.	.2	1292.0	*	1	1350	167	950.	551.7	1319.9	*	1	2210	267	102.	492.0	1317.9
1	0535	68	0.	.2	1292.0	*	1	1355	168	916.	550.1	1319.8	*	1	2215	268	102.	491.8	1317.9
1	0540	69	0.	.3	1292.0	*	1	1400	169	878.	548.2	1319.8	*	1	2220	269	102.	491.6	1317.9
1	0545	70	0.	.3	1292.0	*	1	1405	170	837.	546.2	1319.7	*	1	2225	270	102.	491.4	1317.9
1	0550	71	0.	.4	1292.1	*	1	1410	171	796.	544.2	1319.6	*	1	2230	271	101.	491.1	1317.9
1	0555	72	0.	.4	1292.1	*	1	1415	172	755.	542.2	1319.6	*	1	2235	272	101.	490.9	1317.8
1	0600	73	0.	.5	1292.1	*	1	1420	173	715.	540.3	1319.5	*	1	2240	273	101.	490.6	1317.8
1	0605	74	0.	.6	1292.1	*	1	1425	174	679.	538.3	1319.4	*	1	2245	274	101.	490.4	1317.8
1	0610	75	0.	.7	1292.1	*	1	1430	175	645.	536.5	1319.4	*	1	2250	275	101.	490.2	1317.8
1	0615	76	0.	.8	1292.1	*	1	1435	176	612.	534.7	1319.3	*	1	2255	276	101.	489.9	1317.8
1	0620	77	0.	.9	1292.1	*	1	1440	177	581.	533.0	1319.3	*	1	2300	277	101.	489.7	1317.8
1	0625	78	0.	1.0	1292.1	*	1	1445	178	551.	531.4	1319.2	*	1	2305	278	101.	489.4	1317.8
1	0630	79	0.	1.1	1292.2	*	1	1450	179	524.	529.9	1319.2	*	1	2310	279	101.	489.1	1317.8
1	0635	80	0.	1.2	1292.2	*	1	1455	180	498.	528.5	1319.1	*	1	2315	280	101.	488.9	1317.8
1	0640	81	0.	1.4	1292.2	*	1	1500	181	474.	527.2	1319.1	*	1	2320	281	101.	488.6	1317.8
1	0645	82	0.	1.5	1292.2	*	1	1505	182	452.	526.0	1319.0	*	1	2325	282	101.	488.3	1317.8
1	0650	83	0.	1.7	1292.2	*	1	1510	183	432.	524.9	1319.0	*	1	2330	283	101.	488.1	1317.7
1	0655	84	0.	1.8	1292.3	*	1	1515	184	417.	523.8	1319.0	*	1	2335	284	101.	487.8	1317.7
1	0700	85	0.	2.0	1292.3	*	1	1520	185	402.	522.8	1318.9	*	1	2340	285	101.	487.5	1317.7

1	0705	86	0.	2.2	1292.3	*	1	1525	186	388.	521.8	1318.9	*	1	2345	286	101.	487.3	1317.7
1	0710	87	0.	2.4	1292.3	*	1	1530	187	374.	520.8	1318.9	*	1	2350	287	101.	487.0	1317.7
1	0715	88	0.	2.6	1292.4	*	1	1535	188	361.	519.9	1318.8	*	1	2355	288	101.	486.7	1317.7
1	0720	89	0.	2.8	1292.4	*	1	1540	189	348.	519.0	1318.8	*	2	0000	289	101.	486.4	1317.7
1	0725	90	0.	3.0	1292.4	*	1	1545	190	336.	518.1	1318.8	*	2	0005	290	101.	486.1	1317.7
1	0730	91	0.	3.2	1292.5	*	1	1550	191	324.	517.3	1318.7	*	2	0010	291	101.	485.8	1317.7
1	0735	92	0.	3.5	1292.5	*	1	1555	192	313.	516.4	1318.7	*	2	0015	292	101.	485.5	1317.6
1	0740	93	0.	3.7	1292.5	*	1	1600	193	301.	515.7	1318.7	*	2	0020	293	101.	485.2	1317.6
1	0745	94	0.	4.0	1292.6	*	1	1605	194	291.	514.9	1318.7	*	2	0025	294	101.	484.8	1317.6
1	0750	95	0.	4.3	1292.6	*	1	1610	195	281.	514.2	1318.6	*	2	0030	295	101.	484.4	1317.6
1	0755	96	0.	4.6	1292.7	*	1	1615	196	271.	513.5	1318.6	*	2	0035	296	101.	484.0	1317.6
1	0800	97	0.	4.9	1292.7	*	1	1620	197	262.	512.9	1318.6	*	2	0040	297	100.	483.5	1317.6
1	0805	98	0.	5.2	1292.7	*	1	1625	198	253.	512.2	1318.6	*	2	0045	298	100.	483.0	1317.6
1	0810	99	0.	5.5	1292.8	*	1	1630	199	245.	511.7	1318.6	*	2	0050	299	100.	482.5	1317.5
1	0815	100	0.	5.9	1292.8	*	1	1635	200	238.	511.1	1318.5	*	2	0055	300	100.	481.9	1317.5
						*							*						

****

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
997.	13.58	(CFS)	405.	130.	125.	125.
		(INCHES)	.911	1.170	1.170	1.170
		(AC-FT)	201.	258.	258.	258.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
(AC-FT)	(HR)	6-HR	24-HR	72-HR	24.92-HR
554.	13.58	520.	267.	257.	257.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
(FEET)	(HR)	6-HR	24-HR	72-HR	24.92-HR
1319.94	13.58	1318.84	1306.31	1305.79	1305.79

CUMULATIVE AREA = 4.13 SQ MI

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          *            *
149 KK    *    RT212B  *       Route DA CD210 (Ignore 36" pipe in routing) to Central Ave.
          *            *
          **************

             HYDROGRAPH ROUTING DATA

150 RD          MUSKINGUM-CUNGE CHANNEL ROUTING

151 RC          NORMAL DEPTH CHANNEL
                      ANL        .070  LEFT OVERBANK N-VALUE
                     ANCH        .040  MAIN CHANNEL N-VALUE
                      ANR        .070  RIGHT OVERBANK N-VALUE
                    RLNTH        600.  REACH LENGTH
                      SEL       .0025  ENERGY SLOPE
                    ELMAX          .0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

                                  CROSS-SECTION DATA
              --- LEFT OVERBANK --- + ------ MAIN CHANNEL ------- + --- RIGHT OVERBANK ---
```

153 RY	ELEVATION	1310.00	1310.00	1305.00	1301.00	1301.00	1305.00	1310.00	1310.00
152 RX	DISTANCE	.00	1.00	300.00	308.00	318.00	326.00	525.00	526.00

***

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	.00	.07	.16	.25	.36	.48	.61	.76	.92	1.13
OUTFLOW	.00	5.48	17.96	36.56	61.30	92.40	130.13	174.81	226.79	294.46
ELEVATION	1301.00	1301.47	1301.95	1302.42	1302.89	1303.37	1303.84	1304.32	1304.79	1305.26
STORAGE	1.63	2.43	3.54	4.96	6.68	8.71	11.06	13.70	16.66	19.92
OUTFLOW	388.61	517.27	690.88	918.54	1208.49	1568.39	2005.49	2526.65	3138.45	3847.25
ELEVATION	1305.74	1306.21	1306.68	1307.16	1307.63	1308.10	1308.58	1309.05	1309.53	1310.00

COMPUTED MUSKINGUM-CUNGE PARAMETERS

COMPUTATION TIME STEP

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN			4.41	600.00	986.10	823.87	1.17	2.27

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN			5.00		984.66	820.00	1.17	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2578E+03 EXCESS= .0000E+00 OUTFLOW= .2571E+03 BASIN STORAGE= .5086E+00 PERCENT ERROR= .1

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HYDROGRAPH AT STATION RT212B

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
985.	13.67	(CFS)	404.	130.	125.	125.
		(INCHES)	.909	1.167	1.167	1.167
		(AC-FT)	200.	257.	257.	257.

CUMULATIVE AREA = 4.13 SQ MI

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          ***************
          *             *
154 KK    *   RT212C    *      Route DA CD210 Between Central and 7th Ave.
          *             *
          ***************
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HYDROGRAPH ROUTING DATA

155 RD MUSKINGUM-CUNGE CHANNEL ROUTING

156 RC NORMAL DEPTH CHANNEL

ANL	.070	LEFT OVERBANK N-VALUE
ANCH	.050	MAIN CHANNEL N-VALUE
ANR	.070	RIGHT OVERBANK N-VALUE
RLNTH	2000.	REACH LENGTH
SEL	.0190	ENERGY SLOPE
ELMAX	.0	MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

CROSS-SECTION DATA

		--- LEFT OVERBANK ---		+ ------ MAIN CHANNEL -------			+ --- RIGHT OVERBANK ---		
158 RY	ELEVATION	1280.00	1270.00	1265.00	1262.00	1262.00	1265.00	1270.00	1270.00
157 RX	DISTANCE	.00	100.00	300.00	323.00	343.00	346.00	745.00	746.00

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COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	.00	1.05	2.45	4.22	7.93	16.51	30.03	48.49	71.88	99.54
OUTFLOW	.00	80.62	278.94	598.28	1176.96	2263.03	4101.22	6899.69	10843.15	16603.19
ELEVATION	1262.00	1262.95	1263.89	1264.84	1265.79	1266.74	1267.68	1268.63	1269.58	1270.53
STORAGE	128.08	157.02	186.38	216.15	246.34	276.93	307.94	339.36	371.19	403.43
OUTFLOW	24090.61	32790.26	42638.71	53589.29	65606.27	78661.57	92732.69	107801.30	123852.50	140874.20
ELEVATION	1271.47	1272.42	1273.37	1274.32	1275.26	1276.21	1277.16	1278.11	1279.05	1280.00

COMPUTED MUSKINGUM-CUNGE PARAMETERS

COMPUTATION TIME STEP

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN			4.33	1000.00	984.21	826.09	1.16	7.71

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN			5.00		981.69	825.00	1.16	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2569E+03 EXCESS= .0000E+00 OUTFLOW= .2556E+03 BASIN STORAGE= .1189E+01 PERCENT ERROR= .0

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HYDROGRAPH AT STATION RT212C

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
982.	13.75	(CFS)	404.	129.	124.	124.
		(INCHES)	.909	1.161	1.161	1.161
		(AC-FT)	200.	256.	256.	256.

CUMULATIVE AREA = 4.13 SQ MI

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              ***************
              *             *
159 KK        *   RT212D    *        Route DA CD210 Overland flow to point N.
              *             *
              ***************
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HYDROGRAPH ROUTING DATA

160 RD MUSKINGUM-CUNGE CHANNEL ROUTING

161 RC NORMAL DEPTH CHANNEL

ANL	.070	LEFT OVERBANK N-VALUE
ANCH	.070	MAIN CHANNEL N-VALUE
ANR	.070	RIGHT OVERBANK N-VALUE
RLNTH	26050.	REACH LENGTH
SEL	.0080	ENERGY SLOPE
ELMAX	1205.0	MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

CROSS-SECTION DATA

		--- LEFT OVERBANK --- +		------ MAIN CHANNEL ------- +			--- RIGHT OVERBANK ---		
163 RY	ELEVATION	1200.00	1200.00	1198.00	1197.90	1197.90	1198.00	1200.00	1200.00
162 RX	DISTANCE	.00	1.00	400.00	420.00	421.00	440.00	839.00	840.00

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COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	.00	16.71	66.71	150.02	266.64	416.59	597.61	785.31	973.02	1160.72
OUTFLOW	.00	19.25	116.91	338.44	721.73	1300.58	2175.25	3403.92	4847.51	6490.84
ELEVATION	1197.90	1198.27	1198.65	1199.02	1199.39	1199.77	1200.14	1200.52	1200.89	1201.26
STORAGE	1348.42	1536.13	1723.83	1911.53	2099.24	2286.94	2474.64	2662.35	2850.05	3037.76
OUTFLOW	8322.32	10332.66	12514.18	14860.39	17365.67	20025.11	22834.34	25789.47	28886.98	32123.64
ELEVATION	1201.64	1202.01	1202.38	1202.76	1203.13	1203.50	1203.88	1204.25	1204.63	1205.00

COMPUTED MUSKINGUM-CUNGE PARAMETERS

COMPUTATION TIME STEP

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN			5.00	296.02	1024.57	1075.00	.90	1.74

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN			5.00		1024.57	1075.00	.90	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2561E+03 EXCESS= .0000E+00 OUTFLOW= .1985E+03 BASIN STORAGE= .6289E+02 PERCENT ERROR= -2.1

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HYDROGRAPH AT STATION RT212D

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
1025.	17.92	(CFS)	367.	100.	96.	96.
		(INCHES)	.826	.899	.899	.899
		(AC-FT)	182.	198.	198.	198.

CUMULATIVE AREA = 4.13 SQ MI

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          *            *
164 KK    *     CD220  *       (N)
          *            *
          **************
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SUBBASIN RUNOFF DATA

165 BA SUBBASIN CHARACTERISTICS

TAREA 1.48 SUBBASIN AREA

PRECIPITATION DATA

92 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.79	1.55	2.72	2.97	3.14	3.45	3.74	4.05	.00	.00	.00	.00

STORM AREA = 24.31

166 LS SCS LOSS RATE

STRTL .27 INITIAL ABSTRACTION

CRVNBR 88.10 CURVE NUMBER

RTIMP .00 PERCENT IMPERVIOUS AREA

167 UD SCS DIMENSIONLESS UNITGRAPH

TLAG .53 LAG

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UNIT HYDROGRAPH
34 END-OF-PERIOD ORDINATES

78.	228.	463.	786.	1066.	1220.	1249.	1189.	1064.	904.
696.	532.	417.	332.	265.	209.	164.	129.	102.	80.
63.	50.	40.	31.	25.	19.	15.	13.	10.	8.
6.	4.	2.	1.						

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HYDROGRAPH AT STATION CD220

TOTAL RAINFALL = 3.94, TOTAL LOSS = 1.26, TOTAL EXCESS = 2.68

PEAK FLOW TIME MAXIMUM AVERAGE FLOW

(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
1921.	12.58	(CFS)	385.	107.	103.	103.
		(INCHES)	2.421	2.680	2.680	2.680
		(AC-FT)	191.	212.	212.	212.

CUMULATIVE AREA = 1.48 SQ MI

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          **************
          *            *
168 KK    *     RT220  *       KINEMATIC WAVE ROUTING TO 27TH AND DOBBINS
          *            *
          **************
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HYDROGRAPH ROUTING DATA

169 RK KINEMATIC WAVE STREAM ROUTING

L	5800.	CHANNEL LENGTH
S	.0079	SLOPE
N	.040	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	40.00	BOTTOM WIDTH OR DIAMETER
Z	25.00	SIDE SLOPE
NDXMIN	2	MINIMUM NUMBER OF DX INTERVALS

***

COMPUTED KINEMATIC PARAMETERS
VARIABLE TIME STEP
(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.53	1.38	4.81	1933.33	1910.94	767.15	2.67	6.87

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2115E+03 EXCESS= .0000E+00 OUTFLOW= .2110E+03 BASIN STORAGE= .6131E+00 PERCENT ERROR= -.1

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	.53	1.38	5.00	1898.49	765.00	2.67

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HYDROGRAPH AT STATION RT220

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
1898.	12.75	(CFS)	385.	106.	102.	102.
		(INCHES)	2.420	2.669	2.669	2.669
		(AC-FT)	191.	211.	211.	211.

CUMULATIVE AREA = 1.48 SQ MI

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          **************
          *            *
170 KK    *     CD221  *
          *            *
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SUBBASIN RUNOFF DATA

171 BA SUBBASIN CHARACTERISTICS

TAREA	1.68	SUBBASIN AREA

PRECIPITATION DATA

92 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

HYDRO-35			TP-40					TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.79	1.55	2.72	2.97	3.14	3.45	3.74	4.05	.00	.00	.00	.00

STORM AREA = 24.31

172 LS SCS LOSS RATE

STRTL	.38	INITIAL ABSTRACTION
CRVNBR	84.00	CURVE NUMBER
RTIMP	.00	PERCENT IMPERVIOUS AREA

173 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	.54	LAG

***

UNIT HYDROGRAPH
34 END-OF-PERIOD ORDINATES

84.	248.	499.	850.	1170.	1348.	1396.	1343.	1211.	1043.
822.	623.	492.	388.	315.	250.	195.	155.	124.	97.
76.	61.	49.	38.	30.	24.	19.	15.	13.	10.
8.	6.	4.	2.						

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HYDROGRAPH AT STATION CD221

TOTAL RAINFALL = 3.94, TOTAL LOSS = 1.62, TOTAL EXCESS = 2.32

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
1868.	12.67	(CFS)	380.	105.	101.	101.
		(INCHES)	2.102	2.316	2.316	2.316
		(AC-FT)	188.	207.	207.	207.

CUMULATIVE AREA = 1.68 SQ MI

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* *
174 KK * AD221 * ADD HYDS. 220 AND 221
* *
****

175 HC HYDROGRAPH COMBINATION
ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION AD221

PEAK FLOW (CFS)	TIME (HR)		6-HR	MAXIMUM AVERAGE FLOW 24-HR	72-HR	24.92-HR
3694.	12.75	(CFS)	765.	211.	203.	203.
		(INCHES)	2.251	2.481	2.481	2.481
		(AC-FT)	379.	418.	418.	418.

CUMULATIVE AREA = 3.16 SQ MI

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* *
176 KK * RT221 * KINEMATIC WAVE ROUTING TO 27TH AND BASELINE
* *
****

HYDROGRAPH ROUTING DATA

177 RK KINEMATIC WAVE STREAM ROUTING

L	5140.	CHANNEL LENGTH
S	.0054	SLOPE
N	.040	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	40.00	BOTTOM WIDTH OR DIAMETER
Z	50.00	SIDE SLOPE
NDXMIN	2	MINIMUM NUMBER OF DX INTERVALS

***

COMPUTED KINEMATIC PARAMETERS
VARIABLE TIME STEP
(DT SHOWN IS A MINIMUM)

ELEMENT ALPHA

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.41	1.35	4.86	1713.33	3691.28	772.62	2.47	5.91

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4182E+03 EXCESS= .0000E+00 OUTFLOW= .4165E+03 BASIN STORAGE= .1690E+01 PERCENT ERROR= .0

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	.41	1.35	5.00	3650.84	775.00	2.47
***	***	***	***	***		

HYDROGRAPH AT STATION RT221

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
3651.	12.92	(CFS)	765.	210.	202.	202.
		(INCHES)	2.250	2.469	2.469	2.469
		(AC-FT)	379.	416.	416.	416.

CUMULATIVE AREA = 3.16 SQ MI

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178 KK
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* *
* CD222 *
* *
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SUBBASIN RUNOFF DATA

179 BA SUBBASIN CHARACTERISTICS
TAREA 1.23 SUBBASIN AREA

PRECIPITATION DATA

92 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.79	1.55	2.72	2.97	3.14	3.45	3.74	4.05	.00	.00	.00	.00

STORM AREA = 24.31

180 LS SCS LOSS RATE
STRTL .47 INITIAL ABSTRACTION
CRVNBR 81.00 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

181 UD SCS DIMENSIONLESS UNITGRAPH
TLAG 1.63 LAG

***

UNIT HYDROGRAPH
100 END-OF-PERIOD ORDINATES

5.	11.	23.	35.	51.	67.	88.	110.	138.	166.
200.	233.	262.	290.	310.	330.	341.	351.	354.	355.
354.	352.	342.	331.	319.	307.	293.	278.	261.	243.
222.	201.	183.	165.	152.	140.	129.	119.	109.	101.
94.	87.	81.	74.	69.	64.	58.	53.	49.	46.
42.	39.	36.	33.	30.	28.	26.	24.	22.	20.
18.	17.	16.	14.	13.	12.	11.	11.	10.	9.
8.	8.	7.	7.	6.	5.	5.	5.	4.	4.
4.	4.	3.	3.	3.	3.	2.	2.	2.	2.
2.	1.	1.	1.	1.	1.	1.	0.	0.	0.

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HYDROGRAPH AT STATION CD222

TOTAL RAINFALL = 3.94, TOTAL LOSS = 1.87, TOTAL EXCESS = 2.07

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
539.	13.83	(CFS)	241.	68.	65.	65.
		(INCHES)	1.822	2.046	2.046	2.046
		(AC-FT)	120.	134.	134.	134.

CUMULATIVE AREA = 1.23 SQ MI

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          **************
          *            *
182 KK    *     AD222  *       ADD HYDS. 220 THRU 222
          *            *
          **************
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183 HC HYDROGRAPH COMBINATION
ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION AD222

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
3934.	12.92	(CFS)	1005.	277.	267.	267.
		(INCHES)	2.128	2.350	2.350	2.350
		(AC-FT)	498.	550.	550.	550.

CUMULATIVE AREA = 4.39 SQ MI

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          *            *
184 KK    *     RT222  *       KINEMATIC WAVE DEPTH ROUTING TO 35TH AND BASELINE
          *            *
          **************
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HYDROGRAPH ROUTING DATA

185 RK KINEMATIC WAVE STREAM ROUTING

L	5600.	CHANNEL LENGTH
S	.0046	SLOPE
N	.040	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	40.00	BOTTOM WIDTH OR DIAMETER
Z	50.00	SIDE SLOPE
NDXMIN	2	MINIMUM NUMBER OF DX INTERVALS

***

COMPUTED KINEMATIC PARAMETERS
VARIABLE TIME STEP
(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.38	1.35	5.00	1866.67	3916.14	784.46	2.34	5.66

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5503E+03 EXCESS= .0000E+00 OUTFLOW= .5469E+03 BASIN STORAGE= .3011E+01 PERCENT ERROR= .1

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	.38	1.35	5.00	3909.17	785.00	2.33

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HYDROGRAPH AT STATION RT222

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
3909.	13.08	(CFS)	1002.	275.	265.	265.
		(INCHES)	2.122	2.332	2.332	2.332
		(AC-FT)	497.	546.	546.	546.

CUMULATIVE AREA = 4.39 SQ MI

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*            *
186 KK  *     CD223  *
*            *
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SUBBASIN RUNOFF DATA

187 BA SUBBASIN CHARACTERISTICS

TAREA	1.10	SUBBASIN AREA

PRECIPITATION DATA

92 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

HYDRO-35			TP-40					TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.79	1.55	2.72	2.97	3.14	3.45	3.74	4.05	.00	.00	.00	.00

STORM AREA = 24.31

188 LS SCS LOSS RATE

STRTL	.45	INITIAL ABSTRACTION
CRVNBR	81.70	CURVE NUMBER
RTIMP	.00	PERCENT IMPERVIOUS AREA

189 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	1.67	LAG

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UNIT HYDROGRAPH
102 END-OF-PERIOD ORDINATES

5.	9.	19.	30.	43.	57.	74.	92.	115.	139.
167.	196.	221.	245.	265.	282.	294.	303.	308.	310.
310.	308.	304.	295.	285.	274.	263.	251.	239.	223.
208.	190.	172.	157.	142.	131.	121.	112.	103.	95.
88.	82.	76.	71.	65.	61.	56.	52.	47.	44.
40.	37.	34.	32.	30.	27.	25.	23.	21.	20.
18.	17.	16.	14.	13.	12.	11.	11.	10.	9.
8.	8.	7.	6.	6.	6.	5.	5.	4.	4.
4.	3.	3.	3.	3.	3.	3.	2.	2.	2.
2.	2.	1.	1.	1.	1.	1.	1.	1.	0.
0.	0.								

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HYDROGRAPH AT STATION CD223

TOTAL RAINFALL = 3.94, TOTAL LOSS = 1.81, TOTAL EXCESS = 2.13

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
486.	13.83	(CFS)	221.	62.	60.	60.
		(INCHES)	1.869	2.101	2.101	2.101
		(AC-FT)	110.	123.	123.	123.

CUMULATIVE AREA = 1.10 SQ MI

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          *            *
190 KK    *     AD223  *       ADD HYDS. 220 THRU 223
          *            *
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191 HC          HYDROGRAPH COMBINATION
                     ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

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                       HYDROGRAPH AT STATION    AD223

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR       72-HR     24.92-HR
   4230.     13.08        (CFS)    1223.        337.        325.        325.
                         (INCHES)  2.071       2.286       2.286       2.286
                         (AC-FT)    606.        669.        669.        669.

                       CUMULATIVE AREA =    5.49 SQ MI
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          *            *
192 KK    *    RT223A  *       NORMAL DEPTH ROUTING TO 35TH AND SOUTHERN
          *            *
          **************

             HYDROGRAPH ROUTING DATA

193 RS          STORAGE ROUTING
                     NSTPS           3  NUMBER OF SUBREACHES
                      ITYP        FLOW  TYPE OF INITIAL CONDITION
                     RSVRIC      -1.00  INITIAL CONDITION
                          X        .00 WORKING R AND D COEFFICIENT

194 RC          NORMAL DEPTH CHANNEL
                       ANL        .050  LEFT OVERBANK N-VALUE
                      ANCH        .030  MAIN CHANNEL N-VALUE
                       ANR        .050  RIGHT OVERBANK N-VALUE
                     RLNTH       2600.  REACH LENGTH
                       SEL       .0032  ENERGY SLOPE
                     ELMAX          .0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

                                  CROSS-SECTION DATA
                          --- LEFT OVERBANK --- + ------ MAIN CHANNEL ------- + --- RIGHT OVERBANK ---
196 RY       ELEVATION  1059.00  1056.00  1056.00  1055.00  1055.00  1055.80  1056.00  1058.00
195 RX       DISTANCE    999.00  1000.00  1001.00  1050.00  1055.00  1060.00  1280.00  1650.00
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COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	.00	.14	.42	.85	1.48	4.15	8.04	12.42	17.29	22.64
OUTFLOW	.00	1.70	7.76	19.98	40.19	87.38	186.08	324.50	501.87	718.77
ELEVATION	1055.00	1055.21	1055.42	1055.63	1055.84	1056.05	1056.26	1056.47	1056.68	1056.90
STORAGE	28.49	34.83	41.66	48.99	56.80	64.96	73.14	81.32	89.50	97.68
OUTFLOW	976.32	1275.89	1618.95	2007.05	2441.77	2983.21	3591.88	4246.78	4946.29	5688.99
ELEVATION	1057.11	1057.32	1057.53	1057.74	1057.95	1058.16	1058.37	1058.58	1058.79	1059.00

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HYDROGRAPH AT STATION RT223A

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
4112.	13.25	(CFS)	1217.	336.	323.	323.
		(INCHES)	2.061	2.274	2.274	2.274
		(AC-FT)	603.	666.	666.	666.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.92-HR
27.	13.25	10.	3.	3.	3.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.92-HR
1058.54	13.25	1057.09	1055.83	1055.80	1055.80

CUMULATIVE AREA = 5.49 SQ MI

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          *            *
197 KK    *    RT223B  *       MUSKINGUM-CUNGE ROUTING TO 43RD VIA CHAMPION DRAIN
          *            *
          **************
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HYDROGRAPH ROUTING DATA

193 RS	STORAGE ROUTING		
	NSTPS	3	NUMBER OF SUBREACHES
	ITYP	FLOW	TYPE OF INITIAL CONDITION
	RSVRIC	-1.00	INITIAL CONDITION
	X	.00	WORKING R AND D COEFFICIENT
198 RC	NORMAL DEPTH CHANNEL		
	ANL	.050	LEFT OVERBANK N-VALUE
	ANCH	.030	MAIN CHANNEL N-VALUE
	ANR	.050	RIGHT OVERBANK N-VALUE
	RLNTH	5200.	REACH LENGTH
	SEL	.0054	ENERGY SLOPE

ELMAX .0 MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

CROSS-SECTION DATA

--- LEFT OVERBANK --- + ------ MAIN CHANNEL ------- + --- RIGHT OVERBANK ---

200 RY	ELEVATION	1030.00	1028.00	1028.00	1023.00	1023.00	1027.40	1025.00	1026.50
199 RX	DISTANCE	1300.00	1600.00	1980.00	2000.00	2010.00	2050.00	2350.00	2650.00

***

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	.00	.55	1.30	2.27	3.46	4.85	7.32	14.77	27.71	46.13
OUTFLOW	.00	7.60	26.83	58.52	104.22	165.56	247.62	393.58	652.96	1064.05
ELEVATION	1023.00	1023.37	1023.74	1024.11	1024.47	1024.84	1025.21	1025.58	1025.95	1026.32
STORAGE	69.61	95.75	124.11	153.51	190.34	238.77	289.64	342.93	398.66	456.81
OUTFLOW	1691.55	2541.96	3590.69	4983.50	6612.74	8652.89	11049.40	13782.83	16846.83	20240.00
ELEVATION	1026.68	1027.05	1027.42	1027.79	1028.16	1028.53	1028.89	1029.26	1029.63	1030.00

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HYDROGRAPH AT STATION RT223B

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
3584.	13.75	(CFS)	1213.	334.	322.	322.
		(INCHES)	2.055	2.264	2.264	2.264
		(AC-FT)	602.	663.	663.	663.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.92-HR
41.	13.75	16.	4.	4.	4.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.92-HR
1027.42	13.75	1026.16	1024.19	1024.15	1024.15

CUMULATIVE AREA = 5.49 SQ MI

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*            *
*     CD224  *
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201 KK

SUBBASIN RUNOFF DATA

202 BA SUBBASIN CHARACTERISTICS

TAREA 1.52 SUBBASIN AREA

PRECIPITATION DATA

92 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.79	1.55	2.72	2.97	3.14	3.45	3.74	4.05	.00	.00	.00	.00

STORM AREA = 24.31

203 LS SCS LOSS RATE

STRTL	.43	INITIAL ABSTRACTION
CRVNBR	82.30	CURVE NUMBER
RTIMP	.00	PERCENT IMPERVIOUS AREA

204 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	1.53	LAG

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UNIT HYDROGRAPH
94 END-OF-PERIOD ORDINATES

7.	16.	33.	52.	74.	99.	129.	163.	203.	246.
293.	335.	375.	405.	432.	448.	463.	465.	467.	464.
459.	444.	428.	411.	392.	372.	350.	325.	297.	267.
241.	216.	199.	181.	167.	152.	140.	128.	119.	110.
101.	93.	85.	78.	71.	65.	60.	55.	50.	46.
43.	39.	35.	33.	30.	27.	25.	23.	21.	19.
18.	16.	15.	14.	13.	12.	11.	10.	9.	8.
8.	7.	6.	6.	5.	5.	5.	4.	4.	4.
3.	3.	3.	3.	2.	2.	2.	2.	1.	1.
1.	1.	0.	0.						

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HYDROGRAPH AT STATION CD224

TOTAL RAINFALL = 3.94, TOTAL LOSS = 1.76, TOTAL EXCESS = 2.18

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
740.	13.67	(CFS)	315.	88.	85.	85.
		(INCHES)	1.927	2.153	2.153	2.153
		(AC-FT)	156.	175.	175.	175.

CUMULATIVE AREA = 1.52 SQ MI

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*     AD224  *
*            *
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205 KK ADD HYDS. 220 THRU 224 PLUS 200 THRU 203 PLUS 210 THRU 212

206 HC HYDROGRAPH COMBINATION

ICOMP	4	NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION AD224

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
4901.	14.33	(CFS)	2706.	839.	808.	808.
		(INCHES)	1.503	1.865	1.865	1.865
		(AC-FT)	1342.	1665.	1665.	1665.

CUMULATIVE AREA = 16.74 SQ MI

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*            *
207 KK  *  RT224A  *   MODIFIED PULS ROUTING (STREET WEIR AT 43RD AVE.)
*            *
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HYDROGRAPH ROUTING DATA

208 RS STORAGE ROUTING

NSTPS 1 NUMBER OF SUBREACHES
ITYP STOR TYPE OF INITIAL CONDITION
RSVRIC .00 INITIAL CONDITION
X .00 WORKING R AND D COEFFICIENT

209 SV	STORAGE	.0	1.0	2.4	10.0	17.4	41.0	63.9
210 SE	ELEVATION	1019.40	1019.70	1020.00	1020.50	1021.00	1021.50	1022.00
211 SQ	DISCHARGE	0.	0.	33.	299.	938.	2546.	6103.

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HYDROGRAPH AT STATION RT224A

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
4883.	14.42	(CFS)	2698.	834.	803.	803.
		(INCHES)	1.498	1.853	1.853	1.853
		(AC-FT)	1338.	1654.	1654.	1654.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.92-HR
56.	14.42	38.	13.	13.	13.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.92-HR
1021.83	14.42	1021.44	1020.27	1020.24	1020.24

CUMULATIVE AREA = 16.74 SQ MI

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          *            *
212 KK    *    RT224B  *      MODIFIED PULS ROUTING VIA CHAMPION DRAIN TO 51ST AND BASELINE
          *            *
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HYDROGRAPH ROUTING DATA

213 RS STORAGE ROUTING

NSTPS	5	NUMBER OF SUBREACHES
ITYP	FLOW	TYPE OF INITIAL CONDITION
RSVRIC	-1.00	INITIAL CONDITION
X	.00	WORKING R AND D COEFFICIENT

214 SV	STORAGE	.0	27.0	48.0	79.0	106.0	142.0	154.0
215 SQ	DISCHARGE	0.	500.	1000.	2000.	3000.	4500.	5000.

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HYDROGRAPH AT STATION RT224B

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
4826.	14.75	(CFS)	2682.	824.	794.	794.
		(INCHES)	1.489	1.831	1.831	1.831
		(AC-FT)	1330.	1635.	1635.	1635.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.92-HR
30.	14.75	19.	6.	6.	6.

CUMULATIVE AREA = 16.74 SQ MI

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216 KK    *    RT224C  *
          *            *
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HYDROGRAPH ROUTING DATA

217 RS STORAGE ROUTING

NSTPS	3	NUMBER OF SUBREACHES
ITYP	FLOW	TYPE OF INITIAL CONDITION
RSVRIC	-1.00	INITIAL CONDITION

```
                    X         .00 WORKING R AND D COEFFICIENT

218 SV          STORAGE         .0      34.0      50.0      79.0     104.0     138.0     149.0

219 SQ          DISCHARGE       0.      500.     1000.     2000.    3000.     4500.     5000.

                                                                    ***

    ***           ***           ***           ***           ***

                    HYDROGRAPH AT STATION   RT224C

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                6-HR        24-HR        72-HR      24.92-HR
  4772.      14.92      (CFS)     2650.         811.         781.         781.
                        (INCHES)  1.472        1.801        1.801        1.801
                        (AC-FT)   1314.        1608.        1608.        1608.

PEAK STORAGE  TIME                          MAXIMUM AVERAGE STORAGE
  (AC-FT)     (HR)                6-HR        24-HR        72-HR      24.92-HR
    48.       14.92                31.          11.          10.          10.

                    CUMULATIVE AREA =   16.74 SQ MI


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          *            *
220 KK    *    RT224D  *
          *            *
          **************

              HYDROGRAPH ROUTING DATA

221 RS          STORAGE ROUTING
                     NSTPS          5  NUMBER OF SUBREACHES
                      ITYP       FLOW  TYPE OF INITIAL CONDITION
                     RSVRIC     -1.00  INITIAL CONDITION
                         X       .00 WORKING R AND D COEFFICIENT

222 SV          STORAGE         .0      40.0      68.0     107.0     141.0     186.0     201.0

223 SQ          DISCHARGE       0.      500.     1000.     2000.    3000.     4500.     5000.

                                                                    ***

    ***           ***           ***           ***           ***

                    HYDROGRAPH AT STATION   RT224D

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                6-HR        24-HR        72-HR      24.92-HR
  4716.      15.33      (CFS)     2601.         792.         763.         763.
                        (INCHES)  1.445        1.760        1.760        1.760
                        (AC-FT)   1290.        1571.        1571.        1571.
```

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.92-HR
38.	15.33	25.	8.	8.	8.

CUMULATIVE AREA = 16.74 SQ MI

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          *            *
224 KK    *     CD230  *
          *            *
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SUBBASIN RUNOFF DATA

225 BA SUBBASIN CHARACTERISTICS

TAREA 1.93 SUBBASIN AREA

PRECIPITATION DATA

92 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.79	1.55	2.72	2.97	3.14	3.45	3.74	4.05	.00	.00	.00	.00

STORM AREA = 24.31

226 LS SCS LOSS RATE

STRTL .39 INITIAL ABSTRACTION

CRVNBR 83.60 CURVE NUMBER

RTIMP .00 PERCENT IMPERVIOUS AREA

227 UD SCS DIMENSIONLESS UNITGRAPH

TLAG .53 LAG

***

UNIT HYDROGRAPH

34 END-OF-PERIOD ORDINATES

101.	298.	603.	1025.	1390.	1591.	1629.	1551.	1388.	1179.
908.	694.	543.	433.	346.	273.	214.	169.	133.	105.
82.	65.	52.	41.	32.	25.	20.	16.	13.	11.
8.	5.	3.	1.						

*** *** *** *** ***

HYDROGRAPH AT STATION CD230

TOTAL RAINFALL = 3.94, TOTAL LOSS = 1.66, TOTAL EXCESS = 2.28

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
2133.	12.67	(CFS)	430.	118.	114.	114.
		(INCHES)	2.072	2.282	2.282	2.282
		(AC-FT)	213.	235.	235.	235.

CUMULATIVE AREA = 1.93 SQ MI

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228 KK * RT230 * KINEMATIC WAVE ROUTING TO 43RD AND BASELINE
* *
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HYDROGRAPH ROUTING DATA

229 RK KINEMATIC WAVE STREAM ROUTING

L	11800.	CHANNEL LENGTH
S	.0046	SLOPE
N	.040	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	30.00	BOTTOM WIDTH OR DIAMETER
Z	50.00	SIDE SLOPE
NDXMIN	2	MINIMUM NUMBER OF DX INTERVALS

***

COMPUTED KINEMATIC PARAMETERS
VARIABLE TIME STEP
(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.39	1.35	5.00	1475.00	2120.74	794.81	2.27	4.83

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2349E+03 EXCESS= .0000E+00 OUTFLOW= .2336E+03 BASIN STORAGE= .4159E+01 PERCENT ERROR= -1.2

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	.39	1.35	5.00	2118.44	795.00	2.27
***	***	***	***	***		

HYDROGRAPH AT STATION RT230

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
2118.	13.25	(CFS)	432.	118.	113.	113.
		(INCHES)	2.082	2.267	2.267	2.267
		(AC-FT)	214.	233.	233.	233.

CUMULATIVE AREA = 1.93 SQ MI

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          *            *
230 KK    *     CD231  *
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SUBBASIN RUNOFF DATA

231 BA SUBBASIN CHARACTERISTICS

TAREA 1.45 SUBBASIN AREA

PRECIPITATION DATA

92 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.79	1.55	2.72	2.97	3.14	3.45	3.74	4.05	.00	.00	.00	.00

STORM AREA = 24.31

232 LS SCS LOSS RATE

STRTL .45 INITIAL ABSTRACTION

CRVNBR 81.50 CURVE NUMBER

RTIMP .00 PERCENT IMPERVIOUS AREA

233 UD SCS DIMENSIONLESS UNITGRAPH

TLAG 2.20 LAG

***

UNIT HYDROGRAPH

134 END-OF-PERIOD ORDINATES

3.	7.	12.	20.	28.	38.	48.	59.	72.	86.
101.	120.	138.	159.	181.	203.	222.	241.	258.	271.
284.	294.	301.	308.	310.	311.	312.	311.	310.	306.
300.	293.	285.	277.	268.	259.	250.	240.	228.	217.
203.	189.	176.	164.	152.	142.	133.	125.	118.	111.
104.	98.	92.	87.	82.	78.	74.	70.	65.	62.
58.	55.	51.	48.	45.	43.	40.	38.	36.	33.
32.	30.	28.	26.	25.	23.	22.	21.	19.	18.
17.	16.	15.	14.	13.	13.	12.	11.	11.	10.
9.	9.	8.	8.	7.	7.	7.	6.	6.	5.
5.	5.	5.	4.	4.	4.	4.	3.	3.	3.
3.	3.	3.	3.	2.	2.	2.	2.	2.	2.
2.	1.	1.	1.	1.	1.	1.	1.	1.	1.
0.	0.	0.	0.						

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HYDROGRAPH AT STATION CD231

TOTAL RAINFALL = 3.94, TOTAL LOSS = 1.83, TOTAL EXCESS = 2.11

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
(CFS)	(HR)	6-HR	24-HR	72-HR	24.92-HR

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505.    14.42      (CFS)     279.        81.        78.        78.
                 (INCHES)    1.788      2.070      2.070      2.070
                  (AC-FT)     138.       160.       160.       160.

                 CUMULATIVE AREA =    1.45 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

          ***************
          *             *
234 KK    *    AD231    *       ADD HYDS. 230 AND 231
          *             *
          ***************

235 HC         HYDROGRAPH COMBINATION
                  ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                        ***

    ***          ***          ***          ***          ***

                  HYDROGRAPH AT STATION    AD231

PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                    6-HR      24-HR      72-HR    24.92-HR
  2388.      13.25       (CFS)        710.       198.       191.       191.
                       (INCHES)      1.954      2.182      2.182      2.182
                        (AC-FT)       352.       393.       393.       393.

                 CUMULATIVE AREA =    3.38 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

          ***************
          *             *
236 KK    *    RT231    *       KINEMATIC WAVE ROUTING TO 51ST AND BASELINE
          *             *
          ***************

             HYDROGRAPH ROUTING DATA

237 RK         KINEMATIC WAVE STREAM ROUTING
                        L       4950.  CHANNEL LENGTH
                        S       .0053  SLOPE
                        N        .040  CHANNEL ROUGHNESS COEFFICIENT
                       CA         .00  CONTRIBUTING AREA
                    SHAPE        TRAP  CHANNEL SHAPE
                       WD       10.00  BOTTOM WIDTH OR DIAMETER
                        Z       50.00  SIDE SLOPE
                   NDXMIN           2  MINIMUM NUMBER OF DX INTERVALS

                                                        ***
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215

COMPUTED KINEMATIC PARAMETERS
VARIABLE TIME STEP
(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.46	1.34	5.00	1650.00	2373.60	807.79	2.17	5.24

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3934E+03 EXCESS= .0000E+00 OUTFLOW= .3916E+03 BASIN STORAGE= .2157E+01 PERCENT ERROR= -.1

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	.46	1.34	5.00	2361.65	805.00	2.17
***	***	***	***	***		

HYDROGRAPH AT STATION RT231

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
2362.	13.42	(CFS)	710.	197.	190.	190.
		(INCHES)	1.954	2.171	2.171	2.171
		(AC-FT)	352.	391.	391.	391.

CUMULATIVE AREA = 3.38 SQ MI

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*            *
*     CD232  *
*            *
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238 KK

SUBBASIN RUNOFF DATA

239 BA SUBBASIN CHARACTERISTICS

TAREA 2.15 SUBBASIN AREA

PRECIPITATION DATA

92 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.79	1.55	2.72	2.97	3.14	3.45	3.74	4.05	.00	.00	.00	.00

STORM AREA = 24.31

240 LS SCS LOSS RATE

STRTL .47 INITIAL ABSTRACTION

CRVNBR 81.10 CURVE NUMBER

RTIMP .00 PERCENT IMPERVIOUS AREA

241 UD SCS DIMENSIONLESS UNITGRAPH
TLAG 2.61 LAG

***

UNIT HYDROGRAPH
159 END-OF-PERIOD ORDINATES

4.	7.	11.	19.	27.	36.	46.	57.	68.	81.
96.	111.	127.	146.	166.	186.	210.	233.	256.	276.
296.	316.	331.	345.	358.	368.	376.	383.	388.	389.
391.	391.	390.	389.	388.	380.	373.	366.	357.	349.
340.	331.	321.	311.	300.	288.	275.	262.	248.	233.
218.	206.	194.	181.	172.	164.	155.	147.	140.	133.
126.	120.	114.	108.	104.	99.	95.	90.	86.	81.
77.	74.	70.	66.	63.	59.	56.	54.	51.	49.
46.	44.	41.	40.	38.	36.	34.	32.	30.	29.
28.	26.	25.	24.	22.	21.	20.	19.	18.	17.
16.	16.	15.	14.	14.	13.	12.	11.	11.	10.
10.	9.	9.	8.	8.	8.	7.	7.	7.	6.
6.	6.	5.	5.	5.	5.	4.	4.	4.	4.
4.	4.	3.	3.	3.	3.	3.	3.	3.	2.
2.	2.	2.	2.	2.	2.	1.	1.	1.	1.
1.	1.	1.	1.	1.	0.	0.	0.	0.	

*** *** *** *** ***

HYDROGRAPH AT STATION CD232

TOTAL RAINFALL = 3.94, TOTAL LOSS = 1.86, TOTAL EXCESS = 2.08

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
637.	14.92	(CFS)	392.	117.	113.	113.
		(INCHES)	1.697	2.025	2.025	2.025
		(AC-FT)	195.	232.	232.	232.

CUMULATIVE AREA = 2.15 SQ MI

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* *
242 KK * AD232 * ADD HYDS. 230 THRU 232
* *
****

243 HC HYDROGRAPH COMBINATION
ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

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*** *** *** *** ***

HYDROGRAPH AT STATION AD232

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
2693.	13.50	(CFS)	1102.	314.	303.	303.
		(INCHES)	1.853	2.114	2.114	2.114
		(AC-FT)	546.	623.	623.	623.

CUMULATIVE AREA = 5.53 SQ MI

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          *            *
244 KK    *     AD232  *       ADD HYDS 200 THRU 232
          *            *
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245 HC HYDROGRAPH COMBINATION

ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION AD232

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
6064.	15.17	(CFS)	3389.	1107.	1066.	1066.
		(INCHES)	1.415	1.848	1.848	1.848
		(AC-FT)	1680.	2195.	2195.	2195.

CUMULATIVE AREA = 22.27 SQ MI

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          **************
          *            *
246 KK    *    RT232A  *       MODIFIED PULS ROUTING VIA CHAMPION DRAIN TO S. MTN. ALIGNMENT
          *            *
          **************
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HYDROGRAPH ROUTING DATA

247 RS STORAGE ROUTING

NSTPS 3 NUMBER OF SUBREACHES

ITYP FLOW TYPE OF INITIAL CONDITION

RSVRIC -1.00 INITIAL CONDITION

X .00 WORKING R AND D COEFFICIENT

248 SV STORAGE .0 25.0 36.0 55.0 68.0 116.0 164.0

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249 SQ          DISCHARGE          0.      500.     1000.     2000.     3000.     4500.     6000.

                                                        ***

WARNING --- ROUTED OUTFLOW (   6013.) IS GREATER THAN MAXIMUM OUTFLOW (   6000.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (   6007.) IS GREATER THAN MAXIMUM OUTFLOW (   6000.) IN STORAGE-OUTFLOW TABLE

     ***             ***             ***             ***             ***

                    HYDROGRAPH AT STATION   RT232A

 PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                    6-HR       24-HR       72-HR     24.92-HR
    5906.     15.67          (CFS)     3372.       1093.       1053.       1053.
                             (INCHES)  1.408       1.826       1.826       1.826
                             (AC-FT)   1672.       2168.       2168.       2168.

 PEAK STORAGE  TIME                            MAXIMUM AVERAGE STORAGE
   (AC-FT)     (HR)                    6-HR       24-HR       72-HR     24.92-HR
      54.      15.67                    29.         10.         10.         10.

                    CUMULATIVE AREA =   22.27 SQ MI


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          **************
          *            *
250 KK    *    RT232B  *
          *            *
          **************

              HYDROGRAPH ROUTING DATA

251 RS          STORAGE ROUTING
                     NSTPS          11  NUMBER OF SUBREACHES
                      ITYP        FLOW  TYPE OF INITIAL CONDITION
                     RSVRIC      -1.00  INITIAL CONDITION
                         X         .00 WORKING R AND D COEFFICIENT

252 SV            STORAGE          .0     110.0     169.0     264.0     343.0     438.0     533.0

253 SQ          DISCHARGE          0.      500.     1000.     2000.     3000.     4500.     6000.

                                                        ***

     ***             ***             ***             ***             ***

                    HYDROGRAPH AT STATION   RT232B

 PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                    6-HR       24-HR       72-HR     24.92-HR
    5750.     16.50          (CFS)     3315.       1030.        992.        992.
                             (INCHES)  1.384       1.720       1.720       1.720
                             (AC-FT)   1644.       2043.       2043.       2043.
```

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.92-HR
47.	16.50	32.	11.	11.	11.

CUMULATIVE AREA = 22.27 SQ MI

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          *            *
254 KK    *     CD250  *       (P)
          *            *
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SUBBASIN RUNOFF DATA

255 BA SUBBASIN CHARACTERISTICS

TAREA 1.99 SUBBASIN AREA

PRECIPITATION DATA

92 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.79	1.55	2.72	2.97	3.14	3.45	3.74	4.05	.00	.00	.00	.00

STORM AREA = 24.31

256 LS SCS LOSS RATE

STRTL .45 INITIAL ABSTRACTION

CRVNBR 81.50 CURVE NUMBER

RTIMP .00 PERCENT IMPERVIOUS AREA

257 UD SCS DIMENSIONLESS UNITGRAPH

TLAG 2.40 LAG

***

UNIT HYDROGRAPH

146 END-OF-PERIOD ORDINATES

4.	8.	12.	22.	31.	41.	53.	65.	78.	94.
110.	128.	150.	171.	194.	220.	245.	269.	290.	312.
330.	345.	360.	371.	379.	387.	391.	392.	393.	393.
391.	390.	384.	376.	367.	358.	349.	339.	329.	318.
307.	294.	280.	267.	251.	235.	219.	205.	192.	179.
170.	161.	151.	143.	135.	128.	121.	114.	108.	103.
98.	94.	89.	84.	79.	75.	71.	67.	63.	59.
56.	53.	51.	48.	45.	43.	40.	38.	36.	34.
32.	30.	29.	27.	26.	24.	23.	22.	21.	20.
19.	18.	17.	16.	15.	14.	13.	13.	12.	11.
11.	10.	10.	9.	9.	8.	8.	7.	7.	6.
6.	6.	5.	5.	5.	5.	4.	4.	4.	4.
4.	4.	3.	3.	3.	3.	3.	3.	2.	2.
2.	2.	2.	2.	2.	1.	1.	1.	1.	1.
1.	1.	0.	0.	0.	0.				

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   ***           ***           ***           ***           ***

                    HYDROGRAPH AT STATION    CD250

  TOTAL RAINFALL =   3.94, TOTAL LOSS =   1.83, TOTAL EXCESS =   2.11

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                6-HR       24-HR       72-HR      24.92-HR
   644.      14.67       (CFS)     376.        110.        106.         106.
                         (INCHES)  1.758       2.063       2.063        2.063
                         (AC-FT)   187.        219.        219.         219.

                    CUMULATIVE AREA =   1.99 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
258 KK    *     AD250  *       ADD ALL HYDS. FROM TRADITIONAL CHAMPION DRAIN DRAINAGE AREA
          *            *
          **************

259 HC          HYDROGRAPH COMBINATION
                     ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                    ***

   ***           ***           ***           ***           ***

                    HYDROGRAPH AT STATION    AD250

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                6-HR       24-HR       72-HR      24.92-HR
  6092.      16.42       (CFS)    3547.       1140.       1098.        1098.
                         (INCHES)  1.359       1.748       1.748        1.748
                         (AC-FT)   1759.       2262.       2262.        2262.

                    CUMULATIVE AREA =   24.26 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
260 KK    *     ADTOT  *       ADD ALL HYDS.
          *            *
          **************

261 HC          HYDROGRAPH COMBINATION
                     ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                    ***
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*** *** *** *** ***

HYDROGRAPH AT STATION ADTOT

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
7136.	16.42	(CFS)	4356.	1494.	1439.	1439.
		(INCHES)	1.309	1.796	1.796	1.796
		(AC-FT)	2160.	2963.	2963.	2963.

CUMULATIVE AREA = 30.94 SQ MI

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	CD160	1274.	12.58	239.	65.	63.	.97		
DIVERSION TO	ESTREL	255.	12.58	114.	34.	33.	.97		
HYDROGRAPH AT	ESTREL	1019.	12.58	125.	31.	30.	.97		
ROUTED TO	RT160	982.	12.67	125.	31.	30.	.97	1034.47	12.67
HYDROGRAPH AT	CD170	2040.	12.58	368.	100.	96.	1.55		
ROUTED TO	RT170	1377.	13.75	360.	98.	94.	1.55	1037.95	13.75
HYDROGRAPH AT	CD171	312.	13.75	133.	37.	36.	.65		
3 COMBINED AT	AD171	1718.	13.75	612.	166.	160.	3.17		
ROUTED TO	RT171	1712.	13.83	612.	166.	159.	3.17		
HYDROGRAPH AT	CD180	751.	14.17	378.	106.	102.	1.56		
ROUTED TO	RT180A	705.	14.58	354.	102.	98.	1.56	1034.28	14.58
ROUTED TO	RT180B	645.	16.33	330.	94.	91.	1.56	1030.42	16.33
HYDROGRAPH AT	CD190	1469.	12.58	266.	72.	70.	1.26		
2 COMBINED AT	AD190	1469.	12.58	481.	166.	160.	2.82		
2 COMBINED AT	AD190	2380.	12.75	1091.	332.	320.	5.99		
ROUTED TO	DET08	1151.	14.42	955.	316.	304.	5.99	1016.46	14.42
ROUTED TO	RT06	1150.	14.50	954.	315.	304.	5.99		
HYDROGRAPH AT	CD240	218.	13.00	61.	17.	16.	.29		
2 COMBINED AT	AD240	1206.	14.25	1002.	332.	320.	6.28		
ROUTED TO	RT240	1206.	14.33	1001.	331.	318.	6.28		
HYDROGRAPH AT	CD260	167.	12.75	38.	10.	10.	.18		
2 COMBINED AT	AD260	1237.	13.50	1025.	341.	328.	6.46		
HYDROGRAPH AT	CD270	101.	13.83	45.	12.	12.	.22		
2 COMBINED AT	AD270	1331.	13.50	1069.	353.	340.	6.68		
HYDROGRAPH AT	CD200	567.	12.75	128.	35.	34.	.59		
ROUTED TO	RT200A	542.	13.00	128.	35.	34.	.59	1141.62	13.00

ROUTED TO	RT200B	535.	13.33	127.	35.	33.	.59		
HYDROGRAPH AT	CD201	1034.	13.25	339.	94.	90.	1.58		
2 COMBINED AT	AD201	1569.	13.25	464.	128.	124.	2.17		
ROUTED TO	RT201	1558.	13.50	462.	127.	122.	2.17		
HYDROGRAPH AT	CD202	472.	14.50	268.	78.	75.	1.40		
HYDROGRAPH AT	CD203	607.	15.00	381.	114.	110.	2.03		
3 COMBINED AT	AD203	2229.	13.67	1108.	319.	308.	5.60		
ROUTED TO	RT203	2046.	14.67	1099.	317.	306.	5.60		
HYDROGRAPH AT	CD210	3735.	12.42	630.	178.	171.	1.97		
ROUTED TO	RT210	3736.	12.58	630.	178.	171.	1.97		
HYDROGRAPH AT	CD211	2711.	12.42	432.	122.	117.	1.35		
HYDROGRAPH AT	CD212	1303.	12.58	259.	73.	70.	.81		
3 COMBINED AT	AD212	7472.	12.50	1320.	373.	359.	4.13		
ROUTED TO	RT212A	997.	13.58	405.	130.	125.	4.13	1319.94	13.58
ROUTED TO	RT212B	985.	13.67	404.	130.	125.	4.13		
ROUTED TO	RT212C	982.	13.75	404.	129.	124.	4.13		
ROUTED TO	RT212D	1025.	17.92	367.	100.	96.	4.13		
HYDROGRAPH AT	CD220	1921.	12.58	385.	107.	103.	1.48		
ROUTED TO	RT220	1898.	12.75	385.	106.	102.	1.48		
HYDROGRAPH AT	CD221	1868.	12.67	380.	105.	101.	1.68		
2 COMBINED AT	AD221	3694.	12.75	765.	211.	203.	3.16		
ROUTED TO	RT221	3651.	12.92	765.	210.	202.	3.16		
HYDROGRAPH AT	CD222	539.	13.83	241.	68.	65.	1.23		
2 COMBINED AT	AD222	3934.	12.92	1005.	277.	267.	4.39		
ROUTED TO	RT222	3909.	13.08	1002.	275.	265.	4.39		
HYDROGRAPH AT	CD223	486.	13.83	221.	62.	60.	1.10		
2 COMBINED AT	AD223	4230.	13.08	1223.	337.	325.	5.49		
ROUTED TO	RT223A	4112.	13.25	1217.	336.	323.	5.49	1058.54	13.25
ROUTED TO	RT223B	3584.	13.75	1213.	334.	322.	5.49	1027.42	13.75
HYDROGRAPH AT	CD224	740.	13.67	315.	88.	85.	1.52		

4 COMBINED AT	AD224	4901.	14.33	2706.	839.	808.	16.74		
ROUTED TO	RT224A	4883.	14.42	2698.	834.	803.	16.74	1021.83	14.42
ROUTED TO	RT224B	4826.	14.75	2682.	824.	794.	16.74		
ROUTED TO	RT224C	4772.	14.92	2650.	811.	781.	16.74		
ROUTED TO	RT224D	4716.	15.33	2601.	792.	763.	16.74		
HYDROGRAPH AT	CD230	2133.	12.67	430.	118.	114.	1.93		
ROUTED TO	RT230	2118.	13.25	432.	118.	113.	1.93		
HYDROGRAPH AT	CD231	505.	14.42	279.	81.	78.	1.45		
2 COMBINED AT	AD231	2388.	13.25	710.	198.	191.	3.38		
ROUTED TO	RT231	2362.	13.42	710.	197.	190.	3.38		
HYDROGRAPH AT	CD232	637.	14.92	392.	117.	113.	2.15		
2 COMBINED AT	AD232	2693.	13.50	1102.	314.	303.	5.53		
2 COMBINED AT	AD232	6064.	15.17	3389.	1107.	1066.	22.27		
ROUTED TO	RT232A	5906.	15.67	3372.	1093.	1053.	22.27		
ROUTED TO	RT232B	5750.	16.50	3315.	1030.	992.	22.27		
HYDROGRAPH AT	CD250	644.	14.67	376.	110.	106.	1.99		
2 COMBINED AT	AD250	6092.	16.42	3547.	1140.	1098.	24.26		
2 COMBINED AT	ADTOT	7136.	16.42	4356.	1494.	1439.	30.94		

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	INTERPOLATED TO COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
RT171	MANE	5.00	1712.19	830.00	1.94	5.00	1712.19	830.00	1.94
CONTINUITY SUMMARY (AC-FT) - INFLOW= .3291E+03 EXCESS= .0000E+00 OUTFLOW= .3285E+03 BASIN STORAGE= .1085E+01 PERCENT ERROR= -.1									
RT06	MANE	4.56	1150.72	866.96	1.96	5.00	1150.25	870.00	1.96
CONTINUITY SUMMARY (AC-FT) - INFLOW= .6268E+03 EXCESS= .0000E+00 OUTFLOW= .6254E+03 BASIN STORAGE= .2137E+01 PERCENT ERROR= -.1									
RT240	MANE	5.00	1205.72	860.00	1.96	5.00	1205.72	860.00	1.96
CONTINUITY SUMMARY (AC-FT) - INFLOW= .6590E+03 EXCESS= .0000E+00 OUTFLOW= .6563E+03 BASIN STORAGE= .3280E+01 PERCENT ERROR= -.1									
RT200B	MANE	5.00	541.92	796.83	2.19	5.00	535.39	800.00	2.18
CONTINUITY SUMMARY (AC-FT) - INFLOW= .6951E+02 EXCESS= .0000E+00 OUTFLOW= .6880E+02 BASIN STORAGE= .7188E+00 PERCENT ERROR= .0									
RT201	MANE	4.93	1559.53	812.40	2.18	5.00	1557.60	810.00	2.18
CONTINUITY SUMMARY (AC-FT) - INFLOW= .2545E+03 EXCESS= .0000E+00 OUTFLOW= .2521E+03 BASIN STORAGE= .2104E+01 PERCENT ERROR= .1									
RT203	MANE	5.00	2045.64	880.00	2.11	5.00	2045.64	880.00	2.11
CONTINUITY SUMMARY (AC-FT) - INFLOW= .6336E+03 EXCESS= .0000E+00 OUTFLOW= .6296E+03 BASIN STORAGE= .5618E+01 PERCENT ERROR= -.3									
RT210	MANE	5.00	3736.10	755.00	3.36	5.00	3736.10	755.00	3.36
CONTINUITY SUMMARY (AC-FT) - INFLOW= .3530E+03 EXCESS= .0000E+00 OUTFLOW= .3528E+03 BASIN STORAGE= .1317E+01 PERCENT ERROR= -.3									
RT212B	MANE	4.41	986.10	823.87	1.17	5.00	984.66	820.00	1.17
CONTINUITY SUMMARY (AC-FT) - INFLOW= .2578E+03 EXCESS= .0000E+00 OUTFLOW= .2571E+03 BASIN STORAGE= .5086E+00 PERCENT ERROR= .1									
RT212C	MANE	4.33	984.21	826.09	1.16	5.00	981.69	825.00	1.16

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2569E+03 EXCESS= .0000E+00 OUTFLOW= .2556E+03 BASIN STORAGE= .1189E+01 PERCENT ERROR= .0

RT212D	MANE	5.00	1024.57	1075.00	.90	5.00	1024.57	1075.00	.90

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2561E+03 EXCESS= .0000E+00 OUTFLOW= .1985E+03 BASIN STORAGE= .6289E+02 PERCENT ERROR= -2.1

RT220	MANE	4.81	1910.94	767.15	2.67	5.00	1898.49	765.00	2.67

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2115E+03 EXCESS= .0000E+00 OUTFLOW= .2110E+03 BASIN STORAGE= .6131E+00 PERCENT ERROR= -.1

RT221	MANE	4.86	3691.28	772.62	2.47	5.00	3650.84	775.00	2.47

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4182E+03 EXCESS= .0000E+00 OUTFLOW= .4165E+03 BASIN STORAGE= .1690E+01 PERCENT ERROR= .0

RT222	MANE	5.00	3916.14	784.46	2.34	5.00	3909.17	785.00	2.33

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5503E+03 EXCESS= .0000E+00 OUTFLOW= .5469E+03 BASIN STORAGE= .3011E+01 PERCENT ERROR= .1

RT230	MANE	5.00	2120.74	794.81	2.27	5.00	2118.44	795.00	2.27

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2349E+03 EXCESS= .0000E+00 OUTFLOW= .2336E+03 BASIN STORAGE= .4159E+01 PERCENT ERROR= -1.2

RT231	MANE	5.00	2373.60	807.79	2.17	5.00	2361.65	805.00	2.17

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3934E+03 EXCESS= .0000E+00 OUTFLOW= .3916E+03 BASIN STORAGE= .2157E+01 PERCENT ERROR= -.1

*** NORMAL END OF HEC-1 ***
Elapsed Time - 00:03:12.18 (192.18 Seconds)
NORMAL END OF HEC-1

ESTIMATE OF DISCHARGE WITHIN A HEC-1 SUBBASIN
CALCULATION SHEET

LOCATION DATA

PROJECT Price Road - Phase

LOCATION Channel between Sta 595+00 & E/St Ave

DESIGN DATA

FREQUENCY 100 YEARS

Q = DESIGN DISCHARGE
Q_S = DESIGN DISCHARGE OF SUBBASIN IN HEC-1 STUDY
A = CATCHMENT AREA
A_S = CATCHMENT AREA OF THE SUBBASIN IN HEC-1 STUDY
c = 0.5

$Q = Q_S(A/A_S)^c = 1124\left(\frac{0.25}{5.97}\right)^{\frac{1}{2}}$

Q = 765 cfs

COMPUTED BY [signature] DATE 04-02-97

CHECKED BY _____ DATE _____

ESTIMATE OF DISCHARGE WITHIN A HEC-1 SUBBASIN
CALCULATION SHEET

LOCATION DATA

PROJECT Price Rd PH II

LOCATION Chan. u.s. of 51st Ave

DESIGN DATA

FREQUENCY 100 YEARS

Q = DESIGN DISCHARGE
Q_s = DESIGN DISCHARGE OF SUBBASIN IN HEC-1 STUDY
A = CATCHMENT AREA
A_s = CATCHMENT AREA OF THE SUBBASIN IN HEC-1 STUDY
c = 0.5

$Q = Q_s(A/A_s)^c = 1274\,(.03/.97)^{.5}$

Q = 224 cfs

COMPUTED BY E.L. DATE 5/13/91

CHECKED BY _____ DATE _____

SEGMENT II
CULVERT DESIGN SHEETS

03-04-1992 10:53:28 FREEWAY 03-03-19

MINUMUM DISCHARGE (CFS) 0
DESIGN DISCHARGE (CFS) 1237
MAXIMUM DISCHARGE (CFS) 1484

C	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
U								
L	INLET	OUTLET	CULVERT	BARRELS	SPAN	RISE	MANN.	INLET
V	ELEV.	ELEV.	LENGTH	SHAPE			N	TYPE
#	(FT)	(FT)	(FT)	MATERIAL	(FT)	(FT)		
1	994.86	993.90	500.00	3 - RCB	10.00	8.00	.013	CONVENTIONAL
2								
3								
4								
5								
6								

CULVERT NUMBER: 1
INLET STATION (FT) 0.00
INLET ELEVATION (FT) 994.86
OUTLET STATION (FT) 500.00
OUTLET ELEVATION (FT) 993.90
NUMBER OF BARRELS 3.00
SLOPE (V-FT/H-FT) 0.0019
CULVERT LENGTH ALONG SLOPE (FT) 500.00
BARREL SHAPE: 10.00 FT X 8.00 FT BOX
BARREL MATERIAL: CONCRETE
WITH A MANNING'S N OF 0.013
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION: NONE

DOWNSTREAM CHANNEL CROSS-SECTION

BOTTOM WIDTH (FT) 8.00
SIDE SLOPE H/V _:1 2.0
CHANNEL SLOPE V/H (FT/FT) 0.002
MANNING'S N (.01-0.1) 0.018
CHANNEL INVERT ELEVATION (FT) 993.90
CULVERT %9941 OUTLET INVERT ELEVATION AT

UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NO.	VEL. (FPS)	SHEAR (PSF)
0.00	993.90	0.000	0.00	0.00
148.40	996.22	0.000	5.05	0.29
296.80	997.22	0.000	6.11	0.41
445.20	997.96	0.000	6.81	0.51
593.60	998.57	0.000	7.34	0.58
742.00	999.09	0.000	7.78	0.65
890.40	999.56	0.000	8.15	0.71
1038.80	999.98	0.000	8.48	0.76
1187.20	1000.36	0.000	8.78	0.81
1237.00	1000.49	0.000	8.87	0.82
1484.00	1001.06	0.000	9.29	0.89

SELECTED OVERTOPPING CREST

ROADWAY SURFACE: PAVED

EMBANKMENT TOP WIDTH (FT): 160.00

CONSTANT ROADWAY ELEVATION PROFILE
CREST LENGTH (FT) 100.00
OVERTOPPING CREST ELEVATION (FT) 1006.00

SUMMARY OF CULVERT FLOWS (CFS) FILE: FREEWAY DATE: 03-03-1992

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
994.86	0	0	0	0	0	0	0	0	0
996.57	148	148	0	0	0	0	0	0	2
997.67	297	297	0	0	0	0	0	0	2
998.55	445	445	0	0	0	0	0	0	2
999.29	594	594	0	0	0	0	0	0	2
999.95	742	742	0	0	0	0	0	0	2
1000.56	890	890	0	0	0	0	0	0	2
1001.12	1039	1039	0	0	0	0	0	0	2
1001.66	1187	1187	0	0	0	0	0	0	2
1001.83	1237	1237	0	0	0	0	0	0	2
1002.65	1484	1484	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 3 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	994.86	993.90	0.00	-0.96	-0.96	994.86	0.00	0.00
148	996.57	996.22	1.42	1.71	1.71	0.00	0.00	2.13
297	997.67	997.22	2.18	2.81	2.81	0.00	0.00	2.98
445	998.55	997.96	2.88	3.69	3.69	0.00	0.00	3.66
594	999.29	998.57	3.51	4.43	4.43	0.00	0.00	4.24
742	999.95	999.09	4.10	5.09	5.09	0.00	0.00	4.77
890	1000.56	999.56	4.64	5.70	5.70	0.00	0.00	5.25
1039	1001.12	999.98	5.15	6.26	6.26	0.00	0.00	5.70
1187	1001.66	1000.36	5.63	6.80	6.80	0.00	0.00	6.12
1237	1001.83	1000.49	5.79	6.97	6.97	0.00	0.00	6.26
1484	1002.65	1001.06	6.55	7.79	7.79	0.00	0.00	6.91

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: FREEWAY DATE: 03-03-1992

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
994.86	0.00	0	0	0.00
996.57	0.00	148	0	0.00
997.67	0.00	297	0	0.00
998.55	0.00	445	0	0.00
999.29	0.00	594	0	0.00
999.95	0.00	742	0	0.00
1000.56	0.00	890	0	0.00
1001.12	0.00	1039	0	0.00
1001.66	0.00	1187	0	0.00
1001.83	0.00	1237	0	0.00
1002.65	0.00	1484	0	0.00

CULVERT ANALYSIS VERSION 2.0

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-28-19	12:03:42	C7	11-19-91

PERFORMANCE CURVE DISCHARGE RANGE
OF FLOWS ANALYZED

MINUMUM DISCHARGE (CFS)	0
DESIGN DISCHARGE (CFS)	41
MAXIMUM DISCHARGE (CFS)	50

CULV #	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANN. N	INLET TYPE
1	995.00	994.00	290.00	1 - RCP	3.00	3.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-28-19	12:03:42	C7	11-19-91

CULVERT NUMBER: 1

CULVERT INVERT DATA

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	995.00
OUTLET STATION (FT)	290.00
OUTLET ELEVATION (FT)	994.00
NUMBER OF BARRELS	1.00
SLOPE (V-FT/H-FT)	0.0034
CULVERT LENGTH ALONG SLOPE (FT)	290.00

BARREL SHAPE: CIRCULAR 3.00 FT IN DIAMETER
BARREL MATERIAL:
WITH A MANNING'S N OF 0.012
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: SQUARE EDGE WITH HEADWALL
INLET DEPRESSION: NONE

CONSTANT WATER SURFACE ELEVATION
995.80 (Outlet channel assumed full.)

SELECTED OVERTOPPING CREST

ROADWAY SURFACE:	PAVED
EMBANKMENT TOP WIDTH (FT):	160.00

CONSTANT ROADWAY ELEVATION PROFILE

CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1010.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-28-19	12:03:42	C7	11-19-91

SUMMARY OF CULVERT FLOWS (CFS) FILE: C7 DATE: 11-19-91

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
995.00	0	0	0	0	0	0	0	0	0
996.09	5	5	0	0	0	0	0	0	2
996.55	10	10	0	0	0	0	0	0	2
996.94	15	15	0	0	0	0	0	0	2
997.26	20	20	0	0	0	0	0	0	2
997.56	25	25	0	0	0	0	0	0	2
997.85	30	30	0	0	0	0	0	0	2
998.14	35	35	0	0	0	0	0	0	2
998.41	40	40	0	0	0	0	0	0	2
998.46	41	41	0	0	0	0	0	0	2
999.10	50	50	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	995.80	995.80	0.00	0.80	0.80	995.00	0.00	0.00
5	996.09	995.80	0.87	1.09	1.09	0.00	0.00	1.13
10	996.55	995.80	1.35	1.55	1.55	0.00	0.00	2.26
15	996.94	995.80	1.76	1.94	1.94	0.00	0.00	3.39
20	997.26	995.80	2.10	2.26	2.26	0.00	0.00	4.52
25	997.56	995.80	2.40	2.56	2.56	0.00	0.00	5.65
30	997.85	995.80	2.70	2.85	2.85	0.00	0.00	6.77
35	998.14	995.80	2.99	3.14	3.14	0.00	0.00	7.35
40	998.41	995.80	3.30	3.41	3.41	0.00	0.00	7.75
41	998.46	995.80	3.36	3.46	3.46	0.00	0.00	7.83
50	999.10	995.80	4.00	4.10	4.10	0.00	0.00	8.64

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: C7 DATE: 11-19-91

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
995.00	0.00	0	0	0.00
996.09	0.00	5	0	0.00
996.55	0.00	10	0	0.00
996.94	0.00	15	0	0.00
997.26	0.00	20	0	0.00
997.56	0.00	25	0	0.00
997.85	0.00	30	0	0.00
998.14	0.00	35	0	0.00
998.41	0.00	40	0	0.00
998.46	0.00	41	0	0.00
999.10	0.00	50	0	0.00

CULVERT ANALYSIS VERSION 2.0

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-28-19	12:04:26	C8	11-19-91

PERFORMANCE CURVE DISCHARGE RANGE
OF FLOWS ANALYZED

MINUMUM DISCHARGE (CFS)	0
DESIGN DISCHARGE (CFS)	41
MAXIMUM DISCHARGE (CFS)	50

C U L V #	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANN. N	INLET TYPE
1	995.00	994.00	240.00	1 - RCP	3.00	3.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-28-19	12:04:26	C8	11-19-91

CULVERT NUMBER: 1

CULVERT INVERT DATA

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	995.00
OUTLET STATION (FT)	240.00
OUTLET ELEVATION (FT)	994.00
NUMBER OF BARRELS	1.00
SLOPE (V-FT/H-FT)	0.0042
CULVERT LENGTH ALONG SLOPE (FT)	240.00

BARREL SHAPE: CIRCULAR 3.00 FT IN DIAMETER
BARREL MATERIAL:
WITH A MANNING'S N OF 0.012
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: SQUARE EDGE WITH HEADWALL
INLET DEPRESSION: NONE

CONSTANT WATER SURFACE ELEVATION
996.60 (Outlet channel assumed full.)

SELECTED OVERTOPPING CREST

ROADWAY SURFACE:	PAVED
EMBANKMENT TOP WIDTH (FT):	160.00

CONSTANT ROADWAY ELEVATION PROFILE

CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1005.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-28-19	12:04:26	C8	11-19-91

SUMMARY OF CULVERT FLOWS (CFS) FILE: C8 DATE: 11-19-91

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
995.00	0	0	0	0	0	0	0	0	0
996.67	5	5	0	0	0	0	0	0	2
996.78	10	10	0	0	0	0	0	0	2
997.06	15	15	0	0	0	0	0	0	2
997.28	20	20	0	0	0	0	0	0	2
997.62	25	25	0	0	0	0	0	0	2
997.90	30	30	0	0	0	0	0	0	2
998.16	35	35	0	0	0	0	0	0	2
998.41	40	40	0	0	0	0	0	0	2
998.47	41	41	0	0	0	0	0	0	2
998.99	50	50	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	996.60	996.60	0.00	1.60	1.60	995.00	0.00	0.00
5	996.67	996.60	0.86	1.67	1.67	0.00	0.00	0.77
10	996.78	996.60	1.35	1.78	1.78	0.00	0.00	1.54
15	997.06	996.60	1.75	2.06	2.06	0.00	0.00	2.31
20	997.28	996.60	2.10	2.28	2.28	0.00	0.00	3.08
25	997.62	996.60	2.40	2.62	2.62	0.00	0.00	3.85
30	997.90	996.60	2.70	2.90	2.90	0.00	0.00	4.62
35	998.16	996.60	2.99	3.16	3.16	0.00	0.00	5.39
40	998.41	996.60	3.30	3.41	3.41	0.00	0.00	6.17
41	998.47	996.60	3.36	3.47	3.47	0.00	0.00	6.32
50	998.99	996.60	3.99	3.48	3.48	0.00	0.00	7.71

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: C8 DATE: 11-19-91

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
995.00	0.00	0	0	0.00
996.67	0.00	5	0	0.00
996.78	0.00	10	0	0.00
997.06	0.00	15	0	0.00
997.28	0.00	20	0	0.00
997.62	0.00	25	0	0.00
997.90	0.00	30	0	0.00
998.16	0.00	35	0	0.00
998.41	0.00	40	0	0.00
998.47	0.00	41	0	0.00
998.99	0.00	50	0	0.00

CULVERT ANALYSIS VERSION 2.0

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-28-19	12:05:16	C9	11-19-91

PERFORMANCE CURVE DISCHARGE RANGE
OF FLOWS ANALYZED

MINUMUM DISCHARGE (CFS)	0
DESIGN DISCHARGE (CFS)	41
MAXIMUM DISCHARGE (CFS)	50

CULV #	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANN. N	INLET TYPE
1	995.00	994.00	300.00	1 - RCP	3.50	3.50	.012	CONVENTIONAL
2								
3								
4								
5								
6								

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-28-19	12:05:16	C9	11-19-91

CULVERT NUMBER: 1

CULVERT INVERT DATA

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	995.00
OUTLET STATION (FT)	300.00
OUTLET ELEVATION (FT)	994.00
NUMBER OF BARRELS	1.00
SLOPE (V-FT/H-FT)	0.0033
CULVERT LENGTH ALONG SLOPE (FT)	300.00

BARREL SHAPE: CIRCULAR 3.50 FT IN DIAMETER
BARREL MATERIAL:
WITH A MANNING'S N OF 0.012
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: SQUARE EDGE WITH HEADWALL
INLET DEPRESSION: NONE

CONSTANT WATER SURFACE ELEVATION
997.60 (Outlet channel assumed full.)

SELECTED OVERTOPPING CREST

ROADWAY SURFACE:	PAVED
EMBANKMENT TOP WIDTH (FT):	160.00

CONSTANT ROADWAY ELEVATION PROFILE

CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1010.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-28-19	12:05:16	C9	11-19-91

SUMMARY OF CULVERT FLOWS (CFS) FILE: C9 DATE: 11-19-91

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
995.00	0	0	0	0	0	0	0	0	0
997.78	5	5	0	0	0	0	0	0	2
997.79	10	10	0	0	0	0	0	0	1
997.79	15	15	0	0	0	0	0	0	1
998.00	20	20	0	0	0	0	0	0	2
997.85	25	25	0	0	0	0	0	0	2
997.99	30	30	0	0	0	0	0	0	2
998.16	35	35	0	0	0	0	0	0	2
998.34	40	40	0	0	0	0	0	0	2
998.38	41	41	0	0	0	0	0	0	2
998.76	50	50	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	997.60	997.60	0.00	2.60	2.60	995.00	0.00	0.00
5	997.78	997.60	0.80	2.78	2.78	0.00	0.00	0.52
10	997.79	997.60	1.23	2.79	2.79	0.00	0.00	1.04
15	997.79	997.60	1.60	2.79	2.79	0.00	0.00	1.56
20	998.00	997.60	1.93	3.00	3.00	0.00	0.00	2.08
25	997.85	997.60	2.21	2.85	2.85	0.00	0.00	2.08
30	997.99	997.60	2.48	2.99	2.99	0.00	0.00	2.08
35	998.16	997.60	2.72	3.16	3.16	0.00	0.00	2.08
40	998.34	997.60	2.96	3.34	3.34	0.00	0.00	2.08
41	998.38	997.60	3.00	3.38	3.38	0.00	0.00	2.08
50	998.76	997.60	3.42	3.76	3.76	0.00	0.00	2.08

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: C9 DATE: 11-19-91

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
995.00	0.00	0	0	0.00
997.78	0.00	5	0	0.00
997.79	0.00	10	0	0.00
997.79	0.01	15	0	0.00
998.00	0.00	20	0	0.00
997.85	0.00	25	0	0.00
997.99	0.00	30	0	0.00
998.16	0.00	35	0	0.00
998.34	0.00	40	0	0.00
998.38	0.00	41	0	0.00
998.76	0.00	50	0	0.00

03-04-1992 11:08:37 DOBBINS 03-03-19

MINUMUM DISCHARGE (CFS) 0
DESIGN DISCHARGE (CFS) 1206
MAXIMUM DISCHARGE (CFS) 1447

C	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
U								
L	INLET	OUTLET	CULVERT	BARRELS	SPAN	RISE	MANN.	INLET
V	ELEV.	ELEV.	LENGTH	SHAPE			N	TYPE
#	(FT)	(FT)	(FT)	MATERIAL	(FT)	(FT)		
1	1004.53	1004.09	220.00	3 - RCB	10.00	8.00	.013	CONVENTIONAL
2								
3								
4								
5								
6								

CULVERT NUMBER: 1
INLET STATION (FT) 0.00
INLET ELEVATION (FT) 1004.53
OUTLET STATION (FT) 220.00
OUTLET ELEVATION (FT) 1004.09
NUMBER OF BARRELS 3.00
SLOPE (V-FT/H-FT) 0.0020
CULVERT LENGTH ALONG SLOPE (FT) 220.00
BARREL SHAPE: 10.00 FT X 8.00 FT BOX
BARREL MATERIAL: CONCRETE
WITH A MANNING'S N OF 0.013
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: SQUARE EDGE (90-45 DEG.)
INLET DEPRESSION: NONE

DOWNSTREAM CHANNEL CROSS-SECTION
BOTTOM WIDTH (FT) 8.00
SIDE SLOPE H/V _:1 2.0
CHANNEL SLOPE V/H (FT/FT) 0.002
MANNING'S N (.01-0.1) 0.018
CHANNEL INVERT ELEVATION (FT) 1004.09

UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NO.	VEL. (FPS)	SHEAR (PSF)
0.00	1004.09	0.000	0.00	0.00
144.70	1006.38	0.000	5.01	0.29
289.40	1007.37	0.000	6.07	0.41
434.10	1008.10	0.000	6.76	0.50
578.80	1008.70	0.000	7.29	0.57
723.50	1009.22	0.000	7.73	0.64
868.20	1009.68	0.000	8.10	0.70
1012.90	1010.09	0.000	8.43	0.75
1157.60	1010.48	0.000	8.72	0.80
1206.00	1010.60	0.000	8.81	0.81
1447.00	1011.16	0.000	9.23	0.88

SELECTED OVERTOPPING CREST

ROADWAY SURFACE: PAVED

EMBANKMENT TOP WIDTH (FT): 20.00

CONSTANT ROADWAY ELEVATION PROFILE

CREST LENGTH (FT) 100.00
OVERTOPPING CREST ELEVATION (FT) 1024.00

SUMMARY OF CULVERT FLOWS (CFS) FILE: DOBBINS DATE: 03-03-1992

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1004.53	0	0	0	0	0	0	0	0	0
1006.57	145	145	0	0	0	0	0	0	2
1007.66	289	289	0	0	0	0	0	0	2
1008.52	434	434	0	0	0	0	0	0	2
1009.24	579	579	0	0	0	0	0	0	2
1009.89	724	724	0	0	0	0	0	0	2
1010.47	868	868	0	0	0	0	0	0	2
1011.02	1013	1013	0	0	0	0	0	0	2
1011.53	1158	1158	0	0	0	0	0	0	2
1011.69	1206	1206	0	0	0	0	0	0	2
1012.49	1447	1447	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 3 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	1004.53	1004.09	0.00	-0.44	-0.44	1004.53	0.00	0.00
145	1006.57	1006.38	1.79	2.04	2.04	0.00	0.00	2.10
289	1007.66	1007.37	2.55	3.13	3.13	0.00	0.00	2.94
434	1008.52	1008.10	3.24	3.99	3.99	0.00	0.00	3.61
579	1009.24	1008.70	3.88	4.71	4.71	0.00	0.00	4.19
724	1009.89	1009.22	4.48	5.36	5.36	0.00	0.00	4.70
868	1010.47	1009.68	5.04	5.94	5.94	0.00	0.00	5.18
1013	1011.02	1010.09	5.57	6.49	6.49	0.00	0.00	5.62
1158	1011.53	1010.48	6.07	7.00	7.00	0.00	0.00	6.04
1206	1011.69	1010.60	6.24	7.16	7.16	0.00	0.00	6.18
1447	1012.49	1011.16	7.04	7.96	7.96	0.00	0.00	6.82

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: DOBBINS DATE: 03-03-1992

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1004.53	0.00	0	0	0.00
1006.57	0.00	145	0	0.00
1007.66	0.00	289	0	0.00
1008.52	0.00	434	0	0.00
1009.24	0.00	579	0	0.00
1009.89	0.00	724	0	0.00
1010.47	0.00	868	0	0.00
1011.02	0.00	1013	0	0.00
1011.53	0.00	1158	0	0.00
1011.69	0.00	1206	0	0.00
1012.49	0.00	1447	0	0.00

03-04-1992 13:46:24 ELLIOT 03-03-19

MINUMUM DISCHARGE (CFS) 0
DESIGN DISCHARGE (CFS) 2380
MAXIMUM DISCHARGE (CFS) 2856

C	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
U								
L	INLET	OUTLET	CULVERT	BARRELS	SPAN	RISE	MANN.	INLET
V	ELEV.	ELEV.	LENGTH	SHAPE			N	TYPE
#	(FT)	(FT)	(FT)	MATERIAL	(FT)	(FT)		
1	1010.00	1009.82	112.00	7 - RCB	10.00	6.00	.013	CONVENTIONAL
2								
3								
4								
5								
6								

CULVERT NUMBER: 1
INLET STATION (FT) 0.00
INLET ELEVATION (FT) 1010.00
OUTLET STATION (FT) 112.00
OUTLET ELEVATION (FT) 1009.82
NUMBER OF BARRELS 7.00
SLOPE (V-FT/H-FT) 0.0016
CULVERT LENGTH ALONG SLOPE (FT) 112.00

BARREL SHAPE: 10.00 FT X 6.00 FT BOX
BARREL MATERIAL: CONCRETE
WITH A MANNING'S N OF 0.013
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: 1:1 BEVEL (45 DEG. FLARE)
INLET DEPRESSION: NONE

TAILWATER RATING CURVE

FLOW(CFS)	W.S.E.(FT)
0	1009.73
286	1010.00
571	1011.00
857	1012.00
1142	1013.00
1428	1014.00
1714	1014.50
1999	1015.00
2285	1016.00
2380	1016.37
2856	1018.30

SELECTED OVERTOPPING CREST
ROADWAY SURFACE: PAVED
EMBANKMENT TOP WIDTH (FT): 100.00
CONSTANT ROADWAY ELEVATION PROFILE
CREST LENGTH (FT) 100.00
OVERTOPPING CREST ELEVATION (FT) 1020.00

SUMMARY OF CULVERT FLOWS (CFS) FILE: ELLIOT DATE: 03-03-1992

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1010.00	0	0	0	0	0	0	0	0	0
1011.28	286	286	0	0	0	0	0	0	2
1012.05	571	571	0	0	0	0	0	0	2
1012.75	857	857	0	0	0	0	0	0	2
1013.60	1142	1142	0	0	0	0	0	0	2
1014.52	1428	1428	0	0	0	0	0	0	2
1015.10	1714	1714	0	0	0	0	0	0	2
1015.65	1999	1999	0	0	0	0	0	0	2
1016.66	2285	2285	0	0	0	0	0	0	2
1017.09	2380	2380	0	0	0	0	0	0	2
1019.33	2856	2856	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 7 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	1010.00	1009.73	0.00	-0.18	-0.18	1010.00	0.00	0.00
286	1011.28	1010.00	1.23	1.28	1.28	0.00	0.00	5.07
571	1012.05	1011.00	1.88	2.05	2.05	0.00	0.00	6.39
857	1012.75	1012.00	2.47	2.75	2.75	0.00	0.00	5.61
1142	1013.60	1013.00	3.02	3.60	3.60	0.00	0.00	5.13
1428	1014.52	1014.00	3.54	4.52	4.52	0.00	0.00	4.88
1714	1015.10	1014.50	4.02	5.10	5.10	0.00	0.00	5.23
1999	1015.65	1015.00	4.49	5.65	5.65	0.00	0.00	5.51
2285	1016.66	1016.00	4.94	6.66	6.66	0.00	0.00	5.44
2380	1017.09	1016.37	5.09	7.09	7.09	0.00	0.00	5.67
2856	1019.33	1018.30	5.83	9.33	9.33	0.00	0.00	6.80

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: ELLIOT DATE: 03-03-1992

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1010.00	0.00	0	0	0.00
1011.28	0.00	286	0	0.00
1012.05	0.00	571	0	0.00
1012.75	0.00	857	0	0.00
1013.60	0.00	1142	0	0.00
1014.52	0.00	1428	0	0.00
1015.10	0.00	1714	0	0.00
1015.65	0.00	1999	0	0.00
1016.66	0.00	2285	0	0.00
1017.09	0.00	2380	0	0.00
1019.33	0.00	2856	0	0.00

03-04-1992 11:29:31 ESTRELLA 03-04-19

MINUMUM DISCHARGE (CFS) 0
DESIGN DISCHARGE (CFS) 1019
MAXIMUM DISCHARGE (CFS) 1223

C	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
U								
L	INLET	OUTLET	CULVERT	BARRELS	SPAN	RISE	MANN.	INLET
V	ELEV.	ELEV.	LENGTH	SHAPE			N	TYPE
#	(FT)	(FT)	(FT)	MATERIAL	(FT)	(FT)		
1	1030.80	1030.13	135.00	4 - RCB	10.00	6.00	.013	CONVENTIONAL
2								
3								
4								
5								
6								

CULVERT NUMBER: 1
INLET STATION (FT) 0.00
INLET ELEVATION (FT) 1030.80
OUTLET STATION (FT) 135.00
OUTLET ELEVATION (FT) 1030.13
NUMBER OF BARRELS 4.00
SLOPE (V-FT/H-FT) 0.0050
CULVERT LENGTH ALONG SLOPE (FT) 135.00
BARREL SHAPE: 10.00 FT X 6.00 FT BOX
BARREL MATERIAL: CONCRETE
WITH A MANNING'S N OF 0.013
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: SQUARE EDGE (90-45 DEG.)
INLET DEPRESSION: NONE

DOWNSTREAM CHANNEL CROSS-SECTION
BOTTOM WIDTH (FT) 8.00
SIDE SLOPE H/V _:1 2.0
CHANNEL SLOPE V/H (FT/FT) 0.004
MANNING'S N (.01-0.1) 0.018
CHANNEL INVERT ELEVATION (FT) 1030.13
CULVERT %10301 OUTLET INVERT ELEVATION AT

UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NO.	VEL. (FPS)	SHEAR (PSF)
0.00	1030.13	0.000	0.00	0.00
122.30	1031.94	0.000	5.83	0.39
244.60	1032.74	0.000	7.10	0.57
366.90	1033.34	0.000	7.93	0.70
489.20	1033.84	0.000	8.57	0.81
611.50	1034.26	0.000	9.09	0.90
733.80	1034.65	0.000	9.54	0.99
856.10	1034.99	0.000	9.93	1.06
978.40	1035.31	0.000	10.28	1.13
1019.00	1035.41	0.000	10.39	1.15
1223.00	1035.89	0.000	10.89	1.26

SELECTED OVERTOPPING CREST

ROADWAY SURFACE: PAVED

EMBANKMENT TOP WIDTH (FT): 100.00

CONSTANT ROADWAY ELEVATION PROFILE
CREST LENGTH (FT) 100.00
OVERTOPPING CREST ELEVATION (FT) 1037.00

SUMMARY OF CULVERT FLOWS (CFS) FILE: ESTRELLA DATE: 03-04-1992

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1030.80	0	0	0	0	0	0	0	0	0
1032.12	122	122	0	0	0	0	0	0	2
1033.00	245	245	0	0	0	0	0	0	2
1033.77	367	367	0	0	0	0	0	0	2
1034.28	489	489	0	0	0	0	0	0	2
1034.80	612	612	0	0	0	0	0	0	2
1035.33	734	734	0	0	0	0	0	0	2
1035.64	856	856	0	0	0	0	0	0	2
1036.18	978	978	0	0	0	0	0	0	2
1036.27	1019	1019	0	0	0	0	0	0	2
1036.74	1223	1223	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 4 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	1030.80	1030.13	0.00	-0.67	-0.67	1030.80	0.00	0.00
122	1032.12	1031.94	1.32	1.32	1.32	0.00	0.00	1.69
245	1033.00	1032.74	1.88	2.20	2.20	0.00	0.00	2.35
367	1033.77	1033.34	2.39	2.97	2.97	0.00	0.00	2.86
489	1034.28	1033.84	2.86	3.48	3.48	0.00	0.00	3.30
612	1034.80	1034.26	3.30	4.00	4.00	0.00	0.00	3.70
734	1035.33	1034.65	3.71	4.53	4.53	0.00	0.00	4.06
856	1035.64	1034.99	4.10	4.84	4.84	0.00	0.00	4.40
978	1036.18	1035.31	4.48	5.38	5.38	0.00	0.00	4.72
1019	1036.27	1035.41	4.60	5.47	5.47	0.00	0.00	4.82
1223	1036.74	1035.89	5.18	5.94	5.94	0.00	0.00	5.31

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: ESTRELLA DATE: 03-04-1992

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1030.80	0.00	0	0	0.00
1032.12	0.00	122	0	0.00
1033.00	0.00	245	0	0.00
1033.77	0.00	367	0	0.00
1034.28	0.00	489	0	0.00
1034.80	0.00	612	0	0.00
1035.33	0.00	734	0	0.00
1035.64	0.00	856	0	0.00
1036.18	0.00	978	0	0.00
1036.27	0.00	1019	0	0.00
1036.74	0.00	1223	0	0.00

SEGMENT II
HEC-2 ANALYSIS AND CHANNEL CALCULATIONS
SALT RIVER TO 51ST AVENUE

```
*********************************************
*  HEC-2 WATER SURFACE PROFILES             *
*                                           *
*  Version   4.6.2;  May 1991               *
*                                           *
*  RUN DATE    30JUL92    TIME    6:46:23   *
*********************************************
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****************************************
*  U.S. ARMY CORPS OF ENGINEERS        *
*  HYDROLOGIC ENGINEERING CENTER       *
*  609 SECOND STREET, SUITE D          *
*  DAVIS, CALIFORNIA 95616-4687        *
*           (916) 756-1104             *
****************************************
```


HEC-2 100 YR
SALT RIVER TO 51ST AVE

```
X     X  XXXXXXX   XXXXX             XXXXX
X     X  X        X     X           X     X
X     X  X        X                       X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX  XXXXX              XXXXXXX
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::::::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::::::
:::                                        :::
:::   FULL MICRO-COMPUTER IMPLEMENTATION   :::
:::                                        :::
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::::::::::::::::::::::::::::::::::::::::::::::
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============================
H A E S T A D  M E T H O D S
============================
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37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

THIS RUN EXECUTED 30JUL92 6:46:23

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**************************************
 HEC-2 WATER SURFACE PROFILES

 Version  4.6.2;  May 1991
**************************************


T1      PRICE PHASE II  00173 039 044
T2      LINED NEW CHANNEL RUN FROM BASELINE RD. TO SALT RIVER
T3      100 YEAR PROFILE      10-YEAR TW = 989.0

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                2                           .0008                           990.0

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      1                 -1


J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38        39        43         1        42         8        26         4

QT        2       1331       1597
NC     .020       .020       .018        .1        .3
   28 ft B/Width, 7 ft Deep, 2:1 SS Then 3:1 for 2 ft more.
X1      1.0          6       1006       1062
GR   993.50       1000     991.50       1006     984.50       1020     984.50       1048     991.50       1062
GR   993.50       1068

X1      2.0                                        670        670        670                 0.536

X1      3.0                                       1120       1120       1120                 0.896

X1      4.0                                       1770       1770       1770                 1.416

NC    0.018      0.018      0.018
   Southern Ave.  5-10x7 box culvert
X1      4.5         16        100     142.57         20         20         20
BT        2        100       1001     993.36     142.57       1001     993.36
GR   993.36        100     987.36     100.01     987.36     110.01     993.36     110.02     993.36     110.85
GR   987.36     110.86     987.36     120.86     993.36     120.87     993.36     121.70     987.36     121.71
GR   987.36     131.71     993.36     131.72     993.36     132.55     987.36     132.56     987.36     142.56
GR   993.36     142.57

X1      4.6                                       170        170        170                 0.136
X2                                                                       1
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NC     .020       .020       .018
   28 ft B/Width, 7 ft Deep, 2:1 SS Then 3:1 for 2 ft more.
X1      5.0          6       1006       1062         20         20         20
GR   996.52       1000     994.52       1006     987.52       1020     987.52       1048     994.52       1062
GR   996.52       1068

X1      6.0                                          1000       1000       1000                 0.800

X1      7.0                                           500        500        500                 0.400

X1      8.0                                           500        500        500                 0.400

X1      9.0                                           500        500        500                 0.400

X1     10.0                                           500        500        500                 0.400

X1     11.0                                           500        500        500                 0.400

QT        2       1237       1484
X1    39200                                           500        500        500                 0.400
   3-10X8 SIPHON AT BASELINE ROAD

X1    39490                                           290        290        290                   .23
X3       10                                                                          999        999

SC    3.013         .2          3          0          8         10       2310        9.1        993     990.95
X1    41300                                          2310       2310       2310                 2.05
X2                                2       1001       1003
X3       10                                                                         1003       1003
BT        2       1000       1003                    1058       1003
   8' BOTTOMWIDTH CHANNEL

X1    41400          4          0         46         100        100        100
GR   1002.7          0      993.2         19      993.2         27     1002.7         46
   3-10X8 BOX BENEATH S. MTN. FREEWAY
   HEC2 SPECIAL CULVERT ROUTINE UNABLE TO CALCULATE LOSSES
   HY8 USED TO CALCULATE LOSSES, HW ENTERED ON X5 CARD, SECT 42050

X1    41700                                           330        330        330                   0.7

X1    42050                                           500        500        500                   .96
X3       10                                                                         1010       1010
X5        2    1001.42    1002.06

X1    42500          4          0         42         450        450        450
GR   1006.2          0      995.75         17      995.75         25     1006.24         42

X1    42501          4          0         42           1          1          1
GR   1006.2          0      997.74         17      997.74         25     1006.24         42
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X1    43000                                  499       499       499                1.0

X1    44000                                 1000      1000      1000                2.0

X1    45000                                 1000      1000      1000                2.0

X1    45500                                  500       500       500                1.0

QT        2      1206      1447
   3-10X8 BOX AT DOBBINS ROAD
   HEC2 SPECIAL CULVERT ROUTINE UNABLE TO CALCULATE LOSSES
   HY8 USED TO CALCULATE LOSSES, HW ENTERED ON X5 CARD, SECT 45895
X1    45675                                  175       175       175                .35

X1    45895         4         0        42     220       220       220
X5        2   1011.30   1011.93
BT        2         0      1022               42      1022
GR   1013.0         0   1004.53        17  1004.53        25   1013.03        42

QT        2      1151      1381
X1    46000                                  105       105       105                .20

X1    46500                                  500       500       500                0.98

X1    47000                                  500       500       500                0.98
   2-8X6 BOX AT DETENTION BASIN 8

X1    47080                                   80        80        80                .15
X3       10                                                          1015       1015

SC    2.013        .2         3         0       6         8        80         9.1   1007   1006.84
X1    47160                                   80        80        80                .16
X2                               2      1013    1023
X3       10                                                          1023       1023
BT        2         0      1023               42      1023

NC                           .025
X1    47500         4         0       385     340       340       340
   DETENTION AREA 8 SECTIONS
GR     1018         0   1006.32        45  1006.32       335      1023       385

X1    48000                                  500       500       500                .5

X1    49000                                 1000      1000      1000                1.

X1    50000                                 1000      1000      1000                1.

QT        2      2380      2856
X1    50900                                  900       900       900                0.9
   7-10X6 AT ELLIOT ROAD
   HEC2 SPECIAL CULVERT ROUTINE UNABLE TO CALCULATE LOSSES
   HY8 USED TO CALCULATE LOSSES, HW ENTERED ON X5 CARD, SECT 51102
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```
X1    50990        4         0        95        90        90        90
GR     1020        0   1009.82        10   1009.82        85      1020        95

NC                           .018
X1    51102        4         0        74       112       112       112
X3       10                                                      1020      1020
X5        2  1016.59   1018.61
GR   1016.5        0      1010        13      1010        61    1016.5        74
   48' BOTTOMWIDTH CHANNEL

X1    51500                                      398       398       398                 0.6

X1    52000                                      500       500       500                 .75

QT        2     1718      2062
X1    52900                                      900       900       900                1.35
   CHANNEL TRANSITION TO 24' BOTTOMWIDTH

X1    53000        4         0        42       100       100       100
GR   1019.4        0   1012.85        13   1012.85        37    1019.35        50

X1    53400                                      400       400       400                0.60

X1    53800                                      400       400       400                0.60
   STATION EQUATION

X1    54000                                      200       200       200                0.29

X1    54450                                   712.28    712.28    712.28                1.07

QT        2     1369      1643
   CHANNEL TRANSITION TO 10' BOTTOMWIDTH CHANNEL, DEPTH = 6.5'
   SUPERCRITICAL FLOW IS PREDICTED FOR STA. 54550 TO 59500 - REFER TO
   FLOWMASTER CALCULATIONS FOR CORRECT FLOW DEPTHS AND FROUDE NUMBERS.
X1    54550        4         0        40       100       100       100
GR   1021.9        0   1015.89        13   1015.89        23    1021.89        36

X1    55000                                      450       450       450                2.16

X1    55500                                      500       500       500                2.40

X1    55600        4         0        36       100       100       100
GR   1026.9        0   1020.93        13   1020.93        23    1026.93        36

QT        2     1019      1223
   CHANNEL TRANSITION TO 8' BOTTOMWIDTH, DEPTH = 6.5'
X1    56000        4         0        34       400       400       400
GR   1029.3        0   1022.84        13   1022.84        21    1029.34        34
```

```
X1    56500                                    500       500       500            2.39

X1    57000                                    500       500       500            2.39

X1    57490                                    490       490       490            2.35
   4-10X6 BOX AT ESTRELLA DR.
   HEC2 SPECIAL CULVERT ROUTINE UNABLE TO CALCULATE LOSSES
   HY8 USED TO CALCULATE LOSSES, HW ENTERED ON X5 CARD, SECT 57660

X1    57665        4         0        41       175       175       175
X5        2  1035.99   1036.34
GR  1036.8         0    1030.8         1    1030.8        40    1036.8        41
   CHANNEL TRANSITION TO 10' BOTTOMWIDTH, DEPTH = 6.5'

X1    57700        4         0        36        35        35        35
GR  1037.4         0   1030.90        13   1030.90        23   1037.40        36

X1    58000                                    300       300       300            0.75

X1    58500                                    500       500       500            1.25

X1    59000                                    500       500       500            1.25

QT        2       765       918
X1    59500                                    500       500       500            1.25

X1    60000                                    500       500       500            1.25
   2-8X6 BOX AT 51ST AVENUE

QT        2       224       269
X1    60300                                    300       300       300            0.80
X3       10                                                          1048           1048

SC    2.013        .2         3         0         6         8       230       9.1  1038.08  1037.45
X1    60530                                    230       230       230             .63
X2                               2  1044.08      1050
X3       10                                                          1050           1050
BT        2         0      1050                 31      1050
   8' BOTTOMWIDTH CHANNEL, DEPTH = 6'

X1    60700        4         0        20       170       170       170
GR  1044.5         0   1038.50        12   1038.50        20   1044.50        28

X1    60730                                     30        30        30             .08
   DROP STRUCTURE

X1    60731                                      1         1         1            4.48
```

X1	61000	269	269	269	.67
X1	61500	570	570	570	1.425
X1	61640	150	150	150	.375

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CCHV= .100 CEHV= .300

*SECNO 1.000

1.000	5.60	990.10	.00	990.00	990.67	.57	.00	.00	991.50
1331.0	.0	1331.0	.0	.0	219.5	.0	.0	.0	991.50
.00	.00	6.06	.00	.000	.018	.000	.000	984.50	1008.80
.000812	0.	0.	0.	0	0	3	.00	50.40	1059.20

*SECNO 2.000

2.000	5.61	990.64	.00	.00	991.21	.57	.54	.00	992.04
1331.0	.0	1331.0	.0	.0	219.9	.0	3.4	.8	992.04
.03	.00	6.05	.00	.000	.018	.000	.000	985.04	1008.78
.000807	670.	670.	670.	0	0	0	.00	50.43	1059.22

*SECNO 3.000

3.000	5.62	991.55	.00	.00	992.11	.57	.90	.00	992.93
1331.0	.0	1331.0	.0	.0	220.5	.0	9.0	2.1	992.93
.08	.00	6.04	.00	.000	.018	.000	.000	985.93	1008.76
.000801	1120.	1120.	1120.	0	0	0	.00	50.48	1059.24

*SECNO 4.000

4.000	5.62	992.97	.00	.00	993.53	.56	1.42	.00	994.35
1331.0	.0	1331.0	.0	.0	220.8	.0	18.0	4.1	994.35
.16	.00	6.03	.00	.000	.018	.000	.000	987.35	1008.75
.000799	1770.	1770.	1770.	0	0	0	.00	50.50	1059.25

*SECNO 4.500

3265 DIVIDED FLOW

3370 NORMAL BRIDGE, NRD= 2 MIN ELTRD= 1001.00 MAX ELLC= 993.36

4.500	5.66	993.02	.00	.00	993.55	.54	.02	.00	993.36
1331.0	.0	1331.0	.0	.0	226.6	.0	18.1	4.1	993.36
.16	.00	5.87	.00	.000	.018	.000	.000	987.36	100.00
.001376	20.	20.	20.	2	0	0	.00	40.08	142.57

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 4.600

3265 DIVIDED FLOW

3370 NORMAL BRIDGE, NRD= 2 MIN ELTRD= 1001.00 MAX ELLC= 993.50

4.600	5.77	993.27	.00	.00	993.78	.51	.23	.00	993.50
1331.0	.0	1331.0	.0	.0	231.2	.0	19.0	4.3	993.50
.17	.00	5.76	.00	.000	.018	.000	.000	987.50	100.00
.001305	170.	170.	170.	2	0	0	.00	40.08	142.57

*SECNO 5.000

5.000	5.76	993.28	.00	.00	993.81	.53	.02	.00	994.52
1331.0	.0	1331.0	.0	.0	228.1	.0	19.1	4.3	994.52
.17	.00	5.84	.00	.000	.018	.000	.000	987.52	1008.46
.000728	20.	20.	20.	1	0	0	.00	51.07	1059.54

*SECNO 6.000

6.000	5.69	994.01	.00	.00	994.56	.55	.75	.01	995.32
1331.0	.0	1331.0	.0	.0	223.9	.0	24.3	5.5	995.32
.22	.00	5.95	.00	.000	.018	.000	.000	988.32	1008.63
.000768	1000.	1000.	1000.	2	0	0	.00	50.74	1059.37

*SECNO 7.000

7.000	5.68	994.40	.00	.00	994.95	.55	.39	.00	995.72
1331.0	.0	1331.0	.0	.0	222.9	.0	26.9	6.1	995.72
.24	.00	5.97	.00	.000	.018	.000	.000	988.72	1008.67
.000777	500.	500.	500.	0	0	0	.00	50.67	1059.33

*SECNO 8.000

8.000	5.66	994.78	.00	.00	995.34	.55	.39	.00	996.12
1331.0	.0	1331.0	.0	.0	222.6	.0	29.4	6.7	996.12
.27	.00	5.98	.00	.000	.018	.000	.000	989.12	1008.68
.000780	500.	500.	500.	0	0	0	.00	50.65	1059.32

*SECNO 9.000

9.000	5.65	995.17	.00	.00	995.73	.56	.39	.00	996.52
1331.0	.0	1331.0	.0	.0	222.2	.0	32.0	7.2	996.52
.29	.00	5.99	.00	.000	.018	.000	.000	989.52	1008.69
.000784	500.	500.	500.	0	0	0	.00	50.61	1059.31

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 10.000

10.000	5.64	995.57	.00	.00	996.12	.56	.39	.00	996.92
1331.0	.0	1331.0	.0	.0	221.8	.0	34.5	7.8	996.92
.31	.00	6.00	.00	.000	.018	.000	.000	989.92	1008.71
.000789	500.	500.	500.	0	0	0	.00	50.58	1059.29

*SECNO 11.000

11.000	5.64	995.96	.00	.00	996.52	.56	.40	.00	997.32
1331.0	.0	1331.0	.0	.0	221.4	.0	37.1	8.4	997.32
.34	.00	6.01	.00	.000	.018	.000	.000	990.32	1008.72
.000792	500.	500.	500.	0	0	0	.00	50.55	1059.28

*SECNO 39200.000

39200.000	5.70	996.42	.00	.00	996.89	.47	.36	.01	997.72
1237.0	.0	1237.0	.0	.0	224.5	.0	39.6	9.0	997.72
.36	.00	5.51	.00	.000	.018	.000	.000	990.72	1008.60
.000658	500.	500.	500.	2	0	0	.00	50.80	1059.40

*SECNO 39490.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 999.00 ELREA= 999.00

39490.000	5.66	996.61	.00	.00	997.09	.48	.19	.00	997.95
1237.0	.0	1237.0	.0	.0	222.3	.0	41.1	9.3	997.95
.38	.00	5.56	.00	.000	.018	.000	.000	990.95	1008.69
.000676	290.	290.	290.	2	0	0	.00	50.62	1059.31

SPECIAL CULVERT

SC	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	3	.013	.20	3.00	.00	8.00	10.00	2310.00	9	1	993.00	990.95

CHART 9 - BOX CULVERT WITH FLARED WINGWALL AND INLET TOP EDGE BEVEL
SCALE 1 - WINGWALL FLARED 45 DEGREES; INLET TOP EDGE = 0.043D

*SECNO 41300.000

SPECIAL CULVERT OUTLET CONTROL
EGIC = 999.088 EGOC = 999.892 PCWSE= 996.606 ELTRD= 1003.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SPECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
999.09	999.89	2.81	0.	1237.	4.579	240.0	1003.00	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1003.00 ELREA= 1003.00

41300.000	6.57	999.57	.00	.00	999.89	.33	2.81	.00	1000.00
1237.0	.0	1237.0	.0	.0	270.2	.0	54.2	12.1	1000.00
.52	.00	4.58	.00	.000	.018	.000	.000	993.00	1006.86
.000390	2310.	2310.	2310.	2	0	0	.00	54.27	1061.14

*SECNO 41400.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

41400.000	5.80	999.00	999.00	.00	1000.84	1.84	.09	.46	1002.70
1237.0	.0	1237.0	.0	.0	113.6	.0	54.6	12.2	1002.70
.52	.00	10.89	.00	.000	.018	.000	.000	993.20	7.41
.003476	100.	100.	100.	20	11	0	.00	31.19	38.59

*SECNO 41700.000

3301 HV CHANGED MORE THAN HVINS

41700.000	6.65	1000.55	.00	.00	1001.74	1.18	.83	.07	1003.40
1237.0	.0	1237.0	.0	.0	141.8	.0	55.6	12.4	1003.40
.53	.00	8.73	.00	.000	.018	.000	.000	993.90	5.69
.001915	330.	330.	330.	3	0	0	.00	34.61	40.31

*SECNO 42050.000
WATER EL=X5 CARD= 1001.420

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1010.00 ELREA= 1010.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
42050.000	6.56	1001.42	.00	.00	1002.66	1.24	.99	.02	1004.36
1237.0	.0	1237.0	.0	.0	138.5	.0	57.2	12.8	1004.36
.55	.00	8.93	.00	.000	.018	.000	.000	994.86	5.88
.002036	500.	500.	500.	0	0	0	.00	34.24	40.12

*SECNO 42500.000

42500.000	6.43	1002.18	.00	.00	1003.87	1.69	1.08	.14	1006.20
1237.0	.0	1237.0	.0	.0	118.6	.0	58.5	13.2	1006.24
.56	.00	10.43	.00	.000	.018	.000	.000	995.75	6.54
.002845	450.	450.	450.	2	0	0	.00	28.88	35.42

*SECNO 42501.000

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

3693 PROBABLE MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

42501.000	5.79	1003.53	1003.53	.00	1005.37	1.85	.00	.05	1006.20
1237.0	.0	1237.0	.0	.0	113.4	.0	58.5	13.2	1006.24
.56	.00	10.91	.00	.000	.018	.000	.000	997.74	5.37
.003494	1.	1.	1.	20	11	0	.00	31.20	36.57

*SECNO 43000.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.42

43000.000	6.80	1005.54	.00	.00	1006.64	1.09	1.19	.08	1007.20
1237.0	.0	1237.0	.0	.0	147.4	.0	60.0	13.5	1007.24
.57	.00	8.39	.00	.000	.018	.000	.000	998.74	3.32
.001726	499.	499.	499.	2	0	0	.00	35.30	38.62

*SECNO 44000.000

44000.000	6.57	1007.31	.00	.00	1008.54	1.23	1.86	.04	1009.20
1237.0	.0	1237.0	.0	.0	139.2	.0	63.3	14.3	1009.24
.60	.00	8.89	.00	.000	.018	.000	.000	1000.74	3.79
.002012	1000.	1000.	1000.	3	0	0	.00	34.35	38.15

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 45000.000									
45000.000	6.58	1009.32	.00	.00	1010.54	1.22	2.01	.00	1011.20
1237.0	.0	1237.0	.0	.0	139.5	.0	66.5	15.1	1011.24
.64	.00	8.87	.00	.000	.018	.000	.000	1002.74	3.77
.002001	1000.	1000.	1000.	2	0	0	.00	34.39	38.16
*SECNO 45500.000									
45500.000	6.59	1010.33	.00	.00	1011.54	1.22	1.00	.00	1012.20
1237.0	.0	1237.0	.0	.0	139.7	.0	68.1	15.5	1012.24
.65	.00	8.86	.00	.000	.018	.000	.000	1003.74	3.76
.001994	500.	500.	500.	0	0	0	.00	34.41	38.17
*SECNO 45675.000									
45675.000	6.70	1010.79	.00	.00	1011.88	1.10	.33	.01	1012.55
1206.0	.0	1206.0	.0	.0	143.6	.0	68.7	15.7	1012.59
.66	.00	8.40	.00	.000	.018	.000	.000	1004.09	3.54
.001760	175.	175.	175.	2	0	0	.00	34.86	38.40
*SECNO 45895.000									
WATER EL=X5 CARD=		1011.300							
45895.000	6.77	1011.30	.00	.00	1012.36	1.06	.38	.00	1013.00
1206.0	.0	1206.0	.0	.0	146.0	.0	69.4	15.8	1013.03
.67	.00	8.26	.00	.000	.018	.000	.000	1004.53	3.41
.001683	220.	220.	220.	0	0	0	.00	35.13	38.54
*SECNO 46000.000									
46000.000	6.90	1011.63	.00	.00	1012.54	.91	.16	.02	1013.20
1151.0	.0	1151.0	.0	.0	150.7	.0	69.8	15.9	1013.23
.67	.00	7.64	.00	.000	.018	.000	.000	1004.73	3.15
.001408	105.	105.	105.	2	0	0	.00	35.66	38.81
*SECNO 46500.000									
46500.000	6.59	1012.30	.00	.00	1013.36	1.05	.78	.04	1014.18
1151.0	.0	1151.0	.0	.0	139.9	.0	71.4	16.3	1014.21
.69	.00	8.23	.00	.000	.018	.000	.000	1005.71	3.76
.001718	500.	500.	500.	2	0	0	.00	34.43	38.19

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 47000.000

47000.000	6.46	1013.15	.00	.00	1014.27	1.12	.90	.02	1015.16
1151.0	.0	1151.0	.0	.0	135.4	.0	73.0	16.7	1015.19
.70	.00	8.50	.00	.000	.018	.000	.000	1006.69	4.03
.001877	500.	500.	500.	2	0	0	.00	33.90	37.92

*SECNO 47080.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1015.00 ELREA= 1015.00

47080.000	6.46	1013.30	.00	.00	1014.43	1.13	.15	.00	1015.31
1151.0	.0	1151.0	.0	.0	135.2	.0	73.3	16.8	1015.34
.70	.00	8.52	.00	.000	.018	.000	.000	1006.84	4.04
.001885	80.	80.	80.	0	0	0	.00	33.87	37.91

SPECIAL CULVERT

SC	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	2	.013	.20	3.00	.00	6.00	8.00	80.00	9	1	1007.00	1006.84

CHART 9 - BOX CULVERT WITH FLARED WINGWALL AND INLET TOP EDGE BEVEL
SCALE 1 - WINGWALL FLARED 45 DEGREES; INLET TOP EDGE = 0.043D

*SECNO 47160.000

SPECIAL CULVERT OUTLET CONTROL
EGIC = 1016.236 EGOC = 1016.408 PCWSE= 1013.300 ELTRD= 1023.000

3280 CROSS SECTION 47160.00 EXTENDED .57 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.16

SPECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
1016.24	1016.41	1.98	0.	1151.	4.890	96.0	1023.00	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1023.00 ELREA= 1023.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
47160.000	9.04	1016.04	.00	.00	1016.41	.37	1.98	.00	1015.47
1151.0	.0	1151.0	.0	.0	235.4	.0	73.6	16.9	1015.50
.71	.00	4.89	.00	.000	.018	.000	.000	1007.00	.00
.000404	80.	80.	80.	2	0	0	.00	42.00	42.00

*SECNO 47500.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 14.82

47500.000	10.13	1016.45	.00	.00	1016.45	.00	.00	.04	1018.00
1151.0	.0	1151.0	.0	.0	3283.9	.0	87.3	18.4	1023.00
.98	.00	.35	.00	.000	.025	.000	.000	1006.32	6.03
.000002	340.	340.	340.	1	0	0	.00	359.29	365.32

*SECNO 48000.000

48000.000	9.63	1016.45	.00	.00	1016.45	.00	.00	.00	1018.50
1151.0	.0	1151.0	.0	.0	3108.9	.0	124.0	22.5	1023.50
1.35	.00	.37	.00	.000	.025	.000	.000	1006.82	7.91
.000002	500.	500.	500.	2	0	0	.00	355.94	363.85

*SECNO 49000.000

49000.000	8.63	1016.45	.00	.00	1016.45	.00	.00	.00	1019.50
1151.0	.0	1151.0	.0	.0	2757.1	.0	191.3	30.6	1024.50
2.02	.00	.42	.00	.000	.025	.000	.000	1007.82	11.76
.000003	1000.	1000.	1000.	0	0	0	.00	349.10	360.86

*SECNO 50000.000

50000.000	7.63	1016.45	.00	.00	1016.45	.00	.00	.00	1020.50
1151.0	.0	1151.0	.0	.0	2412.4	.0	250.7	38.6	1025.50
2.60	.00	.48	.00	.000	.025	.000	.000	1008.82	15.60
.000005	1000.	1000.	1000.	0	0	0	.00	342.27	357.87

*SECNO 50900.000

50900.000	6.73	1016.45	.00	.00	1016.47	.02	.01	.00	1021.40
2380.0	.0	2380.0	.0	.0	2108.5	.0	297.4	45.6	1026.40
2.82	.00	1.13	.00	.000	.025	.000	.000	1009.72	19.05
.000031	900.	900.	900.	0	0	0	.00	336.14	355.19

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 50990.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .23

50990.000	6.43	1016.25	.00	.00	1016.57	.32	.01	.09	1020.00
2380.0	.0	2380.0	.0	.0	522.8	.0	300.1	46.0	1020.00
2.83	.00	4.55	.00	.000	.025	.000	.000	1009.82	3.68
.000587	90.	90.	90.	2	0	0	.00	87.63	91.32

*SECNO 51102.000
WATER EL=X5 CARD= 1016.590
3280 CROSS SECTION 51102.00 EXTENDED .09 FEET

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1020.00 ELREA= 1020.00

51102.000	6.59	1016.59	.00	.00	1017.13	.54	.06	.07	1016.50
2380.0	.0	2380.0	.0	.0	403.2	.0	301.3	46.2	1016.50
2.83	.00	5.90	.00	.000	.018	.000	.000	1010.00	.00
.000564	112.	112.	112.	0	0	0	.00	74.00	74.00

*SECNO 51500.000

51500.000	6.18	1016.78	.00	.00	1017.41	.63	.25	.03	1017.10
2380.0	.0	2380.0	.0	.0	372.8	.0	304.8	46.9	1017.10
2.85	.00	6.38	.00	.000	.018	.000	.000	1010.60	.65
.000713	398.	398.	398.	2	0	0	.00	72.71	73.35

*SECNO 52000.000

52000.000	5.75	1017.10	.00	.00	1017.85	.75	.40	.04	1017.85
2380.0	.0	2380.0	.0	.0	341.9	.0	308.9	47.7	1017.85
2.87	.00	6.96	.00	.000	.018	.000	.000	1011.35	1.51
.000919	500.	500.	500.	0	0	0	.00	70.99	72.49

*SECNO 52900.000

52900.000	5.41	1018.11	.00	.00	1018.56	.45	.68	.03	1019.20
1718.0	.0	1718.0	.0	.0	318.1	.0	315.8	49.2	1019.20
2.92	.00	5.40	.00	.000	.018	.000	.000	1012.70	2.18
.000593	900.	900.	900.	2	0	0	.00	69.63	71.82

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 53000.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

53000.000	4.77	1017.62	1017.62	.00	1019.52	1.90	.11	.43	1019.40
1718.0	.0	1563.3	154.7	.0	137.2	22.8	316.3	49.3	1012.85
2.92	.00	11.39	6.79	.000	.018	.020	.000	1012.85	3.52
.003035	100.	100.	100.	20	11	0	.00	43.02	46.55

*SECNO 53400.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.44

53400.000	5.83	1019.28	.00	.00	1020.41	1.13	.81	.08	1020.00
1718.0	.0	1535.4	182.6	.0	173.6	34.0	318.0	49.7	1013.45
2.93	.00	8.84	5.37	.000	.018	.020	.000	1013.45	1.43
.001458	400.	400.	400.	3	0	0	.00	47.23	48.66

*SECNO 53800.000

53800.000	5.81	1019.86	.00	.00	1021.00	1.14	.59	.00	1020.60
1718.0	.0	1535.7	182.3	.0	173.2	33.8	319.9	50.1	1014.05
2.95	.00	8.87	5.39	.000	.018	.020	.000	1014.05	1.46
.001470	400.	400.	400.	2	0	0	.00	47.18	48.63

*SECNO 54000.000

54000.000	5.81	1020.15	.00	.00	1021.30	1.14	.29	.00	1020.89
1718.0	.0	1535.8	182.2	.0	173.1	33.8	320.9	50.4	1014.34
2.95	.00	8.87	5.39	.000	.018	.020	.000	1014.34	1.46
.001472	200.	200.	200.	0	0	0	.00	47.17	48.63

*SECNO 54450.000

54450.000	5.79	1021.20	.00	.00	1022.35	1.15	1.06	.00	1021.96
1718.0	.0	1536.3	181.7	.0	172.3	33.6	324.2	51.1	1015.41
2.98	.00	8.92	5.41	.000	.018	.020	.000	1015.41	1.50
.001493	712.	712.	712.	0	0	0	.00	47.08	48.58

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 54550.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

54550.000	5.66	1021.55	1021.55	.00	1023.38	1.84	.21	.21	1021.90
1369.0	.0	1369.0	.0	.0	125.8	.0	324.6	51.2	1021.89
2.98	.00	10.88	.00	.000	.018	.000	.000	1015.89	.76
.003392	100.	100.	100.	20	8	0	.00	34.49	35.26

*SECNO 55000.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

55000.000	5.65	1023.70	1023.70	.00	1025.54	1.84	1.53	.00	1024.06
1369.0	.0	1369.0	.0	.0	125.7	.0	325.9	51.6	1024.05
2.99	.00	10.89	.00	.000	.018	.000	.000	1018.05	.77
.003403	450.	450.	450.	3	5	0	.00	34.47	35.25

*SECNO 55500.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

55500.000	5.65	1026.10	1026.10	.00	1027.94	1.84	1.70	.00	1026.46
1369.0	.0	1369.0	.0	.0	125.7	.0	327.4	52.0	1026.45
3.00	.00	10.89	.00	.000	.018	.000	.000	1020.45	.77
.003400	500.	500.	500.	3	5	0	.00	34.48	35.25

*SECNO 55600.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

55600.000	5.65	1026.58	1026.58	.00	1028.42	1.84	.34	.00	1026.90
1369.0	.0	1369.0	.0	.0	125.8	.0	327.6	52.0	1026.93
3.00	.00	10.88	.00	.000	.018	.000	.000	1020.93	.70
.003400	100.	100.	100.	3	5	0	.00	34.54	35.24

*SECNO 56000.000

56000.000	5.33	1028.17	1028.09	.00	1029.79	1.62	1.35	.02	1029.30
1019.0	.0	1019.0	.0	.0	99.6	.0	328.7	52.3	1029.34
3.02	.00	10.23	.00	.000	.018	.000	.000	1022.84	2.27
.003360	400.	400.	400.	5	11	0	.00	29.39	31.66

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 56500.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

56500.000	5.24	1030.47	1030.47	.00	1032.18	1.72	1.74	.03	1031.69
1019.0	.0	1019.0	.0	.0	96.9	.0	329.8	52.7	1031.73
3.03	.00	10.52	.00	.000	.018	.000	.000	1025.23	2.46
.003624	500.	500.	500.	2	5	0	.00	29.01	31.47

*SECNO 57000.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

57000.000	5.26	1032.88	1032.88	.00	1034.57	1.69	1.79	.00	1034.08
1019.0	.0	1019.0	.0	.0	97.6	.0	330.9	53.0	1034.12
3.04	.00	10.44	.00	.000	.018	.000	.000	1027.62	2.41
.003554	500.	500.	500.	2	5	0	.00	29.11	31.52

*SECNO 57490.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

57490.000	5.25	1035.22	1035.22	.00	1036.92	1.70	1.75	.00	1036.43
1019.0	.0	1019.0	.0	.0	97.4	.0	332.0	53.3	1036.47
3.06	.00	10.46	.00	.000	.018	.000	.000	1029.97	2.43
.003569	490.	490.	490.	2	5	0	.00	29.08	31.51

*SECNO 57665.000
WATER EL=X5 CARD= 1035.990

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.60

57665.000	5.19	1035.99	.00	.00	1036.37	.38	.19	.13	1036.80
1019.0	.0	1019.0	.0	.0	206.9	.0	332.6	53.5	1036.80
3.07	.00	4.93	.00	.000	.018	.000	.000	1030.80	.14
.000529	175.	175.	175.	0	0	0	.00	40.73	40.86

*SECNO 57700.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

57700.000	4.96	1035.86	1035.86	.00	1037.51	1.65	.04	.38	1037.40
1019.0	.0	1019.0	.0	.0	98.8	.0	332.7	53.5	1037.40
3.07	.00	10.32	.00	.000	.018	.000	.000	1030.90	3.08
.003502	35.	35.	35.	20	8	0	.00	29.83	32.92

*SECNO 58000.000

58000.000	5.56	1037.21	.00	.00	1038.38	1.17	.82	.05	1038.15
1019.0	.0	1019.0	.0	.0	117.4	.0	333.5	53.7	1038.15
3.08	.00	8.68	.00	.000	.018	.000	.000	1031.65	1.88
.002191	300.	300.	300.	3	0	0	.00	32.23	34.12

*SECNO 58500.000

58500.000	5.40	1038.30	.00	.00	1039.58	1.28	1.16	.03	1039.40
1019.0	.0	1019.0	.0	.0	112.2	.0	334.8	54.1	1039.40
3.09	.00	9.08	.00	.000	.018	.000	.000	1032.90	2.21
.002476	500.	500.	500.	3	0	0	.00	31.59	33.79

*SECNO 59000.000

59000.000	5.38	1039.53	.00	.00	1040.82	1.29	1.24	.00	1040.65
1019.0	.0	1019.0	.0	.0	111.8	.0	336.1	54.4	1040.65
3.11	.00	9.12	.00	.000	.018	.000	.000	1034.15	2.23
.002501	500.	500.	500.	2	0	0	.00	31.53	33.77

*SECNO 59500.000

3301 HV CHANGED MORE THAN HVINS

59500.000	5.73	1041.13	.00	.00	1041.73	.60	.84	.07	1041.90
765.0	.0	765.0	.0	.0	123.1	.0	337.4	54.8	1041.90
3.13	.00	6.21	.00	.000	.018	.000	.000	1035.40	1.53
.001084	500.	500.	500.	2	0	0	.00	32.94	34.47

*SECNO 60000.000

60000.000	4.96	1041.61	.00	.00	1042.54	.92	.71	.10	1043.15
765.0	.0	765.0	.0	.0	99.2	.0	338.7	55.2	1043.15
3.15	.00	7.71	.00	.000	.018	.000	.000	1036.65	3.06
.001951	500.	500.	500.	2	0	0	.00	29.89	32.94

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 60300.000

3301 HV CHANGED MORE THAN HVINS

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1048.00 ELREA= 1048.00

60300.000	5.32	1042.77	.00	.00	1042.84	.06	.21	.09	1043.95
224.0	.0	224.0	.0	.0	109.9	.0	339.4	55.4	1043.95
3.19	.00	2.04	.00	.000	.018	.000	.000	1037.45	2.36
.000127	300.	300.	300.	2	0	0	.00	31.29	33.64

SPECIAL CULVERT

SC	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	2	.013	.20	3.00	.00	6.00	8.00	230.00	9	1	1038.08	1037.45

CHART 9 - BOX CULVERT WITH FLARED WINGWALL AND INLET TOP EDGE BEVEL
SCALE 1 - WINGWALL FLARED 45 DEGREES; INLET TOP EDGE = 0.043D

*SECNO 60530.000

SPECIAL CULVERT OUTLET CONTROL
EGIC = 1041.042 EGOC = 1042.954 PCWSE= 1042.772 ELTRD= 1050.000

SPECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
1041.04	1042.95	.12	0.	224.	2.392	96.0	1050.00	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1050.00 ELREA= 1050.00

60530.000	4.79	1042.87	.00	.00	1042.95	.09	.12	.00	1044.58
224.0	.0	224.0	.0	.0	93.6	.0	340.0	55.5	1044.58
3.21	.00	2.39	.00	.000	.018	.000	.000	1038.08	3.43
.000196	230.	230.	230.	2	0	0	.00	29.14	32.57

*SECNO 60700.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .66

60700.000	4.34	1042.84	.00	.00	1043.03	.19	.05	.03	1044.50
224.0	.0	195.5	28.5	.0	53.6	12.6	340.3	55.7	1038.50
3.23	.00	3.65	2.27	.000	.018	.020	.000	1038.50	3.32
.000446	170.	170.	170.	2	0	0	.00	22.47	25.79

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 60730.000

60730.000	4.27	1042.85	.00	.00	1043.05	.20	.01	.00	1044.58
224.0	.0	195.8	28.2	.0	52.4	12.2	340.3	55.7	1038.58
3.23	.00	3.74	2.32	.000	.018	.020	.000	1038.58	3.46
.000476	30.	30.	30.	0	0	0	.00	22.24	25.70

*SECNO 60731.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

60731.000	2.46	1045.52	1045.52	.00	1046.45	.93	.00	.22	1049.06
224.0	.0	205.3	18.7	.0	25.8	4.0	340.3	55.7	1043.06
3.23	.00	7.96	4.61	.000	.018	.020	.000	1043.06	7.07
.003927	1.	1.	1.	20	11	0	.00	16.22	23.29

*SECNO 61000.000

61000.000	2.92	1046.65	.00	.00	1047.24	.59	.75	.03	1049.73
224.0	.0	202.7	21.3	.0	31.9	5.7	340.5	55.8	1043.73
3.24	.00	6.36	3.76	.000	.018	.020	.000	1043.73	6.16
.002079	269.	269.	269.	2	0	0	.00	17.73	23.89

*SECNO 61500.000

61500.000	2.75	1047.90	.00	.00	1048.60	.70	1.33	.03	1051.16
224.0	.0	203.6	20.4	.0	29.5	5.0	341.0	56.0	1045.16
3.27	.00	6.90	4.05	.000	.018	.020	.000	1045.16	6.51
.002623	570.	570.	570.	3	0	0	.00	17.15	23.66

*SECNO 61640.000

61640.000	2.78	1048.31	.00	.00	1048.99	.68	.39	.00	1051.53
224.0	.0	203.5	20.5	.0	29.8	5.1	341.1	56.1	1045.53
3.27	.00	6.82	4.01	.000	.018	.020	.000	1045.53	6.46
.002539	150.	150.	150.	2	0	0	.00	17.23	23.69

```
T1      PRICE PHASE II  00173 039 044
T2      LINED NEW CHANNEL RUN FROM BASELINE RD. TO SALT RIVER
T3      1.2x100yr PROFILE       10-YEAR TW = 989.0

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                3                             .0008                                 991.0

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     15                  -1
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 2

CCHV= .100 CEHV= .300

*SECNO 1.000

1.000	6.21	990.71	.00	991.00	991.34	.63	.00	.00	991.50
1597.0	.0	1597.0	.0	.0	251.2	.0	.0	.0	991.50
.00	.00	6.36	.00	.000	.018	.000	.000	984.50	1007.57
.000797	0.	0.	0.	0	0	4	.00	52.86	1060.43

*SECNO 2.000

2.000	6.21	991.25	.00	.00	991.88	.63	.53	.00	992.04
1597.0	.0	1597.0	.0	.0	251.1	.0	3.9	.8	992.04
.03	.00	6.36	.00	.000	.018	.000	.000	985.04	1007.57
.000798	670.	670.	670.	0	0	0	.00	52.85	1060.43

*SECNO 3.000

3.000	6.21	992.14	.00	.00	992.77	.63	.89	.00	992.93
1597.0	.0	1597.0	.0	.0	251.0	.0	10.3	2.2	992.93
.08	.00	6.36	.00	.000	.018	.000	.000	985.93	1007.58
.000799	1120.	1120.	1120.	0	0	0	.00	52.84	1060.42

*SECNO 4.000

4.000	6.21	993.56	.00	.00	994.19	.63	1.42	.00	994.35
1597.0	.0	1597.0	.0	.0	250.9	.0	20.5	4.3	994.35
.16	.00	6.36	.00	.000	.018	.000	.000	987.35	1007.58
.000800	1770.	1770.	1770.	0	0	0	.00	52.83	1060.42

*SECNO 4.500

3280 CROSS SECTION 4.50 EXTENDED .18 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .53

3370 NORMAL BRIDGE, NRD= 2 MIN ELTRD= 1001.00 MAX ELLC= 993.36

4.500	6.18	993.54	.00	.00	994.23	.69	.03	.02	993.36
1597.0	.0	1597.0	.0	.0	240.0	.0	20.6	4.3	993.36
.16	.00	6.65	.00	.000	.018	.000	.000	987.36	100.00
.002810	20.	20.	20.	2	0	0	-8.07	42.57	142.57

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 4.600
3280 CROSS SECTION 4.60 EXTENDED .53 FEET

3370 NORMAL BRIDGE, NRD= 2 MIN ELTRD= 1001.00 MAX ELLC= 993.50

4.600	6.53	994.02	.00	.00	994.71	.69	.48	.00	993.50
1597.0	.0	1597.0	.0	.0	240.0	.0	21.6	4.5	993.50
.16	.00	6.65	.00	.000	.018	.000	.000	987.50	100.00
.002810	170.	170.	170.	2	0	0	-22.62	42.57	142.57

*SECNO 5.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.17

5.000	6.72	994.24	.00	.00	994.75	.51	.02	.02	994.52
1597.0	.0	1597.0	.0	.0	278.4	.0	21.7	4.5	994.52
.16	.00	5.74	.00	.000	.018	.000	.000	987.52	1006.56
.000597	20.	20.	20.	2	0	0	.00	54.88	1061.44

*SECNO 6.000

6.000	6.52	994.84	.00	.00	995.39	.55	.63	.01	995.32
1597.0	.0	1597.0	.0	.0	267.5	.0	28.0	5.8	995.32
.21	.00	5.97	.00	.000	.018	.000	.000	988.32	1006.96
.000668	1000.	1000.	1000.	3	0	0	.00	54.08	1061.04

*SECNO 7.000

7.000	6.45	995.17	.00	.00	995.74	.57	.34	.01	995.72
1597.0	.0	1597.0	.0	.0	263.4	.0	31.0	6.4	995.72
.23	.00	6.06	.00	.000	.018	.000	.000	988.72	1007.12
.000698	500.	500.	500.	1	0	0	.00	53.77	1060.88

*SECNO 8.000

8.000	6.39	995.51	.00	.00	996.10	.58	.35	.00	996.12
1597.0	.0	1597.0	.0	.0	260.6	.0	34.0	7.0	996.12
.26	.00	6.13	.00	.000	.018	.000	.000	989.12	1007.22
.000719	500.	500.	500.	0	0	0	.00	53.56	1060.78

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 9.000									
9.000	6.35	995.87	.00	.00	996.46	.59	.36	.00	996.52
1597.0	.0	1597.0	.0	.0	258.3	.0	37.0	7.6	996.52
.28	.00	6.18	.00	.000	.018	.000	.000	989.52	1007.30
.000737	500.	500.	500.	0	0	0	.00	53.39	1060.70
*SECNO 10.000									
10.000	6.32	996.24	.00	.00	996.84	.60	.37	.00	996.92
1597.0	.0	1597.0	.0	.0	256.6	.0	39.9	8.2	996.92
.30	.00	6.22	.00	.000	.018	.000	.000	989.92	1007.37
.000751	500.	500.	500.	0	0	0	.00	53.26	1060.63
*SECNO 11.000									
11.000	6.29	996.61	.00	.00	997.22	.61	.38	.00	997.32
1597.0	.0	1597.0	.0	.0	255.2	.0	42.9	8.9	997.32
.32	.00	6.26	.00	.000	.018	.000	.000	990.32	1007.42
.000763	500.	500.	500.	0	0	0	.00	53.16	1060.58
*SECNO 39200.000									
39200.000	6.34	997.06	.00	.00	997.58	.51	.35	.01	997.72
1484.0	.0	1484.0	.0	.0	258.2	.0	45.8	9.5	997.72
.35	.00	5.75	.00	.000	.018	.000	.000	990.72	1007.31
.000637	500.	500.	500.	2	0	0	.00	53.38	1060.69
*SECNO 39490.000									
3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 999.00 ELREA= 999.00									
39490.000	6.29	997.24	.00	.00	997.77	.52	.19	.00	997.95
1484.0	.0	1484.0	.0	.0	255.5	.0	47.5	9.8	997.95
.36	.00	5.81	.00	.000	.018	.000	.000	990.95	1007.41
.000656	290.	290.	290.	2	0	0	.00	53.18	1060.59

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SPECIAL CULVERT

SC	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	3	.013	.20	3.00	.00	8.00	10.00	2310.00	9	1	993.00	990.95

CHART 9 - BOX CULVERT WITH FLARED WINGWALL AND INLET TOP EDGE BEVEL
SCALE 1 - WINGWALL FLARED 45 DEGREES; INLET TOP EDGE = 0.043D

*SECNO 41300.000

SPECIAL CULVERT OUTLET CONTROL
EGIC = 999.874 EGOC = 1000.811 PCWSE= 997.245 ELTRD= 1003.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.41

SPECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
999.87	1000.81	3.04	0.	1484.	4.624	240.0	1003.00	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1003.00 ELREA= 1003.00

41300.000	7.48	1000.48	.00	.00	1000.81	.33	3.04	.00	1000.00
1484.0	.0	1484.0	.0	.0	320.9	.0	62.8	12.7	1000.00
.50	.00	4.62	.00	.000	.018	.000	.000	993.00	1006.00
.000330	2310.	2310.	2310.	2	0	0	.00	56.00	1062.00

*SECNO 41400.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

41400.000	6.33	999.53	999.53	.00	1001.53	2.00	.08	.50	1002.70
1484.0	.0	1484.0	.0	.0	130.7	.0	63.3	12.8	1002.70
.50	.00	11.35	.00	.000	.018	.000	.000	993.20	6.34
.003425	100.	100.	100.	20	15	0	.00	33.31	39.66

*SECNO 41700.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

41700.000	7.23	1001.13	.00	.00	1002.43	1.30	.83	.07	1003.40
1484.0	.0	1484.0	.0	.0	162.2	.0	64.4	13.1	1003.40
.51	.00	9.15	.00	.000	.018	.000	.000	993.90	4.55
.001918	330.	330.	330.	3	0	0	.00	36.90	41.45

*SECNO 42050.000
WATER EL=X5 CARD= 1002.060

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1010.00 ELREA= 1010.00

42050.000	7.20	1002.06	.00	.00	1003.37	1.31	.97	.00	1004.36
1484.0	.0	1484.0	.0	.0	161.3	.0	66.3	13.5	1004.36
.53	.00	9.20	.00	.000	.018	.000	.000	994.86	4.60
.001949	500.	500.	500.	0	0	0	.00	36.80	41.40

*SECNO 42500.000

3301 HV CHANGED MORE THAN HVINS

42500.000	6.97	1002.72	.00	.00	1004.60	1.88	1.06	.17	1006.20
1484.0	.0	1484.0	.0	.0	134.8	.0	67.8	13.9	1006.24
.54	.00	11.01	.00	.000	.018	.000	.000	995.75	5.65
.002900	450.	450.	450.	2	0	0	.00	30.65	36.30

*SECNO 42501.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

42501.000	6.33	1004.07	1004.07	.00	1006.06	2.00	.00	.03	1006.20
1484.0	.0	1484.0	.0	.0	130.8	.0	67.8	13.9	1006.24
.54	.00	11.34	.00	.000	.018	.000	.000	997.74	4.29
.003421	1.	1.	1.	20	11	0	.00	33.36	37.65

*SECNO 43000.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.41

43000.000	7.38	1006.12	.00	.00	1007.32	1.20	1.18	.08	1007.20
1484.0	.0	1484.0	.0	.0	168.6	.0	69.5	14.3	1007.24
.55	.00	8.80	.00	.000	.018	.000	.000	998.74	2.15
.001732	499.	499.	499.	2	0	0	.00	37.63	39.78

*SECNO 44000.000

44000.000	7.14	1007.88	.00	.00	1009.23	1.34	1.86	.04	1009.20
1484.0	.0	1484.0	.0	.0	159.6	.0	73.3	15.1	1009.24
.58	.00	9.30	.00	.000	.018	.000	.000	1000.74	2.64
.002008	1000.	1000.	1000.	3	0	0	.00	36.65	39.29

*SECNO 45000.000

45000.000	7.15	1009.89	.00	.00	1011.23	1.34	2.00	.00	1011.20
1484.0	.0	1484.0	.0	.0	159.7	.0	77.0	16.0	1011.24
.61	.00	9.29	.00	.000	.018	.000	.000	1002.74	2.63
.002001	1000.	1000.	1000.	2	0	0	.00	36.67	39.30

*SECNO 45500.000

45500.000	7.15	1010.89	.00	.00	1012.23	1.34	1.00	.00	1012.20
1484.0	.0	1484.0	.0	.0	159.9	.0	78.8	16.4	1012.24
.63	.00	9.28	.00	.000	.018	.000	.000	1003.74	2.62
.001997	500.	500.	500.	0	0	0	.00	36.69	39.31

*SECNO 45675.000

45675.000	7.29	1011.38	.00	.00	1012.57	1.20	.33	.01	1012.55
1447.0	.0	1447.0	.0	.0	164.8	.0	79.5	16.5	1012.59
.64	.00	8.78	.00	.000	.018	.000	.000	1004.09	2.35
.001749	175.	175.	175.	2	0	0	.00	37.23	39.58

*SECNO 45895.000

WATER EL=X5 CARD= 1011.930

45895.000	7.40	1011.93	.00	.00	1013.07	1.14	.37	.01	1013.00
1447.0	.0	1447.0	.0	.0	168.9	.0	80.3	16.7	1013.03
.64	.00	8.57	.00	.000	.018	.000	.000	1004.53	2.15
.001638	220.	220.	220.	0	0	0	.00	37.65	39.80

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 46000.000

46000.000	7.54	1012.27	.00	.00	1013.24	.98	.16	.02	1013.20
1381.0	.0	1381.0	.0	.0	174.2	.0	80.7	16.8	1013.23
.65	.00	7.93	.00	.000	.018	.000	.000	1004.73	1.87
.001372	105.	105.	105.	2	0	0	.00	38.22	40.08

*SECNO 46500.000

46500.000	7.20	1012.91	.00	.00	1014.05	1.13	.76	.05	1014.18
1381.0	.0	1381.0	.0	.0	161.6	.0	82.6	17.2	1014.21
.66	.00	8.54	.00	.000	.018	.000	.000	1005.71	2.54
.001679	500.	500.	500.	2	0	0	.00	36.87	39.41

*SECNO 47000.000

47000.000	7.05	1013.74	.00	.00	1014.95	1.22	.88	.03	1015.16
1381.0	.0	1381.0	.0	.0	155.8	.0	84.5	17.7	1015.19
.68	.00	8.86	.00	.000	.018	.000	.000	1006.69	2.86
.001853	500.	500.	500.	2	0	0	.00	36.23	39.09

*SECNO 47080.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1015.00 ELREA= 1015.00

47080.000	7.04	1013.88	.00	.00	1015.11	1.22	.15	.00	1015.31
1381.0	.0	1381.0	.0	.0	155.5	.0	84.8	17.7	1015.34
.68	.00	8.88	.00	.000	.018	.000	.000	1006.84	2.88
.001863	80.	80.	80.	0	0	0	.00	36.19	39.07

SPECIAL CULVERT

SC	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	2	.013	.20	3.00	.00	6.00	8.00	80.00	9	1	1007.00	1006.84

CHART 9 - BOX CULVERT WITH FLARED WINGWALL AND INLET TOP EDGE BEVEL
SCALE 1 - WINGWALL FLARED 45 DEGREES; INLET TOP EDGE = 0.043D

*SECNO 47160.000

SPECIAL CULVERT OUTLET CONTROL
EGIC = 1018.188 EGOC = 1018.354 PCWSE= 1013.880 ELTRD= 1023.000

3280 CROSS SECTION 47160.00 EXTENDED 2.60 FEET

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.91

SPECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
1018.19	1018.35	3.25	0.	1381.	4.309	96.0	1023.00	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1023.00 ELREA= 1023.00

47160.000	11.07	1018.07	.00	.00	1018.35	.29	3.25	.00	1015.47
1381.0	.0	1381.0	.0	.0	320.5	.0	85.2	17.8	1015.50
.69	.00	4.31	.00	.000	.018	.000	.000	1007.00	.00
.000220	80.	80.	80.	2	0	0	.00	42.00	42.00

*SECNO 47500.000

3280 CROSS SECTION 47500.00 EXTENDED .38 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 12.35

47500.000	12.06	1018.38	.00	.00	1018.38	.00	.00	.03	1018.00
1381.0	.0	1381.0	.0	.0	3996.1	.0	102.0	19.4	1023.00
.96	.00	.35	.00	.000	.025	.000	.000	1006.32	.00
.000001	340.	340.	340.	2	0	0	.00	371.16	371.16

*SECNO 48000.000

48000.000	11.56	1018.38	.00	.00	1018.38	.00	.00	.00	1018.50
1381.0	.0	1381.0	.0	.0	3811.2	.0	146.8	23.7	1023.50
1.34	.00	.36	.00	.000	.025	.000	.000	1006.82	.45
.000002	500.	500.	500.	2	0	0	.00	369.21	369.66

*SECNO 49000.000

49000.000	10.56	1018.38	.00	.00	1018.39	.00	.00	.00	1019.50
1381.0	.0	1381.0	.0	.0	3445.9	.0	230.1	32.1	1024.50
2.04	.00	.40	.00	.000	.025	.000	.000	1007.82	4.30
.000002	1000.	1000.	1000.	0	0	0	.00	362.37	366.67

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 50000.000

50000.000	9.57	1018.39	.00	.00	1018.39	.00	.00	.00	1020.50
1381.0	.0	1381.0	.0	.0	3087.7	.0	305.1	40.3	1025.50
2.66	.00	.45	.00	.000	.025	.000	.000	1008.82	8.14
.000003	1000.	1000.	1000.	0	0	0	.00	355.53	363.68

*SECNO 50900.000

50900.000	8.67	1018.39	.00	.00	1018.40	.02	.01	.00	1021.40
2856.0	.0	2856.0	.0	.0	2771.4	.0	365.7	47.6	1026.40
2.90	.00	1.03	.00	.000	.025	.000	.000	1009.72	11.60
.000019	900.	900.	900.	0	0	0	.00	349.39	360.99

*SECNO 50990.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .24

50990.000	8.40	1018.22	.00	.00	1018.48	.26	.00	.07	1020.00
2856.0	.0	2856.0	.0	.0	699.3	.0	369.3	48.0	1020.00
2.91	.00	4.08	.00	.000	.025	.000	.000	1009.82	1.75
.000346	90.	90.	90.	2	0	0	.00	91.50	93.25

*SECNO 51102.000

WATER EL=X5 CARD= 1018.610

3280 CROSS SECTION 51102.00 EXTENDED 2.11 FEET

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1020.00 ELREA= 1020.00

51102.000	8.61	1018.61	.00	.00	1019.02	.41	.04	.05	1016.50
2856.0	.0	2856.0	.0	.0	552.6	.0	370.9	48.2	1016.50
2.91	.00	5.17	.00	.000	.018	.000	.000	1010.00	.00
.000294	112.	112.	112.	0	0	0	.00	74.00	74.00

*SECNO 51500.000

3280 CROSS SECTION 51500.00 EXTENDED 1.60 FEET

51500.000	8.10	1018.70	.00	.00	1019.18	.48	.13	.02	1017.10
2856.0	.0	2856.0	.0	.0	514.8	.0	375.7	48.9	1017.10
2.93	.00	5.55	.00	.000	.018	.000	.000	1010.60	.00
.000379	398.	398.	398.	2	0	0	.00	74.00	74.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 52000.000
3280 CROSS SECTION 52000.00 EXTENDED 1.01 FEET

52000.000	7.50	1018.85	.00	.00	1019.42	.57	.22	.03	1017.85
2856.0	.0	2856.0	.0	.0	471.1	.0	381.4	49.8	1017.85
2.95	.00	6.06	.00	.000	.018	.000	.000	1011.35	.00
.000499	500.	500.	500.	1	0	0	.00	74.00	74.00

*SECNO 52900.000
3280 CROSS SECTION 52900.00 EXTENDED .26 FEET

52900.000	6.76	1019.46	.00	.00	1019.84	.38	.40	.02	1019.20
2062.0	.0	2062.0	.0	.0	415.7	.0	390.6	51.3	1019.20
3.00	.00	4.96	.00	.000	.018	.000	.000	1012.70	.00
.000385	900.	900.	900.	2	0	0	.00	74.00	74.00

*SECNO 53000.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .42

53000.000	5.79	1018.64	.00	.00	1020.30	1.65	.08	.38	1019.40
2062.0	.0	1843.7	218.3	.0	172.6	33.6	391.3	51.4	1012.85
3.01	.00	10.68	6.49	.000	.018	.020	.000	1012.85	1.49
.002140	100.	100.	100.	3	0	0	.00	47.11	48.60

*SECNO 53400.000

53400.000	6.27	1019.72	.00	.00	1021.06	1.34	.74	.03	1020.00
2062.0	.0	1829.3	232.7	.0	189.7	39.4	393.3	51.9	1013.45
3.02	.00	9.64	5.91	.000	.018	.020	.000	1013.45	.54
.001595	400.	400.	400.	3	0	0	.00	49.01	49.55

*SECNO 53800.000

53800.000	6.34	1020.39	.00	.00	1021.69	1.31	.63	.00	1020.60
2062.0	.0	1827.6	234.4	.0	192.0	40.2	395.4	52.3	1014.05
3.03	.00	9.52	5.84	.000	.018	.020	.000	1014.05	.42
.001539	400.	400.	400.	2	0	0	.00	49.25	49.67

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 54000.000

54000.000	6.37	1020.71	.00	.00	1022.00	1.30	.31	.00	1020.89
2062.0	.0	1826.9	235.1	.0	192.8	40.5	396.5	52.6	1014.34
3.04	.00	9.48	5.81	.000	.018	.020	.000	1014.34	.38
.001519	200.	200.	200.	0	0	0	.00	49.34	49.72

*SECNO 54450.000

54450.000	6.38	1021.79	.00	.00	1023.08	1.28	1.07	.00	1021.96
2062.0	.0	1826.2	235.8	.0	193.7	40.8	400.3	53.4	1015.41
3.06	.00	9.43	5.79	.000	.018	.020	.000	1015.41	.33
.001497	712.	712.	712.	0	0	0	.00	49.44	49.77

*SECNO 54550.000

3280 CROSS SECTION 54550.00 EXTENDED .18 FEET

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

3693 PROBABLE MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

54550.000	6.18	1022.07	1022.07	.00	1024.08	2.01	.20	.22	1021.90
1643.0	.0	1643.0	.0	.0	144.5	.0	400.7	53.5	1021.89
3.06	.00	11.37	.00	.000	.018	.000	.000	1015.89	.00
.003305	100.	100.	100.	20	8	0	.00	36.00	36.00

*SECNO 55000.000

3280 CROSS SECTION 55000.00 EXTENDED .15 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

3693 PROBABLE MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

55000.000	6.15	1024.20	1024.20	.00	1026.24	2.04	1.51	.01	1024.06
1643.0	.0	1643.0	.0	.0	143.4	.0	402.2	53.8	1024.05
3.07	.00	11.46	.00	.000	.018	.000	.000	1018.05	.00
.003389	450.	450.	450.	20	5	0	.00	36.00	36.00

*SECNO 55500.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3280 CROSS SECTION 55500.00 EXTENDED .16 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

55500.000	6.16	1026.61	1026.61	.00	1028.64	2.03	1.69	.00	1026.46
1643.0	.0	1643.0	.0	.0	143.7	.0	403.9	54.2	1026.45
3.08	.00	11.43	.00	.000	.018	.000	.000	1020.45	.00
.003362	500.	500.	500.	4	5	0	.00	36.00	36.00

*SECNO 55600.000
3280 CROSS SECTION 55600.00 EXTENDED .18 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

55600.000	6.15	1027.08	1027.08	.00	1029.11	2.03	.34	.00	1026.90
1643.0	.0	1643.0	.0	.0	143.5	.0	404.2	54.3	1026.93
3.09	.00	11.45	.00	.000	.018	.000	.000	1020.93	.00
.003378	100.	100.	100.	3	5	0	.00	36.00	36.00

*SECNO 56000.000

56000.000	5.95	1028.79	.00	.00	1030.44	1.66	1.29	.04	1029.30
1223.0	.0	1223.0	.0	.0	118.4	.0	405.4	54.6	1029.34
3.10	.00	10.33	.00	.000	.018	.000	.000	1022.84	1.04
.003039	400.	400.	400.	4	0	0	.00	31.85	32.89

*SECNO 56500.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

56500.000	5.77	1031.00	1031.00	.00	1032.82	1.82	1.62	.05	1031.69
1223.0	.0	1223.0	.0	.0	113.0	.0	406.7	55.0	1031.73
3.11	.00	10.83	.00	.000	.018	.000	.000	1025.23	1.39
.003450	500.	500.	500.	20	8	0	.00	31.15	32.54

*SECNO 57000.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

57000.000	5.75	1033.37	1033.37	.00	1035.21	1.84	1.74	.01	1034.08
1223.0	.0	1223.0	.0	.0	112.4	.0	408.0	55.4	1034.12
3.12	.00	10.88	.00	.000	.018	.000	.000	1027.62	1.42
.003495	500.	500.	500.	3	5	0	.00	31.09	32.51

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 57490.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

57490.000	5.76	1035.73	1035.73	.00	1037.56	1.83	1.71	.00	1036.43
1223.0	.0	1223.0	.0	.0	112.5	.0	409.3	55.7	1036.47
3.14	.00	10.87	.00	.000	.018	.000	.000	1029.97	1.41
.003486	490.	490.	490.	2	5	0	.00	31.10	32.51

*SECNO 57665.000
WATER EL=X5 CARD= 1036.340

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.37

57665.000	5.54	1036.34	.00	.00	1036.81	.47	.22	.14	1036.80
1223.0	.0	1223.0	.0	.0	221.2	.0	409.9	55.9	1036.80
3.14	.00	5.53	.00	.000	.018	.000	.000	1030.80	.08
.000622	175.	175.	175.	0	0	0	.00	40.85	40.92

*SECNO 57700.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

57700.000	5.44	1036.34	1036.34	.00	1038.14	1.80	.04	.40	1037.40
1223.0	.0	1223.0	.0	.0	113.6	.0	410.1	55.9	1037.40
3.15	.00	10.77	.00	.000	.018	.000	.000	1030.90	2.12
.003452	35.	35.	35.	20	8	0	.00	31.76	33.88

*SECNO 58000.000

3301 HV CHANGED MORE THAN HVINS

58000.000	6.07	1037.72	.00	.00	1039.01	1.29	.82	.05	1038.15
1223.0	.0	1223.0	.0	.0	134.2	.0	410.9	56.1	1038.15
3.15	.00	9.11	.00	.000	.018	.000	.000	1031.65	.87
.002194	300.	300.	300.	3	0	0	.00	34.26	35.13

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 58500.000

58500.000	5.90	1038.80	.00	.00	1040.20	1.40	1.16	.03	1039.40
1223.0	.0	1223.0	.0	.0	128.6	.0	412.4	56.5	1039.40
3.17	.00	9.51	.00	.000	.018	.000	.000	1032.90	1.20
.002465	500.	500.	500.	3	0	0	.00	33.60	34.80

*SECNO 59000.000

59000.000	5.88	1040.03	.00	.00	1041.45	1.42	1.24	.00	1040.65
1223.0	.0	1223.0	.0	.0	127.9	.0	413.9	56.9	1040.65
3.18	.00	9.56	.00	.000	.018	.000	.000	1034.15	1.24
.002499	500.	500.	500.	2	0	0	.00	33.52	34.76

*SECNO 59500.000

3301 HV CHANGED MORE THAN HVINS

59500.000	6.31	1041.71	.00	.00	1042.35	.64	.82	.08	1041.90
918.0	.0	918.0	.0	.0	142.9	.0	415.5	57.3	1041.90
3.21	.00	6.43	.00	.000	.018	.000	.000	1035.40	.37
.001045	500.	500.	500.	2	0	0	.00	35.25	35.63

*SECNO 60000.000

60000.000	5.50	1042.15	.00	.00	1043.13	.98	.68	.10	1043.15
918.0	.0	918.0	.0	.0	115.8	.0	417.0	57.7	1043.15
3.22	.00	7.93	.00	.000	.018	.000	.000	1036.65	1.98
.001844	500.	500.	500.	2	0	0	.00	32.04	34.02

*SECNO 60300.000

3301 HV CHANGED MORE THAN HVINS

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1048.00 ELREA= 1048.00

60300.000	5.90	1043.35	.00	.00	1043.42	.07	.20	.09	1043.95
269.0	.0	269.0	.0	.0	128.6	.0	417.8	57.9	1043.95
3.26	.00	2.09	.00	.000	.018	.000	.000	1037.45	1.20
.000119	300.	300.	300.	2	0	0	.00	33.60	34.80

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SPECIAL CULVERT

SC	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	2	.013	.20	3.00	.00	6.00	8.00	230.00	9	1	1038.08	1037.45

CHART 9 - BOX CULVERT WITH FLARED WINGWALL AND INLET TOP EDGE BEVEL
SCALE 1 - WINGWALL FLARED 45 DEGREES; INLET TOP EDGE = 0.043D

*SECNO 60530.000

SPECIAL CULVERT OUTLET CONTROL
EGIC = 1041.427 EGOC = 1043.559 PCWSE= 1043.350 ELTRD= 1050.000

SPECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
1041.43	1043.56	.14	0.	269.	2.402	96.0	1050.00	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1050.00 ELREA= 1050.00

60530.000	5.39	1043.47	.00	.00	1043.56	.09	.14	.00	1044.58
269.0	.0	269.0	.0	.0	112.0	.0	418.4	58.1	1044.58
3.29	.00	2.40	.00	.000	.018	.000	.000	1038.08	2.22
.000173	230.	230.	230.	2	0	0	.00	31.56	33.78

*SECNO 60700.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .67

60700.000	4.94	1043.44	.00	.00	1043.63	.19	.04	.03	1044.50
269.0	.0	231.7	37.3	.0	64.0	16.3	418.8	58.2	1038.50
3.30	.00	3.62	2.29	.000	.018	.020	.000	1038.50	2.11
.000383	170.	170.	170.	2	0	0	.00	24.48	26.59

*SECNO 60730.000

60730.000	4.87	1043.45	.00	.00	1043.64	.20	.01	.00	1044.58
269.0	.0	232.1	36.9	.0	62.7	15.8	418.9	58.2	1038.58
3.31	.00	3.70	2.34	.000	.018	.020	.000	1038.58	2.26
.000406	30.	30.	30.	0	0	0	.00	24.24	26.50

*SECNO 60731.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

60731.000	2.73	1045.79	1045.79	.00	1046.81	1.02	.00	.25	1049.06
269.0	.0	244.7	24.3	.0	29.3	5.0	418.9	58.2	1043.06
3.31	.00	8.34	4.89	.000	.018	.020	.000	1043.06	6.54
.003852	1.	1.	1.	20	11	0	.00	17.11	23.64

*SECNO 61000.000

61000.000	3.21	1046.94	.00	.00	1047.59	.65	.75	.04	1049.73
269.0	.0	241.4	27.6	.0	36.0	6.9	419.1	58.3	1043.73
3.32	.00	6.71	4.01	.000	.018	.020	.000	1043.73	5.58
.002092	269.	269.	269.	2	0	0	.00	18.70	24.28

*SECNO 61500.000

61500.000	3.03	1048.19	.00	.00	1048.95	.77	1.33	.03	1051.16
269.0	.0	242.6	26.4	.0	33.4	6.1	419.6	58.5	1045.16
3.34	.00	7.26	4.31	.000	.018	.020	.000	1045.16	5.94
.002604	570.	570.	570.	3	0	0	.00	18.10	24.04

*SECNO 61640.000

61640.000	3.06	1048.59	.00	.00	1049.34	.75	.39	.00	1051.53
269.0	.0	242.5	26.5	.0	33.7	6.2	419.8	58.6	1045.53
3.35	.00	7.19	4.27	.000	.018	.020	.000	1045.53	5.90
.002536	150.	150.	150.	2	0	0	.00	18.17	24.07

THIS RUN EXECUTED 30JUL92 6:46:53

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

100 YEAR PROFILE 10

SUMMARY PRINTOUT

	SECNO	XLCH	Q	CWSEL	ELMIN	DEPTH	VCH	TOPWID
	1.000	.00	1331.00	990.10	984.50	5.60	6.06	50.40
	1.000	.00	1597.00	990.71	984.50	6.21	6.36	52.86
	2.000	670.00	1331.00	990.64	985.04	5.61	6.05	50.43
	2.000	670.00	1597.00	991.25	985.04	6.21	6.36	52.85
	3.000	1120.00	1331.00	991.55	985.93	5.62	6.04	50.48
	3.000	1120.00	1597.00	992.14	985.93	6.21	6.36	52.84
	4.000	1770.00	1331.00	992.97	987.35	5.62	6.03	50.50
	4.000	1770.00	1597.00	993.56	987.35	6.21	6.36	52.83
	4.500	20.00	1331.00	993.02	987.36	5.66	5.87	40.08
*	4.500	20.00	1597.00	993.54	987.36	6.18	6.65	42.57
	4.600	170.00	1331.00	993.27	987.50	5.77	5.76	40.08
	4.600	170.00	1597.00	994.02	987.50	6.53	6.65	42.57
	5.000	20.00	1331.00	993.28	987.52	5.76	5.84	51.07
*	5.000	20.00	1597.00	994.24	987.52	6.72	5.74	54.88
	6.000	1000.00	1331.00	994.01	988.32	5.69	5.95	50.74
	6.000	1000.00	1597.00	994.84	988.32	6.52	5.97	54.08
	7.000	500.00	1331.00	994.40	988.72	5.68	5.97	50.67
	7.000	500.00	1597.00	995.17	988.72	6.45	6.06	53.77
	8.000	500.00	1331.00	994.78	989.12	5.66	5.98	50.65
	8.000	500.00	1597.00	995.51	989.12	6.39	6.13	53.56
	9.000	500.00	1331.00	995.17	989.52	5.65	5.99	50.61
	9.000	500.00	1597.00	995.87	989.52	6.35	6.18	53.39

	SECNO	XLCH	Q	CWSEL	ELMIN	DEPTH	VCH	TOPWID
	10.000	500.00	1331.00	995.57	989.92	5.64	6.00	50.58
	10.000	500.00	1597.00	996.24	989.92	6.32	6.22	53.26
	11.000	500.00	1331.00	995.96	990.32	5.64	6.01	50.55
	11.000	500.00	1597.00	996.61	990.32	6.29	6.26	53.16
	39200.000	500.00	1237.00	996.42	990.72	5.70	5.51	50.80
	39200.000	500.00	1484.00	997.06	990.72	6.34	5.75	53.38
	39490.000	290.00	1237.00	996.61	990.95	5.66	5.56	50.62
	39490.000	290.00	1484.00	997.24	990.95	6.29	5.81	53.18
	41300.000	2310.00	1237.00	999.57	993.00	6.57	4.58	54.27
*	41300.000	2310.00	1484.00	1000.48	993.00	7.48	4.62	56.00
*	41400.000	100.00	1237.00	999.00	993.20	5.80	10.89	31.19
*	41400.000	100.00	1484.00	999.53	993.20	6.33	11.35	33.31
	41700.000	330.00	1237.00	1000.55	993.90	6.65	8.73	34.61
	41700.000	330.00	1484.00	1001.13	993.90	7.23	9.15	36.90
*	42050.000	500.00	1237.00	1001.42	994.86	6.56	8.93	34.24
*	42050.000	500.00	1484.00	1002.06	994.86	7.20	9.20	36.80
	42500.000	450.00	1237.00	1002.18	995.75	6.43	10.43	28.88
	42500.000	450.00	1484.00	1002.72	995.75	6.97	11.01	30.65
*	42501.000	1.00	1237.00	1003.53	997.74	5.79	10.91	31.20
*	42501.000	1.00	1484.00	1004.07	997.74	6.33	11.34	33.36
*	43000.000	499.00	1237.00	1005.54	998.74	6.80	8.39	35.30
*	43000.000	499.00	1484.00	1006.12	998.74	7.38	8.80	37.63
	44000.000	1000.00	1237.00	1007.31	1000.74	6.57	8.89	34.35
	44000.000	1000.00	1484.00	1007.88	1000.74	7.14	9.30	36.65
	45000.000	1000.00	1237.00	1009.32	1002.74	6.58	8.87	34.39
	45000.000	1000.00	1484.00	1009.89	1002.74	7.15	9.29	36.67
	45500.000	500.00	1237.00	1010.33	1003.74	6.59	8.86	34.41
	45500.000	500.00	1484.00	1010.89	1003.74	7.15	9.28	36.69
	45675.000	175.00	1206.00	1010.79	1004.09	6.70	8.40	34.86
	45675.000	175.00	1447.00	1011.38	1004.09	7.29	8.78	37.23
*	45895.000	220.00	1206.00	1011.30	1004.53	6.77	8.26	35.13
*	45895.000	220.00	1447.00	1011.93	1004.53	7.40	8.57	37.65
	46000.000	105.00	1151.00	1011.63	1004.73	6.90	7.64	35.66
	46000.000	105.00	1381.00	1012.27	1004.73	7.54	7.93	38.22

	SECNO	XLCH	Q	CWSEL	ELMIN	DEPTH	VCH	TOPWID
	46500.000	500.00	1151.00	1012.30	1005.71	6.59	8.23	34.43
	46500.000	500.00	1381.00	1012.91	1005.71	7.20	8.54	36.87
	47000.000	500.00	1151.00	1013.15	1006.69	6.46	8.50	33.90
	47000.000	500.00	1381.00	1013.74	1006.69	7.05	8.86	36.23
	47080.000	80.00	1151.00	1013.30	1006.84	6.46	8.52	33.87
	47080.000	80.00	1381.00	1013.88	1006.84	7.04	8.88	36.19
*	47160.000	80.00	1151.00	1016.04	1007.00	9.04	4.89	42.00
*	47160.000	80.00	1381.00	1018.07	1007.00	11.07	4.31	42.00
*	47500.000	340.00	1151.00	1016.45	1006.32	10.13	.35	359.29
*	47500.000	340.00	1381.00	1018.38	1006.32	12.06	.35	371.16
	48000.000	500.00	1151.00	1016.45	1006.82	9.63	.37	355.94
	48000.000	500.00	1381.00	1018.38	1006.82	11.56	.36	369.21
	49000.000	1000.00	1151.00	1016.45	1007.82	8.63	.42	349.10
	49000.000	1000.00	1381.00	1018.38	1007.82	10.56	.40	362.37
	50000.000	1000.00	1151.00	1016.45	1008.82	7.63	.48	342.27
	50000.000	1000.00	1381.00	1018.39	1008.82	9.57	.45	355.53
	50900.000	900.00	2380.00	1016.45	1009.72	6.73	1.13	336.14
	50900.000	900.00	2856.00	1018.39	1009.72	8.67	1.03	349.39
*	50990.000	90.00	2380.00	1016.25	1009.82	6.43	4.55	87.63
*	50990.000	90.00	2856.00	1018.22	1009.82	8.40	4.08	91.50
*	51102.000	112.00	2380.00	1016.59	1010.00	6.59	5.90	74.00
*	51102.000	112.00	2856.00	1018.61	1010.00	8.61	5.17	74.00
	51500.000	398.00	2380.00	1016.78	1010.60	6.18	6.38	72.71
	51500.000	398.00	2856.00	1018.70	1010.60	8.10	5.55	74.00
	52000.000	500.00	2380.00	1017.10	1011.35	5.75	6.96	70.99
	52000.000	500.00	2856.00	1018.85	1011.35	7.50	6.06	74.00
	52900.000	900.00	1718.00	1018.11	1012.70	5.41	5.40	69.63
	52900.000	900.00	2062.00	1019.46	1012.70	6.76	4.96	74.00
*	53000.000	100.00	1718.00	1017.62	1012.85	4.77	11.39	43.02
*	53000.000	100.00	2062.00	1018.64	1012.85	5.79	10.68	47.11
*	53400.000	400.00	1718.00	1019.28	1013.45	5.83	8.84	47.23
	53400.000	400.00	2062.00	1019.72	1013.45	6.27	9.64	49.01
	53800.000	400.00	1718.00	1019.86	1014.05	5.81	8.87	47.18
	53800.000	400.00	2062.00	1020.39	1014.05	6.34	9.52	49.25

	SECNO	XLCH	Q	CWSEL	ELMIN	DEPTH	VCH	TOPWID
	54000.000	200.00	1718.00	1020.15	1014.34	5.81	8.87	47.17
	54000.000	200.00	2062.00	1020.71	1014.34	6.37	9.48	49.34
	54450.000	712.28	1718.00	1021.20	1015.41	5.79	8.92	47.08
	54450.000	712.28	2062.00	1021.79	1015.41	6.38	9.43	49.44
*	54550.000	100.00	1369.00	1021.55	1015.89	5.66	10.88	34.49
*	54550.000	100.00	1643.00	1022.07	1015.89	6.18	11.37	36.00
*	55000.000	450.00	1369.00	1023.70	1018.05	5.65	10.89	34.47
*	55000.000	450.00	1643.00	1024.20	1018.05	6.15	11.46	36.00
*	55500.000	500.00	1369.00	1026.10	1020.45	5.65	10.89	34.48
*	55500.000	500.00	1643.00	1026.61	1020.45	6.16	11.43	36.00
*	55600.000	100.00	1369.00	1026.58	1020.93	5.65	10.88	34.54
*	55600.000	100.00	1643.00	1027.08	1020.93	6.15	11.45	36.00
	56000.000	400.00	1019.00	1028.17	1022.84	5.33	10.23	29.39
	56000.000	400.00	1223.00	1028.79	1022.84	5.95	10.33	31.85
*	56500.000	500.00	1019.00	1030.47	1025.23	5.24	10.52	29.01
*	56500.000	500.00	1223.00	1031.00	1025.23	5.77	10.83	31.15
*	57000.000	500.00	1019.00	1032.88	1027.62	5.26	10.44	29.11
*	57000.000	500.00	1223.00	1033.37	1027.62	5.75	10.88	31.09
*	57490.000	490.00	1019.00	1035.22	1029.97	5.25	10.46	29.08
*	57490.000	490.00	1223.00	1035.73	1029.97	5.76	10.87	31.10
*	57665.000	175.00	1019.00	1035.99	1030.80	5.19	4.93	40.73
*	57665.000	175.00	1223.00	1036.34	1030.80	5.54	5.53	40.85
*	57700.000	35.00	1019.00	1035.86	1030.90	4.96	10.32	29.83
*	57700.000	35.00	1223.00	1036.34	1030.90	5.44	10.77	31.76
	58000.000	300.00	1019.00	1037.21	1031.65	5.56	8.68	32.23
	58000.000	300.00	1223.00	1037.72	1031.65	6.07	9.11	34.26
	58500.000	500.00	1019.00	1038.30	1032.90	5.40	9.08	31.59
	58500.000	500.00	1223.00	1038.80	1032.90	5.90	9.51	33.60
	59000.000	500.00	1019.00	1039.53	1034.15	5.38	9.12	31.53
	59000.000	500.00	1223.00	1040.03	1034.15	5.88	9.56	33.52
	59500.000	500.00	765.00	1041.13	1035.40	5.73	6.21	32.94
	59500.000	500.00	918.00	1041.71	1035.40	6.31	6.43	35.25
	60000.000	500.00	765.00	1041.61	1036.65	4.96	7.71	29.89
	60000.000	500.00	918.00	1042.15	1036.65	5.50	7.93	32.04

	SECNO	XLCH	Q	CWSEL	ELMIN	DEPTH	VCH	TOPWID
	60300.000	300.00	224.00	1042.77	1037.45	5.32	2.04	31.29
	60300.000	300.00	269.00	1043.35	1037.45	5.90	2.09	33.60
	60530.000	230.00	224.00	1042.87	1038.08	4.79	2.39	29.14
	60530.000	230.00	269.00	1043.47	1038.08	5.39	2.40	31.56
*	60700.000	170.00	224.00	1042.84	1038.50	4.34	3.65	22.47
*	60700.000	170.00	269.00	1043.44	1038.50	4.94	3.62	24.48
	60730.000	30.00	224.00	1042.85	1038.58	4.27	3.74	22.24
	60730.000	30.00	269.00	1043.45	1038.58	4.87	3.70	24.24
*	60731.000	1.00	224.00	1045.52	1043.06	2.46	7.96	16.22
*	60731.000	1.00	269.00	1045.79	1043.06	2.73	8.34	17.11
	61000.000	269.00	224.00	1046.65	1043.73	2.92	6.36	17.73
	61000.000	269.00	269.00	1046.94	1043.73	3.21	6.71	18.70
	61500.000	570.00	224.00	1047.90	1045.16	2.75	6.90	17.15
	61500.000	570.00	269.00	1048.19	1045.16	3.03	7.26	18.10
	61640.000	150.00	224.00	1048.31	1045.53	2.78	6.82	17.23
	61640.000	150.00	269.00	1048.59	1045.53	3.06	7.19	18.17

SUMMARY OF ERRORS AND SPECIAL NOTES

WARNING SECNO= 4.500 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 5.000 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 41300.000 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 41400.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 41400.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 41400.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 41400.000 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 41400.000 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 41400.000 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

NOTE SECNO= 42050.000 PROFILE= 1 WSEL BASED ON X5 CARD
NOTE SECNO= 42050.000 PROFILE= 2 WSEL BASED ON X5 CARD

CAUTION SECNO= 42501.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 42501.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 42501.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 42501.000 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 42501.000 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 42501.000 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO= 43000.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 43000.000 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

NOTE SECNO= 45895.000 PROFILE= 1 WSEL BASED ON X5 CARD
NOTE SECNO= 45895.000 PROFILE= 2 WSEL BASED ON X5 CARD

WARNING SECNO= 47160.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 47160.000 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 47500.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 47500.000 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 50990.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 50990.000 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

NOTE SECNO= 51102.000 PROFILE= 1 WSEL BASED ON X5 CARD
NOTE SECNO= 51102.000 PROFILE= 2 WSEL BASED ON X5 CARD

CAUTION SECNO= 53000.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 53000.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 53000.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
WARNING SECNO= 53000.000 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 53400.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 54550.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 54550.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 54550.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

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CAUTION SECNO=  54550.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  54550.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=  54550.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=  55000.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  55000.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=  55000.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  55000.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=  55000.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=  55500.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  55500.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=  55500.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  55500.000  PROFILE=  2  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=  55600.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  55600.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=  55600.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  55600.000  PROFILE=  2  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=  56500.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  56500.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=  56500.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  56500.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=  56500.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=  57000.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  57000.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=  57000.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  57000.000  PROFILE=  2  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=  57490.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  57490.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=  57490.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  57490.000  PROFILE=  2  MINIMUM SPECIFIC ENERGY

NOTE    SECNO=  57665.000  PROFILE=  1  WSEL BASED ON X5 CARD
WARNING SECNO=  57665.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
NOTE    SECNO=  57665.000  PROFILE=  2  WSEL BASED ON X5 CARD
WARNING SECNO=  57665.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=  57700.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  57700.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=  57700.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=  57700.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  57700.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=  57700.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=  60700.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=  60700.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=  60731.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=  60731.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=  60731.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
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CAUTION SECNO= 60731.000 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 60731.000 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 60731.000 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

Normal program termination

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: sm5

Comment: Elliot Road to 530+00

Solve For Depth

Given Input Data:

Bottom Width.....	48.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0015 ft/ft
Discharge.....	2380.00 cfs

Computed Results:

Depth.....	5.00 ft
Velocity.....	8.22 fps
Flow Area.....	289.70 sf
Flow Top Width...	67.98 ft
Wetted Perimeter.	70.34 ft
Critical Depth...	4.00 ft
Critical Slope...	0.0032 ft/ft
Froude Number....	0.70 (flow is Subcritical)

Open Channel Flow Module, Version 3.16 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: sm5a

Comment: 530+00 to 545+00

Solve For Depth

Given Input Data:

Bottom Width.....	24.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0048 ft/ft
Discharge.....	1718.00 cfs

Computed Results:

Depth.....	4.25 ft
Velocity.....	12.45 fps
Flow Area.....	138.03 sf
Flow Top Width...	40.99 ft
Wetted Perimeter.	43.00 ft
Critical Depth...	4.72 ft
Critical Slope...	0.0033 ft/ft
Froude Number....	1.20 (flow is Supercritical)

Open Channel Flow Module, Version 3.16 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: sm5b

Comment: 545+00 to 560+00

Solve For Depth

Given Input Data:

Bottom Width.....	10.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0048 ft/ft
Discharge.....	1369.00 cfs

Computed Results:

Depth.....	5.30 ft
Velocity.....	12.53 fps
Flow Area.....	109.29 sf
Flow Top Width...	31.21 ft
Wetted Perimeter.	33.72 ft
Critical Depth...	5.77 ft
Critical Slope...	0.0034 ft/ft
Froude Number....	1.18 (flow is Supercritical)

Open Channel Flow Module, Version 3.16 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: sm6

Comment: 560+00 to 574+90

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0048 ft/ft
Discharge.....	1019.00 cfs

Computed Results:

Depth.....	4.90 ft
Velocity.....	11.68 fps
Flow Area.....	87.27 sf
Flow Top Width...	27.61 ft
Wetted Perimeter.	29.92 ft
Critical Depth...	5.28 ft
Critical Slope...	0.0035 ft/ft
Froude Number....	1.16 (flow is Supercritical)

Open Channel Flow Module, Version 3.16 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: sm6a

Comment: 576+60 to 595+00

Solve For Depth

Given Input Data:

Bottom Width.....	10.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0025 ft/ft
Discharge.....	1019.00 cfs

Computed Results:

Depth.....	5.38 ft
Velocity.....	9.11 fps
Flow Area.....	111.80 sf
Flow Top Width...	31.53 ft
Wetted Perimeter.	34.08 ft
Critical Depth...	4.96 ft
Critical Slope...	0.0035 ft/ft
Froude Number....	0.85 (flow is Subcritical)

Open Channel Flow Module, Version 3.16 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: sm7

Comment: 595+00 to 603+00

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0025 ft/ft
Discharge.....	765.00 cfs

Computed Results:

Depth.....	4.99 ft
Velocity.....	8.51 fps
Flow Area.....	89.86 sf
Flow Top Width...	27.98 ft
Wetted Perimeter.	30.34 ft
Critical Depth...	4.56 ft
Critical Slope...	0.0036 ft/ft
Froude Number....	0.84 (flow is Subcritical)

Open Channel Flow Module, Version 3.16 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: sm8

Comment: 605+40 to 616+40

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0025 ft/ft
Discharge.....	224.00 cfs

Computed Results:

Depth.....	2.72 ft
Velocity.....	6.13 fps
Flow Area.....	36.51 sf
Flow Top Width...	18.87 ft
Wetted Perimeter.	20.15 ft
Critical Depth...	2.36 ft
Critical Slope...	0.0043 ft/ft
Froude Number....	0.78 (flow is Subcritical)

Open Channel Flow Module, Version 3.16 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

SEGMENT II
OUTLET ALTERNATIVES DATA

Price Road GEC Phase II
Southwest Loop
00173 039 044

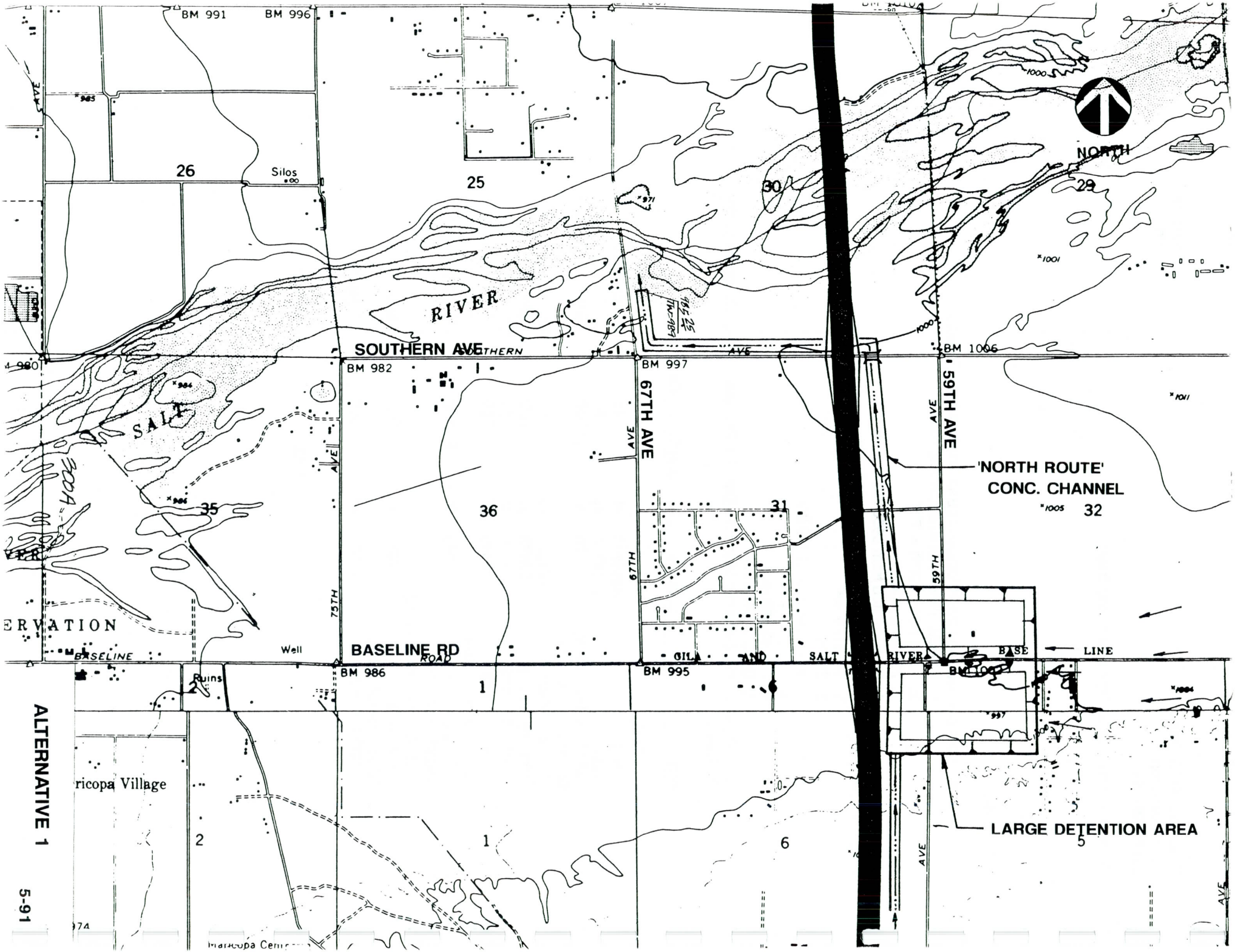
5-21-91
ETL

Champion Drain Outfall Alternatives and Costs

Alternative #1

A. 146 acre detention basin located at Baseline Road and Freeway
    1. collects all flows from south and east
    2. basin water depth = 7.0'
    3. 763 ac-ft storage
    4. Q attenuated from 6950 cfs to 4500 cfs
B. "North Route" lined outfall channel from basin
    1. 140'/170' bw
    2. 2:1 ss
    3. S = 0.0008 to 0.0010 ft/ft
    4. d = 5' to 4'
    5. L = 10,050 feet
    6. Q100 = 4500 cfs
C. 130 feet nominal length bridge over Baseline Rd. and existing Champion Drain
D. Costs

Item	Quantity	Unit	Unit Cost	Cost
Det. Basin				
Land	6359760	sf	$1	$6,359,760
Exc.	1177733	cy	$3	$3,533,199
10-10'x5' box culvert	50	lf	$2,340	$117,000
Channel, conc. lined				
140' bw (8940')	161278	sy	$22	$3,548,116
170' bw (1110')	23173	sy	$22	$509,806
land (175' strip)	1641300	sf	$1	$1,641,300
Bridge, L = 130'	14040	sf	$50	$702,000
15-10'x4' box culvert Southern Ave.	160	lf	$3,750	$600,000
Addtl. bridge (175') at Southern Ave. freeway overpass	19075	sf	$50	$953,750
Addtl. ramp structures (350') at Southern	11900	sf	$50	$595,000
			Total	$18,559,931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BM 996
26
Silos
25
30
29
NORTH
RIVER
SOUTHERN AVE
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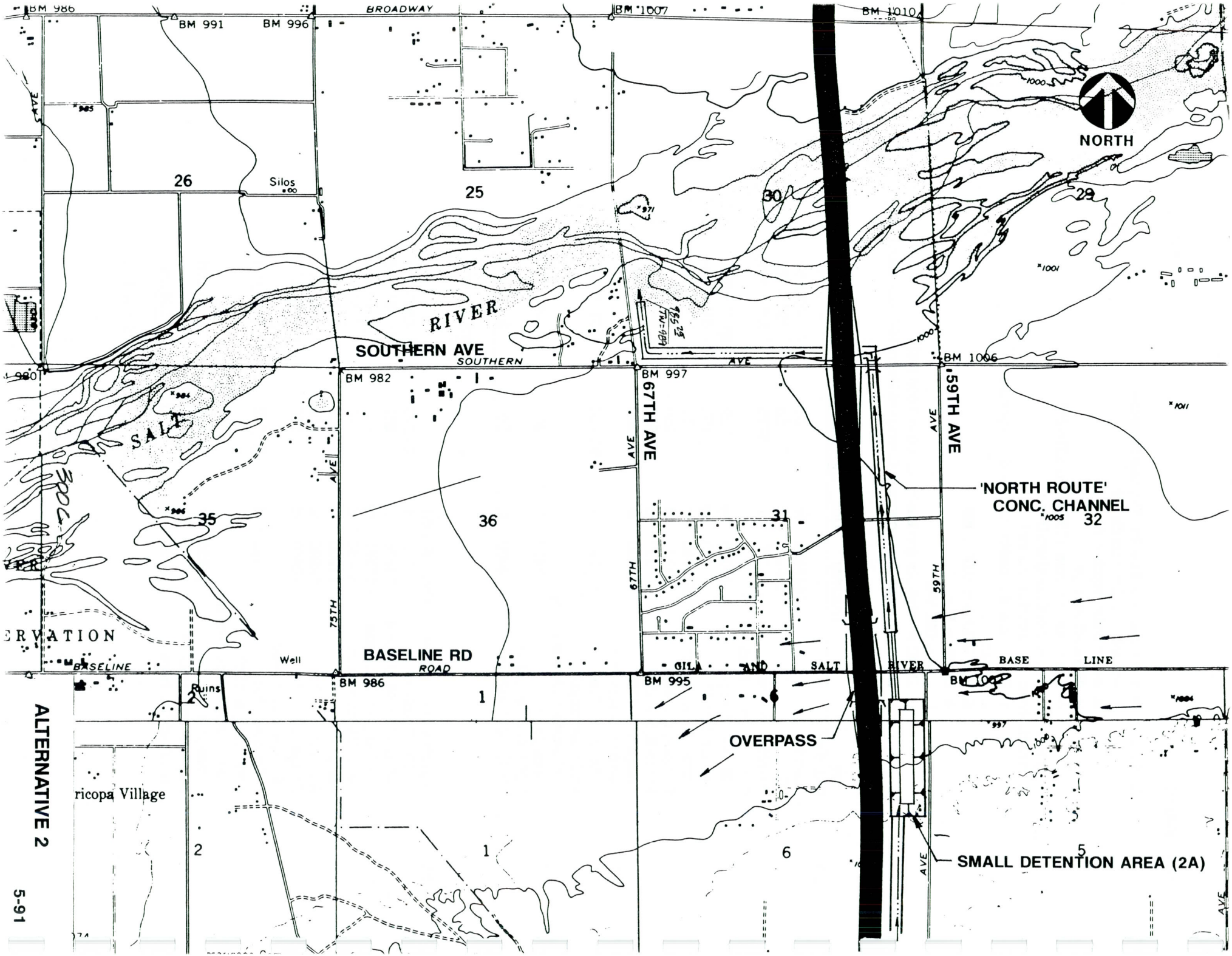
BM 997
BM 1006
67TH AVE
59TH AVE
'NORTH ROUTE'
CONC. CHANNEL
35
36
31
32
SALT
RIVER
BASELINE RD
BASELINE
Well
Ruins
BM 986
BM 995
GILA AND SALT RIVER BASE LINE
1
2
6
5
LARGE DETENTION AREA
ricopa Village
ALTERNATIVE 1
5-91

Alternative #2 5-17-91

A. 33 acre detention basin at Baseline Rd. and Freeway
   1. collects flow from south only
   2. basin water depth = 6'
   3. 183 ac-ft storage
   4. Q attenuation from 1690 cfs to 1016 cfs
B. 3-10'x4' siphon under Champion Drain
C. "North Route" lined outfall channel
   1. 26'/40' bw (no basin - 50'/70' bw required)
   2. 2:1 ss
   3. S = 0.0008 to 0.0010 ft/ft
   4. depth = 5' to 4'
   5. L = 10050 feet
   6. Q100 = 1016 cfs (no basin - Q100 = 1690 cfs)
D. 1300' elevated roadway section spanning Champion Drain 100-year floodplain
E. Costs

	Item	Quantity	Unit	Unit Cost	Cost
2A	Det. Basin				
	Land	1437480	sf	$1	$1,437,480
	Exc.	319440	cy	$3	$958,320
	3-10'x4' siphon	500	lf	$775	$387,500
	Channel, conc. lined				
	26' bw (8940')	48038	sy	$22	$1,056,836
	40' bw (1110')	7140	sy	$22	$157,080
	land (50' avg. strip)	477840	sf	$1	$477,840
	Ramp A, L = 400'	11200	sf	$50	$560,000
	Ramp B, L = 300'	12000	sf	$50	$600,000
	Bridge, L = 1300'	140400	sf	$50	$7,020,000
	4-10'x4' box culvert Southern Ave.	160	lf	$1,000	$160,000
	Addtl. bridge (50') at Southern Ave. freeway overpass	5450	sf	$50	$272,500
	Addtl. ramp structures (100') at Southern	3400	sf	$50	$170,000
				Total	$13,257,556
2B	Sub alternative (no basin, channel only)				
	5-10'x4' siphon	500	lf	$1,200	$600,000
	50' bw (8940') channel	71878	sy	$22	$1,581,316
	70' bw (1110') channel	11391	sy	$22	$250,602
	land (75' avg. strip)	753750	sf	$1	$753,750
	Ramp A, L = 400'	11200	sf	$50	$560,000
	Ramp B, L = 300'	12000	sf	$50	$600,000
	Bridge, L = 1300'	140400	sf	$50	$7,020,000
	5-10'x4' box culvert Southern Ave.	160	lf	$1,200	$192,000
	Addtl. bridge (100') at Southern Ave. freeway overpass	10900	sf	$50	$545,000
	Addtl. ramp structures (150') at Southern	5100	sf	$50	$255,000
				Total	$12,357,668

300B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'NORTH ROUTE'
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BASELINE RD
ROAD
Well
Ruins
BM 986
BM 995
GILA AND SALT RIVER
BASE LINE
OVERPASS
ricopa Village
2
1
6
5
SMALL DETENTION AREA (2A)
ALTERNATIVE 2
5-91

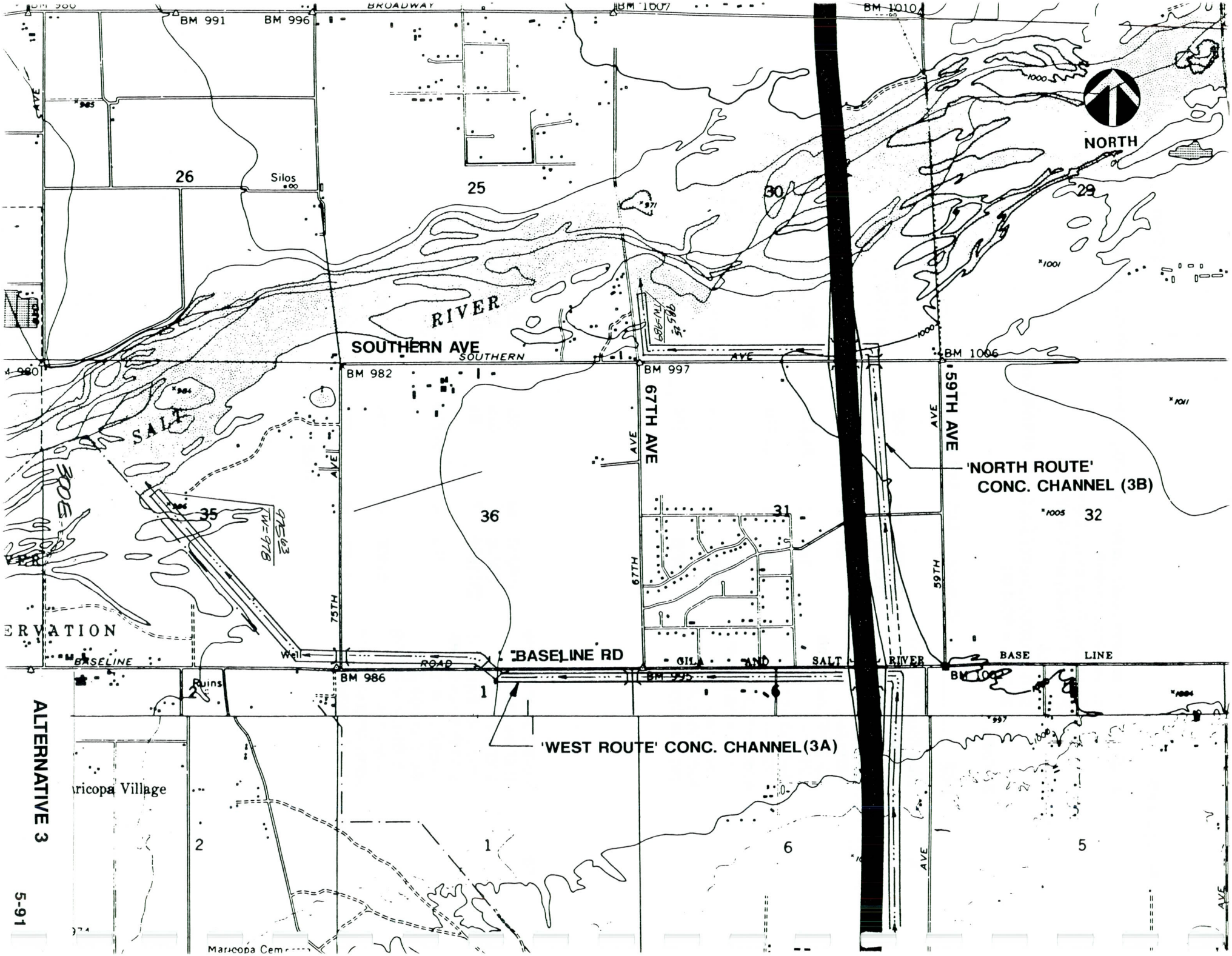
Alternative #3

5-17-91

A. Channel improvement option only for full 100-year flow conditions (6951 cfs)
   1. west or north route
   2. concrete lined channel, n = .018
   3. d = 4.5'(west), d = 5'-4'(north)
   4. 2:1 ss
   5. S = 0.0008 ft/ft (north) or S = 0.0013 ft/ft (west)
   6. Q100 = 6951 cfs

B. Costs

	Item	Quantity	Unit	Unit Cost	Cost
3A	"West Route" Channel				
	188' bw (13500')	318895	sy	$22	$7,015,690
	land (210' strip)	2835000	sf	$1	$2,835,000
	20-10'x5' box culvert 67th Ave.	60	lf	$5,200	$312,000
	20-10'x5' box culvert 71st Ave.	180	lf	$5,200	$936,000
	20-10'x5' box culvert 75th Ave.	60	lf	$5,200	$312,000
	Addtl. bridge (200') at Baseline freeway overpass	21600	sf	$50	$1,080,000
	Addtl. ramp structures (400') at Baseline	12400	sf	$50	$620,000
				Total	$13,110,690
3B	"North Route" Channel				
	200' bw (8940')	225320	sy	$22	$4,957,040
	260' bw (1110')	34825	sy	$22	$766,150
	land (230' avg. strip)	2311500	sf	$1	$2,311,500
	20-10'x4' box culvert Southern Ave.	160	lf	$5,000	$800,000
	addtl. bridge (200') at Southern freeway overpass	21600	sf	$50	$1,080,000
	Addtl. ramp structures (440') at Southern	14960	sf	$50	$748,000
				Total	$10,662,690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SOUTHERN AVE
SOUTHERN
AVE
BM 1006
BM 982
BM 997
67TH AVE
59TH AVE
SALT
'NORTH ROUTE'
CONC. CHANNEL (3B)
35
36
31
32
75TH
67TH
59TH
BASELINE
Well
ROAD
BASELINE RD
GILA AND SALT RIVER
BASE LINE
BM 986
BM 995
Ruins
1
'WEST ROUTE' CONC. CHANNEL(3A)
ricopa Village
2
1
6
5
ALTERNATIVE 3
5-91

To File:

5-17-91

Comments:

1. All alternatives assume implementation of small basins 06 and 07, which lie along the east side of the freeway alignment and attenuate flows from the south.

2. The use of detention basins to mitigate large flows at the concentration point of Baseline Rd. and the freeway is somewhat expensive due to the shallowness at which they would be constructed, given a shallow ground water condition in this proximity to the Salt River bed. The shallowness of construction (6 to 10') translates to correspondingly large surface areas, in order to attain significant storage volume.

3. It is approximately 20% less costly to convey flows via the "North Route" to the Salt River than it is go the "West Route", the general route now taken by the Champion Drain.

4. The proposed idea of drawing off, with a north diverting side weir, sufficient flow from the Champion Drain in order to decrease flood levels to existing condition was investigated. Trial HEC-2 runs resulted in most of the flow needing to go over the side weir in order to achieve this purpose. Also, it seemed that this idea served only to displace the bridge constriction (and elevated water surface) and not really solve the problem of the design flow being forced through an inadequate opening.

5. If the "West Route" is taken with a new channel, portions of it will probably fall on the same side of Baseline Rd. as lies the existing Champion Drain. This is due to many single family residences present on the north side of Baseline Rd. from 62nd Ave. to 71st Ave.

6. One crossing location along the N-S leg, south of Baseline Rd. was identified as having significant potential for diverting flows through the freeway embankment, with the flows allowed to follow a traditional concentrated path. This condition was judged to be probable at the Estrella Rd. crossing, beneath the freeway. 255 cfs was presumed to be diverted through this crossing point and this diversion has been assumed for all alternatives.

7. Of the 6529 ac-ft of rainfall over the entire watershed, 3008 ac-ft is the resulting runoff (an additional 1200+ ac-ft of runoff is lost to hydrograph truncation) in a delta-t = 5 minutes HEC-1 run. 3545 ac-ft is the resulting runoff (an additional 466+ ac-ft of runoff is lost to hydrograph truncation) in a delta-t = 10 minutes HEC-1 run. The single most significant location of lost volume appears to be the South Mtn. Park detention basin, which takes several days to drain.

ETL's recommendation:

Recommend Alternative #2 with sub-alternative for following reasons:

1. Low to middle in cost range
2. Existing Champion Drain flooding flows are passed through the embankment at low velocity and require minimal special handling.
3. Improvements upstream in the watershed can be undertaken at the leisure of other agencies, without ADOT having to invest heavily in high maintenance flood control measures which may be devalued based upon those future upstream improvements
4. The issue of improving the Champion Drain is skirted.
5. The construction of detention basins in the proximity of Champion Drain may be a mistake, due to potential boggy conditions.

The entrance and exit ramps at Baseline Road complicate this alternative somewhat in that conveyance will have to be provided through the ramps as well. HEC-2 modeling of the ramp obstructions have not been performed at this time. Portions of two ramps may require bridge sections, while the other two ramps may require only box culverts or pipes.

300F

SEGMENT II
ON-SITE STORM DRAIN CALCULATIONS
DOBBINS ROAD VICINITY

PRICE ROAD GEC
ON-SITE SR-218 SW LOOP
STORM SEWER DESIGN FREQUENCY=50 YEARS P6= P24= P1=2.37 IN.
RUNOFF CALCULATION SHEET

FN=A:RAT4.WS
5-21-91
REV 5-25-92

DA NO.	STATION FROM - TO	AREA ACRES	*	PAV'T C	A	CA	*	3:1 DG C	A	CA	*	5:1 DG C	A	CA	*	SUM CA	Tc MIN	I IN/HR	Q CFS
DOBBINS ROAD AREA			*				*				*				*				
SUMP			*				*				*				*				
1	47000-47900RT	4.44	*	0.95	3.03	2.88	*	0.70	1.41	0.99	*	0.60	0.00	0.00	*	3.87	10	6.50	25
2	47100-47900LT	3.39	*	0.95	2.72	2.58	*	0.70	0.67	0.47	*	0.60	0.00	0.00	*	3.05	10	6.50	20
3	46300-47000	4.00	*	0.95	2.33	2.21	*	0.70	1.67	1.17	*	0.60	0.00	0.00	*	3.38	10	6.50	22
4	45640-46300	5.24	*	0.95	2.12	2.01	*	0.70	3.12	2.18	*	0.60	0.00	0.00	*	4.20	10	6.50	27
5	44980-45640	5.11	*	0.95	2.12	2.01	*	0.70	2.99	2.09	*	0.60	0.00	0.00	*	4.11	10	6.50	27
6	44320-44980	2.66	*	0.95	1.74	1.65	*	0.70	0.92	0.64	*	0.60	0.00	0.00	*	2.30	10	6.50	15
7	43690-44320	7.11	*	0.95	5.37	5.10	*	0.70	1.74	1.22	*	0.60	0.00	0.00	*	6.32	10	6.50	41
8	42400-43690	5.62	*	0.95	4.44	4.22	*	0.70	1.18	0.83	*	0.60	0.00	0.00	*	5.04	10	6.50	33
			*				*				*				*				
			*				*				*				*				
			*				*				*				*				
			*				*				*				*				

PRICE ROAD GEC
ON-SITE SR-218 SW LOOP
STORM SEWER DESIGN FREQUENCY=50 YEARS P6= P24= P1=2.37 IN. FN=A:STORM4.WS
SEWER CALCULATION SHEET PIPE N=.012 TW= 6-3-91 REV 6-11-92

LINE NO.	STATION FROM - TO	DA NO.	INCREM CA	SUM CA	TIME INLET	TIME SEWER	TIME DESIGN	I IN/HR	Q CFS	CROWN EL INLET	CROWN EL OUTLET	LENGTH FT	SLOPE FT/FT	DIAM IN	QFULL CFS	V FPS	SF FT/FT	HL FT	ELEV INLET	ELEV OUTLET	ASSUMED STR LOSS, FT
	Sump Area near Dobbins																				
S-1	RAMP D-46845	1	3.87	3.87	10.0		10.0	6.5	25	1010.00	1008.70	200	0.0065	30	36	5.1	0.0032	0.63	1012.04	1010.90	0.50
S-2	RAMP C-46845	2	3.05	3.05	10.0		10.0	6.5	20	1009.00	1008.70	40	0.0075	30	38	4.0	0.0022	0.09	1011.31	1010.90	0.32
S-3	46300-46845	1-2	6.92	6.92	10.0		10.0	6.5	45	1008.70	1007.28	545	0.0026	42	56	4.7	0.0017	0.93	1010.90	1009.64	0.34
S-4	45640-46300	3	3.38	10.30	10.0	1.7	11.7	6.1	63	1007.28	1005.56	660	0.0026	48	79	5.0	0.0016	1.08	1009.64	1008.28	0.27
S-5	44980-45640	4	4.20	14.50	10.0	2.2	13.9	5.6	81	1005.56	1003.84	660	0.0026	48	79	6.5	0.0027	1.78	1008.28	1006.04	0.46
S-6	44320-44980	5	4.11	18.61	10.0	1.7	15.6	5.3	99	1003.84	1002.12	660	0.0026	48	79	7.9	0.0041	2.67	1006.04	1002.79	0.58
S-7	43690-44320	6	2.30	20.91	10.0	1.4	17.0	5.1	107	1002.12	1001.00	630	0.0018	2-48	132	4.2	0.0012	0.74	1002.79	1001.98	0.06
S-8	43090-43690	7	6.32	27.23	10.0	2.5	19.5	4.8	131	1001.00	1000.60	600	0.0007	2-48	88	5.2	0.0018	1.05	1001.98	1000.52	0.41
S-9	42475-43090	8	5.04	32.27	10.0	1.9	21.4	4.6	148	1000.60	1000.30	615	0.0005	2-54	95	4.7	0.0012	0.74	1000.52	999.66	0.13
S-10	42475-LEFT	-	-	-	-	-	-	-	148	1000.30	1000.20	140	0.0007	2-54	113	4.7	0.0012	0.17	999.66	999.25	0.24
																				(1)	(2)

202

(1) D+Dc/2
(2) 0.7 V2/2G

Reference : Design of Urban Highway Drainage - The State-of-the-Art
Reitz and Jens, Inc., St. Louis, MO
August 1979
Federal Highway Administration, Washington, DC

5.10.2 (p. 5-73) Losses at Junctions of Several Flows in a Manhole
Formula: Hl-Ho=Vo*Vo/2g-(Ql/Qo)(0.3Vl*Vl/2g)-(Qu/Qo)(Vu*Vu/2g) (5-23)
Hl-Ho="change in hydraulic grade at the manhole (or loss due to the change of direction of flow, expansion and contraction, collision of flows, etc.)", in feet.

Also assume losses for changes in direction of less than than 90 degrees to be:

90 degrees 0.7 V*V/2g of velocity of water being turned
45 degrees 2/3 of 0.7 V*V/2g
30 degrees 1/2 of 0.7 V*V/2g

Vo=Velocity of outgoing flow Qo=Outgoing flow
Vl=Velocity of lateral flow Ql=Lateral flow
Vu=Velocity of incoming flow Qu=Incoming flow

Location	Vo	Vl	Vu	Qo	Ql	Qu	2g	Hl-Ho	
s-9	4.70	3.50	5.20	74	17	66	64.40	-0.04	
		30"				90deg		0.13	Turn Loss of lateral
								0.08	Hl total

Location	Vo	Vl	Vu	Qo	Ql	Qu	2g	Hl-Ho	
s-8	5.20	4.90	4.20	66	24	54	64.40	0.16	
		30"				90deg		0.26	Turn Loss of lateral
								0.41	Hl total

Location	Vo	Vl	Vu	Qo	Ql	Qu	2g	Hl-Ho	
s-7	4.20	2.50	7.90	54	8	49	64.40	-0.61	
		24"				90deg		0.06	Turn Loss of lateral
								-0.5	Hl total

Location	Vo	Vl	Vu	Qo	Ql	Qu	2g	Hl-Ho	
s-6	7.90	3.70	6.40	99	18	81	64.40	0.44	
		30"				90deg		0.14	Turn Loss of Lateral
								0.58	Hl total

Location	Vo	Vl	Vu	Qo	Ql	Qu	2g	Hl-Ho	
s-5	6.40	3.70	5.00	81	18	63	64.40	0.32	
		30"				90deg		0.14	Turn Loss of lateral
								0.46	Hl total

Location	Vo	Vl	Vu	Qo	Ql	Qu	2g	Hl-Ho	
s-4	5.00	3.70	4.70	63	18	45	64.40	0.12	
		30"				90deg		0.14	Turn Loss of lateral
								0.27	Hl total

Location	Vo	Vl	Vu	Qo	Ql	Qu	2g	Hl-Ho	
s-3	4.70			45			64.40	0.34	1.25xVel.Head
						90deg		0	Turn Loss of lateral
								0.34	Hl total

Location	Vo	Vl	Vu	Qo	Ql	Qu	2g	Hl-Ho	
s-2	4.07			20			64.40	0.32	1.25xVel.Head
	30"					90deg		0	Turn Loss of lateral
								0.32	Hl total

Location	Vo	Vl	Vu	Qo	Ql	Qu	2g	Hl-Ho	
s-1	5.10			25			64.40	0.50	1.25xVel.Head
	30"					90deg		0	Turn Loss of lateral
								0.50	Hl total

SOUTH MOUNTAIN FREEWAY
SEGMENT III
TECHNICAL APPENDIX

SEGMENT III
PRECIPITATION CALCULATIONS

HDR

Project: Price Rd. Ph. II hydrology		Computed: EL	Date: 3/12/91
Subject: hydrology		Checked	Date
Task: Rainfall depths (For Segments II & III)		Sht.	Of

2yr-1hr precip., $4_2 = -0.011 + 0.942\,(1.20^2/1.55)$
$= 0.86"$

100yr-1hr precip., $4_{100} = 0.494 + 0.755\,(3.45^2/4.05)$
$= 2.71"$

Need 50 yr. & 100 yr.	50	100	(Rick's 100)
for 5 min	0.69	0.79	(.77)
15 min	1.35	1.55	(1.52)
60 min	2.37	2.72	(2.66)
2 hr.	2.60	2.97	(2.92)
3 hr.	2.76	3.14	(2.97)
4 hr.	3.05	3.45	(3.35)
12 hr.	3.32	3.74	(3.69)
24 hr.	3.60 (HSC)	4.05 (HSC)	(4.04)

✓ Reasonably close check

50 yr.-2 hr. = 0.341 (3.05) + .659 (2.37) = 2.60"
50 yr.-3 hr = 0.569 (3.05) + .431 (2.37) = 2.76"
100 yr-2 hr = 0.341 (3.45) + .659 (2.72) = 2.97"
100 yr-3 hr = 0.569 (3.45) + .431 (2.72) = 3.14"
50 yr-12 hr = 3.60 − .51 (3.60 − 3.05) = 3.32"
100 yr-12 hr = 4.05 − .51 (4.05 − 3.45) = 3.74"
50 yr-5 min = .29 (2.37) = 0.69"
-15 min = .57 (2.37) = 1.35"
100 yr-5 min = .29 (2.72) = 0.79"
.57 (2.72) = 1.55"

ADDENDUM to "HYDROLOGIC DESIGN FOR HIGHWAY DRAINAGE IN ARIZONA" April 1975

Steps to be used to determine precipitation values for various durations and return periods.

STEP 1. From the precipitation maps in the manual "Hydrologic Design for Highway Drainage in Arizona", determine the precipitation values for the 6 and 24 hour duration storms for return periods of 2, 5, 10, 25, 50 and 100 years. Tabulate these values in Table 1 in the column headed 'Map Values'

TABLE 1

Price Rd. Pn II

Return Period (Years)	Precipitation Values (inches)			
	6 hour duration		24 hour duration	
	Map Value	Corrected Value	Map Value	Corrected Value
2	1.2	1.20	1.5	1.55
5	1.7	1.75	2.1	2.15
10	2.1	2.10	2.6	2.55
25	2.6	2.60	3.2	3.10
50	3.0	3.05	3.6	3.60
100	3.4	3.45	4.0	4.05

NOTE: There is a possibility of making an error while reading the maps because, (1) a site is not easy to locate precisely on a series of 12 maps, (2) there may be some slight registration differences in printing, and (3) precise interpolation between isolines is difficult. In order to minimize any errors in reading the maps, these values should be plotted on the diagram "Precipitation Depth versus Return Period" Fig. 1.

Project No. Price Rd. PH II Station _____

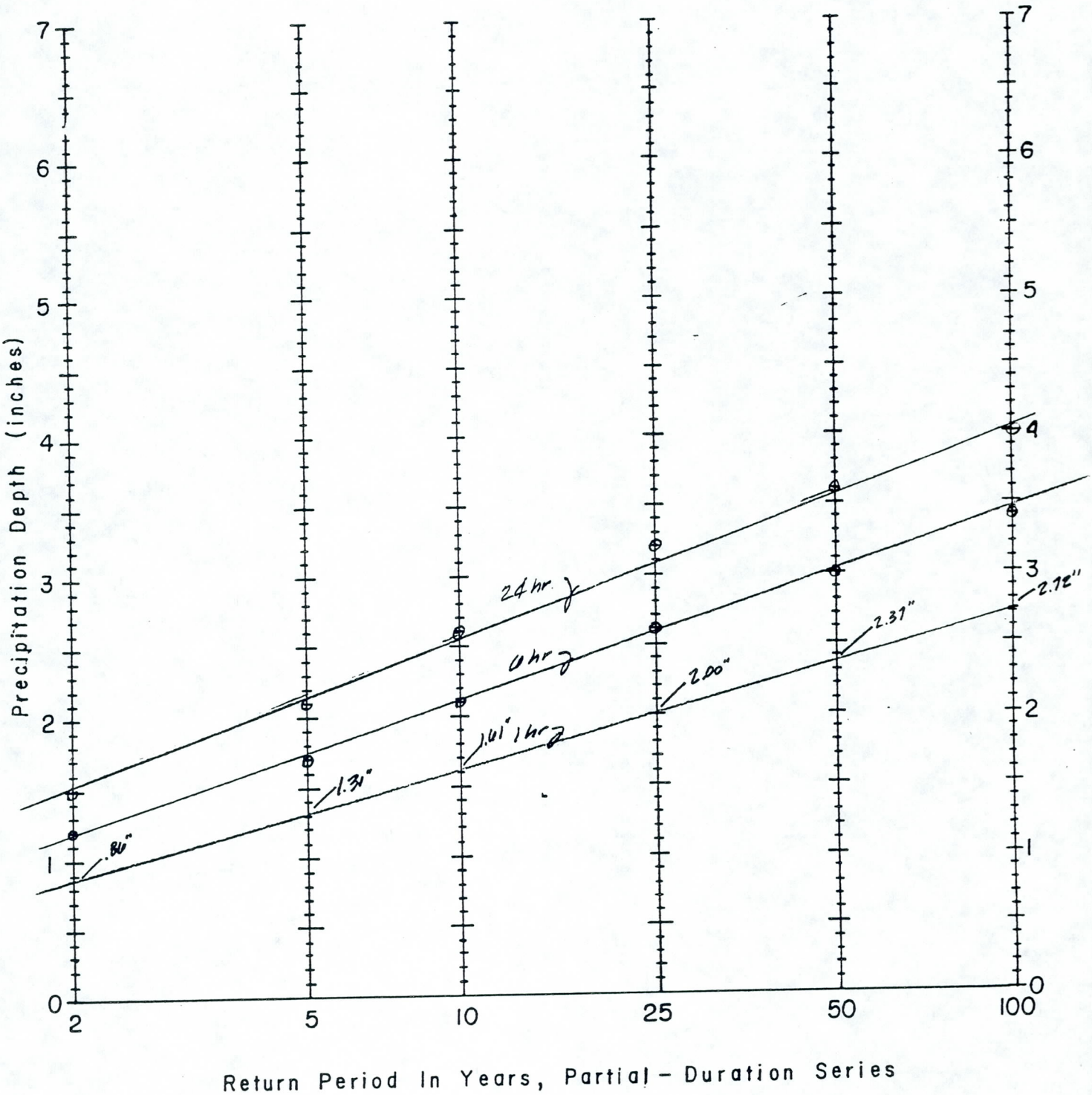

Figure 1 Precipitation Depth Versus Return Period for Partial - Duration Series

SEGMENT III
SUBAREA PARAMETER SHEETS
(TIME OF CONCENTRATION CALCULATIONS)

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: SW90ab

Drainage Area: 0.045 Square Miles

Time of Concentration:

Overland Flow Length			100	feet
N Value			0.05	
2-Year Precipitation			1.55	inches
Upstream Elevation			1550	feet
Downstream Elevation			1500	feet
Overland Flow Slope			0.5	ft/ft
Overland Flow Velocity			0.93	fps
Overland Travel Time			0.03	hours
Shallow Concentrated Flow Length	450	390	400	feet
Upstream Elevation	1500	1250	1160	feet
Downstream Elevation	1250	1160	1115	feet
Slope	0.56	0.23	0.113	ft/ft
Velocity	10	7.7	5.5	fps
Conc. Flow Travel Time		0.05	hours	
Channel Flow Length		1000	feet	
Upstream Elevation			feet	
Downstream Elevation			feet	
Channel Slope			ft/ft	
Channel Velocity		12	fps	
Channel Travel Time		0.02	hours	
TOTAL TRAVEL TIME	0.1	hours	use Tc=0.17	
Tlag	0.06	hours	use Tlag=0.1	

Curve Number: 91.5

Routing Through Downstream Waterway:

Routing Length	feet
Upstream Elevation	feet
Downstream Elevation	feet
Routing Slope	ft/ft
Manning N Value	
Bottom Width	feet
Side Slope	h/v
Method Used	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: SW90c

Drainage Area: 0.067 Square Miles

Time of Concentration:

Overland Flow Length		100	feet
N Value		0.05	
2-Year Precipitation		1.55	inches
Upstream Elevation		1560	feet
Downstream Elevation		1510	feet
Overland Flow Slope		0.5	ft/ft
Overland Flow Velocity		0.93	fps
Overland Travel Time		0.03	hours
Shallow Concentrated Flow Length	600	650	feet
Upstream Elevation	1510	1250	feet
Downstream Elevation	1250	1150	feet
Slope	0.43	0.15	ft/ft
Velocity	10	6.3	fps
Conc. Flow Travel Time		0.05	hours
Channel Flow Length		650	feet
Upstream Elevation		1150	feet
Downstream Elevation		1110	feet
Channel Slope		0.062	ft/ft
Channel Velocity		8.4	fps
Channel Travel Time		0.02	hours
TOTAL TRAVEL TIME	0.1 hours		use Tc=0.17
Tlag	0.06 hours		use Tlag=0.1

Curve Number: 91.5

Routing Through Downstream Waterway:

Routing Length	feet
Upstream Elevation	feet
Downstream Elevation	feet
Routing Slope	ft/ft
Manning N Value	
Bottom Width	feet
Side Slope	h/v
Method Used	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: SW90d

Drainage Area: 0.031 Square Miles

Time of Concentration:

Overland Flow Length		100	feet
N Value		0.05	
2-Year Precipitation		1.55	inches
Upstream Elevation		1500	feet
Downstream Elevation		1450	feet
Overland Flow Slope		0.5	ft/ft
Overland Flow Velocity		0.93	fps
Overland Travel Time		0.03	hours
Shallow Concentrated Flow Length	560	510	feet
Upstream Elevation	1450	1250	feet
Downstream Elevation	1250	1170	feet
Slope	0.36	0.16	ft/ft
Velocity	9.7	6.5	fps
Conc. Flow Travel Time		0.04	hours
Channel Flow Length		920	feet
Upstream Elevation		1170	feet
Downstream Elevation		1116	feet
Channel Slope		0.058	ft/ft
Channel Velocity		7.5	fps
Channel Travel Time		0.03	hours
TOTAL TRAVEL TIME	0.1	hours	use Tc=0.17
Tlag	0.06	hours	use Tlag=0.1

Curve Number: 91.5

Routing Through Downstream Waterway:

Routing Length	feet
Upstream Elevation	feet
Downstream Elevation	feet
Routing Slope	ft/ft
Manning N Value	
Bottom Width	feet
Side Slope	h/v
Method Used	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: SW100

Drainage Area: 1.15 Square Miles

Time of Concentration:

Overland Flow Length		300	feet
N Value		0.05	
2-Year Precipitation		1.55	inches
Upstream Elevation		2500	feet
Downstream Elevation		2350	feet
Overland Flow Slope		0.500	ft/ft
Overland Flow Velocity		1.39	fps
Overland Travel Time		0.06	hours
Shallow Concentrated Flow Length		5230	feet
Upstream Elevation		2350	feet
Downstream Elevation		1290	feet
Slope		0.203	ft/ft
Velocity		7.2	fps
Conc. Flow Travel Time		0.20	hours
Channel Flow Length	4270	4800	feet
Upstream Elevation	1290	1195	feet
Downstream Elevation	1195	1112	feet
Channel Slope	0.022	0.017	ft/ft
Channel Velocity	5.7	11.1	fps
Channel Travel Time		0.33	hours
TOTAL TRAVEL TIME		0.59	hours
Tlag		0.35	hours

Curve Number: 88.5

Routing Through Downstream Waterway:

Routing Length	feet
Upstream Elevation	feet
Downstream Elevation	feet
Routing Slope	ft/ft
Manning N Value	
Bottom Width	feet
Side Slope	h/v
Method Used	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: SW110

Drainage Area: 0.09 Square Miles

Time of Concentration:

Overland Flow Length	100	feet
N Value	0.05	
2-Year Precipitation	1.55	inches
Upstream Elevation	1217.3	feet
Downstream Elevation	1215	feet
Overland Flow Slope	0.023	ft/ft
Overland Flow Velocity	0.31	fps
Overland Travel Time	0.09	hours
Shallow Concentrated Flow Length	1455	feet
Upstream Elevation	1215	feet
Downstream Elevation	1180	feet
Slope	0.024	ft/ft
Velocity	2.5	fps
Conc. Flow Travel Time	0.16	hours
Channel Flow Length	3094	feet
Upstream Elevation	1180	feet
Downstream Elevation	1124	feet
Channel Slope	0.018	ft/ft
Channel Velocity	3.1	fps
Channel Travel Time	0.28	hours
TOTAL TRAVEL TIME	0.53	hours
Tlag	0.32	hours

Curve Number: 85.0

Routing Through Downstream Waterway:

Routing Length	feet
Upstream Elevation	feet
Downstream Elevation	feet
Routing Slope	ft/ft
Manning N Value	
Bottom Width	feet
Side Slope	h/v
Method Used	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: SW120

Drainage Area: 0.12 Square Miles

Time of Concentration:

Overland Flow Length	100	feet
N Value	0.05	
2-Year Precipitation	1.55	inches
Upstream Elevation	1312.6	feet
Downstream Elevation	1310	feet
Overland Flow Slope	0.026	ft/ft
Overland Flow Velocity	0.31	fps
Overland Travel Time	0.09	hours
Shallow Concentrated Flow Length	2560	feet
Upstream Elevation	1310	feet
Downstream Elevation	1250	feet
Slope	0.023	ft/ft
Velocity	2.4	fps
Conc. Flow Travel Time	0.30	hours
Channel Flow Length	6180	feet
Upstream Elevation	1250	feet
Downstream Elevation	1130	feet
Channel Slope	0.019	ft/ft
Channel Velocity	5.1	fps
Channel Travel Time	0.34	hours
TOTAL TRAVEL TIME	0.73	hours
Tlag	0.44	hours

Curve Number: 85.0

Routing Through Downstream Waterway:

Routing Length	feet
Upstream Elevation	feet
Downstream Elevation	feet
Routing Slope	ft/ft
Manning N Value	
Bottom Width	feet
Side Slope	h/v
Method Used	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: SW130

Drainage Area: 0.47 Square Miles

Time of Concentration:

Overland Flow Length	100	feet
N Value	0.05	
2-Year Precipitation	1.55	inches
Upstream Elevation	1312.9	feet
Downstream Elevation	1310	feet
Overland Flow Slope	0.029	ft/ft
Overland Flow Velocity	0.35	fps
Overland Travel Time	0.08	hours
Shallow Concentrated Flow Length	3200	feet
Upstream Elevation	1310	feet
Downstream Elevation	1250	feet
Slope	0.019	ft/ft
Velocity	2.2	fps
Conc. Flow Travel Time	0.40	hours
Channel Flow Length	5870	feet
Upstream Elevation	1250	feet
Downstream Elevation	1130	feet
Channel Slope	0.020	ft/ft
Channel Velocity	7.7	fps
Channel Travel Time	0.21	hours
TOTAL TRAVEL TIME	0.69	hours
Tlag	0.41	hours

Curve Number: 83.1

Routing Through Downstream Waterway:

Routing Length	feet
Upstream Elevation	feet
Downstream Elevation	feet
Routing Slope	ft/ft
Manning N Value	
Bottom Width	feet
Side Slope	h/v
Method Used	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: SW140a

Drainage Area: 1.94 Square Miles

Time of Concentration:

Overland Flow Length		300			feet
N Value		0.05			
2-Year Precipitation		1.55			inches
Upstream Elevation		2300			feet
Downstream Elevation		2075			feet
Overland Flow Slope		0.750			ft/ft
Overland Flow Velocity		1.39			fps
Overland Travel Time		0.06			hours
Shallow Concentrated Flow Length	820	1650			feet
Upstream Elevation	2075	1800			feet
Downstream Elevation	1800	1650			feet
Slope	0.335	0.091			ft/ft
Velocity	9.5	4.9			fps
Conc. Flow Travel Time		0.12			hours
Channel Flow Length	1740	3850	4780	2520	feet
Upstream Elevation	1650	1560	1440	1340	feet
Downstream Elevation	1560	1440	1340	1280	feet
Channel Slope	0.052	0.031	0.021	0.024	ft/ft
Channel Velocity	8.5	9.3	7.4	11.3	fps
Channel Travel Time				0.41	hours
TOTAL TRAVEL TIME		0.59			hours
Tlag		0.35			hours

Curve Number: 92.6

Routing Through Downstream Waterway:

Routing Length	6250	5720 feet
Upstream Elevation	1280	1280 feet
Downstream Elevation	1156	1158 feet
Routing Slope	0.020	0.021 ft/ft
Manning N Value	0.04	0.04 Channel
	0.05	0.05 Overbank
Bottom Width	30	40 feet
Side Slope	(8-point cross-section)	(8-point cross-section)
Method Used	Normal Depth Storage thru sub-area SW140b	Normal Depth Storage thru sub-area SW150

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: SW140b

Drainage Area: 0.22 Square Miles

Time of Concentration:

Overland Flow Length	100	feet
N Value	0.05	
2-Year Precipitation	1.55	inches
Upstream Elevation	1287.5	feet
Downstream Elevation	1285	feet
Overland Flow Slope	0.025	ft/ft
Overland Flow Velocity	0.31	fps
Overland Travel Time	0.09	hours
Shallow Concentrated Flow Length	3800	feet
Upstream Elevation	1285	feet
Downstream Elevation	1198	feet
Slope	0.023	ft/ft
Velocity	2.4	fps
Conc. Flow Travel Time	0.44	hours
Channel Flow Length	2700	feet
Upstream Elevation	1198	feet
Downstream Elevation	1144	feet
Channel Slope	0.020	ft/ft
Channel Velocity	3.4	fps
Channel Travel Time	0.22	hours
TOTAL TRAVEL TIME	0.75	hours
Tlag	0.45	hours

Curve Number: 63.0

Routing Through Downstream Waterway:

Routing Length	feet
Upstream Elevation	feet
Downstream Elevation	feet
Routing Slope	ft/ft
Manning N Value	
Bottom Width	feet
Side Slope	h/v
Method Used	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: SW150

Drainage Area: 0.39 Square Miles

Time of Concentration:

Overland Flow Length	300	feet
N Value	0.05	
2-Year Precipitation	1.55	inches
Upstream Elevation	1880	feet
Downstream Elevation	1750	feet
Overland Flow Slope	0.433	ft/ft
Overland Flow Velocity	1.19	fps
Overland Travel Time	0.07	hours
Shallow Concentrated Flow Length	4270	feet
Upstream Elevation	1750	feet
Downstream Elevation	1250	feet
Slope	0.117	ft/ft
Velocity	5.0	fps
Conc. Flow Travel Time	0.24	hours
Channel Flow Length	4800	feet
Upstream Elevation	1250	feet
Downstream Elevation	1156	feet
Channel Slope	0.020	ft/ft
Channel Velocity	4.6	fps
Channel Travel Time	0.29	hours
TOTAL TRAVEL TIME	0.60	hours
Tlag	0.36	hours

Curve Number: 87.8

Routing Through Downstream Waterway:

Routing Length	feet
Upstream Elevation	feet
Downstream Elevation	feet
Routing Slope	ft/ft
Manning N Value	
Bottom Width	feet
Side Slope	h/v
Method Used	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: SW160

Drainage Area: 0.49 Square Miles

Time of Concentration:

Overland Flow Length	100	feet
N Value	0.05	
2-Year Precipitation	1.55	inches
Upstream Elevation	1880	feet
Downstream Elevation	1850	feet
Overland Flow Slope	0.300	ft/ft
Overland Flow Velocity	0.93	fps
Overland Travel Time	0.03	hours
Shallow Concentrated Flow Length	3250	feet
Upstream Elevation	1850	feet
Downstream Elevation	1350	feet
Slope	0.154	ft/ft
Velocity	6.3	fps
Conc. Flow Travel Time	0.14	hours
Channel Flow Length	4800	feet
Upstream Elevation	1350	feet
Downstream Elevation	1170	feet
Channel Slope	0.038	ft/ft
Channel Velocity	7.2	fps
Channel Travel Time	0.19	hours
TOTAL TRAVEL TIME	0.36	hours
Tlag	0.22	hours

Curve Number: 89.7

Routing Through Downstream Waterway:

Routing Length	feet
Upstream Elevation	feet
Downstream Elevation	feet
Routing Slope	ft/ft
Manning N Value	
Bottom Width	feet
Side Slope	h/v
Method Used	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: SW170

Drainage Area: 0.97 Square Miles

Time of Concentration:

Overland Flow Length		100 feet
N Value		0.05
2-Year Precipitation		1.55 inches
Upstream Elevation		2200 feet
Downstream Elevation		2150 feet
Overland Flow Slope		0.500 ft/ft
Overland Flow Velocity		0.93 fps
Overland Travel Time		0.03 hours
Shallow Concentrated Flow Length		5200 feet
Upstream Elevation		2150 feet
Downstream Elevation		1400 feet
Slope		0.144 ft/ft
Velocity		6.0 fps
Conc. Flow Travel Time		0.24 hours
Channel Flow Length	2700	4000 feet
Upstream Elevation	1400	1290 feet
Downstream Elevation	1290	1190 feet
Channel Slope	0.041	0.025 ft/ft
Channel Velocity	7.3	7.8 fps
Channel Travel Time		0.10 hours
TOTAL TRAVEL TIME		0.52 hours
Tlag		0.31 hours

Curve Number: 90.4

Routing Through Downstream Waterway:

Routing Length	feet
Upstream Elevation	feet
Downstream Elevation	feet
Routing Slope	ft/ft
Manning N Value	
Bottom Width	feet
Side Slope	h/v
Method Used	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: SW180

Drainage Area: 0.04 Square Miles

Time of Concentration:

Overland Flow Length		100	feet
N Value		0.05	
2-Year Precipitation		1.55	inches
Upstream Elevation		1315	feet
Downstream Elevation		1300	feet
Overland Flow Slope		0.150	ft/ft
Overland Flow Velocity		0.69	fps
Overland Travel Time		0.04	hours
Shallow Concentrated Flow Length	500	1000	feet
Upstream Elevation	1300	1150	feet
Downstream Elevation	1150	1090	feet
Slope	0.300	0.060	ft/ft
Velocity	9.0	4.0	fps
Conc. Flow Travel Time		0.08	hours
Channel Flow Length			feet
Upstream Elevation			feet
Downstream Elevation			feet
Channel Slope			ft/ft
Channel Velocity			fps
Channel Travel Time			hours
TOTAL TRAVEL TIME	0.12 hours		use Tc=0.17
Tlag	0.07 hours		use Tlag=0.1

Curve Number: 98.0

Routing Through Downstream Waterway:

Routing Length	feet
Upstream Elevation	feet
Downstream Elevation	feet
Routing Slope	ft/ft
Manning N Value	
Bottom Width	feet
Side Slope	h/v
Method Used	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: SW190

Drainage Area: 0.10 Square Miles

Time of Concentration:

Overland Flow Length		100	feet
N Value		0.05	
2-Year Precipitation		1.55	inches
Upstream Elevation		1460	feet
Downstream Elevation		1400	feet
Overland Flow Slope		0.600	ft/ft
Overland Flow Velocity		1.39	fps
Overland Travel Time		0.02	hours
Shallow Concentrated Flow Length	900	1600	feet
Upstream Elevation	1400	1150	feet
Downstream Elevation	1150	1095	feet
Slope	0.278	0.034	ft/ft
Velocity	8.5	2.8	fps
Conc. Flow Travel Time		0.19	hours
Channel Flow Length			feet
Upstream Elevation			feet
Downstream Elevation			feet
Channel Slope			ft/ft
Channel Velocity			fps
Channel Travel Time			hours
TOTAL TRAVEL TIME		0.21	hours
Tlag		0.13	hours

Curve Number: 88.8

Routing Through Downstream Waterway:

Routing Length	feet
Upstream Elevation	feet
Downstream Elevation	feet
Routing Slope	ft/ft
Manning N Value	
Bottom Width	feet
Side Slope	h/v
Method Used	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: SW200

Drainage Area: 0.11 Square Miles

Time of Concentration:

Overland Flow Length		100	feet
N Value		0.05	
2-Year Precipitation		1.55	inches
Upstream Elevation		1545	feet
Downstream Elevation		1500	feet
Overland Flow Slope		0.450	ft/ft
Overland Flow Velocity		0.93	fps
Overland Travel Time		0.03	hours
Shallow Concentrated Flow Length	900	2300	feet
Upstream Elevation	1500	1200	feet
Downstream Elevation	1200	1090	feet
Slope	0.333	0.048	ft/ft
Velocity	9.5	3.6	fps
Conc. Flow Travel Time		0.20	hours
Channel Flow Length			feet
Upstream Elevation			feet
Downstream Elevation			feet
Channel Slope			ft/ft
Channel Velocity			fps
Channel Travel Time			hours
TOTAL TRAVEL TIME		0.23	hours
Tlag		0.12	hours

Curve Number: 82.0

Routing Through Downstream Waterway:

Routing Length	feet
Upstream Elevation	feet
Downstream Elevation	feet
Routing Slope	ft/ft
Manning N Value	
Bottom Width	feet
Side Slope	h/v
Method Used	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: SW210

Drainage Area: 0.03 Square Miles

Time of Concentration:

Overland Flow Length		100	feet
N Value		0.05	
2-Year Precipitation		1.55	inches
Upstream Elevation		1435	feet
Downstream Elevation		1400	feet
Overland Flow Slope		0.350	ft/ft
Overland Flow Velocity		0.93	fps
Overland Travel Time		0.03	hours
Shallow Concentrated Flow Length	700	2200	feet
Upstream Elevation	1400	1150	feet
Downstream Elevation	1150	1095	feet
Slope	0.357	0.025	ft/ft
Velocity	9.8	2.5	fps
Conc. Flow Travel Time		0.26	hours
Channel Flow Length			feet
Upstream Elevation			feet
Downstream Elevation			feet
Channel Slope			ft/ft
Channel Velocity			fps
Channel Travel Time			hours
TOTAL TRAVEL TIME		0.29	hours
Tlag		0.17	hours

Curve Number: 79.5

Routing Through Downstream Waterway:

Routing Length	feet
Upstream Elevation	feet
Downstream Elevation	feet
Routing Slope	ft/ft
Manning N Value	
Bottom Width	feet
Side Slope	h/v
Method Used	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: SW220

Drainage Area: 0.06 Square Miles

Time of Concentration:

Overland Flow Length		100	feet
N Value		0.13	
2-Year Precipitation		1.55	inches
Upstream Elevation		1550	feet
Downstream Elevation		1500	feet
Overland Flow Slope		0.500	ft/ft
Overland Flow Velocity		0.93	fps
Overland Travel Time		0.03	hours
Shallow Concentrated Flow Length	900	2800	feet
Upstream Elevation	1500	1200	feet
Downstream Elevation	1200	1095	feet
Slope	0.333	0.038	ft/ft
Velocity	9.3	3.2	fps
Conc. Flow Travel Time		0.27	hours
Channel Flow Length			feet
Upstream Elevation			feet
Downstream Elevation			feet
Channel Slope			ft/ft
Channel Velocity			fps
Channel Travel Time			hours
TOTAL TRAVEL TIME		0.30	hours
Tlag		0.18	hours

Curve Number: 82.8

Routing Through Downstream Waterway:

Routing Length	feet
Upstream Elevation	feet
Downstream Elevation	feet
Routing Slope	ft/ft
Manning N Value	
Bottom Width	feet
Side Slope	h/v
Method Used	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: SW230

Drainage Area: 0.06 Square Miles

Time of Concentration:

Overland Flow Length		100	feet
N Value		0.05	
2-Year Precipitation		1.55	inches
Upstream Elevation		1600	feet
Downstream Elevation		1550	feet
Overland Flow Slope		0.500	ft/ft
Overland Flow Velocity		0.93	fps
Overland Travel Time		0.03	hours
Shallow Concentrated Flow Length	1200	3000	feet
Upstream Elevation	1550	1200	feet
Downstream Elevation	1200	1095	feet
Slope	0.292	0.035	ft/ft
Velocity	8.8	3.0	fps
Conc. Flow Travel Time		0.32	hours
Channel Flow Length			feet
Upstream Elevation			feet
Downstream Elevation			feet
Channel Slope			ft/ft
Channel Velocity			fps
Channel Travel Time			hours
TOTAL TRAVEL TIME		0.35	hours
Tlag		0.21	hours

Curve Number: 84.7

Routing Through Downstream Waterway:

Routing Length	feet
Upstream Elevation	feet
Downstream Elevation	feet
Routing Slope	ft/ft
Manning N Value	
Bottom Width	feet
Side Slope	h/v
Method Used	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: SW240

Drainage Area: 0.81 Square Miles

Time of Concentration:

Overland Flow Length		300 feet
N Value		0.05
2-Year Precipitation		1.55 inches
Upstream Elevation		1950 feet
Downstream Elevation		1800 feet
Overland Flow Slope		0.500 ft/ft
Overland Flow Velocity		1.39 fps
Overland Travel Time		0.06 hours
Shallow Concentrated Flow Length	1400	1100 feet
Upstream Elevation	1800	1300 feet
Downstream Elevation	1300	1210 feet
Slope	0.357	0.082 ft/ft
Velocity	9.5	4.6 fps
Conc. Flow Travel Time		0.11 hours
Channel Flow Length	1850	4600 feet
Upstream Elevation	1210	1170 feet
Downstream Elevation	1170	1100 feet
Channel Slope	0.022	0.015 ft/ft
Channel Velocity	7.3	5.5 fps
Channel Travel Time		0.30 hours
TOTAL TRAVEL TIME		0.47 hours
Tlag		0.28 hours

Curve Number: 85.9

Routing Through Downstream Waterway:

Routing Length	feet
Upstream Elevation	feet
Downstream Elevation	feet
Routing Slope	ft/ft
Manning N Value	
Bottom Width	feet
Side Slope	h/v
Method Used	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: SW250

Drainage Area: 0.35 Square Miles

Time of Concentration:

Overland Flow Length		100	feet
N Value		0.05	
2-Year Precipitation		1.55	inches
Upstream Elevation		1242	feet
Downstream Elevation		1238	feet
Overland Flow Slope		0.040	ft/ft
Overland Flow Velocity		0.40	fps
Overland Travel Time		0.07	hours
Shallow Concentrated Flow Length		2150	feet
Upstream Elevation		1238	feet
Downstream Elevation		1180	feet
Slope		0.027	ft/ft
Velocity		2.6	fps
Conc. Flow Travel Time		0.23	hours
Channel Flow Length	3300	1100	feet
Upstream Elevation	1180		feet
Downstream Elevation	1116		feet
Channel Slope	0.019		ft/ft
Channel Velocity	4.5	11.0	fps
Channel Travel Time		0.23	hours
TOTAL TRAVEL TIME		0.53	hours
Tlag		0.32	hours

Curve Number: 70.0

Routing Through Downstream Waterway:

Routing Length	feet
Upstream Elevation	feet
Downstream Elevation	feet
Routing Slope	ft/ft
Manning N Value	
Bottom Width	feet
Side Slope	h/v
Method Used	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: SW260

Drainage Area: 0.12 Square Miles

Time of Concentration:

Overland Flow Length	100	feet
N Value	0.05	
2-Year Precipitation	1.55	inches
Upstream Elevation	1216	feet
Downstream Elevation	1212	feet
Overland Flow Slope	0.040	ft/ft
Overland Flow Velocity	0.40	fps
Overland Travel Time	0.07	hours
Shallow Concentrated Flow Length	1320	feet
Upstream Elevation	1212	feet
Downstream Elevation	1176	feet
Slope	0.027	ft/ft
Velocity	2.6	fps
Conc. Flow Travel Time	0.14	hours
Channel Flow Length	2500	feet
Upstream Elevation	1176	feet
Downstream Elevation	1126	feet
Channel Slope	0.020	ft/ft
Channel Velocity	3.8	fps
Channel Travel Time	0.18	hours
TOTAL TRAVEL TIME	0.39	hours
Tlag	0.23	hours

Curve Number: 72.8

Routing Through Downstream Waterway:

Routing Length	feet
Upstream Elevation	feet
Downstream Elevation	feet
Routing Slope	ft/ft
Manning N Value	
Bottom Width	feet
Side Slope	h/v
Method Used	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: SW270

Drainage Area: 1.27 Square Miles

Time of Concentration:

Overland Flow Length		300	feet
N Value		0.05	
2-Year Precipitation		1.55	inches
Upstream Elevation		2430	feet
Downstream Elevation		2280	feet
Overland Flow Slope		0.500	ft/ft
Overland Flow Velocity		2.78	fps
Overland Travel Time		0.03	hours
Shallow Concentrated Flow Length		3450	feet
Upstream Elevation		2280	feet
Downstream Elevation		1450	feet
Slope		0.241	ft/ft
Velocity		8.0	fps
Conc. Flow Travel Time		0.12	hours
Channel Flow Length	5550	5200	feet
Upstream Elevation	1450	1250	feet
Downstream Elevation	1250	1135	feet
Channel Slope	0.036	0.022	ft/ft
Channel Velocity	8.8	7.2	fps
Channel Travel Time		0.38	hours
TOTAL TRAVEL TIME		0.53	hours
Tlag		0.32	hours

Curve Number: 90.0

Routing Through Downstream Waterway:

Routing Length	feet
Upstream Elevation	feet
Downstream Elevation	feet
Routing Slope	ft/ft
Manning N Value	
Bottom Width	feet
Side Slope	h/v
Method Used	

Price Road GEC
South Mountain Freeway

SUBAREA PARAMETERS

Subarea Number: SW280

Drainage Area: 0.02 Square Miles

Time of Concentration:

Overland Flow Length	100	feet
N Value	0.05	
2-Year Precipitation	1.55	inches
Upstream Elevation	1182	feet
Downstream Elevation	1178	feet
Overland Flow Slope	0.040	ft/ft
Overland Flow Velocity	0.40	fps
Overland Travel Time	0.07	hours
Shallow Concentrated Flow Length	1100	feet
Upstream Elevation	1178	feet
Downstream Elevation	1150	feet
Slope	0.025	ft/ft
Velocity	2.6	fps
Conc. Flow Travel Time	0.12	hours
Channel Flow Length		feet
Upstream Elevation		feet
Downstream Elevation		feet
Channel Slope		ft/ft
Channel Velocity		fps
Channel Travel Time		hours
TOTAL TRAVEL TIME	0.19	hours
Tlag	0.11	hours

Curve Number: 85.0

Routing Through Downstream Waterway:

Routing Length	feet
Upstream Elevation	feet
Downstream Elevation	feet
Routing Slope	ft/ft
Manning N Value	
Bottom Width	feet
Side Slope	h/v
Method Used	

SEGMENT III
SCS CURVE NUMBER CALCULATIONS

Subarea SW90ab D.A. = 29 acres

Land use acreage values approx. from aerial photography (6-90)

Land use	Soil Group	Area	CN
mtn. desert shrub	D	14.5	98
	C	14.5	85

Composite CN = 91.5

Subarea SW90c D.A. = 43 acres

Land use	Soil Group	Area	CN
mtn. desert shrub	D	21.5	98
	C	21.5	85

Composite CN = 91.5

Subarea SW90d D.A. = 20 acres

Land use	Soil Group	Area	CN
mtn. desert shrub	D	10	98
	C	10	85

Composite CN = 91.5

Subarea SW100 D.A. = 799 acres

Land use	Soil Group	Area	CN
mtn. desert shrub	D	458	98
	C	142	63
desert shrub	C	199	85

Composite CN = 88.54192

Subarea SW110 D.A. = 57 acres

Land use	Soil Group	Area	CN
desert shrub	C	57	85

Composite CN = 85

Subarea SW120 D.A. = 74 acres

Land use acreage values approx. from aerial photography (6-90)

Land use	Soil Group	Area	CN
desert shrub	C	74	85

Composite CN = 85

Subarea SW130 D.A. = 181 acres

Land use	Soil Group	Area	CN
desert shrub	C	165	85
desert shrub	A	16	63

Composite CN = 83.05524

Subarea SW140a D.A. = 1245 acres

Land use	Soil Group	Area	CN
mtn.	D	1038	98
desert shrub	A	182	63
desert shrub	C	25	85

Composite CN = 92.62248

Subarea SW140b D.A. = 138 acres

Land use	Soil Group	Area	CN
desert shrub	A	138	63

Composite CN = 63

Subarea SW150 D.A. = 248 acres

Land use acreage values approx. from aerial photography (6-90)

Land use	Soil Group	Area	CN
mtn.	D	176	98
desert shrub	A	72	63

Composite CN = 87.83870

Subarea SW160 D.A. = 316 acres

Land use	Soil Group	Area	CN
mtn.	D	221	98
desert shrub	A	63	63
desert shrub	C	32	85

Composite CN = 89.70569

Subarea SW170 D.A. = 621 acres

Land use	Soil Group	Area	CN
mtn.	D	466	98
desert shrub	A	124	63
desert shrub	C	31	85

Composite CN = 90.36231

Subarea SW180 D.A. = 29 acres

Land use	Soil Group	Area	CN
mtn.	D	29	98

Composite CN = 98

Subarea SW190 D.A. = 67 acres

Land use acreage values approx. from aerial photography (6-90)

Land use	Soil Group	Area	CN
mtn.	D	45	98
desert shrub	A	11	63
desert shrub	B	11	77

Composite CN = 88.80597

Subarea SW200 D.A. = 72 acres

Land use	Soil Group	Area	CN
mtn.	D	29	98
desert shrub	A	18	63
desert shrub	B	25	77

Composite CN = 81.95833

Subarea SW210 D.A. = 17 acres

Land use	Soil Group	Area	CN
mtn.	D	4	98
desert shrub	A	3	63
desert shrub	B	10	77

Composite CN = 79.47058

Subarea SW220 D.A. = 40 acres

Land use	Soil Group	Area	CN
mtn.	D	17	98
desert shrub	A	9	63
desert shrub	B	14	77

Composite CN = 82.775

Subarea SW230 D.A. = 40 acres

Land use acreage values approx. from aerial photography (6-90)

Land use	Soil Group	Area	CN
mtn.	D	20	98
desert shrub	A	8	63
desert shrub	B	12	77

Composite CN = 84.7

Subarea SW240 D.A. = 519 acres

Land use	Soil Group	Area	CN
mtn.	D	259	98
desert shrub	A	104	63
desert shrub	B	78	77
desert shrub	C	78	85

Composite CN = 85.87668

Subarea SW250 D.A. = 133 acres

Land use	Soil Group	Area	CN
desert shrub	A	66.5	63
desert shrub	B	66.5	77

Composite CN = 70

Subarea SW260 D.A. = 77 acres

Land use	Soil Group	Area	CN
desert shrub	A	23	63
desert shrub	B	54	77

Composite CN = 72.81818

Subarea SW270 D.A. = 700 acres

Land use acreage values approx. from aerial photography (6-90)

Land use	Soil Group	Area	CN
mtn.	D	350	98
desert shrub	D	70	85
desert shrub	A	35	63
desert shrub	B	35	77
desert shrub	C	210	85

Composite CN = 90

Subarea SW280 D.A. = 12 acres

Land use	Soil Group	Area	CN
desert shrub	C	12	85

Composite CN = 85

SEGMENT III
HEC-1 ANALYSES
51ST AVE. TO 19TH AVE.
A. SW90 TO SW150 - 50 AND 100 YEAR

HEC1 S/N: HMVersion: 6.00 Data File: c:\scott\price4

Q50 SW90 - SW150

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             SEPTEMBER 1990            *
*              VERSION 4.0              *
*                                       *
*  RUN DATE  02/25/1992  TIME  09:34:42 *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
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:::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::
:::                                     :::
:::  Full Microcomputer Implementation  :::
:::                 by                  :::
:::        Haestad Methods, Inc.        :::
:::                                     :::
:::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::
```

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

    1     ID        PRICE ROAD PHASE II HYDROLOGY CHECK                <PRICE4>
    2     ID        SOUTH MOUNTAIN (19TH AVE TO SALT RIVER)
    3     ID         50-YEAR 24-HOUR STORM EVENT
          *DIAGRAM
    4     IT      5                   300
    5     IO      3

    6     KK   SW90ab
    7     PH             0    0.69    1.35    2.37    2.60    2.76    3.05    3.32    3.60
    8     BA   0.045
    9     LS            91.5
   10     UD    0.10

   11     KK   SM90c
   12     BA   0.067
   13     LS            91.5
   14     UD    0.10

   15     KK   SW90d
   16     BA   0.031
   17     LS            91.5
   18     UD    0.10

   19     KK   SW100
   20     BA    1.15
   21     LS            88.5
   22     UD    0.35

   23     KK   SW110
   24     BA    0.09
   25     LS              85
   26     UD    0.32

   27     KK   SW120
   28     BA    0.12
   29     LS              85
   30     UD    0.44

   31     KK   SW130
   32     BA    0.28
   33     LS            83.1
   34     UD    0.41

   35     KK   SW140a
   36     BA    1.94
   37     LS            92.6
   38     UD    0.35

   39     KK    C112  Normal Depth Storage routing to Culvert C112.
   40     RS       4    ELEV  1166.5       0
   41     RC    0.05    0.04    0.05    6250   0.020
   42     RX       0       1     350     360     390     400     749     750
   43     RY    1170    1170    1168  1166.5  1166.5    1168    1170    1170
```

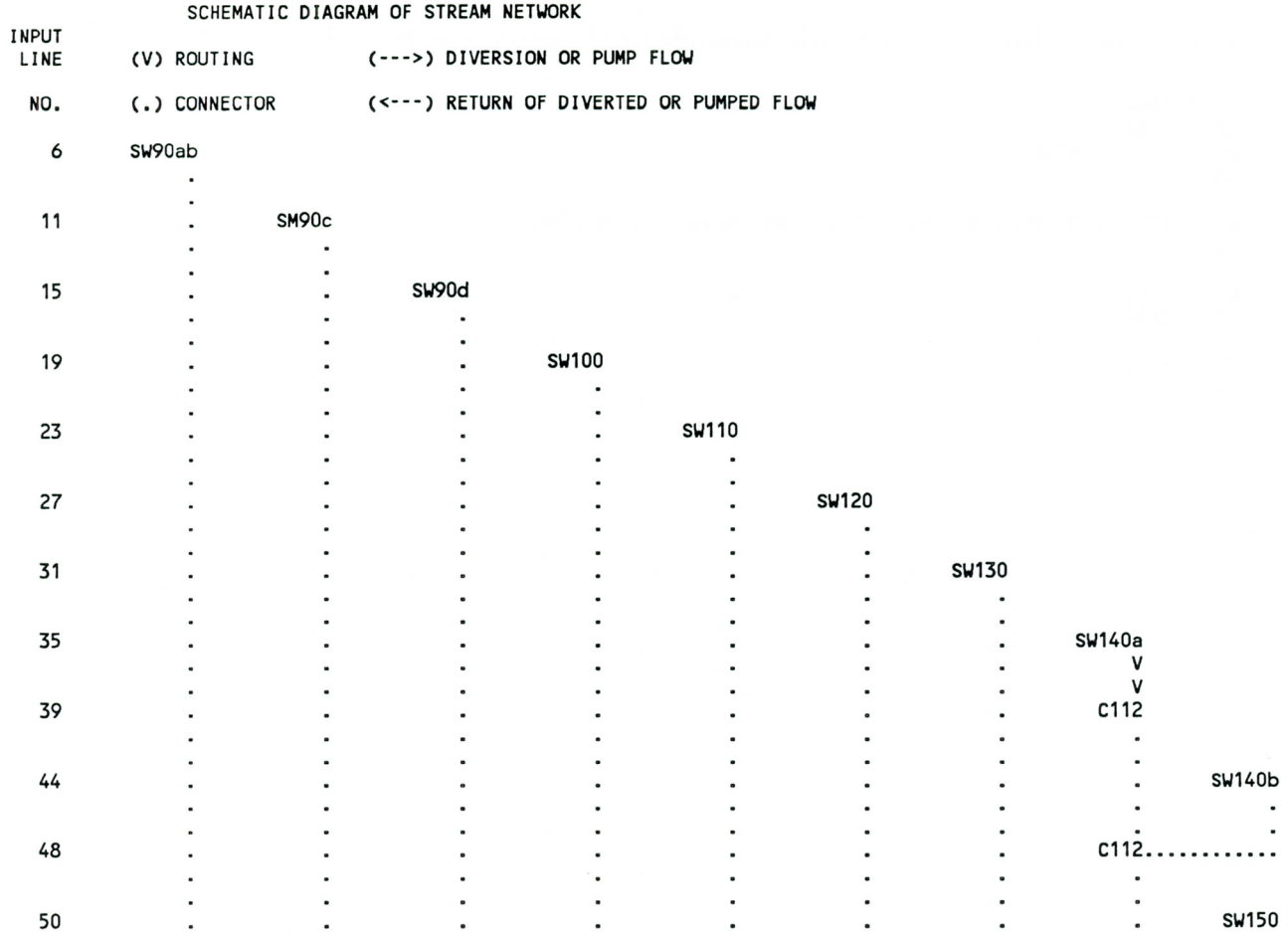
```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  44      KK  SW140b
  45      BA    0.22
  46      LS              63.0
  47      UD    0.45

  48      KK    C112  Add SW140b to routed Q from SW140a at Culvert C112.
  49      HC       2

  50      KK   SW150
  51      BA    0.39
  52      LS              87.8
  53      UD    0.36
  54      ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*          SEPTEMBER 1990               *
*           VERSION 4.0                 *
*                                       *
*  RUN DATE  02/25/1992  TIME  09:34:42 *
*                                       *
*****************************************
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*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*         609 SECOND STREET             *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
```


PRICE ROAD PHASE II HYDROLOGY CHECK <PRICE4>
SOUTH MOUNTAIN (19TH AVE TO SALT RIVER)
50-YEAR 24-HOUR STORM EVENT

5 IO OUTPUT CONTROL VARIABLES

IPRNT	3	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

NMIN		5	MINUTES IN COMPUTATION INTERVAL
IDATE	1	0	STARTING DATE
ITIME		0000	STARTING TIME
NQ		300	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	2	0	ENDING DATE
NDTIME		0055	ENDING TIME
ICENT		19	CENTURY MARK

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 24.92 HOURS

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-FEET
SURFACE AREA	ACRES
TEMPERATURE	DEGREES FAHRENHEIT

*** ***

```
**************
*            *
*    SW90ab  *
*            *
**************
```

6 KK

SUBBASIN RUNOFF DATA

8 BA SUBBASIN CHARACTERISTICS

TAREA	.05	SUBBASIN AREA

PRECIPITATION DATA

7 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.69	1.35	2.37	2.60	2.76	3.05	3.32	3.60	.00	.00	.00	.00

STORM AREA = .05

9 LS SCS LOSS RATE

STRTL	.19	INITIAL ABSTRACTION
CRVNBR	91.50	CURVE NUMBER
RTIMP	.00	PERCENT IMPERVIOUS AREA

10 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	.10	LAG

```
                                                  ***

                                                UNIT HYDROGRAPH
                                              8 END-OF-PERIOD ORDINATES
            99.      146.       64.       25.        9.        4.        1.        0.

     ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION   SW90ab

   TOTAL RAINFALL =    3.60, TOTAL LOSS =     .92, TOTAL EXCESS =    2.68

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR       72-HR     24.92-HR
   138.      12.17       (CFS)       12.          3.          3.          3.
                        (INCHES)    2.449       2.684       2.684       2.684
                        (AC-FT)       6.          6.          6.          6.

                        CUMULATIVE AREA =     .05 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
 11 KK    *     SM90c  *
          *            *
          **************

             SUBBASIN RUNOFF DATA

 12 BA         SUBBASIN CHARACTERISTICS
                    TAREA         .07  SUBBASIN AREA

               PRECIPITATION DATA

  7 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
               ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
               5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                 .69    1.35    2.37    2.60    2.76    3.05    3.32    3.60     .00     .00     .00     .00

                                                 STORM AREA =     .07

 13 LS         SCS LOSS RATE
                    STRTL         .19  INITIAL ABSTRACTION
                   CRVNBR       91.50  CURVE NUMBER
                    RTIMP         .00  PERCENT IMPERVIOUS AREA

 14 UD         SCS DIMENSIONLESS UNITGRAPH
                    TLAG         .10  LAG

                                                  ***

                                                UNIT HYDROGRAPH
                                              8 END-OF-PERIOD ORDINATES
            147.      217.       95.       37.       14.        5.        2.        1.

     ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION    SM90c

   TOTAL RAINFALL =    3.60, TOTAL LOSS =     .92, TOTAL EXCESS =    2.68

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR       72-HR     24.92-HR
   205.      12.17       (CFS)       18.          5.          5.          5.
                        (INCHES)    2.449       2.684       2.684       2.684
                        (AC-FT)       9.         10.         10.         10.

                        CUMULATIVE AREA =     .07 SQ MI


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

```
**************
*            *
15 KK     *     SW90d  *
*            *
**************

   SUBBASIN RUNOFF DATA

16 BA        SUBBASIN CHARACTERISTICS
                TAREA         .03  SUBBASIN AREA

             PRECIPITATION DATA

 7 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
             ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
             5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
               .69    1.35    2.37    2.60    2.76    3.05    3.32    3.60     .00     .00     .00     .00

                                                 STORM AREA =     .03

17 LS        SCS LOSS RATE
                STRTL         .19  INITIAL ABSTRACTION
                CRVNBR      91.50  CURVE NUMBER
                RTIMP         .00  PERCENT IMPERVIOUS AREA

18 UD        SCS DIMENSIONLESS UNITGRAPH
                TLAG          .10  LAG

                                                    ***

                                                UNIT HYDROGRAPH
                                              8 END-OF-PERIOD ORDINATES
             68.      100.      44.      17.       7.       3.       1.       0.

   ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION    SW90d

  TOTAL RAINFALL =    3.60, TOTAL LOSS =     .92, TOTAL EXCESS =    2.68

PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                    6-HR       24-HR       72-HR     24.92-HR
    95.      12.17        (CFS)         8.          2.          2.          2.
                        (INCHES)     2.449       2.684       2.684       2.684
                        (AC-FT)         4.          4.          4.          4.

                    CUMULATIVE AREA =     .03 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


**************
*            *
19 KK     *     SW100  *
*            *
**************

   SUBBASIN RUNOFF DATA

20 BA        SUBBASIN CHARACTERISTICS
                TAREA        1.15  SUBBASIN AREA

             PRECIPITATION DATA

 7 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
             ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
             5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
               .69    1.35    2.37    2.60    2.76    3.05    3.32    3.60     .00     .00     .00     .00

                                                 STORM AREA =    1.15

21 LS        SCS LOSS RATE
                STRTL         .26  INITIAL ABSTRACTION
                CRVNBR      88.50  CURVE NUMBER
                RTIMP         .00  PERCENT IMPERVIOUS AREA

22 UD        SCS DIMENSIONLESS UNITGRAPH
```

```
                    TLAG         .35  LAG

                                                ***

                                                UNIT HYDROGRAPH
                                              23 END-OF-PERIOD ORDINATES
              158.      498.     1024.     1364.     1411.     1244.      981.      651.      458.      331.
              234.      165.      117.       81.       58.       41.       29.       20.       15.       11.
                8.        5.        2.

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION    SW100

   TOTAL RAINFALL =    3.59, TOTAL LOSS =    1.19, TOTAL EXCESS =    2.40

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     24.92-HR
  1853.     12.42       (CFS)        272.         74.         71.         71.
                      (INCHES)     2.199       2.399       2.399       2.399
                      (AC-FT)        135.        147.        147.        147.

                      CUMULATIVE AREA =    1.15 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
 23 KK    *     SW110  *
          *            *
          **************

             SUBBASIN RUNOFF DATA

 24 BA         SUBBASIN CHARACTERISTICS
                    TAREA         .09  SUBBASIN AREA

               PRECIPITATION DATA

  7 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
               ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
               5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                 .69    1.35    2.37    2.60    2.76    3.05    3.32    3.60     .00     .00     .00     .00

                                                STORM AREA =     .09

 25 LS         SCS LOSS RATE
                    STRTL         .35  INITIAL ABSTRACTION
                   CRVNBR       85.00  CURVE NUMBER
                    RTIMP         .00  PERCENT IMPERVIOUS AREA

 26 UD         SCS DIMENSIONLESS UNITGRAPH
                    TLAG         .32  LAG

                                                ***

                                                UNIT HYDROGRAPH
                                              21 END-OF-PERIOD ORDINATES
               15.       49.       97.      119.      115.       95.       66.       44.       30.       21.
               14.       10.        7.        5.        3.        2.        2.        1.        1.        0.
                0.

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION    SW110

   TOTAL RAINFALL =    3.60, TOTAL LOSS =    1.50, TOTAL EXCESS =    2.10

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     24.92-HR
   134.     12.42       (CFS)         19.          5.          5.          5.
                      (INCHES)     1.937       2.103       2.103       2.103
                      (AC-FT)          9.         10.         10.         10.

                      CUMULATIVE AREA =     .09 SQ MI
```

*** ***

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          **************
          *            *
27 KK     *     SW120  *
          *            *
          **************

            SUBBASIN RUNOFF DATA

28 BA         SUBBASIN CHARACTERISTICS
                   TAREA          .12  SUBBASIN AREA

              PRECIPITATION DATA

 7 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
              ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
              5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                .69    1.35    2.37    2.60    2.76    3.05    3.32    3.60     .00     .00     .00     .00

                                                 STORM AREA =      .12

29 LS         SCS LOSS RATE
                   STRTL          .35  INITIAL ABSTRACTION
                  CRVNBR        85.00  CURVE NUMBER
                   RTIMP          .00  PERCENT IMPERVIOUS AREA

30 UD         SCS DIMENSIONLESS UNITGRAPH
                   TLAG          .44  LAG

                                                    ***

                                                UNIT HYDROGRAPH
                                            28 END-OF-PERIOD ORDINATES
                    10.      30.      61.      97.     117.     120.     111.      95.      74.      53.
                    40.      30.      23.      17.      13.      10.       7.       6.       4.       3.
                     2.       2.       1.       1.       1.       1.       0.       0.

    ***             ***              ***              ***              ***

                       HYDROGRAPH AT STATION    SW120

    TOTAL RAINFALL =    3.60, TOTAL LOSS =    1.50, TOTAL EXCESS =    2.10

PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                    6-HR        24-HR        72-HR      24.92-HR
   149.      12.50          (CFS)        25.          7.           7.          7.
                          (INCHES)     1.935        2.103        2.103       2.103
                          (AC-FT)         12.          13.          13.         13.

                       CUMULATIVE AREA =      .12 SQ MI
```

*** ***

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          **************
          *            *
31 KK     *     SW130  *
          *            *
          **************

            SUBBASIN RUNOFF DATA

32 BA         SUBBASIN CHARACTERISTICS
                   TAREA          .28  SUBBASIN AREA

              PRECIPITATION DATA

 7 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
              ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
              5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                .69    1.35    2.37    2.60    2.76    3.05    3.32    3.60     .00     .00     .00     .00
```

STORM AREA = .28

33 LS SCS LOSS RATE
STRTL .41 INITIAL ABSTRACTION
CRVNBR 83.10 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

34 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .41 LAG

***

UNIT HYDROGRAPH
27 END-OF-PERIOD ORDINATES

27.	82.	171.	258.	297.	295.	259.	211.	150.	109.
81.	61.	44.	33.	25.	18.	13.	10.	7.	5.
4.	3.	2.	2.	1.	1.	0.			

*** *** *** *** ***

HYDROGRAPH AT STATION SW130

TOTAL RAINFALL = 3.60, TOTAL LOSS = 1.65, TOTAL EXCESS = 1.95

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
337.	12.50	(CFS)	54.	15.	14.	14.
		(INCHES)	1.796	1.949	1.949	1.949
		(AC-FT)	27.	29.	29.	29.

CUMULATIVE AREA = .28 SQ MI

*** ***

```
          **************
          *            *
35 KK     *   SW140a   *
          *            *
          **************
```

SUBBASIN RUNOFF DATA

36 BA SUBBASIN CHARACTERISTICS
TAREA 1.94 SUBBASIN AREA

PRECIPITATION DATA

7 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35	......		.... TP-40	....				.... TP-49	....		
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.69	1.35	2.37	2.60	2.76	3.05	3.32	3.60	.00	.00	.00	.00

STORM AREA = 1.94

37 LS SCS LOSS RATE
STRTL .16 INITIAL ABSTRACTION
CRVNBR 92.60 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

38 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .35 LAG

***

UNIT HYDROGRAPH
23 END-OF-PERIOD ORDINATES

267.	840.	1728.	2301.	2380.	2099.	1654.	1098.	773.	559.
395.	279.	197.	137.	97.	69.	49.	34.	25.	19.
13.	8.	3.							

*** *** *** *** ***

HYDROGRAPH AT STATION SW140a

TOTAL RAINFALL = 3.59, TOTAL LOSS = .81, TOTAL EXCESS = 2.78

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
3551.	12.42	(CFS)	527.	145.	140.	140.
		(INCHES)	2.526	2.782	2.782	2.782
		(AC-FT)	261.	288.	288.	288.

CUMULATIVE AREA = 1.94 SQ MI

*** ***

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**************
*            *
*      C112  *
*            *
**************
```

39 KK Normal Depth Storage routing to Culvert C112.

HYDROGRAPH ROUTING DATA

40 RS STORAGE ROUTING

NSTPS	4	NUMBER OF SUBREACHES
ITYP	ELEV	TYPE OF INITIAL CONDITION
RSVRIC	1166.50	INITIAL CONDITION
X	.00	WORKING R AND D COEFFICIENT

41 RC NORMAL DEPTH CHANNEL

ANL	.050	LEFT OVERBANK N-VALUE
ANCH	.040	MAIN CHANNEL N-VALUE
ANR	.050	RIGHT OVERBANK N-VALUE
RLNTH	6250.	REACH LENGTH
SEL	.0200	ENERGY SLOPE
ELMAX	.0	MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

CROSS-SECTION DATA

		--- LEFT OVERBANK ---	+	------ MAIN CHANNEL -------	+	--- RIGHT OVERBANK ---		
43 RY	ELEVATION	1170.00	1170.00	1168.00	1166.50	1166.50	1168.00	1170.00	1170.00
42 RX	DISTANCE	.00	1.00	350.00	360.00	390.00	400.00	749.00	750.00

***

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	.00	.83	1.72	2.67	3.69	4.78	5.93	7.14	8.42	10.36
OUTFLOW	.00	9.56	30.80	61.53	101.07	149.18	205.77	270.89	344.60	440.62
ELEVATION	1166.50	1166.68	1166.87	1167.05	1167.24	1167.42	1167.61	1167.79	1167.97	1168.16
STORAGE	13.99	19.32	26.34	35.07	45.49	57.61	71.43	86.95	104.17	123.09
OUTFLOW	567.03	735.99	958.64	1244.83	1603.57	2043.29	2571.95	3197.12	3926.09	4765.88
ELEVATION	1168.34	1168.53	1168.71	1168.89	1169.08	1169.26	1169.45	1169.63	1169.82	1170.00

*** *** *** *** ***

HYDROGRAPH AT STATION C112

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
3043.	12.75	(CFS)	527.	145.	139.	139.
		(INCHES)	2.525	2.776	2.776	2.776
		(AC-FT)	261.	287.	287.	287.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.92-HR
21.	12.75	4.	1.	1.	1.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.92-HR
1169.59	12.75	1167.75	1166.96	1166.95	1166.95

CUMULATIVE AREA = 1.94 SQ MI

*** ***

```
          **************
          *            *
 44 KK    *    SW140b  *
          *            *
          **************

             SUBBASIN RUNOFF DATA

 45 BA          SUBBASIN CHARACTERISTICS
                     TAREA         .22  SUBBASIN AREA

                PRECIPITATION DATA

  7 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .69    1.35    2.37    2.60    2.76    3.05    3.32    3.60     .00     .00     .00     .00

                                                 STORM AREA =      .22

 46 LS          SCS LOSS RATE
                     STRTL        1.17  INITIAL ABSTRACTION
                    CRVNBR       63.00  CURVE NUMBER
                     RTIMP         .00  PERCENT IMPERVIOUS AREA

 47 UD          SCS DIMENSIONLESS UNITGRAPH
                     TLAG         .45  LAG

                                                      ***

                                                  UNIT HYDROGRAPH
                                               29 END-OF-PERIOD ORDINATES
                    17.       51.      105.      170.      207.      216.      203.      176.      141.      101.
                    76.       58.       45.       34.       26.       20.       15.       11.        8.        6.
                     5.        4.        3.        2.        2.        1.        1.        1.        0.

    ***             ***             ***             ***             ***

                          HYDROGRAPH AT STATION   SW140b

   TOTAL RAINFALL =    3.60, TOTAL LOSS =    2.89, TOTAL EXCESS =     .71

PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR        24-HR        72-HR     24.92-HR
    78.      12.67        (CFS)       15.          4.           4.           4.
                        (INCHES)     .629         .708         .708         .708
                         (AC-FT)       7.           8.           8.           8.

                          CUMULATIVE AREA =     .22 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
 48 KK    *      C112  *       Add SW140b to routed Q from SW140a at Culvert C112.
          *            *
          **************

 49 HC          HYDROGRAPH COMBINATION
                     ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                      ***

    ***             ***             ***             ***             ***

                          HYDROGRAPH AT STATION     C112

PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR        24-HR        72-HR     24.92-HR
  3116.      12.75        (CFS)      541.         149.         144.         144.
                        (INCHES)    2.330        2.565        2.565        2.565
                         (AC-FT)      268.         296.         296.         296.

                          CUMULATIVE AREA =    2.16 SQ MI
```

*** ***

****
* *
50 KK * SW150 *
* *
****

SUBBASIN RUNOFF DATA

51 BA SUBBASIN CHARACTERISTICS
TAREA .39 SUBBASIN AREA

PRECIPITATION DATA

7 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.69	1.35	2.37	2.60	2.76	3.05	3.32	3.60	.00	.00	.00	.00

STORM AREA = .39

52 LS SCS LOSS RATE
STRTL .28 INITIAL ABSTRACTION
CRVNBR 87.80 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

53 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .36 LAG

***

UNIT HYDROGRAPH
24 END-OF-PERIOD ORDINATES

50.	157.	327.	445.	468.	422.	342.	235.	164.	119.
86.	61.	43.	31.	22.	16.	11.	8.	6.	4.
3.	2.	1.	0.						

*** *** *** *** ***

HYDROGRAPH AT STATION SW150

TOTAL RAINFALL = 3.60, TOTAL LOSS = 1.26, TOTAL EXCESS = 2.34

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
605.	12.42	(CFS)	90.	25.	24.	24.
		(INCHES)	2.148	2.340	2.340	2.340
		(AC-FT)	45.	49.	49.	49.

CUMULATIVE AREA = .39 SQ MI

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SW90ab	138.	12.17	12.	3.	3.	.05		
HYDROGRAPH AT	SM90c	205.	12.17	18.	5.	5.	.07		
HYDROGRAPH AT	SW90d	95.	12.17	8.	2.	2.	.03		
HYDROGRAPH AT	SW100	1853.	12.42	272.	74.	71.	1.15		
HYDROGRAPH AT	SW110	134.	12.42	19.	5.	5.	.09		
HYDROGRAPH AT	SW120	149.	12.50	25.	7.	7.	.12		
HYDROGRAPH AT	SW130	337.	12.50	54.	15.	14.	.28		
HYDROGRAPH AT	SW140a	3551.	12.42	527.	145.	140.	1.94		
ROUTED TO	C112	3043.	12.75	527.	145.	139.	1.94	1169.59	12.75
HYDROGRAPH AT	SW140b	78.	12.67	15.	4.	4.	.22		
2 COMBINED AT	C112	3116.	12.75	541.	149.	144.	2.16		
HYDROGRAPH AT	SW150	605.	12.42	90.	25.	24.	.39		

*** NORMAL END OF HEC-1 ***
Elapsed Time - 00:00:17.63 (17.63 Seconds)
NORMAL END OF HEC-1

HEC1 S/N: HMVersion: 6.00 Data File: c:\scott\price4

Q100 SW90 - SW150

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             SEPTEMBER 1990            *
*              VERSION 4.0              *
*                                       *
*  RUN DATE  02/25/1992  TIME  09:20:46 *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

```
:::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::
:::                                     :::
:::  Full Microcomputer Implementation  :::
:::                 by                  :::
:::        Haestad Methods, Inc.        :::
:::                                     :::
:::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::
```

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  1       ID        PRICE ROAD PHASE II HYDROLOGY CHECK              <PRICE4>
  2       ID        SOUTH MOUNTAIN (19TH AVE TO SALT RIVER)
  3       ID        100-YEAR 24-HOUR STORM EVENT
          *DIAGRAM
  4       IT      5                   300
  5       IO      3

  6       KK   SW90ab
  7       PH              0    0.79    1.55    2.72    2.97    3.14    3.45    3.74    4.05
  8       BA   0.045
  9       LS            91.5
 10       UD    0.10

 11       KK   SM90c
 12       BA   0.067
 13       LS            91.5
 14       UD    0.10

 15       KK   SW90d
 16       BA   0.031
 17       LS            91.5
 18       UD    0.10

 19       KK   SW100
 20       BA    1.15
 21       LS            88.5
 22       UD    0.35

 23       KK   SW110
 24       BA    0.09
 25       LS              85
 26       UD    0.32

 27       KK   SW120
 28       BA    0.12
 29       LS              85
 30       UD    0.44

 31       KK   SW130
 32       BA    0.28
 33       LS            83.1
 34       UD    0.41

 35       KK   SW140a
 36       BA    1.94
 37       LS            92.6
 38       UD    0.35

 39       KK    C112  Normal Depth Storage routing to Culvert C112.
 40       RS       4    ELEV  1166.5       0
 41       RC    0.05    0.04    0.05    6250   0.020
 42       RX       0       1     350     360     390     400     749     750
 43       RY    1170    1170    1168  1166.5  1166.5    1168    1170    1170
```

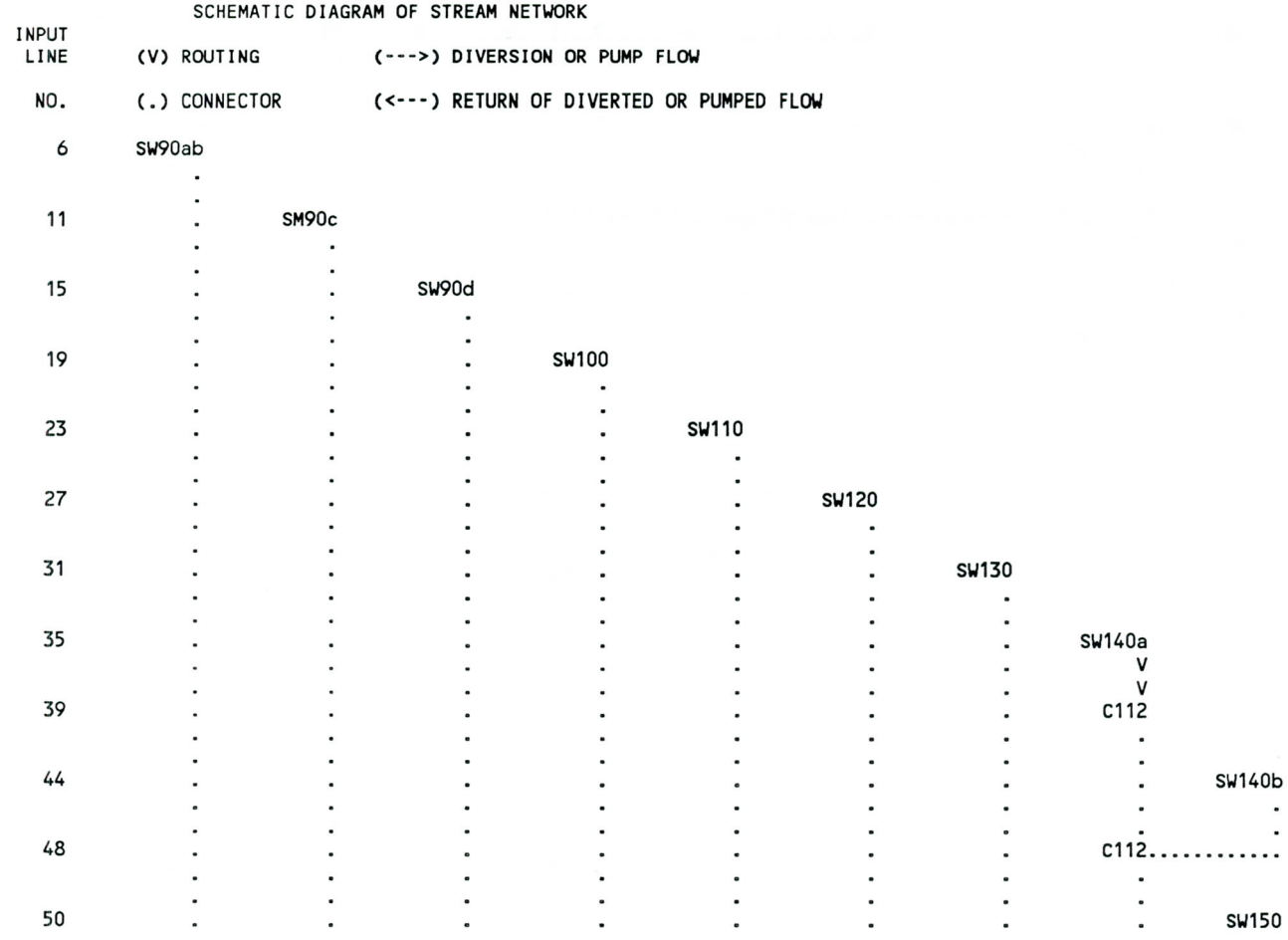
```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  44      KK  SW140b
  45      BA    0.22
  46      LS              63.0
  47      UD    0.45

  48      KK    C112  Add SW140b to routed Q from SW140a at Culvert C112.
  49      HC       2

  50      KK   SW150
  51      BA    0.39
  52      LS              87.8
  53      UD    0.36
  54      ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*          SEPTEMBER 1990               *
*           VERSION 4.0                 *
*                                       *
*  RUN DATE  02/25/1992  TIME  09:20:46 *
*                                       *
*****************************************
```


```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*         609 SECOND STREET             *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
```


PRICE ROAD PHASE II HYDROLOGY CHECK <PRICE4>
SOUTH MOUNTAIN (19TH AVE TO SALT RIVER)
100-YEAR 24-HOUR STORM EVENT

5 IO OUTPUT CONTROL VARIABLES

IPRNT	3	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

NMIN		5	MINUTES IN COMPUTATION INTERVAL
IDATE	1	0	STARTING DATE
ITIME		0000	STARTING TIME
NQ		300	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	2	0	ENDING DATE
NDTIME		0055	ENDING TIME
ICENT		19	CENTURY MARK

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 24.92 HOURS

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-FEET
SURFACE AREA	ACRES
TEMPERATURE	DEGREES FAHRENHEIT

*** ***

```
**************
*            *
*    SW90ab  *
*            *
**************
```

SUBBASIN RUNOFF DATA

8 BA SUBBASIN CHARACTERISTICS

TAREA	.05 SUBBASIN AREA

PRECIPITATION DATA

7 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.79	1.55	2.72	2.97	3.14	3.45	3.74	4.05	.00	.00	.00	.00

STORM AREA = .05

9 LS SCS LOSS RATE

STRTL	.19	INITIAL ABSTRACTION
CRVNBR	91.50	CURVE NUMBER
RTIMP	.00	PERCENT IMPERVIOUS AREA

10 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	.10	LAG

***

UNIT HYDROGRAPH
8 END-OF-PERIOD ORDINATES

99.	146.	64.	25.	9.	4.	1.	0.

*** *** *** *** ***

HYDROGRAPH AT STATION SW90ab

TOTAL RAINFALL = 4.05, TOTAL LOSS = .93, TOTAL EXCESS = 3.12

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
161.	12.17	(CFS)	14.	4.	4.	4.
		(INCHES)	2.847	3.115	3.115	3.115
		(AC-FT)	7.	7.	7.	7.

CUMULATIVE AREA = .05 SQ MI

*** ***

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        **************
        *            *
11 KK   *    SM90c   *
        *            *
        **************
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SUBBASIN RUNOFF DATA

12 BA SUBBASIN CHARACTERISTICS
TAREA .07 SUBBASIN AREA

PRECIPITATION DATA

7 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			.... TP-40					.... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.79	1.55	2.72	2.97	3.14	3.45	3.74	4.05	.00	.00	.00	.00

STORM AREA = .07

13 LS SCS LOSS RATE
STRTL .19 INITIAL ABSTRACTION
CRVNBR 91.50 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

14 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .10 LAG

***

UNIT HYDROGRAPH
8 END-OF-PERIOD ORDINATES

147.	217.	95.	37.	14.	5.	2.	1.

*** *** *** *** ***

HYDROGRAPH AT STATION SM90c

TOTAL RAINFALL = 4.05, TOTAL LOSS = .93, TOTAL EXCESS = 3.11

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
240.	12.17	(CFS)	21.	6.	5.	5.
		(INCHES)	2.847	3.115	3.115	3.115
		(AC-FT)	10.	11.	11.	11.

CUMULATIVE AREA = .07 SQ MI

*** ***

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               **************
               *            *
 15 KK         *   SW90d    *
               *            *
               **************

                  SUBBASIN RUNOFF DATA

 16 BA              SUBBASIN CHARACTERISTICS
                          TAREA          .03  SUBBASIN AREA

                    PRECIPITATION DATA

  7 PH                                      DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                    ..... HYDRO-35 ......    ............... TP-40 ...............    ........... TP-49 ...........
                    5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                      .79    1.55    2.72    2.97    3.14    3.45    3.74    4.05     .00     .00     .00     .00

                                                        STORM AREA =      .03

 17 LS              SCS LOSS RATE
                         STRTL            .19  INITIAL ABSTRACTION
                        CRVNBR          91.50  CURVE NUMBER
                         RTIMP            .00  PERCENT IMPERVIOUS AREA

 18 UD              SCS DIMENSIONLESS UNITGRAPH
                          TLAG            .10  LAG

                                                                 ***

                                                              UNIT HYDROGRAPH
                                                         8 END-OF-PERIOD ORDINATES
                    68.      100.       44.       17.        7.        3.        1.        0.

          ***            ***            ***            ***            ***

                              HYDROGRAPH AT STATION     SW90d

   TOTAL RAINFALL =     4.05, TOTAL LOSS =       .93, TOTAL EXCESS =      3.12

 PEAK FLOW      TIME                                   MAXIMUM AVERAGE FLOW
   (CFS)        (HR)                        6-HR        24-HR        72-HR       24.92-HR
    111.       12.17            (CFS)          9.            3.           3.            3.
                              (INCHES)      2.848        3.115        3.115         3.115
                               (AC-FT)         5.            5.           5.            5.

                             CUMULATIVE AREA =       .03 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

               **************
               *            *
 19 KK         *   SW100    *
               *            *
               **************

                  SUBBASIN RUNOFF DATA

 20 BA              SUBBASIN CHARACTERISTICS
                          TAREA         1.15  SUBBASIN AREA

                    PRECIPITATION DATA

  7 PH                                      DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                    ..... HYDRO-35 ......    ............... TP-40 ...............    ........... TP-49 ...........
                    5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                      .79    1.55    2.72    2.97    3.14    3.45    3.74    4.05     .00     .00     .00     .00

                                                        STORM AREA =     1.15

 21 LS              SCS LOSS RATE
                         STRTL            .26  INITIAL ABSTRACTION
                        CRVNBR          88.50  CURVE NUMBER
                         RTIMP            .00  PERCENT IMPERVIOUS AREA

 22 UD              SCS DIMENSIONLESS UNITGRAPH
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                    TLAG         .35  LAG

                                                ***

                                                UNIT HYDROGRAPH
                                              23 END-OF-PERIOD ORDINATES
              158.      498.     1024.     1364.     1411.     1244.      981.      651.      458.      331.
              234.      165.      117.       81.       58.       41.       29.       20.       15.       11.
                8.        5.        2.

    ***             ***              ***             ***             ***

                    HYDROGRAPH AT STATION    SW100

   TOTAL RAINFALL =    4.04, TOTAL LOSS =    1.23, TOTAL EXCESS =    2.82

PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR        24-HR        72-HR     24.92-HR
   2209.     12.42        (CFS)      320.         87.          84.          84.
                         (INCHES)   2.586        2.816        2.816        2.816
                         (AC-FT)     159.         173.         173.         173.

                    CUMULATIVE AREA =    1.15 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
 23 KK    *     SW110  *
          *            *
          **************

             SUBBASIN RUNOFF DATA

 24 BA         SUBBASIN CHARACTERISTICS
                    TAREA         .09  SUBBASIN AREA

               PRECIPITATION DATA

  7 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
               ..... HYDRO-35 .....   ............. TP-40 .............   ........... TP-49 ...........
               5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                 .79    1.55    2.72    2.97    3.14    3.45    3.74    4.05     .00     .00     .00     .00

                                                STORM AREA =     .09

 25 LS         SCS LOSS RATE
                    STRTL         .35  INITIAL ABSTRACTION
                   CRVNBR       85.00  CURVE NUMBER
                    RTIMP         .00  PERCENT IMPERVIOUS AREA

 26 UD         SCS DIMENSIONLESS UNITGRAPH
                    TLAG         .32  LAG

                                                ***

                                                UNIT HYDROGRAPH
                                              21 END-OF-PERIOD ORDINATES
               15.       49.       97.      119.      115.       95.       66.       44.       30.       21.
               14.       10.        7.        5.        3.        2.        2.        1.        1.        0.
                0.

    ***             ***              ***             ***             ***

                    HYDROGRAPH AT STATION    SW110

   TOTAL RAINFALL =    4.05, TOTAL LOSS =    1.55, TOTAL EXCESS =    2.50

PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR        24-HR        72-HR     24.92-HR
    162.     12.42        (CFS)       22.          6.           6.           6.
                         (INCHES)   2.309        2.502        2.502        2.502
                         (AC-FT)      11.          12.          12.          12.

                    CUMULATIVE AREA =     .09 SQ MI
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          **************
          *            *
27 KK     *     SW120  *
          *            *
          **************

             SUBBASIN RUNOFF DATA

28 BA          SUBBASIN CHARACTERISTICS
                    TAREA         .12  SUBBASIN AREA

               PRECIPITATION DATA

 7 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
               ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
               5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                 .79    1.55    2.72    2.97    3.14    3.45    3.74    4.05     .00     .00     .00     .00

                                                 STORM AREA =      .12

29 LS          SCS LOSS RATE
                    STRTL         .35  INITIAL ABSTRACTION
                   CRVNBR       85.00  CURVE NUMBER
                    RTIMP         .00  PERCENT IMPERVIOUS AREA

30 UD          SCS DIMENSIONLESS UNITGRAPH
                    TLAG         .44  LAG

                                                    ***

                                                 UNIT HYDROGRAPH
                                              28 END-OF-PERIOD ORDINATES
                    10.       30.       61.       97.      117.      120.      111.       95.       74.       53.
                    40.       30.       23.       17.       13.       10.        7.        6.        4.        3.
                     2.        2.        1.        1.        1.        1.        0.        0.

   ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION    SW120

   TOTAL RAINFALL =    4.05, TOTAL LOSS =    1.55, TOTAL EXCESS =    2.50

PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                    6-HR        24-HR        72-HR      24.92-HR
   180.      12.50          (CFS)       30.          8.           8.           8.
                          (INCHES)    2.308        2.501        2.501        2.501
                            (AC-FT)      15.          16.          16.          16.

                       CUMULATIVE AREA =     .12 SQ MI
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          **************
          *            *
31 KK     *     SW130  *
          *            *
          **************

             SUBBASIN RUNOFF DATA

32 BA          SUBBASIN CHARACTERISTICS
                    TAREA         .28  SUBBASIN AREA

               PRECIPITATION DATA

 7 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
               ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
               5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                 .79    1.55    2.72    2.97    3.14    3.45    3.74    4.05     .00     .00     .00     .00
```

STORM AREA = .28

33 LS SCS LOSS RATE
STRTL .41 INITIAL ABSTRACTION
CRVNBR 83.10 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

34 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .41 LAG

***

UNIT HYDROGRAPH
27 END-OF-PERIOD ORDINATES

27.	82.	171.	258.	297.	295.	259.	211.	150.	109.
81.	61.	44.	33.	25.	18.	13.	10.	7.	5.
4.	3.	2.	2.	1.	1.	0.			

*** *** *** *** ***

HYDROGRAPH AT STATION SW130

TOTAL RAINFALL = 4.05, TOTAL LOSS = 1.71, TOTAL EXCESS = 2.34

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
411.	12.50	(CFS)	65.	18.	17.	17.
		(INCHES)	2.158	2.336	2.336	2.336
		(AC-FT)	32.	35.	35.	35.

CUMULATIVE AREA = .28 SQ MI

*** ***

****
* *
35 KK * SW140a *
* *
****

SUBBASIN RUNOFF DATA

36 BA SUBBASIN CHARACTERISTICS
TAREA 1.94 SUBBASIN AREA

PRECIPITATION DATA

7 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.79	1.55	2.72	2.97	3.14	3.45	3.74	4.05	.00	.00	.00	.00

STORM AREA = 1.94

37 LS SCS LOSS RATE
STRTL .16 INITIAL ABSTRACTION
CRVNBR 92.60 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

38 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .35 LAG

***

UNIT HYDROGRAPH
23 END-OF-PERIOD ORDINATES

267.	840.	1728.	2301.	2380.	2099.	1654.	1098.	773.	559.
395.	279.	197.	137.	97.	69.	49.	34.	25.	19.
13.	8.	3.							

*** *** *** *** ***

HYDROGRAPH AT STATION SW140a

TOTAL RAINFALL = 4.04, TOTAL LOSS = .82, TOTAL EXCESS = 3.22

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
4160.	12.42	(CFS)	610.	168.	162.	162.
		(INCHES)	2.926	3.217	3.217	3.217
		(AC-FT)	303.	333.	333.	333.

CUMULATIVE AREA = 1.94 SQ MI

*** ***

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          **************
          *            *
39 KK     *      C112  *       Normal Depth Storage routing to Culvert C112.
          *            *
          **************
```

HYDROGRAPH ROUTING DATA

40 RS STORAGE ROUTING

NSTPS	4	NUMBER OF SUBREACHES
ITYP	ELEV	TYPE OF INITIAL CONDITION
RSVRIC	1166.50	INITIAL CONDITION
X	.00	WORKING R AND D COEFFICIENT

41 RC NORMAL DEPTH CHANNEL

ANL	.050	LEFT OVERBANK N-VALUE
ANCH	.040	MAIN CHANNEL N-VALUE
ANR	.050	RIGHT OVERBANK N-VALUE
RLNTH	6250.	REACH LENGTH
SEL	.0200	ENERGY SLOPE
ELMAX	.0	MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

CROSS-SECTION DATA

		--- LEFT OVERBANK ---	+	------ MAIN CHANNEL -------	+	--- RIGHT OVERBANK ---	
43 RY	ELEVATION	1170.00	1170.00	1168.00	1166.50	1166.50	1168.00	1170.00	1170.00
42 RX	DISTANCE	.00	1.00	350.00	360.00	390.00	400.00	749.00	750.00

***

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	.00	.83	1.72	2.67	3.69	4.78	5.93	7.14	8.42	10.36
OUTFLOW	.00	9.56	30.80	61.53	101.07	149.18	205.77	270.89	344.60	440.62
ELEVATION	1166.50	1166.68	1166.87	1167.05	1167.24	1167.42	1167.61	1167.79	1167.97	1168.16
STORAGE	13.99	19.32	26.34	35.07	45.49	57.61	71.43	86.95	104.17	123.09
OUTFLOW	567.03	735.99	958.64	1244.83	1603.57	2043.29	2571.95	3197.12	3926.09	4765.88
ELEVATION	1168.34	1168.53	1168.71	1168.89	1169.08	1169.26	1169.45	1169.63	1169.82	1170.00

*** *** *** *** ***

HYDROGRAPH AT STATION C112

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
3584.	12.75	(CFS)	610.	167.	161.	161.
		(INCHES)	2.925	3.210	3.210	3.210
		(AC-FT)	303.	332.	332.	332.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.92-HR
24.	12.75	4.	1.	1.	1.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.92-HR
1169.73	12.75	1167.81	1166.99	1166.98	1166.98

CUMULATIVE AREA = 1.94 SQ MI

*** ***

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          **************
          *            *
 44 KK    *    SW140b  *
          *            *
          **************

             SUBBASIN RUNOFF DATA

 45 BA         SUBBASIN CHARACTERISTICS
                    TAREA         .22  SUBBASIN AREA

               PRECIPITATION DATA

  7 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
               ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
               5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                 .79    1.55    2.72    2.97    3.14    3.45    3.74    4.05     .00     .00     .00     .00

                                                 STORM AREA =     .22

 46 LS         SCS LOSS RATE
                    STRTL        1.17  INITIAL ABSTRACTION
                   CRVNBR       63.00  CURVE NUMBER
                    RTIMP         .00  PERCENT IMPERVIOUS AREA

 47 UD         SCS DIMENSIONLESS UNITGRAPH
                    TLAG         .45  LAG

                                                      ***

                                                  UNIT HYDROGRAPH
                                                29 END-OF-PERIOD ORDINATES
                      17.       51.      105.      170.      207.      216.      203.      176.      141.      101.
                      76.       58.       45.       34.       26.       20.       15.       11.        8.        6.
                       5.        4.        3.        2.        2.        1.        1.        1.        0.

    ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION   SW140b

   TOTAL RAINFALL =    4.05, TOTAL LOSS =    3.10, TOTAL EXCESS =     .94

PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR        24-HR        72-HR     24.92-HR
   110.      12.58          (CFS)      20.          6.           5.           5.
                          (INCHES)    .848         .944         .944         .944
                          (AC-FT)      10.          11.          11.          11.

                        CUMULATIVE AREA =     .22 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
 48 KK    *      C112  *       Add SW140b to routed Q from SW140a at Culvert C112.
          *            *
          **************

 49 HC         HYDROGRAPH COMBINATION
                   ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                      ***

    ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION     C112

PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR        24-HR        72-HR     24.92-HR
  3685.      12.75          (CFS)     630.         173.         167.         167.
                          (INCHES)   2.711        2.979        2.979        2.979
                          (AC-FT)     312.         343.         343.         343.

                        CUMULATIVE AREA =    2.16 SQ MI
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          **************
          *            *
50 KK     *     SW150  *
          *            *
          **************

             SUBBASIN RUNOFF DATA

51 BA          SUBBASIN CHARACTERISTICS
                    TAREA         .39  SUBBASIN AREA

               PRECIPITATION DATA

 7 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
               ..... HYDRO-35 .....   ............. TP-40 .............   ........... TP-49 ...........
               5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                 .79    1.55    2.72    2.97    3.14    3.45    3.74    4.05     .00     .00     .00     .00

                                                  STORM AREA =      .39

52 LS          SCS LOSS RATE
                    STRTL         .28  INITIAL ABSTRACTION
                   CRVNBR       87.80  CURVE NUMBER
                    RTIMP         .00  PERCENT IMPERVIOUS AREA

53 UD          SCS DIMENSIONLESS UNITGRAPH
                    TLAG         .36  LAG

                                                     ***

                                                  UNIT HYDROGRAPH
                                              24 END-OF-PERIOD ORDINATES
                    50.     157.     327.     445.     468.     422.     342.     235.     164.     119.
                    86.      61.      43.      31.      22.      16.      11.       8.       6.       4.
                     3.       2.       1.       0.

   ***              ***              ***              ***              ***

                       HYDROGRAPH AT STATION    SW150

   TOTAL RAINFALL =    4.05, TOTAL LOSS =    1.29, TOTAL EXCESS =    2.75

PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                    6-HR        24-HR        72-HR      24.92-HR
   723.      12.42        (CFS)        106.         29.          28.          28.
                         (INCHES)    2.533        2.754        2.754        2.754
                         (AC-FT)        53.          57.          57.          57.

                       CUMULATIVE AREA =     .39 SQ MI
```

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SW90ab	161.	12.17	14.	4.	4.	.05		
HYDROGRAPH AT	SM90c	240.	12.17	21.	6.	5.	.07		
HYDROGRAPH AT	SW90d	111.	12.17	9.	3.	3.	.03		
HYDROGRAPH AT	SW100	2209.	12.42	320.	87.	84.	1.15		
HYDROGRAPH AT	SW110	162.	12.42	22.	6.	6.	.09		
HYDROGRAPH AT	SW120	180.	12.50	30.	8.	8.	.12		
HYDROGRAPH AT	SW130	411.	12.50	65.	18.	17.	.28		
HYDROGRAPH AT	SW140a	4160.	12.42	610.	168.	162.	1.94		
ROUTED TO	C112	3584.	12.75	610.	167.	161.	1.94	1169.73	12.75
HYDROGRAPH AT	SW140b	110.	12.58	20.	6.	5.	.22		
2 COMBINED AT	C112	3685.	12.75	630.	173.	167.	2.16		
HYDROGRAPH AT	SW150	723.	12.42	106.	29.	28.	.39		

*** NORMAL END OF HEC-1 ***
Elapsed Time - 00:00:19.50 (19.50 Seconds)
NORMAL END OF HEC-1

SEGMENT III
HEC-1 ANALYSES
51ST AVE. TO 19TH AVE.
B. SW160 TO SW270 - 50 AND 100 YEAR

HEC1 S/N: HMVersion: 6.00 Data File: c:\scott\price3

Q50 SW160 - SW270

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*         SEPTEMBER 1990                *
*          VERSION 4.0                  *
*                                       *
*  RUN DATE  02/24/1992  TIME  13:05:15 *
*                                       *
*****************************************
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*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*         609 SECOND STREET             *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
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X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
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::::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::::
:::                                      :::
:::  Full Microcomputer Implementation   :::
:::                 by                   :::
:::        Haestad Methods, Inc.         :::
:::                                      :::
::::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::::
```

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  1       ID        PRICE ROAD PHASE II HYDROLOGY CHECK              <PRICE3>
  2       ID        SOUTH MOUNTAIN (19TH AVE TO SALT RIVER)
  3       ID         50-YEAR 24-HOUR STORM EVENT
          *DIAGRAM
  4       IT       5                    300
  5       IO       3

  6       KK  SW160  Culvert C115
  7       PH               0    0.69    1.35    2.37    2.60    2.76    3.05    3.32    3.60
  8       BA    0.49
  9       LS            89.7
 10       UD    0.22

 11       KK  cell10 Route SW160 thru Detention Cell 10.
 12       RS       1    STOR     0.0
 13       SV       0     3.3     6.9    10.7    14.8    19.1    23.7    24.7    25.6    26.6
 14       SV    27.5    28.5    29.5    30.5
 15       SE    1160    1161    1162    1163    1164    1165    1166  1166.2  1166.4  1166.6
 16       SE  1166.8    1167  1167.2  1167.4
 17       SQ       0      13      39      60      78      90     105     164     270     405
 18       SQ     566     749     949    1167
 19       KO       1

 20       KK   SW170  Culvert C116
 21       BA    0.97
 22       LS            90.4
 23       UD    0.31

 24       KK   SW180  Culvert C117
 25       BA    0.04
 26       LS            98.0
 27       UD    0.10

 28       KK   SW190  Culvert C118
 29       BA    0.10
 30       LS            88.8
 31       UD    0.13

 32       KK   SW200  Culvert C119
 33       BA    0.11
 34       LS              82
 35       UD    0.12

 36       KK   SW210  Culvert C120
 37       BA    0.03
 38       LS            79.5
 39       UD    0.17

 40       KK   SW220  Culvert C121
 41       BA    0.06
 42       LS            82.8
 43       UD    0.18
```

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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  44          KK  cell12
  45          HC       5

  46          KK   SW230  Culvert C122
  47          BA    0.06
  48          LS            84.7
  49          UD    0.21

  50          KK   SW240  Culvert C123
  51          BA    0.81
  52          LS            85.9
  53          UD    0.28

  54          KK  cell12  Combine SW180 to SW140 at Detention Cell 12.
  55          HC       3

  56          KK  weir12  Route SW180 to SW240 thru Detention Cell 12.
  57          RS       1    STOR      0.0
  58          SV       0     3.8     14.3     25.4     37.2     49.4     62.5     76.0     90.2     91.6
  59          SV    93.1    94.6     96.0     97.5
  60          SE  1080.6    1081     1082     1083     1084     1085     1086     1087     1088   1088.1
  61          SE  1088.2  1088.3   1088.4   1088.4
  62          SQ       6      13       36       50       60       72       80       88       96      316
  63          SQ     706    1213     1812     2490
  64          KO       1

  65          KK   SW250  Culvert C124
  66          BA    0.21
  67          LS            70.0
  68          UD    0.32

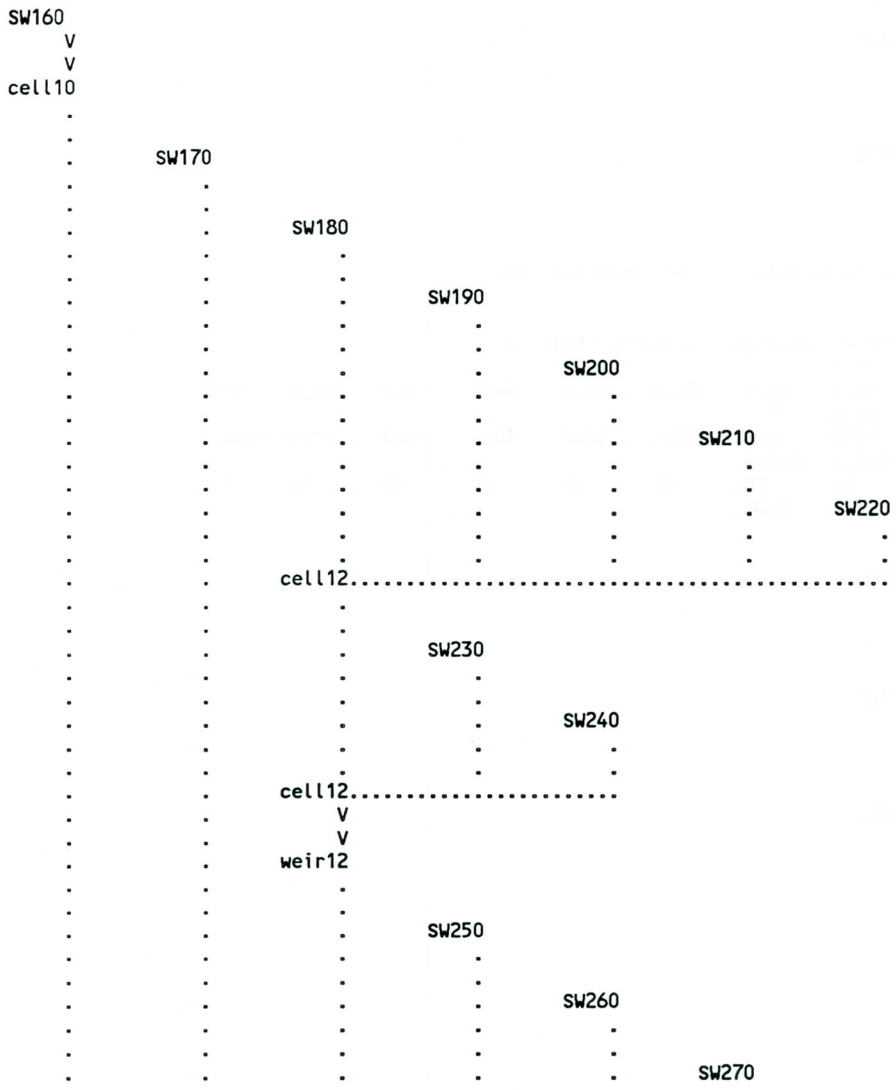
  69          KK   SW260  Culvert C125
  70          BA    0.12
  71          LS            72.8
  72          UD    0.23

  73          KK   SW270  Culvert C126
  74          BA    1.09
  75          LS              90
  76          UD    0.32
  77          ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT LINE NO.

(V) ROUTING
(.) CONNECTOR
(---->) DIVERSION OR PUMP FLOW
(<----) RETURN OF DIVERTED OR PUMPED FLOW



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

HEC1 S/N: HMVersion: 6.00 Data File: c:\scott\price3

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*          SEPTEMBER 1990               *
*           VERSION 4.0                 *
*                                       *
*  RUN DATE  02/24/1992  TIME  13:05:15 *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
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PRICE ROAD PHASE II HYDROLOGY CHECK <PRICE3>
SOUTH MOUNTAIN (19TH AVE TO SALT RIVER)
50-YEAR 24-HOUR STORM EVENT

5 IO OUTPUT CONTROL VARIABLES

IPRNT	3	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

NMIN		5	MINUTES IN COMPUTATION INTERVAL
IDATE	1	0	STARTING DATE
ITIME		0000	STARTING TIME
NQ		300	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	2	0	ENDING DATE
NDTIME		0055	ENDING TIME
ICENT		19	CENTURY MARK

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 24.92 HOURS

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-FEET
SURFACE AREA	ACRES
TEMPERATURE	DEGREES FAHRENHEIT

*** ***

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**************
*            *
*    SW160   *
*            *
**************
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6 KK Culvert C115

SUBBASIN RUNOFF DATA

8 BA SUBBASIN CHARACTERISTICS

TAREA	.49	SUBBASIN AREA

PRECIPITATION DATA

7 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.69	1.35	2.37	2.60	2.76	3.05	3.32	3.60	.00	.00	.00	.00

STORM AREA = .49

9 LS SCS LOSS RATE

STRTL	.23	INITIAL ABSTRACTION
CRVNBR	89.70	CURVE NUMBER
RTIMP	.00	PERCENT IMPERVIOUS AREA

10 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	.22	LAG

***

UNIT HYDROGRAPH
15 END-OF-PERIOD ORDINATES

193. 653. 903. 797. 516. 295. 180. 107. 63. 37.
23. 13. 8. 5. 2.

*** *** *** *** ***

HYDROGRAPH AT STATION SW160

TOTAL RAINFALL = 3.60, TOTAL LOSS = 1.09, TOTAL EXCESS = 2.51

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
1043.	12.25	(CFS)	121.	33.	32.	32.
		(INCHES)	2.299	2.512	2.512	2.512
		(AC-FT)	60.	66.	66.	66.

CUMULATIVE AREA = .49 SQ MI

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          **************
          *            *
 11 KK    *    cell10  *      Route SW160 thru Detention Cell 10.
          *            *
          **************
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19 KO OUTPUT CONTROL VARIABLES
IPRNT 1 PRINT CONTROL
IPLOT 0 PLOT CONTROL
QSCAL 0. HYDROGRAPH PLOT SCALE

HYDROGRAPH ROUTING DATA

12 RS STORAGE ROUTING
NSTPS 1 NUMBER OF SUBREACHES
ITYP STOR TYPE OF INITIAL CONDITION
RSVRIC .00 INITIAL CONDITION
X .00 WORKING R AND D COEFFICIENT

13 SV	STORAGE	.0	3.3	6.9	10.7	14.8	19.1	23.7	24.7	25.6	26.6
		27.5	28.5	29.5	30.5						
15 SE	ELEVATION	1160.00	1161.00	1162.00	1163.00	1164.00	1165.00	1166.00	1166.20	1166.40	1166.60
		1166.80	1167.00	1167.20	1167.40						
17 SQ	DISCHARGE	0.	13.	39.	60.	78.	90.	105.	164.	270.	405.
		566.	749.	949.	1167.						

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HYDROGRAPH AT STATION cell10

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DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	1160.0	1		0820	101	0.	.0	1160.0	1		1640	201	50.	8.9	1162.5
1		0005	2	0.	.0	1160.0	1		0825	102	0.	.0	1160.0	1		1645	202	49.	8.6	1162.5
1		0010	3	0.	.0	1160.0	1		0830	103	0.	.0	1160.0	1		1650	203	47.	8.4	1162.4
1		0015	4	0.	.0	1160.0	1		0835	104	0.	.0	1160.0	1		1655	204	46.	8.2	1162.3
1		0020	5	0.	.0	1160.0	1		0840	105	0.	.0	1160.0	1		1700	205	45.	7.9	1162.3
1		0025	6	0.	.0	1160.0	1		0845	106	0.	.0	1160.0	1		1705	206	44.	7.7	1162.2
1		0030	7	0.	.0	1160.0	1		0850	107	0.	.0	1160.0	1		1710	207	42.	7.5	1162.2
1		0035	8	0.	.0	1160.0	1		0855	108	0.	.0	1160.0	1		1715	208	41.	7.3	1162.1
1		0040	9	0.	.0	1160.0	1		0900	109	0.	.0	1160.0	1		1720	209	40.	7.1	1162.1
1		0045	10	0.	.0	1160.0	1		0905	110	0.	.0	1160.0	1		1725	210	39.	6.9	1162.0
1		0050	11	0.	.0	1160.0	1		0910	111	0.	.0	1160.0	1		1730	211	38.	6.7	1162.0
1		0055	12	0.	.0	1160.0	1		0915	112	0.	.0	1160.0	1		1735	212	36.	6.6	1161.9
1		0100	13	0.	.0	1160.0	1		0920	113	0.	.0	1160.0	1		1740	213	35.	6.4	1161.9
1		0105	14	0.	.0	1160.0	1		0925	114	0.	.1	1160.0	1		1745	214	34.	6.2	1161.8
1		0110	15	0.	.0	1160.0	1		0930	115	0.	.1	1160.0	1		1750	215	33.	6.1	1161.8

1	0115	16	0.	.0	1160.0	*	1	0935	116	0.	.1	1160.0	*	1	1755	216	32.	5.9	1161.7
1	0120	17	0.	.0	1160.0	*	1	0940	117	0.	.1	1160.0	*	1	1800	217	31.	5.8	1161.7
1	0125	18	0.	.0	1160.0	*	1	0945	118	1.	.1	1160.0	*	1	1805	218	30.	5.6	1161.6
1	0130	19	0.	.0	1160.0	*	1	0950	119	1.	.1	1160.0	*	1	1810	219	29.	5.5	1161.6
1	0135	20	0.	.0	1160.0	*	1	0955	120	1.	.2	1160.1	*	1	1815	220	28.	5.4	1161.6
1	0140	21	0.	.0	1160.0	*	1	1000	121	1.	.2	1160.1	*	1	1820	221	27.	5.3	1161.5
1	0145	22	0.	.0	1160.0	*	1	1005	122	1.	.2	1160.1	*	1	1825	222	26.	5.1	1161.5
1	0150	23	0.	.0	1160.0	*	1	1010	123	1.	.3	1160.1	*	1	1830	223	25.	5.0	1161.5
1	0155	24	0.	.0	1160.0	*	1	1015	124	1.	.3	1160.1	*	1	1835	224	25.	4.9	1161.4
1	0200	25	0.	.0	1160.0	*	1	1020	125	1.	.3	1160.1	*	1	1840	225	24.	4.8	1161.4
1	0205	26	0.	.0	1160.0	*	1	1025	126	1.	.4	1160.1	*	1	1845	226	23.	4.7	1161.4
1	0210	27	0.	.0	1160.0	*	1	1030	127	2.	.4	1160.1	*	1	1850	227	22.	4.6	1161.4
1	0215	28	0.	.0	1160.0	*	1	1035	128	2.	.5	1160.1	*	1	1855	228	22.	4.5	1161.3
1	0220	29	0.	.0	1160.0	*	1	1040	129	2.	.5	1160.2	*	1	1900	229	21.	4.4	1161.3
1	0225	30	0.	.0	1160.0	*	1	1045	130	2.	.6	1160.2	*	1	1905	230	21.	4.3	1161.3
1	0230	31	0.	.0	1160.0	*	1	1050	131	2.	.6	1160.2	*	1	1910	231	20.	4.3	1161.3
1	0235	32	0.	.0	1160.0	*	1	1055	132	3.	.7	1160.2	*	1	1915	232	19.	4.2	1161.2
1	0240	33	0.	.0	1160.0	*	1	1100	133	3.	.8	1160.2	*	1	1920	233	19.	4.1	1161.2
1	0245	34	0.	.0	1160.0	*	1	1105	134	3.	.8	1160.3	*	1	1925	234	18.	4.0	1161.2
1	0250	35	0.	.0	1160.0	*	1	1110	135	4.	.9	1160.3	*	1	1930	235	18.	4.0	1161.2
1	0255	36	0.	.0	1160.0	*	1	1115	136	4.	1.0	1160.3	*	1	1935	236	17.	3.9	1161.2
1	0300	37	0.	.0	1160.0	*	1	1120	137	4.	1.1	1160.3	*	1	1940	237	17.	3.8	1161.2
1	0305	38	0.	.0	1160.0	*	1	1125	138	5.	1.3	1160.4	*	1	1945	238	17.	3.8	1161.1
1	0310	39	0.	.0	1160.0	*	1	1130	139	5.	1.4	1160.4	*	1	1950	239	16.	3.7	1161.1
1	0315	40	0.	.0	1160.0	*	1	1135	140	6.	1.6	1160.5	*	1	1955	240	16.	3.7	1161.1
1	0320	41	0.	.0	1160.0	*	1	1140	141	7.	1.8	1160.6	*	1	2000	241	15.	3.6	1161.1
1	0325	42	0.	.0	1160.0	*	1	1145	142	9.	2.2	1160.7	*	1	2005	242	15.	3.6	1161.1
1	0330	43	0.	.0	1160.0	*	1	1150	143	11.	2.9	1160.9	*	1	2010	243	15.	3.5	1161.1
1	0335	44	0.	.0	1160.0	*	1	1155	144	17.	3.9	1161.2	*	1	2015	244	14.	3.5	1161.0
1	0340	45	0.	.0	1160.0	*	1	1200	145	28.	5.4	1161.6	*	1	2020	245	14.	3.4	1161.0
1	0345	46	0.	.0	1160.0	*	1	1205	146	45.	8.0	1162.3	*	1	2025	246	14.	3.4	1161.0
1	0350	47	0.	.0	1160.0	*	1	1210	147	68.	12.5	1163.4	*	1	2030	247	13.	3.3	1161.0
1	0355	48	0.	.0	1160.0	*	1	1215	148	88.	18.5	1164.9	*	1	2035	248	13.	3.3	1161.0
1	0400	49	0.	.0	1160.0	*	1	1220	149	161.	24.6	1166.2	*	1	2040	249	13.	3.3	1161.0
1	0405	50	0.	.0	1160.0	*	1	1225	150	668.	28.1	1166.9	*	1	2045	250	13.	3.2	1161.0
1	0410	51	0.	.0	1160.0	*	1	1230	151	714.	28.3	1167.0	*	1	2050	251	13.	3.2	1161.0
1	0415	52	0.	.0	1160.0	*	1	1235	152	597.	27.7	1166.8	*	1	2055	252	12.	3.1	1161.0
1	0420	53	0.	.0	1160.0	*	1	1240	153	469.	27.0	1166.7	*	1	2100	253	12.	3.1	1160.9
1	0425	54	0.	.0	1160.0	*	1	1245	154	362.	26.3	1166.5	*	1	2105	254	12.	3.1	1160.9
1	0430	55	0.	.0	1160.0	*	1	1250	155	278.	25.7	1166.4	*	1	2110	255	12.	3.0	1160.9
1	0435	56	0.	.0	1160.0	*	1	1255	156	212.	25.1	1166.3	*	1	2115	256	12.	3.0	1160.9
1	0440	57	0.	.0	1160.0	*	1	1300	157	163.	24.7	1166.2	*	1	2120	257	12.	3.0	1160.9
1	0445	58	0.	.0	1160.0	*	1	1305	158	141.	24.3	1166.1	*	1	2125	258	12.	2.9	1160.9
1	0450	59	0.	.0	1160.0	*	1	1310	159	121.	24.0	1166.1	*	1	2130	259	11.	2.9	1160.9
1	0455	60	0.	.0	1160.0	*	1	1315	160	105.	23.7	1166.0	*	1	2135	260	11.	2.9	1160.9
1	0500	61	0.	.0	1160.0	*	1	1320	161	104.	23.4	1165.9	*	1	2140	261	11.	2.8	1160.9
1	0505	62	0.	.0	1160.0	*	1	1325	162	103.	23.0	1165.9	*	1	2145	262	11.	2.8	1160.8
1	0510	63	0.	.0	1160.0	*	1	1330	163	102.	22.7	1165.8	*	1	2150	263	11.	2.8	1160.8
1	0515	64	0.	.0	1160.0	*	1	1335	164	101.	22.3	1165.7	*	1	2155	264	11.	2.7	1160.8
1	0520	65	0.	.0	1160.0	*	1	1340	165	99.	21.9	1165.6	*	1	2200	265	11.	2.7	1160.8
1	0525	66	0.	.0	1160.0	*	1	1345	166	98.	21.6	1165.5	*	1	2205	266	11.	2.7	1160.8
1	0530	67	0.	.0	1160.0	*	1	1350	167	97.	21.2	1165.4	*	1	2210	267	10.	2.6	1160.8
1	0535	68	0.	.0	1160.0	*	1	1355	168	95.	20.8	1165.4	*	1	2215	268	10.	2.6	1160.8
1	0540	69	0.	.0	1160.0	*	1	1400	169	94.	20.4	1165.3	*	1	2220	269	10.	2.6	1160.8
1	0545	70	0.	.0	1160.0	*	1	1405	170	93.	20.0	1165.2	*	1	2225	270	10.	2.6	1160.8
1	0550	71	0.	.0	1160.0	*	1	1410	171	91.	19.6	1165.1	*	1	2230	271	10.	2.5	1160.8
1	0555	72	0.	.0	1160.0	*	1	1415	172	90.	19.2	1165.0	*	1	2235	272	10.	2.5	1160.8
1	0600	73	0.	.0	1160.0	*	1	1420	173	89.	18.8	1164.9	*	1	2240	273	10.	2.5	1160.8
1	0605	74	0.	.0	1160.0	*	1	1425	174	88.	18.3	1164.8	*	1	2245	274	10.	2.5	1160.7
1	0610	75	0.	.0	1160.0	*	1	1430	175	87.	17.9	1164.7	*	1	2250	275	10.	2.4	1160.7
1	0615	76	0.	.0	1160.0	*	1	1435	176	86.	17.5	1164.6	*	1	2255	276	9.	2.4	1160.7
1	0620	77	0.	.0	1160.0	*	1	1440	177	85.	17.1	1164.5	*	1	2300	277	9.	2.4	1160.7
1	0625	78	0.	.0	1160.0	*	1	1445	178	83.	16.7	1164.5	*	1	2305	278	9.	2.4	1160.7
1	0630	79	0.	.0	1160.0	*	1	1450	179	82.	16.3	1164.4	*	1	2310	279	9.	2.3	1160.7
1	0635	80	0.	.0	1160.0	*	1	1455	180	81.	16.0	1164.3	*	1	2315	280	9.	2.3	1160.7
1	0640	81	0.	.0	1160.0	*	1	1500	181	80.	15.6	1164.2	*	1	2320	281	9.	2.3	1160.7
1	0645	82	0.	.0	1160.0	*	1	1505	182	79.	15.2	1164.1	*	1	2325	282	9.	2.3	1160.7
1	0650	83	0.	.0	1160.0	*	1	1510	183	78.	14.8	1164.0	*	1	2330	283	9.	2.2	1160.7
1	0655	84	0.	.0	1160.0	*	1	1515	184	76.	14.4	1163.9	*	1	2335	284	9.	2.2	1160.7
1	0700	85	0.	.0	1160.0	*	1	1520	185	75.	14.0	1163.8	*	1	2340	285	9.	2.2	1160.7
1	0705	86	0.	.0	1160.0	*	1	1525	186	73.	13.6	1163.7	*	1	2345	286	9.	2.2	1160.7
1	0710	87	0.	.0	1160.0	*	1	1530	187	71.	13.3	1163.6	*	1	2350	287	8.	2.1	1160.7
1	0715	88	0.	.0	1160.0	*	1	1535	188	70.	12.9	1163.5	*	1	2355	288	8.	2.1	1160.6
1	0720	89	0.	.0	1160.0	*	1	1540	189	68.	12.6	1163.5	*	2	0000	289	8.	2.1	1160.6
1	0725	90	0.	.0	1160.0	*	1	1545	190	67.	12.2	1163.4	*	2	0005	290	8.	2.1	1160.6
1	0730	91	0.	.0	1160.0	*	1	1550	191	65.	11.9	1163.3	*	2	0010	291	8.	2.1	1160.6
1	0735	92	0.	.0	1160.0	*	1	1555	192	64.	11.5	1163.2	*	2	0015	292	8.	2.0	1160.6
1	0740	93	0.	.0	1160.0	*	1	1600	193	62.	11.2	1163.1	*	2	0020	293	8.	2.0	1160.6
1	0745	94	0.	.0	1160.0	*	1	1605	194	61.	10.9	1163.0	*	2	0025	294	8.	1.9	1160.6
1	0750	95	0.	.0	1160.0	*	1	1610	195	59.	10.6	1163.0	*	2	0030	295	7.	1.9	1160.6

```
  1     0755  96       0.       .0  1160.0 *  1     1615 196       58.      10.3  1162.9 *  2     0035 296        7.      1.9  1160.6
  1     0800  97       0.       .0  1160.0 *  1     1620 197       56.      10.0  1162.8 *  2     0040 297        7.      1.8  1160.5
  1     0805  98       0.       .0  1160.0 *  1     1625 198       54.       9.7  1162.7 *  2     0045 298        7.      1.8  1160.5
  1     0810  99       0.       .0  1160.0 *  1     1630 199       53.       9.4  1162.7 *  2     0050 299        7.      1.7  1160.5
  1     0815 100       0.       .0  1160.0 *  1     1635 200       51.       9.2  1162.6 *  2     0055 300        7.      1.7  1160.5
                                           *                                          *
*************************************************************************************************************************************************

 PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                 6-HR          24-HR          72-HR       24.92-HR
    714.      12.50       (CFS)      112.           32.            31.           31.
                         (INCHES)   2.119          2.448          2.448         2.448
                         (AC-FT)     55.           64.            64.           64.

 PEAK STORAGE  TIME                              MAXIMUM AVERAGE STORAGE
   (AC-FT)     (HR)                 6-HR          24-HR          72-HR       24.92-HR
     28.       12.50                15.            5.             5.            5.

 PEAK STAGE    TIME                              MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                 6-HR          24-HR          72-HR       24.92-HR
  1166.96      12.50              1164.06       1161.32        1161.27       1161.27

                         CUMULATIVE AREA =     .49 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
 20 KK    *     SW170  *       Culvert C116
          *            *
          **************

             SUBBASIN RUNOFF DATA

 21 BA         SUBBASIN CHARACTERISTICS
                    TAREA          .97  SUBBASIN AREA

               PRECIPITATION DATA

  7 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
               ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
               5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                 .69    1.35    2.37    2.60    2.76    3.05    3.32    3.60     .00     .00     .00     .00

                                                 STORM AREA =     .97

 22 LS         SCS LOSS RATE
                    STRTL          .21  INITIAL ABSTRACTION
                   CRVNBR        90.40  CURVE NUMBER
                    RTIMP          .00  PERCENT IMPERVIOUS AREA

 23 UD         SCS DIMENSIONLESS UNITGRAPH
                    TLAG          .31  LAG

                                                    ***

                                                UNIT HYDROGRAPH
                                             21 END-OF-PERIOD ORDINATES
                    178.      571.     1110.     1327.     1252.     1011.      668.      444.      309.      208.
                    141.       96.       65.       45.       30.       20.       14.       10.        7.        3.
                      0.

    ***             ***              ***             ***             ***

                       HYDROGRAPH AT STATION    SW170

   TOTAL RAINFALL =    3.60, TOTAL LOSS =    1.02, TOTAL EXCESS =    2.57

 PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                 6-HR          24-HR          72-HR       24.92-HR
  1763.      12.33       (CFS)      245.           67.            65.           65.
                         (INCHES)   2.352          2.575          2.575         2.575
                         (AC-FT)     122.          133.           133.          133.

                         CUMULATIVE AREA =     .97 SQ MI
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*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

          **************
          *            *
 24 KK    *     SW180  *       Culvert C117
          *            *
          **************

             SUBBASIN RUNOFF DATA

 25 BA         SUBBASIN CHARACTERISTICS
                    TAREA         .04  SUBBASIN AREA

               PRECIPITATION DATA

  7 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
               ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
               5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                 .69    1.35    2.37    2.60    2.76    3.05    3.32    3.60     .00     .00     .00     .00

                                                 STORM AREA =      .04

 26 LS         SCS LOSS RATE
                    STRTL         .04  INITIAL ABSTRACTION
                   CRVNBR       98.00  CURVE NUMBER
                    RTIMP         .00  PERCENT IMPERVIOUS AREA

 27 UD         SCS DIMENSIONLESS UNITGRAPH
                    TLAG         .10  LAG

                                                      ***

                                                   UNIT HYDROGRAPH
                                                 8 END-OF-PERIOD ORDINATES
                 88.      130.       57.       22.        8.        3.        1.        0.

     ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION    SW180

    TOTAL RAINFALL =    3.60, TOTAL LOSS =     .23, TOTAL EXCESS =    3.37

 PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                    6-HR        24-HR       72-HR     24.92-HR
    140.      12.17        (CFS)         13.          4.          3.          3.
                          (INCHES)     2.966       3.366       3.366       3.366
                          (AC-FT)         6.          7.          7.          7.

                      CUMULATIVE AREA =     .04 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

          **************
          *            *
 28 KK    *     SW190  *       Culvert C118
          *            *
          **************

             SUBBASIN RUNOFF DATA

 29 BA         SUBBASIN CHARACTERISTICS
                    TAREA         .10  SUBBASIN AREA

               PRECIPITATION DATA

  7 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
               ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
               5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                 .69    1.35    2.37    2.60    2.76    3.05    3.32    3.60     .00     .00     .00     .00

                                                 STORM AREA =      .10
```

```
30 LS          SCS LOSS RATE
                    STRTL         .25  INITIAL ABSTRACTION
                   CRVNBR       88.80  CURVE NUMBER
                    RTIMP         .00  PERCENT IMPERVIOUS AREA

31 UD          SCS DIMENSIONLESS UNITGRAPH
                    TLAG         .13  LAG

                                                    ***

                                                UNIT HYDROGRAPH
                                             10 END-OF-PERIOD ORDINATES
            127.      283.      205.       88.       40.       18.        8.        4.        2.        0.

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION    SW190

   TOTAL RAINFALL =    3.60, TOTAL LOSS =    1.17, TOTAL EXCESS =    2.43

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR       72-HR     24.92-HR
   261.     12.17        (CFS)       24.         7.          6.          6.
                        (INCHES)   2.230       2.431       2.431       2.431
                        (AC-FT)     12.         13.         13.         13.

                      CUMULATIVE AREA =     .10 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
32 KK     *     SW200  *       Culvert C119
          *            *
          **************

             SUBBASIN RUNOFF DATA

33 BA          SUBBASIN CHARACTERISTICS
                    TAREA         .11  SUBBASIN AREA

               PRECIPITATION DATA

 7 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
               ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
               5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                 .69    1.35    2.37    2.60    2.76    3.05    3.32    3.60     .00     .00     .00     .00

                                                STORM AREA =     .11

34 LS          SCS LOSS RATE
                    STRTL         .44  INITIAL ABSTRACTION
                   CRVNBR       82.00  CURVE NUMBER
                    RTIMP         .00  PERCENT IMPERVIOUS AREA

35 UD          SCS DIMENSIONLESS UNITGRAPH
                    TLAG         .12  LAG

                                                    ***

                                                UNIT HYDROGRAPH
                                              9 END-OF-PERIOD ORDINATES
            165.      330.      207.       85.       37.       16.        7.        3.        1.

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION    SW200

   TOTAL RAINFALL =    3.60, TOTAL LOSS =    1.73, TOTAL EXCESS =    1.87

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR       72-HR     24.92-HR
   229.     12.17        (CFS)       20.         6.          5.          5.
                        (INCHES)   1.722       1.865       1.865       1.865
                        (AC-FT)     10.         11.         11.         11.
```

CUMULATIVE AREA = .11 SQ MI

*** ***

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* *
36 KK * SW210 * Culvert C120
* *
****

SUBBASIN RUNOFF DATA

37 BA SUBBASIN CHARACTERISTICS
TAREA .03 SUBBASIN AREA

PRECIPITATION DATA

7 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.69	1.35	2.37	2.60	2.76	3.05	3.32	3.60	.00	.00	.00	.00

STORM AREA = .03

38 LS SCS LOSS RATE
STRTL .52 INITIAL ABSTRACTION
CRVNBR 79.50 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

39 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .17 LAG

***

UNIT HYDROGRAPH
12 END-OF-PERIOD ORDINATES

21.	63.	65.	41.	20.	11.	6.	3.	2.	1.
0.	0.								

*** *** *** *** ***

HYDROGRAPH AT STATION SW210

TOTAL RAINFALL = 3.60, TOTAL LOSS = 1.92, TOTAL EXCESS = 1.68

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
48.	12.25	(CFS)	5.	1.	1.	1.
		(INCHES)	1.549	1.680	1.680	1.680
		(AC-FT)	2.	3.	3.	3.

CUMULATIVE AREA = .03 SQ MI

*** ***

****
* *
40 KK * SW220 * Culvert C121
* *
****

SUBBASIN RUNOFF DATA

41 BA SUBBASIN CHARACTERISTICS
TAREA .06 SUBBASIN AREA

PRECIPITATION DATA

7 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.69	1.35	2.37	2.60	2.76	3.05	3.32	3.60	.00	.00	.00	.00

STORM AREA = .06

42 LS SCS LOSS RATE

STRTL	.42	INITIAL ABSTRACTION
CRVNBR	82.80	CURVE NUMBER
RTIMP	.00	PERCENT IMPERVIOUS AREA

43 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	.18	LAG

***

UNIT HYDROGRAPH
13 END-OF-PERIOD ORDINATES

37.	115.	127.	88.	45.	25.	13.	7.	4.	2.
1.	1.	0.							

*** *** *** *** ***

HYDROGRAPH AT STATION SW220

TOTAL RAINFALL = 3.60, TOTAL LOSS = 1.67, TOTAL EXCESS = 1.93

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
109.	12.25	(CFS)	11.	3.	3.	3.
		(INCHES)	1.778	1.927	1.927	1.927
		(AC-FT)	6.	6.	6.	6.

CUMULATIVE AREA = .06 SQ MI

*** ***

****
* *
44 KK * cell12 *
* *
****

45 HC HYDROGRAPH COMBINATION

ICOMP	5	NUMBER OF HYDROGRAPHS TO COMBINE

***

*** *** *** *** ***

HYDROGRAPH AT STATION cell12

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
769.	12.17	(CFS)	73.	20.	19.	19.
		(INCHES)	1.997	2.203	2.203	2.203
		(AC-FT)	36.	40.	40.	40.

CUMULATIVE AREA = .34 SQ MI

*** ***

****
* *
46 KK * SW230 * Culvert C122
* *
****

SUBBASIN RUNOFF DATA

47 BA SUBBASIN CHARACTERISTICS

TAREA	.06	SUBBASIN AREA

PRECIPITATION DATA

```
 7 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                  ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
                  5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                    .69    1.35    2.37    2.60    2.76    3.05    3.32    3.60     .00     .00     .00     .00

                                                STORM AREA =      .06

 48 LS          SCS LOSS RATE
                      STRTL         .36  INITIAL ABSTRACTION
                     CRVNBR       84.70  CURVE NUMBER
                      RTIMP         .00  PERCENT IMPERVIOUS AREA

 49 UD          SCS DIMENSIONLESS UNITGRAPH
                      TLAG         .21  LAG

                                                ***

                                                UNIT HYDROGRAPH
                                            15 END-OF-PERIOD ORDINATES
                  26.      88.     115.      97.      58.      33.      20.      12.       7.       4.
                   2.       1.       1.       0.       0.

    ***             ***             ***             ***             ***

                          HYDROGRAPH AT STATION    SW230

    TOTAL RAINFALL =    3.60, TOTAL LOSS =    1.52, TOTAL EXCESS =    2.08

  PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
    (CFS)       (HR)                    6-HR       24-HR       72-HR      24.92-HR
     110.      12.25          (CFS)       12.          3.          3.          3.
                             (INCHES)   1.916       2.079       2.079       2.079
                             (AC-FT)       6.          7.          7.          7.

                          CUMULATIVE AREA =     .06 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


              **************
              *            *
 50 KK        *     SW240  *       Culvert C123
              *            *
              **************

                 SUBBASIN RUNOFF DATA

 51 BA             SUBBASIN CHARACTERISTICS
                      TAREA         .81  SUBBASIN AREA

                   PRECIPITATION DATA

 7 PH                               DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                  ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
                  5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                    .69    1.35    2.37    2.60    2.76    3.05    3.32    3.60     .00     .00     .00     .00

                                                STORM AREA =      .81

 52 LS          SCS LOSS RATE
                      STRTL         .33  INITIAL ABSTRACTION
                     CRVNBR       85.90  CURVE NUMBER
                      RTIMP         .00  PERCENT IMPERVIOUS AREA

 53 UD          SCS DIMENSIONLESS UNITGRAPH
                      TLAG         .28  LAG

                                                ***

                                                UNIT HYDROGRAPH
                                            19 END-OF-PERIOD ORDINATES
                 187.     614.    1102.    1213.    1051.     749.     465.     309.     204.     133.
                  87.      57.      37.      25.      16.      11.       7.       4.       1.

    ***             ***             ***             ***             ***

                          HYDROGRAPH AT STATION    SW240
```

TOTAL RAINFALL = 3.60, TOTAL LOSS = 1.42, TOTAL EXCESS = 2.18

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
1339.	12.33	(CFS)	174.	47.	46.	46.
		(INCHES)	2.001	2.175	2.175	2.175
		(AC-FT)	86.	94.	94.	94.

CUMULATIVE AREA = .81 SQ MI

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          **************
          *            *
 54 KK    *    cell12  *       Combine SW180 to SW140 at Detention Cell 12.
          *            *
          **************
```

55 HC HYDROGRAPH COMBINATION
ICOMP 3 NUMBER OF HYDROGRAPHS TO COMBINE

***

*** *** *** *** ***

HYDROGRAPH AT STATION cell12

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
1998.	12.25	(CFS)	260.	71.	68.	68.
		(INCHES)	1.995	2.178	2.178	2.178
		(AC-FT)	129.	141.	141.	141.

CUMULATIVE AREA = 1.21 SQ MI

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          **************
          *            *
 56 KK    *    weir12  *       Route SW180 to SW240 thru Detention Cell 12.
          *            *
          **************
```

64 KO OUTPUT CONTROL VARIABLES
IPRNT 1 PRINT CONTROL
IPLOT 0 PLOT CONTROL
QSCAL 0. HYDROGRAPH PLOT SCALE

HYDROGRAPH ROUTING DATA

57 RS STORAGE ROUTING
NSTPS 1 NUMBER OF SUBREACHES
ITYP STOR TYPE OF INITIAL CONDITION
RSVRIC .00 INITIAL CONDITION
X .00 WORKING R AND D COEFFICIENT

58 SV	STORAGE	.0	3.8	14.3	25.4	37.2	49.4	62.5	76.0	90.2	91.6
		93.1	94.6	96.0	97.5						
60 SE	ELEVATION	1080.60	1081.00	1082.00	1083.00	1084.00	1085.00	1086.00	1087.00	1088.00	1088.10
		1088.20	1088.30	1088.40	1088.40						
62 SQ	DISCHARGE	6.	13.	36.	50.	60.	72.	80.	88.	96.	316.
		706.	1213.	1812.	2490.						

***

*** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN 706. TO 2490.
THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

HYDROGRAPH AT STATION weir12

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	6.	.0	1080.6	1		0820	101	6.	.0	1080.6	1		1640	201	91.	80.5	1087.3
1		0005	2	6.	.0	1080.6	1		0825	102	6.	.0	1080.6	1		1645	202	90.	80.0	1087.3
1		0010	3	6.	.0	1080.6	1		0830	103	6.	.0	1080.6	1		1650	203	90.	79.6	1087.3
1		0015	4	6.	.0	1080.6	1		0835	104	6.	.0	1080.6	1		1655	204	90.	79.2	1087.2
1		0020	5	6.	.0	1080.6	1		0840	105	6.	.0	1080.6	1		1700	205	90.	78.8	1087.2
1		0025	6	6.	.0	1080.6	1		0845	106	6.	.0	1080.6	1		1705	206	89.	78.4	1087.2
1		0030	7	6.	.0	1080.6	1		0850	107	6.	.0	1080.6	1		1710	207	89.	78.0	1087.1
1		0035	8	6.	.0	1080.6	1		0855	108	6.	.0	1080.6	1		1715	208	89.	77.5	1087.1
1		0040	9	6.	.0	1080.6	1		0900	109	6.	.0	1080.6	1		1720	209	89.	77.1	1087.1
1		0045	10	6.	.0	1080.6	1		0905	110	6.	.0	1080.6	1		1725	210	88.	76.7	1087.0
1		0050	11	6.	.0	1080.6	1		0910	111	6.	.0	1080.6	1		1730	211	88.	76.3	1087.0
1		0055	12	6.	.0	1080.6	1		0915	112	6.	.0	1080.6	1		1735	212	88.	75.8	1087.0
1		0100	13	6.	.0	1080.6	1		0920	113	6.	.0	1080.6	1		1740	213	88.	75.4	1087.0
1		0105	14	6.	.0	1080.6	1		0925	114	6.	.0	1080.6	1		1745	214	87.	75.0	1086.9
1		0110	15	6.	.0	1080.6	1		0930	115	6.	.0	1080.6	1		1750	215	87.	74.6	1086.9
1		0115	16	6.	.0	1080.6	1		0935	116	6.	.0	1080.6	1		1755	216	87.	74.1	1086.9
1		0120	17	6.	.0	1080.6	1		0940	117	6.	.0	1080.6	1		1800	217	87.	73.7	1086.8
1		0125	18	6.	.0	1080.6	1		0945	118	6.	.0	1080.6	1		1805	218	86.	73.3	1086.8
1		0130	19	6.	.0	1080.6	1		0950	119	6.	.0	1080.6	1		1810	219	86.	72.9	1086.8
1		0135	20	6.	.0	1080.6	1		0955	120	6.	.0	1080.6	1		1815	220	86.	72.4	1086.7
1		0140	21	6.	.0	1080.6	1		1000	121	6.	.0	1080.6	1		1820	221	86.	72.0	1086.7
1		0145	22	6.	.0	1080.6	1		1005	122	6.	.0	1080.6	1		1825	222	85.	71.6	1086.7
1		0150	23	6.	.0	1080.6	1		1010	123	6.	.0	1080.6	1		1830	223	85.	71.1	1086.6
1		0155	24	6.	.0	1080.6	1		1015	124	6.	.0	1080.6	1		1835	224	85.	70.7	1086.6
1		0200	25	6.	.0	1080.6	1		1020	125	6.	.0	1080.6	1		1840	225	85.	70.3	1086.6
1		0205	26	6.	.0	1080.6	1		1025	126	6.	.0	1080.6	1		1845	226	84.	69.8	1086.5
1		0210	27	6.	.0	1080.6	1		1030	127	6.	.0	1080.6	1		1850	227	84.	69.4	1086.5
1		0215	28	6.	.0	1080.6	1		1035	128	6.	.0	1080.6	1		1855	228	84.	68.9	1086.5
1		0220	29	6.	.0	1080.6	1		1040	129	6.	.0	1080.6	1		1900	229	84.	68.5	1086.4
1		0225	30	6.	.0	1080.6	1		1045	130	6.	.1	1080.6	1		1905	230	83.	68.1	1086.4
1		0230	31	6.	.0	1080.6	1		1050	131	6.	.1	1080.6	1		1910	231	83.	67.6	1086.4
1		0235	32	6.	.0	1080.6	1		1055	132	6.	.2	1080.6	1		1915	232	83.	67.2	1086.3
1		0240	33	6.	.0	1080.6	1		1100	133	6.	.2	1080.6	1		1920	233	83.	66.8	1086.3
1		0245	34	6.	.0	1080.6	1		1105	134	7.	.3	1080.6	1		1925	234	82.	66.3	1086.3
1		0250	35	6.	.0	1080.6	1		1110	135	7.	.4	1080.6	1		1930	235	82.	65.9	1086.3
1		0255	36	6.	.0	1080.6	1		1115	136	7.	.5	1080.7	1		1935	236	82.	65.5	1086.2
1		0300	37	6.	.0	1080.6	1		1120	137	7.	.7	1080.7	1		1940	237	82.	65.0	1086.2
1		0305	38	6.	.0	1080.6	1		1125	138	8.	.8	1080.7	1		1945	238	81.	64.6	1086.2
1		0310	39	6.	.0	1080.6	1		1130	139	8.	1.0	1080.7	1		1950	239	81.	64.2	1086.1
1		0315	40	6.	.0	1080.6	1		1135	140	8.	1.3	1080.7	1		1955	240	81.	63.7	1086.1
1		0320	41	6.	.0	1080.6	1		1140	141	9.	1.7	1080.8	1		2000	241	80.	63.3	1086.1
1		0325	42	6.	.0	1080.6	1		1145	142	11.	2.5	1080.9	1		2005	242	80.	62.9	1086.0
1		0330	43	6.	.0	1080.6	1		1150	143	13.	3.7	1081.0	1		2010	243	80.	62.4	1086.0
1		0335	44	6.	.0	1080.6	1		1155	144	17.	5.5	1081.2	1		2015	244	80.	62.0	1086.0
1		0340	45	6.	.0	1080.6	1		1200	145	23.	8.5	1081.4	1		2020	245	79.	61.6	1085.9
1		0345	46	6.	.0	1080.6	1		1205	146	36.	14.2	1082.0	1		2025	246	79.	61.2	1085.9
1		0350	47	6.	.0	1080.6	1		1210	147	48.	23.7	1082.8	1		2030	247	79.	60.7	1085.9
1		0355	48	6.	.0	1080.6	1		1215	148	59.	36.1	1083.9	1		2035	248	79.	60.3	1085.8
1		0400	49	6.	.0	1080.6	1		1220	149	72.	49.3	1085.0	1		2040	249	78.	59.9	1085.8
1		0405	50	6.	.0	1080.6	1		1225	150	79.	61.4	1085.9	1		2045	250	78.	59.5	1085.8
1		0410	51	6.	.0	1080.6	1		1230	151	85.	71.7	1086.7	1		2050	251	78.	59.0	1085.7
1		0415	52	6.	.0	1080.6	1		1235	152	90.	80.0	1087.3	1		2055	252	78.	58.6	1085.7
1		0420	53	6.	.0	1080.6	1		1240	153	94.	86.3	1087.7	1		2100	253	77.	58.2	1085.7
1		0425	54	6.	.0	1080.6	1		1245	154	168.	90.7	1088.0	1		2105	254	77.	57.8	1085.6
1		0430	55	6.	.0	1080.6	1		1250	155	505.	92.3	1088.1	1		2110	255	77.	57.3	1085.6
1		0435	56	6.	.0	1080.6	1		1255	156	440.	92.1	1088.1	1		2115	256	77.	56.9	1085.6
1		0440	57	6.	.0	1080.6	1		1300	157	340.	91.7	1088.1	1		2120	257	76.	56.5	1085.5
1		0445	58	6.	.0	1080.6	1		1305	158	281.	91.4	1088.1	1		2125	258	76.	56.1	1085.5
1		0450	59	6.	.0	1080.6	1		1310	159	236.	91.1	1088.1	1		2130	259	76.	55.7	1085.5
1		0455	60	6.	.0	1080.6	1		1315	160	199.	90.9	1088.0	1		2135	260	76.	55.3	1085.4
1		0500	61	6.	.0	1080.6	1		1320	161	172.	90.7	1088.0	1		2140	261	75.	54.8	1085.4
1		0505	62	6.	.0	1080.6	1		1325	162	152.	90.6	1088.0	1		2145	262	75.	54.4	1085.4
1		0510	63	6.	.0	1080.6	1		1330	163	136.	90.5	1088.0	1		2150	263	75.	54.0	1085.4
1		0515	64	6.	.0	1080.6	1		1335	164	124.	90.4	1088.0	1		2155	264	75.	53.6	1085.3
1		0520	65	6.	.0	1080.6	1		1340	165	114.	90.3	1088.0	1		2200	265	74.	53.2	1085.3
1		0525	66	6.	.0	1080.6	1		1345	166	105.	90.3	1088.0	1		2205	266	74.	52.8	1085.3
1		0530	67	6.	.0	1080.6	1		1350	167	98.	90.2	1088.0	1		2210	267	74.	52.4	1085.2
1		0535	68	6.	.0	1080.6	1		1355	168	96.	90.2	1088.0	1		2215	268	74.	52.0	1085.2
1		0540	69	6.	.0	1080.6	1		1400	169	96.	90.1	1088.0	1		2220	269	73.	51.6	1085.2
1		0545	70	6.	.0	1080.6	1		1405	170	96.	90.0	1088.0	1		2225	270	73.	51.2	1085.1
1		0550	71	6.	.0	1080.6	1		1410	171	96.	89.9	1088.0	1		2230	271	73.	50.7	1085.1
1		0555	72	6.	.0	1080.6	1		1415	172	96.	89.7	1088.0	1		2235	272	73.	50.3	1085.1

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 1     0600  73      6.       .0  1080.6 *  1     1420 173      96.     89.6  1088.0 *  1     2240 273      72.     49.9  1085.0
 1     0605  74      6.       .0  1080.6 *  1     1425 174      96.     89.4  1087.9 *  1     2245 274      72.     49.5  1085.0
 1     0610  75      6.       .0  1080.6 *  1     1430 175      95.     89.2  1087.9 *  1     2250 275      72.     49.1  1085.0
 1     0615  76      6.       .0  1080.6 *  1     1435 176      95.     89.0  1087.9 *  1     2255 276      71.     48.7  1084.9
 1     0620  77      6.       .0  1080.6 *  1     1440 177      95.     88.8  1087.9 *  1     2300 277      71.     48.3  1084.9
 1     0625  78      6.       .0  1080.6 *  1     1445 178      95.     88.6  1087.9 *  1     2305 278      71.     47.9  1084.9
 1     0630  79      6.       .0  1080.6 *  1     1450 179      95.     88.3  1087.9 *  1     2310 279      70.     47.6  1084.8
 1     0635  80      6.       .0  1080.6 *  1     1455 180      95.     88.1  1087.8 *  1     2315 280      70.     47.2  1084.8
 1     0640  81      6.       .0  1080.6 *  1     1500 181      95.     87.8  1087.8 *  1     2320 281      69.     46.8  1084.8
 1     0645  82      6.       .0  1080.6 *  1     1505 182      94.     87.5  1087.8 *  1     2325 282      69.     46.4  1084.8
 1     0650  83      6.       .0  1080.6 *  1     1510 183      94.     87.2  1087.8 *  1     2330 283      69.     46.0  1084.7
 1     0655  84      6.       .0  1080.6 *  1     1515 184      94.     86.9  1087.8 *  1     2335 284      68.     45.6  1084.7
 1     0700  85      6.       .0  1080.6 *  1     1520 185      94.     86.6  1087.7 *  1     2340 285      68.     45.2  1084.7
 1     0705  86      6.       .0  1080.6 *  1     1525 186      94.     86.3  1087.7 *  1     2345 286      68.     44.9  1084.6
 1     0710  87      6.       .0  1080.6 *  1     1530 187      94.     85.9  1087.7 *  1     2350 287      67.     44.5  1084.6
 1     0715  88      6.       .0  1080.6 *  1     1535 188      93.     85.5  1087.7 *  1     2355 288      67.     44.1  1084.6
 1     0720  89      6.       .0  1080.6 *  1     1540 189      93.     85.2  1087.6 *  2     0000 289      66.     43.7  1084.5
 1     0725  90      6.       .0  1080.6 *  1     1545 190      93.     84.8  1087.6 *  2     0005 290      66.     43.4  1084.5
 1     0730  91      6.       .0  1080.6 *  1     1550 191      93.     84.4  1087.6 *  2     0010 291      66.     43.0  1084.5
 1     0735  92      6.       .0  1080.6 *  1     1555 192      93.     84.0  1087.6 *  2     0015 292      65.     42.6  1084.4
 1     0740  93      6.       .0  1080.6 *  1     1600 193      92.     83.7  1087.5 *  2     0020 293      65.     42.2  1084.4
 1     0745  94      6.       .0  1080.6 *  1     1605 194      92.     83.3  1087.5 *  2     0025 294      64.     41.8  1084.4
 1     0750  95      6.       .0  1080.6 *  1     1610 195      92.     82.9  1087.5 *  2     0030 295      64.     41.3  1084.3
 1     0755  96      6.       .0  1080.6 *  1     1615 196      92.     82.5  1087.5 *  2     0035 296      64.     40.9  1084.3
 1     0800  97      6.       .0  1080.6 *  1     1620 197      91.     82.1  1087.4 *  2     0040 297      63.     40.5  1084.3
 1     0805  98      6.       .0  1080.6 *  1     1625 198      91.     81.7  1087.4 *  2     0045 298      63.     40.0  1084.2
 1     0810  99      6.       .0  1080.6 *  1     1630 199      91.     81.3  1087.4 *  2     0050 299      62.     39.6  1084.2
 1     0815 100      6.       .0  1080.6 *  1     1635 200      91.     80.9  1087.3 *  2     0055 300      62.     39.2  1084.2
                                        *                                    *
*********************************************************************************************************************************************

 PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR          24-HR          72-HR       24.92-HR
    505.      12.83        (CFS)      116.           53.            51.           51.
                          (INCHES)    .894          1.634          1.641         1.641
                           (AC-FT)     58.           105.           106.          106.

 PEAK STORAGE  TIME                              MAXIMUM AVERAGE STORAGE
   (AC-FT)     (HR)                  6-HR          24-HR          72-HR       24.92-HR
     92.       12.83                  84.           36.            35.           35.

 PEAK STAGE    TIME                              MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                  6-HR          24-HR          72-HR       24.92-HR
  1088.15      12.83              1087.55       1083.70        1083.59       1083.59

                          CUMULATIVE AREA =    1.21 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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          *            *
 65 KK    *     SW250  *       Culvert C124
          *            *
          **************

             SUBBASIN RUNOFF DATA

 66 BA          SUBBASIN CHARACTERISTICS
                      TAREA         .21  SUBBASIN AREA

                PRECIPITATION DATA

  7 PH                              DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .69    1.35    2.37    2.60    2.76    3.05    3.32    3.60     .00     .00     .00     .00

                                                STORM AREA =     .21

 67 LS          SCS LOSS RATE
                      STRTL         .86  INITIAL ABSTRACTION
                     CRVNBR       70.00  CURVE NUMBER
                      RTIMP         .00  PERCENT IMPERVIOUS AREA

 68 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG         .32  LAG
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UNIT HYDROGRAPH
21 END-OF-PERIOD ORDINATES

36.	114.	226.	278.	269.	223.	153.	102.	71.	49.
34.	23.	16.	11.	7.	5.	4.	3.	2.	1.
0.									

*** *** *** *** ***

HYDROGRAPH AT STATION SW250

TOTAL RAINFALL = 3.60, TOTAL LOSS = 2.53, TOTAL EXCESS = 1.07

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
149.	12.42	(CFS)	22.	6.	6.	6.
		(INCHES)	.971	1.070	1.070	1.070
		(AC-FT)	11.	12.	12.	12.

CUMULATIVE AREA = .21 SQ MI

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*            *
*    SW260   *
*            *
**************
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69 KK Culvert C125

SUBBASIN RUNOFF DATA

70 BA SUBBASIN CHARACTERISTICS
TAREA .12 SUBBASIN AREA

PRECIPITATION DATA

7 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.69	1.35	2.37	2.60	2.76	3.05	3.32	3.60	.00	.00	.00	.00

STORM AREA = .12

71 LS SCS LOSS RATE
STRTL .75 INITIAL ABSTRACTION
CRVNBR 72.80 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

72 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .23 LAG

***

UNIT HYDROGRAPH
16 END-OF-PERIOD ORDINATES

42.	145.	212.	194.	136.	78.	48.	29.	18.	11.
6.	4.	2.	2.	1.	0.				

*** *** *** *** ***

HYDROGRAPH AT STATION SW260

TOTAL RAINFALL = 3.60, TOTAL LOSS = 2.36, TOTAL EXCESS = 1.23

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
119.	12.33	(CFS)	15.	4.	4.	4.
		(INCHES)	1.129	1.235	1.235	1.235
		(AC-FT)	7.	8.	8.	8.

CUMULATIVE AREA = .12 SQ MI

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          **************
          *            *
 73 KK    *     SW270  *       Culvert C126
          *            *
          **************

             SUBBASIN RUNOFF DATA

 74 BA         SUBBASIN CHARACTERISTICS
                    TAREA        1.09  SUBBASIN AREA

               PRECIPITATION DATA

  7 PH                              DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
               ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
               5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                 .69    1.35    2.37    2.60    2.76    3.05    3.32    3.60     .00     .00     .00     .00

                                                 STORM AREA =    1.09

 75 LS         SCS LOSS RATE
                    STRTL         .22  INITIAL ABSTRACTION
                   CRVNBR       90.00  CURVE NUMBER
                    RTIMP         .00  PERCENT IMPERVIOUS AREA

 76 UD         SCS DIMENSIONLESS UNITGRAPH
                    TLAG         .32  LAG

                                                    ***

                                                UNIT HYDROGRAPH
                                             21 END-OF-PERIOD ORDINATES
                185.      593.     1173.     1444.     1395.     1155.      796.      530.      368.      256.
                175.      120.       81.       56.       39.       27.       18.       13.        9.        6.
                  2.

    ***            ***            ***            ***            ***

                       HYDROGRAPH AT STATION    SW270

   TOTAL RAINFALL =    3.59, TOTAL LOSS =    1.06, TOTAL EXCESS =    2.54

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     24.92-HR
  1922.      12.42       (CFS)      272.         74.         72.         72.
                        (INCHES)   2.319       2.537       2.537       2.537
                        (AC-FT)    135.        147.        147.        147.

                       CUMULATIVE AREA =    1.09 SQ MI
```

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SW160	1043.	12.25	121.	33.	32.	.49		
ROUTED TO	cell10	714.	12.50	112.	32.	31.	.49	1166.96	12.50
HYDROGRAPH AT	SW170	1763.	12.33	245.	67.	65.	.97		
HYDROGRAPH AT	SW180	140.	12.17	13.	4.	3.	.04		
HYDROGRAPH AT	SW190	261.	12.17	24.	7.	6.	.10		
HYDROGRAPH AT	SW200	229.	12.17	20.	6.	5.	.11		
HYDROGRAPH AT	SW210	48.	12.25	5.	1.	1.	.03		
HYDROGRAPH AT	SW220	109.	12.25	11.	3.	3.	.06		
5 COMBINED AT	cell12	769.	12.17	73.	20.	19.	.34		
HYDROGRAPH AT	SW230	110.	12.25	12.	3.	3.	.06		
HYDROGRAPH AT	SW240	1339.	12.33	174.	47.	46.	.81		
3 COMBINED AT	cell12	1998.	12.25	260.	71.	68.	1.21		
ROUTED TO	weir12	505.	12.83	116.	53.	51.	1.21	1088.15	12.83
HYDROGRAPH AT	SW250	149.	12.42	22.	6.	6.	.21		
HYDROGRAPH AT	SW260	119.	12.33	15.	4.	4.	.12		
HYDROGRAPH AT	SW270	1922.	12.42	272.	74.	72.	1.09		

*** NORMAL END OF HEC-1 ***
Elapsed Time - 00:00:24.77 (24.77 Seconds)
NORMAL END OF HEC-1

Q100 SW160 - SW270

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*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE (HEC-1)    *
*         SEPTEMBER 1990                *
*          VERSION 4.0                  *
*                                       *
*  RUN DATE  02/24/1992  TIME  12:38:41 *
*                                       *
*****************************************
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*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*         609 SECOND STREET             *
*       DAVIS, CALIFORNIA 95616         *
*          (916) 756-1104               *
*                                       *
*****************************************
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X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
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::::::::::::::::::::::::::::::::::::::::::::
:::                                      :::
:::  Full Microcomputer Implementation   :::
:::                 by                   :::
:::        Haestad Methods, Inc.         :::
:::                                      :::
::::::::::::::::::::::::::::::::::::::::::::
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37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  1       ID        PRICE ROAD PHASE II HYDROLOGY CHECK                <PRICE3>
  2       ID        SOUTH MOUNTAIN (19TH AVE TO SALT RIVER)
  3       ID        100-YEAR 24-HOUR STORM EVENT
          *DIAGRAM
  4       IT      5                   300
  5       IO      3

  6       KK  SW160  Culvert C115
  7       PH              0    0.79    1.55    2.72    2.97    3.14    3.45    3.74    4.05
  8       BA   0.49
  9       LS           89.7
 10       UD   0.22

 11       KK  cell10 Route SW160 thru Detention Cell 10.
 12       RS      1    STOR     0.0
 13       SV      0     3.3     6.9    10.7    14.8    19.1    23.7    24.7    25.6    26.6
 14       SV   27.5    28.5    29.5    30.5
 15       SE   1160    1161    1162    1163    1164    1165    1166    1166.2  1166.4  1166.6
 16       SE 1166.8    1167  1167.2  1167.4
 17       SQ      0      13      39      60      78      90     105     164     270     405
 18       SQ    566     749     949    1167
 19       KO      1

 20       KK   SW170  Culvert C116
 21       BA   0.97
 22       LS           90.4
 23       UD   0.31

 24       KK   SW180  Culvert C117
 25       BA   0.04
 26       LS           98.0
 27       UD   0.10

 28       KK   SW190  Culvert C118
 29       BA   0.10
 30       LS           88.8
 31       UD   0.13

 32       KK   SW200  Culvert C119
 33       BA   0.11
 34       LS             82
 35       UD   0.12

 36       KK   SW210  Culvert C120
 37       BA   0.03
 38       LS           79.5
 39       UD   0.17

 40       KK   SW220  Culvert C121
 41       BA   0.06
 42       LS           82.8
 43       UD   0.18
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  44      KK  cell12
  45      HC       5

  46      KK   SW230  Culvert C122
  47      BA    0.06
  48      LS            84.7
  49      UD    0.21

  50      KK   SW240  Culvert C123
  51      BA    0.81
  52      LS            85.9
  53      UD    0.28

  54      KK  cell12  Combine SW180 to SW140 at Detention Cell 12.
  55      HC       3

  56      KK  weir12  Route SW180 to SW240 thru Detention Cell 12.
  57      RS       1    STOR      0.0
  58      SV       0     3.8     14.3     25.4     37.2     49.4     62.5     76.0     90.2     91.6
  59      SV    93.1    94.6     96.0     97.5
  60      SE  1080.6    1081     1082     1083     1084     1085     1086     1087     1088   1088.1
  61      SE  1088.2  1088.3   1088.4   1088.4
  62      SQ       6      13       36       50       60       72       80       88       96      316
  63      SQ     706    1213     1812     2490
  64      KO       1

  65      KK   SW250  Culvert C124
  66      BA    0.21
  67      LS            70.0
  68      UD    0.32

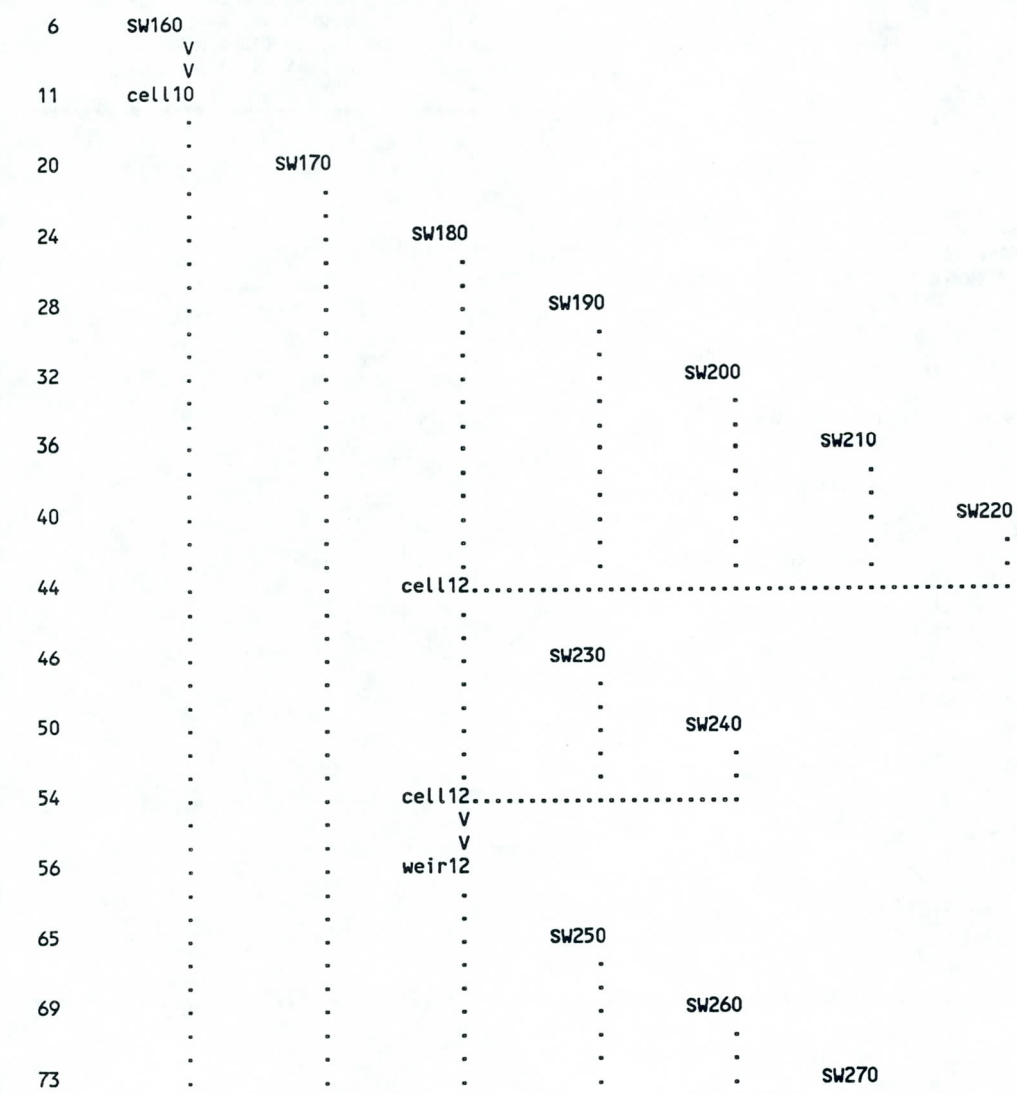
  69      KK   SW260  Culvert C125
  70      BA    0.12
  71      LS            72.8
  72      UD    0.23

  73      KK   SW270  Culvert C126
  74      BA    1.09
  75      LS              90
  76      UD    0.32
  77      ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT LINE NO.

(V) ROUTING
(.) CONNECTOR
(---->) DIVERSION OR PUMP FLOW
(<----) RETURN OF DIVERTED OR PUMPED FLOW



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*           SEPTEMBER 1990              *
*            VERSION 4.0                *
*                                       *
*  RUN DATE  02/24/1992  TIME  12:38:41 *
*                                       *
*****************************************
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*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
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PRICE ROAD PHASE II HYDROLOGY CHECK <PRICE3>
SOUTH MOUNTAIN (19TH AVE TO SALT RIVER)
100-YEAR 24-HOUR STORM EVENT

```
  5 IO          OUTPUT CONTROL VARIABLES
                     IPRNT          3  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE

    IT          HYDROGRAPH TIME DATA
                      NMIN          5  MINUTES IN COMPUTATION INTERVAL
                     IDATE      1   0  STARTING DATE
                     ITIME         0000  STARTING TIME
                        NQ          300  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE      2   0  ENDING DATE
                    NDTIME         0055  ENDING TIME
                     ICENT           19  CENTURY MARK

                  COMPUTATION INTERVAL      .08 HOURS
                       TOTAL TIME BASE    24.92 HOURS

        ENGLISH UNITS
             DRAINAGE AREA          SQUARE MILES
             PRECIPITATION DEPTH    INCHES
             LENGTH, ELEVATION      FEET
             FLOW                   CUBIC FEET PER SECOND
             STORAGE VOLUME         ACRE-FEET
             SURFACE AREA           ACRES
             TEMPERATURE            DEGREES FAHRENHEIT


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
  6 KK    *    SW160   *      Culvert C115
          *            *
          **************

             SUBBASIN RUNOFF DATA

  8 BA         SUBBASIN CHARACTERISTICS
                     TAREA         .49  SUBBASIN AREA

               PRECIPITATION DATA

  7 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
               ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
               5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                 .79    1.55    2.72    2.97    3.14    3.45    3.74    4.05     .00     .00     .00     .00

                                                 STORM AREA =      .49

  9 LS         SCS LOSS RATE
                     STRTL         .23  INITIAL ABSTRACTION
                    CRVNBR       89.70  CURVE NUMBER
                     RTIMP         .00  PERCENT IMPERVIOUS AREA

 10 UD         SCS DIMENSIONLESS UNITGRAPH
                      TLAG         .22  LAG
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UNIT HYDROGRAPH
15 END-OF-PERIOD ORDINATES

193. 653. 903. 797. 516. 295. 180. 107. 63. 37.
23. 13. 8. 5. 2.

*** *** *** *** ***

HYDROGRAPH AT STATION SW160

TOTAL RAINFALL = 4.05, TOTAL LOSS = 1.11, TOTAL EXCESS = 2.93

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
1238.	12.25	(CFS)	142.	39.	37.	37.
		(INCHES)	2.692	2.935	2.935	2.935
		(AC-FT)	70.	77.	77.	77.

CUMULATIVE AREA = .49 SQ MI

*** ***

****
* *
11 KK * cell10 * Route SW160 thru Detention Cell 10.
* *
****

19 KO OUTPUT CONTROL VARIABLES
IPRNT 1 PRINT CONTROL
IPLOT 0 PLOT CONTROL
QSCAL 0. HYDROGRAPH PLOT SCALE

HYDROGRAPH ROUTING DATA

12 RS STORAGE ROUTING
NSTPS 1 NUMBER OF SUBREACHES
ITYP STOR TYPE OF INITIAL CONDITION
RSVRIC .00 INITIAL CONDITION
X .00 WORKING R AND D COEFFICIENT

13 SV	STORAGE	.0	3.3	6.9	10.7	14.8	19.1	23.7	24.7	25.6	26.6
		27.5	28.5	29.5	30.5						
15 SE	ELEVATION	1160.00	1161.00	1162.00	1163.00	1164.00	1165.00	1166.00	1166.20	1166.40	1166.60
		1166.80	1167.00	1167.20	1167.40						
17 SQ	DISCHARGE	0.	13.	39.	60.	78.	90.	105.	164.	270.	405.
		566.	749.	949.	1167.						

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HYDROGRAPH AT STATION cell10

****

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	1160.0	1		0820	101	0.	.0	1160.0	1		1640	201	52.	9.3	1162.6
1		0005	2	0.	.0	1160.0	1		0825	102	0.	.0	1160.0	1		1645	202	51.	9.0	1162.6
1		0010	3	0.	.0	1160.0	1		0830	103	0.	.0	1160.0	1		1650	203	49.	8.8	1162.5
1		0015	4	0.	.0	1160.0	1		0835	104	0.	.0	1160.0	1		1655	204	48.	8.5	1162.4
1		0020	5	0.	.0	1160.0	1		0840	105	0.	.0	1160.0	1		1700	205	47.	8.3	1162.4
1		0025	6	0.	.0	1160.0	1		0845	106	0.	.0	1160.0	1		1705	206	45.	8.1	1162.3
1		0030	7	0.	.0	1160.0	1		0850	107	0.	.0	1160.0	1		1710	207	44.	7.9	1162.3
1		0035	8	0.	.0	1160.0	1		0855	108	0.	.0	1160.0	1		1715	208	43.	7.6	1162.2
1		0040	9	0.	.0	1160.0	1		0900	109	0.	.1	1160.0	1		1720	209	42.	7.4	1162.1
1		0045	10	0.	.0	1160.0	1		0905	110	0.	.1	1160.0	1		1725	210	41.	7.2	1162.1
1		0050	11	0.	.0	1160.0	1		0910	111	0.	.1	1160.0	1		1730	211	40.	7.1	1162.0
1		0055	12	0.	.0	1160.0	1		0915	112	0.	.1	1160.0	1		1735	212	39.	6.9	1162.0
1		0100	13	0.	.0	1160.0	1		0920	113	0.	.1	1160.0	1		1740	213	37.	6.7	1161.9
1		0105	14	0.	.0	1160.0	1		0925	114	0.	.1	1160.0	1		1745	214	36.	6.5	1161.9
1		0110	15	0.	.0	1160.0	1		0930	115	1.	.1	1160.0	1		1750	215	35.	6.3	1161.8

1	0115	16	0.	.0	1160.0	*	1	0935	116	1.	.2	1160.0	*	1	1755	216	34.	6.2	1161.8
1	0120	17	0.	.0	1160.0	*	1	0940	117	1.	.2	1160.1	*	1	1800	217	33.	6.0	1161.8
1	0125	18	0.	.0	1160.0	*	1	0945	118	1.	.2	1160.1	*	1	1805	218	32.	5.9	1161.7
1	0130	19	0.	.0	1160.0	*	1	0950	119	1.	.2	1160.1	*	1	1810	219	31.	5.8	1161.7
1	0135	20	0.	.0	1160.0	*	1	0955	120	1.	.3	1160.1	*	1	1815	220	30.	5.6	1161.6
1	0140	21	0.	.0	1160.0	*	1	1000	121	1.	.3	1160.1	*	1	1820	221	29.	5.5	1161.6
1	0145	22	0.	.0	1160.0	*	1	1005	122	1.	.3	1160.1	*	1	1825	222	28.	5.4	1161.6
1	0150	23	0.	.0	1160.0	*	1	1010	123	1.	.4	1160.1	*	1	1830	223	27.	5.3	1161.5
1	0155	24	0.	.0	1160.0	*	1	1015	124	2.	.4	1160.1	*	1	1835	224	26.	5.1	1161.5
1	0200	25	0.	.0	1160.0	*	1	1020	125	2.	.5	1160.1	*	1	1840	225	26.	5.0	1161.5
1	0205	26	0.	.0	1160.0	*	1	1025	126	2.	.5	1160.2	*	1	1845	226	25.	4.9	1161.5
1	0210	27	0.	.0	1160.0	*	1	1030	127	2.	.6	1160.2	*	1	1850	227	24.	4.8	1161.4
1	0215	28	0.	.0	1160.0	*	1	1035	128	2.	.6	1160.2	*	1	1855	228	23.	4.7	1161.4
1	0220	29	0.	.0	1160.0	*	1	1040	129	3.	.7	1160.2	*	1	1900	229	23.	4.6	1161.4
1	0225	30	0.	.0	1160.0	*	1	1045	130	3.	.7	1160.2	*	1	1905	230	22.	4.6	1161.4
1	0230	31	0.	.0	1160.0	*	1	1050	131	3.	.8	1160.2	*	1	1910	231	21.	4.5	1161.3
1	0235	32	0.	.0	1160.0	*	1	1055	132	4.	.9	1160.3	*	1	1915	232	21.	4.4	1161.3
1	0240	33	0.	.0	1160.0	*	1	1100	133	4.	1.0	1160.3	*	1	1920	233	20.	4.3	1161.3
1	0245	34	0.	.0	1160.0	*	1	1105	134	4.	1.1	1160.3	*	1	1925	234	20.	4.2	1161.3
1	0250	35	0.	.0	1160.0	*	1	1110	135	5.	1.2	1160.4	*	1	1930	235	19.	4.2	1161.2
1	0255	36	0.	.0	1160.0	*	1	1115	136	5.	1.3	1160.4	*	1	1935	236	19.	4.1	1161.2
1	0300	37	0.	.0	1160.0	*	1	1120	137	6.	1.4	1160.4	*	1	1940	237	18.	4.0	1161.2
1	0305	38	0.	.0	1160.0	*	1	1125	138	6.	1.6	1160.5	*	1	1945	238	18.	4.0	1161.2
1	0310	39	0.	.0	1160.0	*	1	1130	139	7.	1.7	1160.5	*	1	1950	239	17.	3.9	1161.2
1	0315	40	0.	.0	1160.0	*	1	1135	140	8.	1.9	1160.6	*	1	1955	240	17.	3.9	1161.2
1	0320	41	0.	.0	1160.0	*	1	1140	141	9.	2.2	1160.7	*	1	2000	241	17.	3.8	1161.1
1	0325	42	0.	.0	1160.0	*	1	1145	142	11.	2.7	1160.8	*	1	2005	242	16.	3.7	1161.1
1	0330	43	0.	.0	1160.0	*	1	1150	143	15.	3.6	1161.1	*	1	2010	243	16.	3.7	1161.1
1	0335	44	0.	.0	1160.0	*	1	1155	144	24.	4.8	1161.4	*	1	2015	244	15.	3.6	1161.1
1	0340	45	0.	.0	1160.0	*	1	1200	145	37.	6.6	1161.9	*	1	2020	245	15.	3.6	1161.1
1	0345	46	0.	.0	1160.0	*	1	1205	146	55.	9.7	1162.7	*	1	2025	246	15.	3.5	1161.1
1	0350	47	0.	.0	1160.0	*	1	1210	147	79.	15.0	1164.1	*	1	2030	247	14.	3.5	1161.1
1	0355	48	0.	.0	1160.0	*	1	1215	148	100.	22.2	1165.7	*	1	2035	248	14.	3.5	1161.0
1	0400	49	0.	.0	1160.0	*	1	1220	149	650.	28.0	1166.9	*	1	2040	249	14.	3.4	1161.0
1	0405	50	0.	.0	1160.0	*	1	1225	150	993.	29.7	1167.2	*	1	2045	250	14.	3.4	1161.0
1	0410	51	0.	.0	1160.0	*	1	1230	151	880.	29.2	1167.1	*	1	2050	251	13.	3.3	1161.0
1	0415	52	0.	.0	1160.0	*	1	1235	152	705.	28.3	1167.0	*	1	2055	252	13.	3.3	1161.0
1	0420	53	0.	.0	1160.0	*	1	1240	153	550.	27.4	1166.8	*	1	2100	253	13.	3.3	1161.0
1	0425	54	0.	.0	1160.0	*	1	1245	154	414.	26.6	1166.6	*	1	2105	254	13.	3.2	1161.0
1	0430	55	0.	.0	1160.0	*	1	1250	155	318.	26.0	1166.5	*	1	2110	255	13.	3.2	1161.0
1	0435	56	0.	.0	1160.0	*	1	1255	156	240.	25.3	1166.3	*	1	2115	256	12.	3.2	1161.0
1	0440	57	0.	.0	1160.0	*	1	1300	157	184.	24.9	1166.2	*	1	2120	257	12.	3.1	1160.9
1	0445	58	0.	.0	1160.0	*	1	1305	158	151.	24.5	1166.2	*	1	2125	258	12.	3.1	1160.9
1	0450	59	0.	.0	1160.0	*	1	1310	159	131.	24.1	1166.1	*	1	2130	259	12.	3.1	1160.9
1	0455	60	0.	.0	1160.0	*	1	1315	160	113.	23.8	1166.0	*	1	2135	260	12.	3.0	1160.9
1	0500	61	0.	.0	1160.0	*	1	1320	161	104.	23.5	1166.0	*	1	2140	261	12.	3.0	1160.9
1	0505	62	0.	.0	1160.0	*	1	1325	162	104.	23.2	1165.9	*	1	2145	262	12.	3.0	1160.9
1	0510	63	0.	.0	1160.0	*	1	1330	163	102.	22.9	1165.8	*	1	2150	263	12.	2.9	1160.9
1	0515	64	0.	.0	1160.0	*	1	1335	164	101.	22.6	1165.8	*	1	2155	264	11.	2.9	1160.9
1	0520	65	0.	.0	1160.0	*	1	1340	165	100.	22.2	1165.7	*	1	2200	265	11.	2.9	1160.9
1	0525	66	0.	.0	1160.0	*	1	1345	166	99.	21.9	1165.6	*	1	2205	266	11.	2.9	1160.9
1	0530	67	0.	.0	1160.0	*	1	1350	167	98.	21.5	1165.5	*	1	2210	267	11.	2.8	1160.9
1	0535	68	0.	.0	1160.0	*	1	1355	168	96.	21.1	1165.4	*	1	2215	268	11.	2.8	1160.8
1	0540	69	0.	.0	1160.0	*	1	1400	169	95.	20.7	1165.3	*	1	2220	269	11.	2.8	1160.8
1	0545	70	0.	.0	1160.0	*	1	1405	170	94.	20.3	1165.3	*	1	2225	270	11.	2.7	1160.8
1	0550	71	0.	.0	1160.0	*	1	1410	171	93.	19.9	1165.2	*	1	2230	271	11.	2.7	1160.8
1	0555	72	0.	.0	1160.0	*	1	1415	172	91.	19.5	1165.1	*	1	2235	272	11.	2.7	1160.8
1	0600	73	0.	.0	1160.0	*	1	1420	173	90.	19.1	1165.0	*	1	2240	273	10.	2.7	1160.8
1	0605	74	0.	.0	1160.0	*	1	1425	174	89.	18.7	1164.9	*	1	2245	274	10.	2.6	1160.8
1	0610	75	0.	.0	1160.0	*	1	1430	175	88.	18.3	1164.8	*	1	2250	275	10.	2.6	1160.8
1	0615	76	0.	.0	1160.0	*	1	1435	176	87.	18.0	1164.7	*	1	2255	276	10.	2.6	1160.8
1	0620	77	0.	.0	1160.0	*	1	1440	177	86.	17.6	1164.6	*	1	2300	277	10.	2.6	1160.8
1	0625	78	0.	.0	1160.0	*	1	1445	178	85.	17.2	1164.6	*	1	2305	278	10.	2.5	1160.8
1	0630	79	0.	.0	1160.0	*	1	1450	179	84.	16.8	1164.5	*	1	2310	279	10.	2.5	1160.8
1	0635	80	0.	.0	1160.0	*	1	1455	180	82.	16.4	1164.4	*	1	2315	280	10.	2.5	1160.8
1	0640	81	0.	.0	1160.0	*	1	1500	181	81.	16.0	1164.3	*	1	2320	281	10.	2.5	1160.7
1	0645	82	0.	.0	1160.0	*	1	1505	182	80.	15.6	1164.2	*	1	2325	282	10.	2.4	1160.7
1	0650	83	0.	.0	1160.0	*	1	1510	183	79.	15.2	1164.1	*	1	2330	283	9.	2.4	1160.7
1	0655	84	0.	.0	1160.0	*	1	1515	184	78.	14.9	1164.0	*	1	2335	284	9.	2.4	1160.7
1	0700	85	0.	.0	1160.0	*	1	1520	185	77.	14.5	1163.9	*	1	2340	285	9.	2.4	1160.7
1	0705	86	0.	.0	1160.0	*	1	1525	186	75.	14.1	1163.8	*	1	2345	286	9.	2.3	1160.7
1	0710	87	0.	.0	1160.0	*	1	1530	187	73.	13.7	1163.7	*	1	2350	287	9.	2.3	1160.7
1	0715	88	0.	.0	1160.0	*	1	1535	188	72.	13.4	1163.6	*	1	2355	288	9.	2.3	1160.7
1	0720	89	0.	.0	1160.0	*	1	1540	189	70.	13.0	1163.6	*	2	0000	289	9.	2.3	1160.7
1	0725	90	0.	.0	1160.0	*	1	1545	190	69.	12.6	1163.5	*	2	0005	290	9.	2.3	1160.7
1	0730	91	0.	.0	1160.0	*	1	1550	191	67.	12.3	1163.4	*	2	0010	291	9.	2.2	1160.7
1	0735	92	0.	.0	1160.0	*	1	1555	192	66.	12.0	1163.3	*	2	0015	292	9.	2.2	1160.7
1	0740	93	0.	.0	1160.0	*	1	1600	193	64.	11.6	1163.2	*	2	0020	293	8.	2.2	1160.7
1	0745	94	0.	.0	1160.0	*	1	1605	194	63.	11.3	1163.1	*	2	0025	294	8.	2.1	1160.6
1	0750	95	0.	.0	1160.0	*	1	1610	195	61.	11.0	1163.1	*	2	0030	295	8.	2.1	1160.6

```
  1    0755  96        0.       .0  1160.0 *  1     1615 196      60.      10.7  1163.0 *  2     0035 296       8.      2.0  1160.6
  1    0800  97        0.       .0  1160.0 *  1     1620 197      58.      10.4  1162.9 *  2     0040 297       8.      2.0  1160.6
  1    0805  98        0.       .0  1160.0 *  1     1625 198      57.      10.1  1162.8 *  2     0045 298       8.      1.9  1160.6
  1    0810  99        0.       .0  1160.0 *  1     1630 199      55.       9.8  1162.8 *  2     0050 299       7.      1.9  1160.6
  1    0815 100        0.       .0  1160.0 *  1     1635 200      54.       9.5  1162.7 *  2     0055 300       7.      1.8  1160.5
                                           *                                     *
**********************************************************************************************************************************

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                6-HR        24-HR        72-HR       24.92-HR
    993.      12.42      (CFS)      132.         38.          36.          36.
                        (INCHES)   2.505        2.866        2.866        2.866
                         (AC-FT)     65.         75.          75.          75.

 PEAK STORAGE  TIME                          MAXIMUM AVERAGE STORAGE
   (AC-FT)     (HR)                6-HR        24-HR        72-HR       24.92-HR
     30.       12.42                16.          5.           5.           5.

 PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                6-HR        24-HR        72-HR       24.92-HR
  1167.24      12.42             1164.19     1161.37      1161.32      1161.32

                        CUMULATIVE AREA =     .49 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
 20 KK    *     SW170  *       Culvert C116
          *            *
          **************

             SUBBASIN RUNOFF DATA

 21 BA          SUBBASIN CHARACTERISTICS
                     TAREA         .97  SUBBASIN AREA

                PRECIPITATION DATA

  7 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .79    1.55    2.72    2.97    3.14    3.45    3.74    4.05     .00     .00     .00     .00

                                                 STORM AREA =     .97

 22 LS          SCS LOSS RATE
                     STRTL         .21  INITIAL ABSTRACTION
                    CRVNBR       90.40  CURVE NUMBER
                     RTIMP         .00  PERCENT IMPERVIOUS AREA

 23 UD          SCS DIMENSIONLESS UNITGRAPH
                     TLAG         .31  LAG

                                                    ***

                                                UNIT HYDROGRAPH
                                             21 END-OF-PERIOD ORDINATES
                     178.       571.      1110.      1327.      1252.      1011.       668.       444.       309.       208.
                     141.        96.        65.        45.        30.        20.        14.        10.         7.         3.
                       0.

    ***             ***             ***             ***             ***

                          HYDROGRAPH AT STATION    SW170

    TOTAL RAINFALL =    4.04, TOTAL LOSS =    1.04, TOTAL EXCESS =    3.00

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                6-HR        24-HR        72-HR       24.92-HR
  2087.      12.33      (CFS)      287.         78.          75.          75.
                        (INCHES)   2.747        3.001        3.001        3.001
                         (AC-FT)    142.        155.         155.         155.

                        CUMULATIVE AREA =     .97 SQ MI
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*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

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        *             *
 24 KK  *    SW180    *      Culvert C117
        *             *
        ***************

             SUBBASIN RUNOFF DATA

 25 BA         SUBBASIN CHARACTERISTICS
                     TAREA          .04  SUBBASIN AREA

               PRECIPITATION DATA

  7 PH                                    DEPTHS FOR  0-PERCENT HYPOTHETICAL STORM
               ..... HYDRO-35 ......   ............... TP-40 ...............   ........... TP-49 ...........
               5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                 .79    1.55    2.72    2.97    3.14    3.45    3.74    4.05     .00     .00     .00     .00

                                                   STORM AREA =      .04

 26 LS         SCS LOSS RATE
                    STRTL           .04  INITIAL ABSTRACTION
                   CRVNBR         98.00  CURVE NUMBER
                    RTIMP           .00  PERCENT IMPERVIOUS AREA

 27 UD         SCS DIMENSIONLESS UNITGRAPH
                     TLAG           .10  LAG

                                                               ***

                                                       UNIT HYDROGRAPH
                                                  8 END-OF-PERIOD ORDINATES
              88.       130.       57.       22.        8.         3.         1.        0.

     ***           ***           ***           ***           ***

                         HYDROGRAPH AT STATION    SW180

   TOTAL RAINFALL =     4.05, TOTAL LOSS =      .24, TOTAL EXCESS =     3.81

 PEAK FLOW     TIME                       MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                 6-HR       24-HR       72-HR      24.92-HR
    160.      12.17      (CFS)        14.          4.          4.          4.
                       (INCHES)     3.370       3.815       3.815       3.815
                        (AC-FT)        7.          8.          8.          8.

                         CUMULATIVE AREA =      .04 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

        ***************
        *             *
 28 KK  *    SW190    *      Culvert C118
        *             *
        ***************

             SUBBASIN RUNOFF DATA

 29 BA         SUBBASIN CHARACTERISTICS
                     TAREA          .10  SUBBASIN AREA

               PRECIPITATION DATA

  7 PH                                    DEPTHS FOR  0-PERCENT HYPOTHETICAL STORM
               ..... HYDRO-35 ......   ............... TP-40 ...............   ........... TP-49 ...........
               5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                 .79    1.55    2.72    2.97    3.14    3.45    3.74    4.05     .00     .00     .00     .00

                                                   STORM AREA =      .10
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```
 30 LS          SCS LOSS RATE
                     STRTL         .25  INITIAL ABSTRACTION
                    CRVNBR       88.80  CURVE NUMBER
                     RTIMP         .00  PERCENT IMPERVIOUS AREA

 31 UD          SCS DIMENSIONLESS UNITGRAPH
                     TLAG         .13  LAG

                                                  ***

                                                UNIT HYDROGRAPH
                                             10 END-OF-PERIOD ORDINATES
            127.      283.      205.       88.       40.       18.        8.        4.        2.        0.

     ***             ***              ***              ***              ***

                       HYDROGRAPH AT STATION    SW190

    TOTAL RAINFALL =    4.05, TOTAL LOSS =    1.20, TOTAL EXCESS =    2.85

PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                   6-HR        24-HR        72-HR      24.92-HR
   311.      12.17        (CFS)        28.          8.           7.           7.
                         (INCHES)    2.620        2.850        2.850        2.850
                         (AC-FT)       14.          15.          15.          15.

                       CUMULATIVE AREA =     .10 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


           **************
           *            *
 32 KK     *     SW200  *       Culvert C119
           *            *
           **************

              SUBBASIN RUNOFF DATA

 33 BA          SUBBASIN CHARACTERISTICS
                     TAREA         .11  SUBBASIN AREA

                PRECIPITATION DATA

  7 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .79    1.55    2.72    2.97    3.14    3.45    3.74    4.05     .00     .00     .00     .00

                                                STORM AREA =     .11

 34 LS          SCS LOSS RATE
                     STRTL         .44  INITIAL ABSTRACTION
                    CRVNBR       82.00  CURVE NUMBER
                     RTIMP         .00  PERCENT IMPERVIOUS AREA

 35 UD          SCS DIMENSIONLESS UNITGRAPH
                     TLAG         .12  LAG

                                                  ***

                                                UNIT HYDROGRAPH
                                              9 END-OF-PERIOD ORDINATES
            165.      330.      207.       85.       37.       16.        7.        3.        1.

     ***             ***              ***              ***              ***

                       HYDROGRAPH AT STATION    SW200

    TOTAL RAINFALL =    4.05, TOTAL LOSS =    1.80, TOTAL EXCESS =    2.25

PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                   6-HR        24-HR        72-HR      24.92-HR
   281.      12.17        (CFS)        25.          7.           6.           6.
                         (INCHES)    2.078        2.245        2.245        2.245
                         (AC-FT)       12.          13.          13.          13.
```

CUMULATIVE AREA = .11 SQ MI

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* *
36 KK * SW210 * Culvert C120
* *
****

SUBBASIN RUNOFF DATA

37 BA SUBBASIN CHARACTERISTICS
TAREA .03 SUBBASIN AREA

PRECIPITATION DATA

7 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.79	1.55	2.72	2.97	3.14	3.45	3.74	4.05	.00	.00	.00	.00

STORM AREA = .03

38 LS SCS LOSS RATE
STRTL .52 INITIAL ABSTRACTION
CRVNBR 79.50 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

39 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .17 LAG

***

UNIT HYDROGRAPH
12 END-OF-PERIOD ORDINATES

21.	63.	65.	41.	20.	11.	6.	3.	2.	1.
0.	0.								

*** *** *** *** ***

HYDROGRAPH AT STATION SW210

TOTAL RAINFALL = 4.05, TOTAL LOSS = 2.01, TOTAL EXCESS = 2.04

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
60.	12.25	(CFS)	6.	2.	2.	2.
		(INCHES)	1.891	2.043	2.043	2.043
		(AC-FT)	3.	3.	3.	3.

CUMULATIVE AREA = .03 SQ MI

*** ***

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* *
40 KK * SW220 * Culvert C121
* *
****

SUBBASIN RUNOFF DATA

41 BA SUBBASIN CHARACTERISTICS
TAREA .06 SUBBASIN AREA

PRECIPITATION DATA

7 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.79	1.55	2.72	2.97	3.14	3.45	3.74	4.05	.00	.00	.00	.00

STORM AREA = .06

42 LS SCS LOSS RATE

STRTL	.42	INITIAL ABSTRACTION
CRVNBR	82.80	CURVE NUMBER
RTIMP	.00	PERCENT IMPERVIOUS AREA

43 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	.18	LAG

***

UNIT HYDROGRAPH
13 END-OF-PERIOD ORDINATES

37.	115.	127.	88.	45.	25.	13.	7.	4.	2.
1.	1.	0.							

*** *** *** *** ***

HYDROGRAPH AT STATION SW220

TOTAL RAINFALL = 4.05, TOTAL LOSS = 1.74, TOTAL EXCESS = 2.31

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
134.	12.25	(CFS)	14.	4.	4.	4.
		(INCHES)	2.139	2.312	2.312	2.312
		(AC-FT)	7.	7.	7.	7.

CUMULATIVE AREA = .06 SQ MI

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* *
44 KK * cell12 *
* *
****

45 HC HYDROGRAPH COMBINATION

ICOMP	5	NUMBER OF HYDROGRAPHS TO COMBINE

***

*** *** *** *** ***

HYDROGRAPH AT STATION cell12

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
926.	12.17	(CFS)	87.	24.	23.	23.
		(INCHES)	2.369	2.602	2.602	2.602
		(AC-FT)	43.	47.	47.	47.

CUMULATIVE AREA = .34 SQ MI

*** ***

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* *
46 KK * SW230 * Culvert C122
* *
****

SUBBASIN RUNOFF DATA

47 BA SUBBASIN CHARACTERISTICS

TAREA	.06	SUBBASIN AREA

PRECIPITATION DATA

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 7 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
              ..... HYDRO-35 .....   ............. TP-40 .............   ........... TP-49 ...........
              5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                .79    1.55    2.72    2.97    3.14    3.45    3.74    4.05     .00     .00     .00     .00

                                                STORM AREA =     .06

 48 LS          SCS LOSS RATE
                      STRTL         .36  INITIAL ABSTRACTION
                     CRVNBR       84.70  CURVE NUMBER
                      RTIMP         .00  PERCENT IMPERVIOUS AREA

 49 UD          SCS DIMENSIONLESS UNITGRAPH
                      TLAG         .21  LAG

                                                  ***

                                                UNIT HYDROGRAPH
                                             15 END-OF-PERIOD ORDINATES
                    26.       88.      115.       97.       58.       33.       20.       12.        7.        4.
                     2.        1.        1.        0.        0.

     ***            ***            ***            ***            ***

                        HYDROGRAPH AT STATION    SW230

    TOTAL RAINFALL =    4.05, TOTAL LOSS =    1.57, TOTAL EXCESS =    2.48

PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                    6-HR       24-HR       72-HR     24.92-HR
   133.      12.25          (CFS)       15.          4.          4.          4.
                            (INCHES)  2.287       2.476       2.476       2.476
                            (AC-FT)     7.          8.          8.          8.

                        CUMULATIVE AREA =     .06 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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              *            *
 50 KK        *     SW240  *       Culvert C123
              *            *
              **************

                 SUBBASIN RUNOFF DATA

 51 BA             SUBBASIN CHARACTERISTICS
                        TAREA         .81  SUBBASIN AREA

                   PRECIPITATION DATA

 7 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
              ..... HYDRO-35 .....   ............. TP-40 .............   ........... TP-49 ...........
              5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                .79    1.55    2.72    2.97    3.14    3.45    3.74    4.05     .00     .00     .00     .00

                                                STORM AREA =     .81

 52 LS          SCS LOSS RATE
                      STRTL         .33  INITIAL ABSTRACTION
                     CRVNBR       85.90  CURVE NUMBER
                      RTIMP         .00  PERCENT IMPERVIOUS AREA

 53 UD          SCS DIMENSIONLESS UNITGRAPH
                      TLAG         .28  LAG

                                                  ***

                                                UNIT HYDROGRAPH
                                             19 END-OF-PERIOD ORDINATES
                   187.      614.     1102.     1213.     1051.      749.      465.      309.      204.      133.
                    87.       57.       37.       25.       16.       11.        7.        4.        1.

     ***            ***            ***            ***            ***

                        HYDROGRAPH AT STATION    SW240
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TOTAL RAINFALL = 4.05, TOTAL LOSS = 1.47, TOTAL EXCESS = 2.58

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
1616.	12.33	(CFS)	207.	56.	54.	54.
		(INCHES)	2.377	2.579	2.579	2.579
		(AC-FT)	103.	111.	111.	111.

CUMULATIVE AREA = .81 SQ MI

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*            *
*    cell12  *
*            *
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54 KK Combine SW180 to SW140 at Detention Cell 12.

55 HC HYDROGRAPH COMBINATION
ICOMP 3 NUMBER OF HYDROGRAPHS TO COMBINE

***

*** *** *** ***

HYDROGRAPH AT STATION cell12

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
2414.	12.25	(CFS)	308.	84.	81.	81.
		(INCHES)	2.370	2.580	2.580	2.580
		(AC-FT)	153.	166.	166.	166.

CUMULATIVE AREA = 1.21 SQ MI

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*    weir12  *
*            *
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56 KK Route SW180 to SW240 thru Detention Cell 12.

64 KO OUTPUT CONTROL VARIABLES
IPRNT 1 PRINT CONTROL
IPLOT 0 PLOT CONTROL
QSCAL 0. HYDROGRAPH PLOT SCALE

HYDROGRAPH ROUTING DATA

57 RS STORAGE ROUTING
NSTPS 1 NUMBER OF SUBREACHES
ITYP STOR TYPE OF INITIAL CONDITION
RSVRIC .00 INITIAL CONDITION
X .00 WORKING R AND D COEFFICIENT

58 SV	STORAGE	.0	3.8	14.3	25.4	37.2	49.4	62.5	76.0	90.2	91.6
		93.1	94.6	96.0	97.5						
60 SE	ELEVATION	1080.60	1081.00	1082.00	1083.00	1084.00	1085.00	1086.00	1087.00	1088.00	1088.10
		1088.20	1088.30	1088.40	1088.40						
62 SQ	DISCHARGE	6.	13.	36.	50.	60.	72.	80.	88.	96.	316.
		706.	1213.	1812.	2490.						

***

*** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN 706. TO 2490.
THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

HYDROGRAPH AT STATION weir12

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	6.	.0	1080.6	1		0820	101	6.	.0	1080.6	1		1640	201	91.	81.5	1087.4
1		0005	2	6.	.0	1080.6	1		0825	102	6.	.0	1080.6	1		1645	202	91.	81.1	1087.4
1		0010	3	6.	.0	1080.6	1		0830	103	6.	.0	1080.6	1		1650	203	91.	80.7	1087.3
1		0015	4	6.	.0	1080.6	1		0835	104	6.	.0	1080.6	1		1655	204	90.	80.3	1087.3
1		0020	5	6.	.0	1080.6	1		0840	105	6.	.0	1080.6	1		1700	205	90.	79.9	1087.3
1		0025	6	6.	.0	1080.6	1		0845	106	6.	.0	1080.6	1		1705	206	90.	79.5	1087.2
1		0030	7	6.	.0	1080.6	1		0850	107	6.	.0	1080.6	1		1710	207	90.	79.1	1087.2
1		0035	8	6.	.0	1080.6	1		0855	108	6.	.0	1080.6	1		1715	208	90.	78.7	1087.2
1		0040	9	6.	.0	1080.6	1		0900	109	6.	.0	1080.6	1		1720	209	89.	78.3	1087.2
1		0045	10	6.	.0	1080.6	1		0905	110	6.	.0	1080.6	1		1725	210	89.	77.9	1087.1
1		0050	11	6.	.0	1080.6	1		0910	111	6.	.0	1080.6	1		1730	211	89.	77.5	1087.1
1		0055	12	6.	.0	1080.6	1		0915	112	6.	.0	1080.6	1		1735	212	89.	77.1	1087.1
1		0100	13	6.	.0	1080.6	1		0920	113	6.	.0	1080.6	1		1740	213	88.	76.7	1087.0
1		0105	14	6.	.0	1080.6	1		0925	114	6.	.0	1080.6	1		1745	214	88.	76.3	1087.0
1		0110	15	6.	.0	1080.6	1		0930	115	6.	.0	1080.6	1		1750	215	88.	75.8	1087.0
1		0115	16	6.	.0	1080.6	1		0935	116	6.	.0	1080.6	1		1755	216	88.	75.4	1087.0
1		0120	17	6.	.0	1080.6	1		0940	117	6.	.0	1080.6	1		1800	217	87.	75.0	1086.9
1		0125	18	6.	.0	1080.6	1		0945	118	6.	.0	1080.6	1		1805	218	87.	74.6	1086.9
1		0130	19	6.	.0	1080.6	1		0950	119	6.	.0	1080.6	1		1810	219	87.	74.2	1086.9
1		0135	20	6.	.0	1080.6	1		0955	120	6.	.0	1080.6	1		1815	220	87.	73.8	1086.8
1		0140	21	6.	.0	1080.6	1		1000	121	6.	.0	1080.6	1		1820	221	86.	73.3	1086.8
1		0145	22	6.	.0	1080.6	1		1005	122	6.	.0	1080.6	1		1825	222	86.	72.9	1086.8
1		0150	23	6.	.0	1080.6	1		1010	123	6.	.0	1080.6	1		1830	223	86.	72.5	1086.7
1		0155	24	6.	.0	1080.6	1		1015	124	6.	.0	1080.6	1		1835	224	86.	72.1	1086.7
1		0200	25	6.	.0	1080.6	1		1020	125	6.	.0	1080.6	1		1840	225	85.	71.7	1086.7
1		0205	26	6.	.0	1080.6	1		1025	126	6.	.0	1080.6	1		1845	226	85.	71.2	1086.6
1		0210	27	6.	.0	1080.6	1		1030	127	6.	.1	1080.6	1		1850	227	85.	70.8	1086.6
1		0215	28	6.	.0	1080.6	1		1035	128	6.	.1	1080.6	1		1855	228	85.	70.4	1086.6
1		0220	29	6.	.0	1080.6	1		1040	129	6.	.1	1080.6	1		1900	229	84.	70.0	1086.6
1		0225	30	6.	.0	1080.6	1		1045	130	6.	.2	1080.6	1		1905	230	84.	69.5	1086.5
1		0230	31	6.	.0	1080.6	1		1050	131	6.	.3	1080.6	1		1910	231	84.	69.1	1086.5
1		0235	32	6.	.0	1080.6	1		1055	132	7.	.4	1080.6	1		1915	232	84.	68.7	1086.5
1		0240	33	6.	.0	1080.6	1		1100	133	7.	.5	1080.6	1		1920	233	83.	68.3	1086.4
1		0245	34	6.	.0	1080.6	1		1105	134	7.	.6	1080.7	1		1925	234	83.	67.8	1086.4
1		0250	35	6.	.0	1080.6	1		1110	135	7.	.7	1080.7	1		1930	235	83.	67.4	1086.4
1		0255	36	6.	.0	1080.6	1		1115	136	8.	.9	1080.7	1		1935	236	83.	67.0	1086.3
1		0300	37	6.	.0	1080.6	1		1120	137	8.	1.1	1080.7	1		1940	237	82.	66.6	1086.3
1		0305	38	6.	.0	1080.6	1		1125	138	8.	1.3	1080.7	1		1945	238	82.	66.2	1086.3
1		0310	39	6.	.0	1080.6	1		1130	139	9.	1.5	1080.8	1		1950	239	82.	65.7	1086.2
1		0315	40	6.	.0	1080.6	1		1135	140	9.	1.8	1080.8	1		1955	240	82.	65.3	1086.2
1		0320	41	6.	.0	1080.6	1		1140	141	10.	2.4	1080.9	1		2000	241	81.	64.9	1086.2
1		0325	42	6.	.0	1080.6	1		1145	142	12.	3.4	1081.0	1		2005	242	81.	64.5	1086.1
1		0330	43	6.	.0	1080.6	1		1150	143	15.	4.9	1081.1	1		2010	243	81.	64.1	1086.1
1		0335	44	6.	.0	1080.6	1		1155	144	20.	7.2	1081.3	1		2015	244	81.	63.6	1086.1
1		0340	45	6.	.0	1080.6	1		1200	145	29.	10.9	1081.7	1		2020	245	80.	63.2	1086.1
1		0345	46	6.	.0	1080.6	1		1205	146	41.	17.9	1082.3	1		2025	246	80.	62.8	1086.0
1		0350	47	6.	.0	1080.6	1		1210	147	53.	29.5	1083.3	1		2030	247	80.	62.4	1086.0
1		0355	48	6.	.0	1080.6	1		1215	148	67.	44.6	1084.6	1		2035	248	80.	62.0	1086.0
1		0400	49	6.	.0	1080.6	1		1220	149	79.	60.5	1085.9	1		2040	249	79.	61.5	1085.9
1		0405	50	6.	.0	1080.6	1		1225	150	88.	75.2	1086.9	1		2045	250	79.	61.1	1085.9
1		0410	51	6.	.0	1080.6	1		1230	151	95.	87.6	1087.8	1		2050	251	79.	60.7	1085.9
1		0415	52	6.	.0	1080.6	1		1235	152	1067.	94.2	1088.3	1		2055	252	79.	60.3	1085.8
1		0420	53	6.	.0	1080.6	1		1240	153	1209.	94.6	1088.3	1		2100	253	78.	59.9	1085.8
1		0425	54	6.	.0	1080.6	1		1245	154	889.	93.6	1088.2	1		2105	254	78.	59.5	1085.8
1		0430	55	6.	.0	1080.6	1		1250	155	672.	93.0	1088.2	1		2110	255	78.	59.0	1085.7
1		0435	56	6.	.0	1080.6	1		1255	156	520.	92.4	1088.2	1		2115	256	78.	58.6	1085.7
1		0440	57	6.	.0	1080.6	1		1300	157	396.	91.9	1088.1	1		2120	257	77.	58.2	1085.7
1		0445	58	6.	.0	1080.6	1		1305	158	311.	91.6	1088.1	1		2125	258	77.	57.8	1085.6
1		0450	59	6.	.0	1080.6	1		1310	159	267.	91.3	1088.1	1		2130	259	77.	57.4	1085.6
1		0455	60	6.	.0	1080.6	1		1315	160	226.	91.0	1088.1	1		2135	260	77.	57.0	1085.6
1		0500	61	6.	.0	1080.6	1		1320	161	194.	90.8	1088.0	1		2140	261	76.	56.6	1085.5
1		0505	62	6.	.0	1080.6	1		1325	162	170.	90.7	1088.0	1		2145	262	76.	56.2	1085.5
1		0510	63	6.	.0	1080.6	1		1330	163	152.	90.6	1088.0	1		2150	263	76.	55.8	1085.5
1		0515	64	6.	.0	1080.6	1		1335	164	137.	90.5	1088.0	1		2155	264	76.	55.4	1085.5
1		0520	65	6.	.0	1080.6	1		1340	165	125.	90.4	1088.0	1		2200	265	75.	55.0	1085.4
1		0525	66	6.	.0	1080.6	1		1345	166	116.	90.3	1088.0	1		2205	266	75.	54.6	1085.4
1		0530	67	6.	.0	1080.6	1		1350	167	108.	90.3	1088.0	1		2210	267	75.	54.1	1085.4
1		0535	68	6.	.0	1080.6	1		1355	168	102.	90.2	1088.0	1		2215	268	75.	53.7	1085.3
1		0540	69	6.	.0	1080.6	1		1400	169	96.	90.2	1088.0	1		2220	269	74.	53.3	1085.3
1		0545	70	6.	.0	1080.6	1		1405	170	96.	90.2	1088.0	1		2225	270	74.	52.9	1085.3
1		0550	71	6.	.0	1080.6	1		1410	171	96.	90.1	1088.0	1		2230	271	74.	52.5	1085.2
1		0555	72	6.	.0	1080.6	1		1415	172	96.	90.0	1088.0	1		2235	272	74.	52.1	1085.2

1	0600	73	6.	.0	1080.6	*	1	1420	173	96.	89.9	1088.0	*	1	2240	273	73.	51.7	1085.2													
1	0605	74	6.	.0	1080.6	*	1	1425	174	96.	89.8	1088.0	*	1	2245	274	73.	51.3	1085.1													
1	0610	75	6.	.0	1080.6	*	1	1430	175	96.	89.6	1088.0	*	1	2250	275	73.	51.0	1085.1													
1	0615	76	6.	.0	1080.6	*	1	1435	176	96.	89.4	1087.9	*	1	2255	276	73.	50.6	1085.1													
1	0620	77	6.	.0	1080.6	*	1	1440	177	95.	89.3	1087.9	*	1	2300	277	72.	50.2	1085.1													
1	0625	78	6.	.0	1080.6	*	1	1445	178	95.	89.1	1087.9	*	1	2305	278	72.	49.8	1085.0													
1	0630	79	6.	.0	1080.6	*	1	1450	179	95.	88.9	1087.9	*	1	2310	279	72.	49.4	1085.0													
1	0635	80	6.	.0	1080.6	*	1	1455	180	95.	88.6	1087.9	*	1	2315	280	72.	49.0	1085.0													
1	0640	81	6.	.0	1080.6	*	1	1500	181	95.	88.4	1087.9	*	1	2320	281	71.	48.6	1084.9													
1	0645	82	6.	.0	1080.6	*	1	1505	182	95.	88.2	1087.9	*	1	2325	282	71.	48.2	1084.9													
1	0650	83	6.	.0	1080.6	*	1	1510	183	95.	87.9	1087.8	*	1	2330	283	70.	47.8	1084.9													
1	0655	84	6.	.0	1080.6	*	1	1515	184	95.	87.6	1087.8	*	1	2335	284	70.	47.4	1084.8													
1	0700	85	6.	.0	1080.6	*	1	1520	185	94.	87.3	1087.8	*	1	2340	285	70.	47.1	1084.8													
1	0705	86	6.	.0	1080.6	*	1	1525	186	94.	87.0	1087.8	*	1	2345	286	69.	46.7	1084.8													
1	0710	87	6.	.0	1080.6	*	1	1530	187	94.	86.7	1087.8	*	1	2350	287	69.	46.3	1084.7													
1	0715	88	6.	.0	1080.6	*	1	1535	188	94.	86.4	1087.7	*	1	2355	288	69.	45.9	1084.7													
1	0720	89	6.	.0	1080.6	*	1	1540	189	94.	86.0	1087.7	*	2	0000	289	68.	45.5	1084.7													
1	0725	90	6.	.0	1080.6	*	1	1545	190	93.	85.7	1087.7	*	2	0005	290	68.	45.2	1084.7													
1	0730	91	6.	.0	1080.6	*	1	1550	191	93.	85.3	1087.7	*	2	0010	291	67.	44.8	1084.6													
1	0735	92	6.	.0	1080.6	*	1	1555	192	93.	85.0	1087.6	*	2	0015	292	67.	44.4	1084.6													
1	0740	93	6.	.0	1080.6	*	1	1600	193	93.	84.6	1087.6	*	2	0020	293	67.	44.0	1084.6													
1	0745	94	6.	.0	1080.6	*	1	1605	194	93.	84.2	1087.6	*	2	0025	294	66.	43.5	1084.5													
1	0750	95	6.	.0	1080.6	*	1	1610	195	92.	83.8	1087.6	*	2	0030	295	66.	43.1	1084.5													
1	0755	96	6.	.0	1080.6	*	1	1615	196	92.	83.5	1087.5	*	2	0035	296	65.	42.7	1084.4													
1	0800	97	6.	.0	1080.6	*	1	1620	197	92.	83.1	1087.5	*	2	0040	297	65.	42.2	1084.4													
1	0805	98	6.	.0	1080.6	*	1	1625	198	92.	82.7	1087.5	*	2	0045	298	65.	41.8	1084.4													
1	0810	99	6.	.0	1080.6	*	1	1630	199	92.	82.3	1087.4	*	2	0050	299	64.	41.3	1084.3													
1	0815	100	6.	.0	1080.6	*	1	1635	200	91.	81.9	1087.4	*	2	0055	300	64.	40.9	1084.3													
						*							*																			

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
1209.	12.67	(CFS)	163.	65.	63.	63.
		(INCHES)	1.251	2.007	2.014	2.014
		(AC-FT)	81.	130.	130.	130.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
(AC-FT)	(HR)	6-HR	24-HR	72-HR	24.92-HR
95.	12.67	85.	37.	36.	36.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
(FEET)	(HR)	6-HR	24-HR	72-HR	24.92-HR
1088.30	12.67	1087.64	1083.77	1083.66	1083.66

CUMULATIVE AREA = 1.21 SQ MI

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          *            *
65 KK     *     SW250  *       Culvert C124
          *            *
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SUBBASIN RUNOFF DATA

66 BA SUBBASIN CHARACTERISTICS

TAREA	.21	SUBBASIN AREA

PRECIPITATION DATA

7 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.79	1.55	2.72	2.97	3.14	3.45	3.74	4.05	.00	.00	.00	.00

STORM AREA = .21

67 LS SCS LOSS RATE

STRTL	.86	INITIAL ABSTRACTION
CRVNBR	70.00	CURVE NUMBER
RTIMP	.00	PERCENT IMPERVIOUS AREA

68 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	.32	LAG

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UNIT HYDROGRAPH
21 END-OF-PERIOD ORDINATES

36.	114.	226.	278.	269.	223.	153.	102.	71.	49.
34.	23.	16.	11.	7.	5.	4.	3.	2.	1.
0.									

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HYDROGRAPH AT STATION SW250

TOTAL RAINFALL = 4.05, TOTAL LOSS = 2.69, TOTAL EXCESS = 1.36

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
197.	12.42	(CFS)	28.	8.	7.	7.
		(INCHES)	1.245	1.362	1.362	1.362
		(AC-FT)	14.	15.	15.	15.

CUMULATIVE AREA = .21 SQ MI

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*            *
*     SW260  *       Culvert C125
*            *
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69 KK

SUBBASIN RUNOFF DATA

70 BA SUBBASIN CHARACTERISTICS

TAREA .12 SUBBASIN AREA

PRECIPITATION DATA

7 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

HYDRO-35			TP-40					TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.79	1.55	2.72	2.97	3.14	3.45	3.74	4.05	.00	.00	.00	.00

STORM AREA = .12

71 LS SCS LOSS RATE

STRTL .75 INITIAL ABSTRACTION
CRVNBR 72.80 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

72 UD SCS DIMENSIONLESS UNITGRAPH

TLAG .23 LAG

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UNIT HYDROGRAPH
16 END-OF-PERIOD ORDINATES

42.	145.	212.	194.	136.	78.	48.	29.	18.	11.
6.	4.	2.	2.	1.	0.				

*** *** *** *** ***

HYDROGRAPH AT STATION SW260

TOTAL RAINFALL = 4.05, TOTAL LOSS = 2.50, TOTAL EXCESS = 1.55

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
155.	12.33	(CFS)	18.	5.	5.	5.
		(INCHES)	1.424	1.549	1.549	1.549
		(AC-FT)	9.	10.	10.	10.

CUMULATIVE AREA = .12 SQ MI

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          *            *
73 KK     *    SW270   *       Culvert C126
          *            *
          **************

            SUBBASIN RUNOFF DATA

74 BA         SUBBASIN CHARACTERISTICS
                   TAREA        1.09  SUBBASIN AREA

              PRECIPITATION DATA

 7 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
              ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
              5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                .79    1.55    2.72    2.97    3.14    3.45    3.74    4.05     .00     .00     .00     .00

                                                 STORM AREA =    1.09

75 LS         SCS LOSS RATE
                   STRTL         .22  INITIAL ABSTRACTION
                  CRVNBR       90.00  CURVE NUMBER
                   RTIMP         .00  PERCENT IMPERVIOUS AREA

76 UD         SCS DIMENSIONLESS UNITGRAPH
                    TLAG         .32  LAG

                                                    ***

                                                  UNIT HYDROGRAPH
                                               21 END-OF-PERIOD ORDINATES
                185.      593.     1173.     1444.     1395.     1155.      796.      530.      368.      256.
                175.      120.       81.       56.       39.       27.       18.       13.        9.        6.
                  2.

   ***             ***              ***              ***              ***

                        HYDROGRAPH AT STATION     SW270

   TOTAL RAINFALL =    4.04, TOTAL LOSS =    1.08, TOTAL EXCESS =    2.96

PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                    6-HR        24-HR        72-HR      24.92-HR
  2274.      12.42        (CFS)        318.         87.          84.          84.
                         (INCHES)     2.712        2.961        2.961        2.961
                         (AC-FT)        158.         172.         172.         172.

                        CUMULATIVE AREA =    1.09 SQ MI
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RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SW160	1238.	12.25	142.	39.	37.	.49		
ROUTED TO	cell10	993.	12.42	132.	38.	36.	.49	1167.24	12.42
HYDROGRAPH AT	SW170	2087.	12.33	287.	78.	75.	.97		
HYDROGRAPH AT	SW180	160.	12.17	14.	4.	4.	.04		
HYDROGRAPH AT	SW190	311.	12.17	28.	8.	7.	.10		
HYDROGRAPH AT	SW200	281.	12.17	25.	7.	6.	.11		
HYDROGRAPH AT	SW210	60.	12.25	6.	2.	2.	.03		
HYDROGRAPH AT	SW220	134.	12.25	14.	4.	4.	.06		
5 COMBINED AT	cell12	926.	12.17	87.	24.	23.	.34		
HYDROGRAPH AT	SW230	133.	12.25	15.	4.	4.	.06		
HYDROGRAPH AT	SW240	1616.	12.33	207.	56.	54.	.81		
3 COMBINED AT	cell12	2414.	12.25	308.	84.	81.	1.21		
ROUTED TO	weir12	1209.	12.67	163.	65.	63.	1.21	1088.30	12.67
HYDROGRAPH AT	SW250	197.	12.42	28.	8.	7.	.21		
HYDROGRAPH AT	SW260	155.	12.33	18.	5.	5.	.12		
HYDROGRAPH AT	SW270	2274.	12.42	318.	87.	84.	1.09		

*** NORMAL END OF HEC-1 ***
Elapsed Time - 00:00:25.32 (25.32 Seconds)
NORMAL END OF HEC-1

SEGMENT III
HEC-1 ANALYSES
51ST AVE. TO 19TH AVE.
C. SW280 (CARTER ASSOC. "G" SUBAREAS) - 50 AND 100 YEAR

HEC1 S/N: HMVersion: 6.00 Data File: c:\scott\g50

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*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*         SEPTEMBER 1990                *
*          VERSION 4.0                  *
*                                       *
*  RUN DATE  02/17/1992  TIME  11:44:37 *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*         609 SECOND STREET             *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

```
::::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::::
:::                                      :::
:::  Full Microcomputer Implementation   :::
:::                 by                   :::
:::         Haestad Methods, Inc.        :::
:::                                      :::
::::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::::
```

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

    1     ID       REVISED PER GRADING AND GOLF COURSE PLAN
          *DIAGRAM
    2     ID       FOOTHILLS PHASE III          Filename: G50     (Modified for 24hr storm
    3     ID       HYDROLOGY REPORT             Previous FILE: FHG.99I   by SMc 09-27-01)
    4     ID       OFF AND ON-SITE DRAINAGE     50 YEAR STORM
    5     ID
    6     IT       5                    300
    7     IO       3       0

    8     KK       NW       EXISTING DRAINAGE IN NORTHWEST CORNER WHERE GR-1 MAY OUTFALL
    9     BA    0.026
   10     PH                      0.69    1.35    2.37    2.60    2.76    3.05    3.32    3.60
   11     LS       0       89
   12     UD     0.1

   13     KK     GA-1       POST-DEVELOPMENT CONDITIONS FOR REMAINDER OF INPUT
   14     BA   0.0417
   15     LS       0       88
   16     UD     0.1

   17     KK     GR-1       OUTLET 24" RCP TO STATE LAND
   18     RS       1     STOR      -1       0
   19     SV       0        3
   20     SE       0        3
   21     SQ       0       20

   22     KK     GA-2
   23     BA   0.0683
   24     LS       0       88
   25     UD     0.1

   26     KK     GR-2       OUTLET 30" RCP TO GA-3
   27     RS       1     STOR      -1       0
   28     SV       0      5.5
   29     SE       0        3
   30     SQ       0     27.5

   31     KK     GC-1
   32     RK     600   0.005   0.027           TRAP       5       3

   33     KK     GA-3
   34     BA   0.017
   35     LS       0       91
   36     UD     0.1

   37     KK     GR-3       OUTLET 24" RCP TO 24" STORM SEWER
   38     RS       1     STOR      -1       0
   39     SV       0      1.1
   40     SE       0        3
   41     SQ       0       20
```

```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  42          KK    GP-1
  43          HC      2

  44          KK    GA-4
  45          BA    0.02
  46          LS      0      91
  47          UD     0.1

  48          KK    GR-4       OUTFLOW TO STORM SEWER
  49          RS      1    STOR      -1       0
  50          SV      0    1.65
  51          SE      0      3
  52          SQ      0     20

  53          KK    GP-2
  54          HC      2

  55          KK    GC-2
  56          RK    1200   0.025   0.013            CIRC       2

  57          KK    GA-5
  58          BA  0.0285
  59          LS      0      94
  60          UD     0.1

  61          KK    GR-5       OUTFLOW TO CHANNEL
  62          RS      1    STOR      -1       0
  63          SV      0     2.2
  64          SE      0      3
  65          SQ      0    27.5

  66          KK    GP-3
  67          HC      2

  68          KK    GC-3
  69          RK     950   0.005   0.027            TRAP       15       .

  70          KK    GA-6
  71          BA  0.0547
  72          LS      0      94
  73          UD     0.1

  74          KK    GR-6       OUTFLOW TO CHANNEL
  75          RS      1    STOR      -1       0
  76          SV      0     1.1      2.2      3.3
  77          SE      0       1        2        3
  78          SQ      0       1       42      117

  79          KK    GP-4
  80          HC      2
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  81      KK    GC-4
  82      RK     950   0.022   0.035           TRAP      20       4

  83      KK    GA-7
  84      BA  0.0303
  85      LS       0      94
  86      UD     0.1

  87      KK    GP-5
  88      HC       2

  89      KK    HA-1  HA-1 added to this model by SMc 02-07-92
  90      KM          Input data from Carter Assoc. Foothills Phase III report
  91      BA  0.0188
  92      LS              89
  93      UD     0.1

  94      KK      AD  Combine at Prop line with State Lands
  95      HC       2

  96      KK   ROUTE  Route Foothills flow to C127 thru conc collector channel N side of FW.
  97      RK     600   0.011   0.018           TRAP       8       2

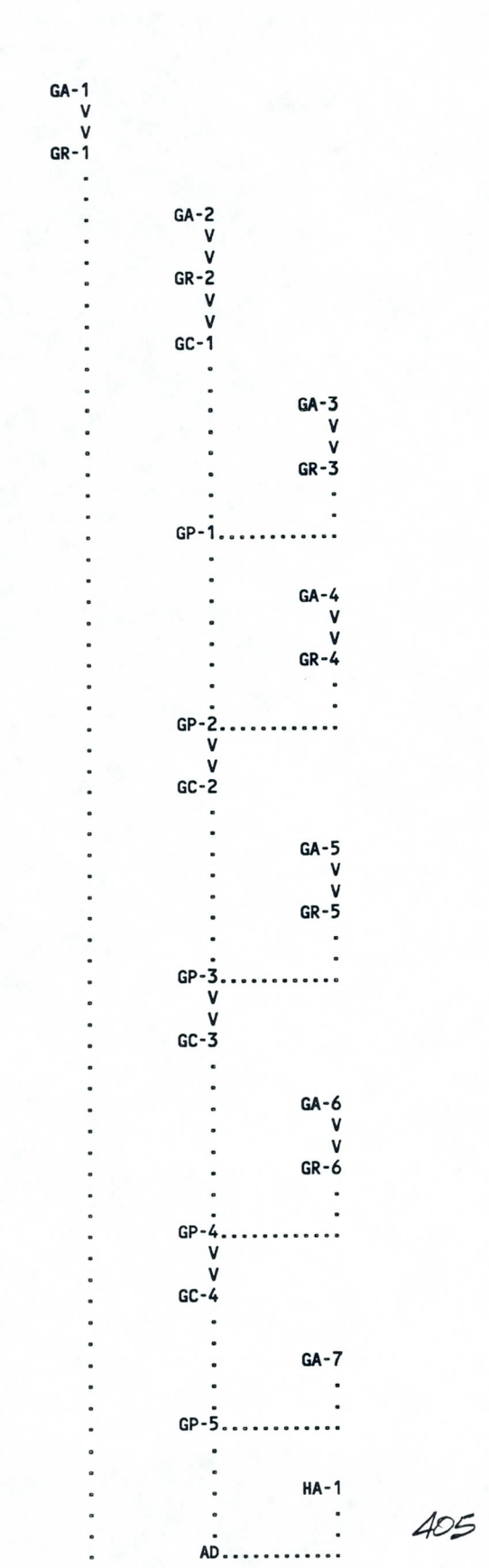
  98      KK   SW280
  99      BA   0.018
 100      LS              85
 101      UD    0.11

 102      KK  ADC127  Combine flows at C127
 103      HC       2
 104      ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT LINE NO.

(V) ROUTING
(.) CONNECTOR
(---->) DIVERSION OR PUMP FLOW
(<----) RETURN OF DIVERTED OR PUMPED FLOW



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
HEC1 S/N:                    HMVersion: 6.00    Data File: c:\scott\g50

*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             SEPTEMBER 1990            *
*              VERSION 4.0              *
*                                       *
*  RUN DATE  02/17/1992  TIME  11:44:37 *
*                                       *
*****************************************

*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************

                        REVISED PER GRADING AND GOLF COURSE PLAN
                        FOOTHILLS PHASE III        Filename: G50     (Modified for 24hr storm
                        HYDROLOGY REPORT           Previous FILE: FHG.99I   by SMc 09-27-01)
                        OFF AND ON-SITE DRAINAGE    50 YEAR STORM

  7 IO          OUTPUT CONTROL VARIABLES
                      IPRNT          3  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE

    IT          HYDROGRAPH TIME DATA
                       NMIN          5  MINUTES IN COMPUTATION INTERVAL
                      IDATE      1    0  STARTING DATE
                      ITIME       0000  STARTING TIME
                         NQ        300  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      2    0  ENDING DATE
                     NDTIME       0055  ENDING TIME
                      ICENT         19  CENTURY MARK

                  COMPUTATION INTERVAL      .08 HOURS
                       TOTAL TIME BASE    24.92 HOURS

          ENGLISH UNITS
              DRAINAGE AREA          SQUARE MILES
              PRECIPITATION DEPTH    INCHES
              LENGTH, ELEVATION      FEET
              FLOW                   CUBIC FEET PER SECOND
              STORAGE VOLUME         ACRE-FEET
              SURFACE AREA           ACRES
              TEMPERATURE            DEGREES FAHRENHEIT


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

          **************
          *            *
  8 KK    *       NW   *          EXISTING DRAINAGE IN NORTHWEST CORNER WHERE GR-1 MAY OUTFALL
          *            *
          **************

             SUBBASIN RUNOFF DATA

  9 BA       SUBBASIN CHARACTERISTICS
                   TAREA        .03  SUBBASIN AREA

             PRECIPITATION DATA

 10 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
             ..... HYDRO-35 .....    ............. TP-40 .............   ........... TP-49 ...........
             5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
               .69    1.35    2.37    2.60    2.76    3.05    3.32    3.60     .00     .00     .00     .00

                                                  STORM AREA =      .03

 11 LS       SCS LOSS RATE
                   STRTL         .25  INITIAL ABSTRACTION
                   CRVNBR      89.00  CURVE NUMBER
                   RTIMP         .00  PERCENT IMPERVIOUS AREA

 12 UD       SCS DIMENSIONLESS UNITGRAPH                    407
```

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                    TLAG          .10  LAG

                                                  ***

                                             UNIT HYDROGRAPH
                                          8 END-OF-PERIOD ORDINATES
             57.       84.       37.       14.        5.        2.        1.        0.

     ***          ***          ***          ***          ***

                    HYDROGRAPH AT STATION       NW

   TOTAL RAINFALL =     3.60, TOTAL LOSS =     1.15, TOTAL EXCESS =     2.45

 PEAK FLOW     TIME                             MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                    6-HR        24-HR        72-HR      24.92-HR
     74.      12.17         (CFS)        6.           2.           2.            2.
                          (INCHES)    2.247        2.450        2.450         2.450
                           (AC-FT)       3.           3.           3.            3.

                    CUMULATIVE AREA =      .03 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

          ***************
          *             *
  13 KK   *     GA-1    *           POST-DEVELOPMENT CONDITIONS FOR REMAINDER OF INPUT
          *             *
          ***************

             SUBBASIN RUNOFF DATA

  14 BA        SUBBASIN CHARACTERISTICS
                    TAREA         .04  SUBBASIN AREA

               PRECIPITATION DATA

  10 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
               ..... HYDRO-35 ......   ................ TP-40 ................   ............ TP-49 ...........
               5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                 .69    1.35    2.37    2.60    2.76    3.05    3.32    3.60     .00     .00     .00     .00

                                                 STORM AREA =       .04

  15 LS        SCS LOSS RATE
                    STRTL         .27  INITIAL ABSTRACTION
                   CRVNBR       88.00  CURVE NUMBER
                    RTIMP         .00  PERCENT IMPERVIOUS AREA

  16 UD        SCS DIMENSIONLESS UNITGRAPH
                    TLAG          .10  LAG

                                                  ***

                                             UNIT HYDROGRAPH
                                          8 END-OF-PERIOD ORDINATES
             91.      135.       59.       23.        9.        3.        1.        0.

     ***          ***          ***          ***          ***

                    HYDROGRAPH AT STATION     GA-1

   TOTAL RAINFALL =     3.60, TOTAL LOSS =     1.24, TOTAL EXCESS =     2.36

 PEAK FLOW     TIME                             MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                    6-HR        24-HR        72-HR      24.92-HR
    115.      12.17         (CFS)       10.           3.           3.            3.
                          (INCHES)    2.168        2.360        2.360         2.360
                           (AC-FT)       5.           5.           5.            5.

                    CUMULATIVE AREA =      .04 SQ MI


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

```
          **************
          *            *
17 KK     *     GR-1   *          OUTLET 24" RCP TO STATE LAND
          *            *
          **************

     HYDROGRAPH ROUTING DATA

18 RS     STORAGE ROUTING
               NSTPS          1  NUMBER OF SUBREACHES
                ITYP       STOR  TYPE OF INITIAL CONDITION
              RSVRIC      -1.00  INITIAL CONDITION
                   X        .00 WORKING R AND D COEFFICIENT

19 SV       STORAGE          .0       3.0

20 SE       ELEVATION       .00      3.00

21 SQ       DISCHARGE        0.       20.

                                                    ***

WARNING --- ROUTED OUTFLOW (     20.) IS GREATER THAN MAXIMUM OUTFLOW (     20.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (     20.) IS GREATER THAN MAXIMUM OUTFLOW (     20.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (     20.) IS GREATER THAN MAXIMUM OUTFLOW (     20.) IN STORAGE-OUTFLOW TABLE

     ***            ***             ***            ***            ***

                    HYDROGRAPH AT STATION     GR-1

 PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                    6-HR        24-HR        72-HR     24.92-HR
     20.      12.58          (CFS)        9.           3.           3.           3.
                          (INCHES)    2.028        2.335        2.335        2.335
                            (AC-FT)       5.           5.           5.           5.

 PEAK STORAGE  TIME                          MAXIMUM AVERAGE STORAGE
   (AC-FT)     (HR)                    6-HR        24-HR        72-HR     24.92-HR
      3.       12.58                    1.           0.           0.           0.

 PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                    6-HR        24-HR        72-HR     24.92-HR
     3.04      12.58                   1.36          .39          .38          .38

                    CUMULATIVE AREA =     .04 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
22 KK     *     GA-2   *
          *            *
          **************

     SUBBASIN RUNOFF DATA

23 BA       SUBBASIN CHARACTERISTICS
                 TAREA         .07  SUBBASIN AREA

            PRECIPITATION DATA

10 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
          ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
          5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR    2-DAY   4-DAY   7-DAY  10-DAY
            .69    1.35    2.37    2.60    2.76    3.05    3.32    3.60      .00     .00     .00     .00

                                                 STORM AREA =      .07

24 LS       SCS LOSS RATE
                 STRTL         .27  INITIAL ABSTRACTION
                CRVNBR       88.00  CURVE NUMBER
                 RTIMP         .00  PERCENT IMPERVIOUS AREA
```

```
 25 UD          SCS DIMENSIONLESS UNITGRAPH
                      TLAG         .10  LAG

                                                    ***

                                                UNIT HYDROGRAPH
                                             8 END-OF-PERIOD ORDINATES
             150.      221.       97.       38.       14.        6.        2.        1.

     ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION     GA-2

    TOTAL RAINFALL =    3.60, TOTAL LOSS =    1.24, TOTAL EXCESS =    2.36

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR     24.92-HR
    188.      12.17        (CFS)       16.         4.          4.          4.
                          (INCHES)    2.167       2.360       2.360       2.360
                          (AC-FT)       8.          9.          9.          9.

                        CUMULATIVE AREA =     .07 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
 26 KK    *      GR-2  *            OUTLET 30" RCP TO GA-3
          *            *
          **************

             HYDROGRAPH ROUTING DATA

 27 RS         STORAGE ROUTING
                    NSTPS           1  NUMBER OF SUBREACHES
                     ITYP        STOR  TYPE OF INITIAL CONDITION
                    RSVRIC      -1.00  INITIAL CONDITION
                        X         .00 WORKING R AND D COEFFICIENT

 28 SV           STORAGE          .0       5.5

 29 SE         ELEVATION         .00      3.00

 30 SQ         DISCHARGE          0.       28.

                                                    ***

     ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION     GR-2

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR     24.92-HR
     26.      12.67        (CFS)       14.         4.          4.          4.
                          (INCHES)    1.912       2.313       2.313       2.313
                          (AC-FT)       7.          8.          8.          8.

PEAK STORAGE   TIME                       MAXIMUM AVERAGE STORAGE
   (AC-FT)     (HR)                  6-HR       24-HR       72-HR     24.92-HR
      5.      12.67                    3.          1.          1.          1.

 PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                  6-HR       24-HR       72-HR     24.92-HR
     2.88     12.67                  1.53         .46         .45         .45

                        CUMULATIVE AREA =     .07 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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          *            *
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31 KK     *      GC-1  *
          *            *
          **************

             HYDROGRAPH ROUTING DATA

32 RK          KINEMATIC WAVE STREAM ROUTING
                        L       600.  CHANNEL LENGTH
                        S      .0050  SLOPE
                        N       .027  CHANNEL ROUGHNESS COEFFICIENT
                       CA        .00  CONTRIBUTING AREA
                    SHAPE       TRAP  CHANNEL SHAPE
                       WD       5.00  BOTTOM WIDTH OR DIAMETER
                        Z       3.00  SIDE SLOPE
                   NDXMIN          2  MINIMUM NUMBER OF DX INTERVALS

                                                    ***
                                  COMPUTED KINEMATIC PARAMETERS
                                       VARIABLE TIME STEP
                                    (DT SHOWN IS A MINIMUM)

                    ELEMENT    ALPHA       M         DT         DX       PEAK    TIME TO      VOLUME    MAXIMUM
                                                                                      PEAK                 CELERITY
                                                      (MIN)      (FT)     (CFS)    (MIN)        (IN)      (FPS)

                    MAIN          1.36      1.37        .88     200.00     26.41   760.98        2.31      4.19

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8424E+01  EXCESS= .0000E+00 OUTFLOW= .8419E+01 BASIN STORAGE= .5894E-02 PERCENT ERROR=     .0

                                       INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                    MAIN          1.36      1.37       5.00                26.41   760.00        2.31

     ***              ***               ***              ***               ***

                          HYDROGRAPH AT STATION     GC-1

 PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                    6-HR        24-HR        72-HR      24.92-HR
     26.      12.67          (CFS)       14.          4.           4.           4.
                          (INCHES)    1.911        2.311        2.311        2.311
                           (AC-FT)       7.           8.           8.           8.

                          CUMULATIVE AREA =     .07 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
33 KK     *      GA-3  *
          *            *
          **************

             SUBBASIN RUNOFF DATA

34 BA          SUBBASIN CHARACTERISTICS
                    TAREA         .02  SUBBASIN AREA

               PRECIPITATION DATA

10 PH                                 DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
               ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
               5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                 .69    1.35    2.37    2.60    2.76    3.05    3.32    3.60     .00     .00     .00     .00

                                                STORM AREA =     .02

35 LS          SCS LOSS RATE
                    STRTL         .20  INITIAL ABSTRACTION
                   CRVNBR       91.00  CURVE NUMBER
                    RTIMP         .00  PERCENT IMPERVIOUS AREA

36 UD          SCS DIMENSIONLESS UNITGRAPH
```

TLAG .10 LAG

***

UNIT HYDROGRAPH
8 END-OF-PERIOD ORDINATES

37. 55. 24. 9. 4. 1. 1. 0.

*** *** *** *** ***

HYDROGRAPH AT STATION GA-3

TOTAL RAINFALL = 3.60, TOTAL LOSS = .96, TOTAL EXCESS = 2.64

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
51.	12.17	(CFS)	4.	1.	1.	1.
		(INCHES)	2.408	2.636	2.636	2.636
		(AC-FT)	2.	2.	2.	2.

CUMULATIVE AREA = .02 SQ MI

*** ***

****
* *
37 KK * GR-3 * OUTLET 24" RCP TO 24" STORM SEWER
* *
****

HYDROGRAPH ROUTING DATA

38 RS STORAGE ROUTING
NSTPS 1 NUMBER OF SUBREACHES
ITYP STOR TYPE OF INITIAL CONDITION
RSVRIC -1.00 INITIAL CONDITION
X .00 WORKING R AND D COEFFICIENT

39 SV STORAGE .0 1.1

40 SE ELEVATION .00 3.00

41 SQ DISCHARGE 0. 20.

***

*** *** *** *** ***

HYDROGRAPH AT STATION GR-3

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
19.	12.42	(CFS)	4.	1.	1.	1.
		(INCHES)	2.397	2.632	2.632	2.632
		(AC-FT)	2.	2.	2.	2.

PEAK STORAGE (AC-FT)	TIME (HR)		MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.92-HR
1.	12.42		0.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)		MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.92-HR
2.78	12.42		.66	.18	.17	.17

CUMULATIVE AREA = .02 SQ MI

*** ***

****
* *
42 KK * GP-1 *
* *

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***************

43 HC        HYDROGRAPH COMBINATION
                  ICOMP             2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                              ***

   ***          ***          ***          ***          ***

                    HYDROGRAPH AT STATION    GP-1

PEAK FLOW    TIME                          MAXIMUM AVERAGE FLOW
  (CFS)      (HR)                  6-HR      24-HR      72-HR     24.92-HR
    44.     12.50      (CFS)        18.        5.         5.          5.
                     (INCHES)     1.997      2.375      2.375       2.375
                      (AC-FT)        9.        11.        11.         11.

                  CUMULATIVE AREA =      .09 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

        ***************
        *             *
44 KK   *     GA-4    *
        *             *
        ***************

          SUBBASIN RUNOFF DATA

45 BA       SUBBASIN CHARACTERISTICS
                  TAREA         .02  SUBBASIN AREA

            PRECIPITATION DATA

10 PH                             DEPTHS FOR  0-PERCENT HYPOTHETICAL STORM
            ..... HYDRO-35 ......    ................ TP-40 ................    ............ TP-49 ...........
            5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
              .69    1.35    2.37    2.60    2.76    3.05    3.32    3.60     .00     .00     .00     .00

                                                  STORM AREA =     .02

46 LS       SCS LOSS RATE
                  STRTL         .20  INITIAL ABSTRACTION
                 CRVNBR       91.00  CURVE NUMBER
                  RTIMP         .00  PERCENT IMPERVIOUS AREA

47 UD       SCS DIMENSIONLESS UNITGRAPH
                   TLAG         .10  LAG

                                                              ***

                                                    UNIT HYDROGRAPH
                                                 8 END-OF-PERIOD ORDINATES
            44.       65.       28.       11.       4.       2.       1.       0.

   ***          ***          ***          ***          ***

                    HYDROGRAPH AT STATION    GA-4

  TOTAL RAINFALL =     3.60, TOTAL LOSS =     .96, TOTAL EXCESS =     2.64

PEAK FLOW    TIME                          MAXIMUM AVERAGE FLOW
  (CFS)      (HR)                  6-HR      24-HR      72-HR     24.92-HR
    60.     12.17      (CFS)         5.         1.         1.          1.
                     (INCHES)     2.408      2.636      2.636       2.636
                      (AC-FT)        3.         3.         3.          3.

                  CUMULATIVE AREA =      .02 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

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          *           *
 48 KK    *     GR-4  *          OUTFLOW TO STORM SEWER
          *           *
          *************

             HYDROGRAPH ROUTING DATA

 49 RS         STORAGE ROUTING
                    NSTPS          1  NUMBER OF SUBREACHES
                     ITYP       STOR  TYPE OF INITIAL CONDITION
                   RSVRIC      -1.00  INITIAL CONDITION
                        X        .00 WORKING R AND D COEFFICIENT

 50 SV           STORAGE          .0       1.6

 51 SE         ELEVATION         .00      3.00

 52 SQ         DISCHARGE          0.       20.

                                                        ***

     ***           ***           ***           ***           ***

                       HYDROGRAPH AT STATION     GR-4

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                 6-HR       24-HR       72-HR     24.92-HR
     17.      12.50       (CFS)        5.          1.          1.           1.
                          (INCHES)  2.377       2.627       2.627        2.627
                          (AC-FT)      3.          3.          3.           3.

 PEAK STORAGE  TIME                          MAXIMUM AVERAGE STORAGE
   (AC-FT)     (HR)                 6-HR       24-HR       72-HR     24.92-HR
      1.       12.50                 0.          0.          0.           0.

 PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                 6-HR       24-HR       72-HR     24.92-HR
     2.51      12.50                .77         .21         .20          .20

                       CUMULATIVE AREA =     .02 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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          *            *
 53 KK    *      GP-2  *
          *            *
          **************

 54 HC         HYDROGRAPH COMBINATION
                    ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                        ***

     ***           ***           ***           ***           ***

                       HYDROGRAPH AT STATION     GP-2

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                 6-HR       24-HR       72-HR     24.92-HR
     60.      12.50       (CFS)       23.          7.          7.           7.
                          (INCHES)  2.066       2.423       2.423        2.423
                          (AC-FT)     12.         14.         14.          14.

                       CUMULATIVE AREA =     .11 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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          *            *
 55 KK    *      GC-2  *
          *            *
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           HYDROGRAPH ROUTING DATA

 56 RK       KINEMATIC WAVE STREAM ROUTING
                      L      1200.  CHANNEL LENGTH
                      S      .0250  SLOPE
                      N       .013  CHANNEL ROUGHNESS COEFFICIENT
                     CA        .00  CONTRIBUTING AREA
                  SHAPE       CIRC  CHANNEL SHAPE
                     WD       2.00  BOTTOM WIDTH OR DIAMETER
                      Z        .00  SIDE SLOPE
                NDXMIN           2  MINIMUM NUMBER OF DX INTERVALS

                                                  ***
                                   COMPUTED KINEMATIC PARAMETERS
                                        VARIABLE TIME STEP
                                     (DT SHOWN IS A MINIMUM)

              ELEMENT    ALPHA       M        DT        DX      PEAK    TIME TO    VOLUME   MAXIMUM
                                                                          PEAK               CELERITY
                                            (MIN)      (FT)     (CFS)    (MIN)      (IN)     (FPS)

               MAIN      10.98     1.25      .37     400.00     60.38   750.84     2.42     19.30

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1361E+02  EXCESS= .0000E+00 OUTFLOW= .1360E+02 BASIN STORAGE= .2408E-02 PERCENT ERROR=     .0

                                    INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

               MAIN      10.98     1.25     5.00                60.26   750.00     2.42

     ***          ***         ***          ***          ***

                      HYDROGRAPH AT STATION     GC-2

 PEAK FLOW      TIME                        MAXIMUM AVERAGE FLOW
   (CFS)        (HR)                 6-HR        24-HR       72-HR      24.92-HR
      60.      12.50        (CFS)     23.          7.          7.           7.
                          (INCHES)  2.066       2.423       2.423        2.423
                           (AC-FT)    12.         14.         14.          14.

                       CUMULATIVE AREA =      .11 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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        *             *
 57 KK  *     GA-5    *
        *             *
        ***************

           SUBBASIN RUNOFF DATA

 58 BA       SUBBASIN CHARACTERISTICS
                TAREA          .03  SUBBASIN AREA

             PRECIPITATION DATA

 10 PH                              DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
             ..... HYDRO-35 ......   ............... TP-40 ...............   ........... TP-49 ...........
             5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
               .69    1.35    2.37    2.60    2.76    3.05    3.32    3.60     .00     .00     .00     .00

                                                   STORM AREA =       .03

 59 LS       SCS LOSS RATE
                STRTL          .13  INITIAL ABSTRACTION
               CRVNBR        94.00  CURVE NUMBER
                RTIMP          .00  PERCENT IMPERVIOUS AREA

 60 UD       SCS DIMENSIONLESS UNITGRAPH
                 TLAG          .10  LAG
```

***

UNIT HYDROGRAPH
8 END-OF-PERIOD ORDINATES

62.	92.	41.	16.	6.	2.	1.	0.

***   ***   ***   ***   ***

HYDROGRAPH AT STATION GA-5

TOTAL RAINFALL = 3.60, TOTAL LOSS = .67, TOTAL EXCESS = 2.93

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
93.	12.17	(CFS)	8.	2.	2.	2.
		(INCHES)	2.655	2.933	2.933	2.933
		(AC-FT)	4.	4.	4.	4.

CUMULATIVE AREA = .03 SQ MI

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        ***************
        *             *
61 KK   *     GR-5    *          OUTFLOW TO CHANNEL
        *             *
        ***************
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HYDROGRAPH ROUTING DATA

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62 RS         STORAGE ROUTING
                   NSTPS           1  NUMBER OF SUBREACHES
                    ITYP        STOR  TYPE OF INITIAL CONDITION
                  RSVRIC       -1.00  INITIAL CONDITION
                       X         .00  WORKING R AND D COEFFICIENT

63 SV           STORAGE          .0        2.2

64 SE         ELEVATION         .00       3.00

65 SQ         DISCHARGE          0.        28.
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***

***   ***   ***   ***   ***

HYDROGRAPH AT STATION GR-5

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
27.	12.42	(CFS)	8.	2.	2.	2.
		(INCHES)	2.621	2.925	2.925	2.925
		(AC-FT)	4.	4.	4.	4.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
(AC-FT)	(HR)	6-HR	24-HR	72-HR	24.92-HR
2.	12.42	1.	0.	0.	0.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
(FEET)	(HR)	6-HR	24-HR	72-HR	24.92-HR
2.94	12.42	.88	.24	.24	.24

CUMULATIVE AREA = .03 SQ MI

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        ***************
        *             *
66 KK   *     GP-3    *
        *             *
        ***************
```

67 HC HYDROGRAPH COMBINATION
ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

***

*** *** *** *** ***

HYDROGRAPH AT STATION GP-3

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
87.	12.50	(CFS)	31.	9.	9.	9.
		(INCHES)	2.178	2.530	2.530	2.530
		(AC-FT)	16.	18.	18.	18.

CUMULATIVE AREA = .13 SQ MI

*** ***

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* *
68 KK * GC-3 *
* *
****

HYDROGRAPH ROUTING DATA

69 RK KINEMATIC WAVE STREAM ROUTING

L	950.	CHANNEL LENGTH
S	.0050	SLOPE
N	.027	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	15.00	BOTTOM WIDTH OR DIAMETER
Z	.00	SIDE SLOPE
NDXMIN	2	MINIMUM NUMBER OF DX INTERVALS

***

COMPUTED KINEMATIC PARAMETERS
VARIABLE TIME STEP
(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.64	1.67	.79	316.67	87.06	751.74	2.53	7.63

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1805E+02 EXCESS= .0000E+00 OUTFLOW= .1803E+02 BASIN STORAGE= .2103E-01 PERCENT ERROR= .0

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	.64	1.67	5.00	86.78	750.00	2.53

*** *** *** *** ***

HYDROGRAPH AT STATION GC-3

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
87.	12.50	(CFS)	31.	9.	9.	9.
		(INCHES)	2.179	2.528	2.528	2.528
		(AC-FT)	16.	18.	18.	18.

CUMULATIVE AREA = .13 SQ MI

*** ***

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          *           *
70 KK     *     GA-6  *
          *           *
          *************

             SUBBASIN RUNOFF DATA

71 BA          SUBBASIN CHARACTERISTICS
                    TAREA         .05  SUBBASIN AREA

               PRECIPITATION DATA

10 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
               ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
               5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                 .69    1.35    2.37    2.60    2.76    3.05    3.32    3.60     .00     .00     .00     .00

                                                 STORM AREA =     .05

72 LS          SCS LOSS RATE
                    STRTL         .13  INITIAL ABSTRACTION
                   CRVNBR       94.00  CURVE NUMBER
                    RTIMP         .00  PERCENT IMPERVIOUS AREA

73 UD          SCS DIMENSIONLESS UNITGRAPH
                    TLAG         .10  LAG

                                                        ***

                                                   UNIT HYDROGRAPH
                                                 8 END-OF-PERIOD ORDINATES
               120.      177.       78.       30.       12.        4.        2.        1.

    ***             ***             ***             ***             ***

                     HYDROGRAPH AT STATION     GA-6

   TOTAL RAINFALL =    3.60, TOTAL LOSS =     .67, TOTAL EXCESS =    2.93

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     24.92-HR
   178.     12.17        (CFS)       16.         4.          4.          4.
                        (INCHES)   2.655       2.933       2.933       2.933
                        (AC-FT)      8.          9.          9.          9.

                     CUMULATIVE AREA =     .05 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          *************
          *           *
74 KK     *     GR-6  *          OUTFLOW TO CHANNEL
          *           *
          *************

             HYDROGRAPH ROUTING DATA

75 RS          STORAGE ROUTING
                    NSTPS          1  NUMBER OF SUBREACHES
                     ITYP       STOR  TYPE OF INITIAL CONDITION
                   RSVRIC      -1.00  INITIAL CONDITION
                        X        .00 WORKING R AND D COEFFICIENT

76 SV            STORAGE         .0       1.1       2.2       3.3

77 SE          ELEVATION        .00      1.00      2.00      3.00

78 SQ          DISCHARGE         0.        1.       42.      117.

                                                        ***

    ***             ***             ***             ***             ***

                     HYDROGRAPH AT STATION     GR-6

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW  418
```

(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
113.	12.25	(CFS)	14.	4.	4.	4.
		(INCHES)	2.385	2.605	2.605	2.605
		(AC-FT)	7.	8.	8.	8.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.92-HR
3.	12.25	1.	1.	1.	1.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.92-HR
2.95	12.25	1.27	.63	.61	.61

CUMULATIVE AREA = .05 SQ MI

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          **************
          *            *
79 KK     *      GP-4  *
          *            *
          **************
```

80 HC HYDROGRAPH COMBINATION

ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

***

*** *** *** *** ***

HYDROGRAPH AT STATION GP-4

PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
188.	12.33	(CFS) 45.	13.	12.	12.
		(INCHES) 2.239	2.550	2.550	2.550
		(AC-FT) 23.	26.	26.	26.

CUMULATIVE AREA = .19 SQ MI

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          **************
          *            *
81 KK     *      GC-4  *
          *            *
          **************
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HYDROGRAPH ROUTING DATA

82 RK KINEMATIC WAVE STREAM ROUTING

L	950.	CHANNEL LENGTH
S	.0220	SLOPE
N	.035	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	20.00	BOTTOM WIDTH OR DIAMETER
Z	4.00	SIDE SLOPE
NDXMIN	2	MINIMUM NUMBER OF DX INTERVALS

***

COMPUTED KINEMATIC PARAMETERS
VARIABLE TIME STEP
(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	1.26	1.45	.75	316.67	187.72	741.17	2.55	8.73

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2564E+02 EXCESS= .0000E+00 OUTFLOW= .2562E+02 BASIN STORAGE= .1938E-01 PERCENT ERROR= .0

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	1.26	1.45	5.00	185.92	740.00	2.55

*** *** *** *** ***

HYDROGRAPH AT STATION GC-4

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
186.	12.33	(CFS)	45.	13.	12.	12.
		(INCHES)	2.240	2.550	2.550	2.550
		(AC-FT)	23.	26.	26.	26.

CUMULATIVE AREA = .19 SQ MI

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          ***************
          *             *
83 KK     *     GA-7    *
          *             *
          ***************
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SUBBASIN RUNOFF DATA

84 BA SUBBASIN CHARACTERISTICS
TAREA .03 SUBBASIN AREA

PRECIPITATION DATA

10 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			.... TP-40					.... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.69	1.35	2.37	2.60	2.76	3.05	3.32	3.60	.00	.00	.00	.00

STORM AREA = .03

85 LS SCS LOSS RATE
STRTL .13 INITIAL ABSTRACTION
CRVNBR 94.00 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

86 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .10 LAG

***

UNIT HYDROGRAPH
8 END-OF-PERIOD ORDINATES

66.	98.	43.	17.	6.	2.	1.	0.

*** *** *** *** ***

HYDROGRAPH AT STATION GA-7

TOTAL RAINFALL = 3.60, TOTAL LOSS = .67, TOTAL EXCESS = 2.93

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
99.	12.17	(CFS)	9.	2.	2.	2.
		(INCHES)	2.655	2.933	2.933	2.933
		(AC-FT)	4.	5.	5.	5.

CUMULATIVE AREA = .03 SQ MI

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          **************
          *            *
87 KK     *      GP-5  *
          *            *
          **************

88 HC          HYDROGRAPH COMBINATION
                    ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                        ***

    ***            ***            ***            ***            ***

                       HYDROGRAPH AT STATION     GP-5

PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                    6-HR       24-HR       72-HR     24.92-HR
   238.      12.25        (CFS)        54.         15.         15.          15.
                         (INCHES)    2.278       2.603       2.603        2.603
                         (AC-FT)      27.         30.         30.          30.

                       CUMULATIVE AREA =     .22 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
89 KK     *      HA-1  *       HA-1 added to this model by SMc 02-07-92
          *            *
          **************
                              Input data from Carter Assoc. Foothills Phase III report

             SUBBASIN RUNOFF DATA

91 BA          SUBBASIN CHARACTERISTICS
                    TAREA          .02  SUBBASIN AREA

               PRECIPITATION DATA

10 PH                                  DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
               ..... HYDRO-35 .....   ............. TP-40 .............   ........... TP-49 ...........
               5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                 .69    1.35    2.37    2.60    2.76    3.05    3.32    3.60     .00     .00     .00     .00

                                                 STORM AREA =     .02

92 LS          SCS LOSS RATE
                    STRTL          .25  INITIAL ABSTRACTION
                   CRVNBR        89.00  CURVE NUMBER
                    RTIMP          .00  PERCENT IMPERVIOUS AREA

93 UD          SCS DIMENSIONLESS UNITGRAPH
                    TLAG          .10  LAG

                                                        ***

                                                  UNIT HYDROGRAPH
                                               8 END-OF-PERIOD ORDINATES
                41.       61.       27.       10.        4.        2.        1.        0.

    ***            ***            ***            ***            ***

                       HYDROGRAPH AT STATION     HA-1

  TOTAL RAINFALL =    3.60, TOTAL LOSS =    1.15, TOTAL EXCESS =    2.45

PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                    6-HR       24-HR       72-HR     24.92-HR
    53.      12.17        (CFS)         5.          1.          1.           1.
                         (INCHES)    2.247       2.450       2.450        2.450
                         (AC-FT)       2.          2.          2.           2.

                       CUMULATIVE AREA =     .02 SQ MI
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*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

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          *            *
 94 KK    *        AD  *       Combine at Prop line with State Lands
          *            *
          **************

 95 HC          HYDROGRAPH COMBINATION
                     ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                        ***

     ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION       AD

 PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR        24-HR        72-HR     24.92-HR
    277.      12.25        (CFS)       58.          17.          16.          16.
                          (INCHES)   2.274        2.591        2.591        2.591
                          (AC-FT)     29.          33.          33.          33.

                       CUMULATIVE AREA =     .24 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

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          *            *
 96 KK    *     ROUTE  *       Route Foothills flow to C127 thru conc collector channel N side of FW.
          *            *
          **************

             HYDROGRAPH ROUTING DATA

 97 RK          KINEMATIC WAVE STREAM ROUTING
                          L       600.  CHANNEL LENGTH
                          S      .0110  SLOPE
                          N       .018  CHANNEL ROUGHNESS COEFFICIENT
                         CA        .00  CONTRIBUTING AREA
                      SHAPE       TRAP  CHANNEL SHAPE
                         WD       8.00  BOTTOM WIDTH OR DIAMETER
                          Z       2.00  SIDE SLOPE
                     NDXMIN          2  MINIMUM NUMBER OF DX INTERVALS

                                                  ***
                                 COMPUTED KINEMATIC PARAMETERS
                                      VARIABLE TIME STEP
                                   (DT SHOWN IS A MINIMUM)

                  ELEMENT    ALPHA       M         DT        DX       PEAK    TIME TO      VOLUME    MAXIMUM
                                                                               PEAK                   CELERITY
                                                    (MIN)     (FT)     (CFS)    (MIN)        (IN)      (FPS)

                  MAIN         2.65      1.42        .38    200.00    276.32   735.22        2.59      15.10

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3283E+02  EXCESS= .0000E+00 OUTFLOW= .3282E+02 BASIN STORAGE= .7400E-02 PERCENT ERROR=    .0

                                        INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                  MAIN         2.65      1.42       5.00              276.07   735.00        2.59

     ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION    ROUTE

 PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR        24-HR        72-HR     24.92-HR
    276.      12.25        (CFS)       58.          17.          16.          16.
                          (INCHES)   2.275        2.591        2.591        2.591
                          (AC-FT)     29.          33.          33.          33.
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                    CUMULATIVE AREA =     .24 SQ MI


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          *            *
 98 KK    *     SW280  *
          *            *
          **************

             SUBBASIN RUNOFF DATA

 99 BA          SUBBASIN CHARACTERISTICS
                     TAREA         .02  SUBBASIN AREA

                PRECIPITATION DATA

 10 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .69    1.35    2.37    2.60    2.76    3.05    3.32    3.60     .00     .00     .00     .00

                                                 STORM AREA =     .02

100 LS          SCS LOSS RATE
                     STRTL          .35  INITIAL ABSTRACTION
                    CRVNBR        85.00  CURVE NUMBER
                     RTIMP          .00  PERCENT IMPERVIOUS AREA

101 UD          SCS DIMENSIONLESS UNITGRAPH
                     TLAG          .11  LAG

                                                      ***

                                                   UNIT HYDROGRAPH
                                                 9 END-OF-PERIOD ORDINATES
                  33.       57.       30.       12.        5.        2.        1.        0.        0.

     ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION    SW280

    TOTAL RAINFALL =    3.60, TOTAL LOSS =    1.50, TOTAL EXCESS =    2.10

PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                    6-HR        24-HR        72-HR      24.92-HR
    44.      12.17         (CFS)         4.           1.           1.           1.
                         (INCHES)      1.939        2.104        2.104        2.104
                          (AC-FT)         2.           2.           2.           2.

                       CUMULATIVE AREA =     .02 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
102 KK    *    ADC127  *       Combine flows at C127
          *            *
          **************

103 HC          HYDROGRAPH COMBINATION
                     ICOMP             2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                      ***

     ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION   ADC127

PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                    6-HR        24-HR        72-HR      24.92-HR
```

311.	12.25	(CFS)	62.	18.	17.	17.
		(INCHES)	2.251	2.557	2.557	2.557
		(AC-FT)	31.	35.	35.	35.

CUMULATIVE AREA = .26 SQ MI

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	NW	74.	12.17	6.	2.	2.	.03		
HYDROGRAPH AT	GA-1	115.	12.17	10.	3.	3.	.04		
ROUTED TO	GR-1	20.	12.58	9.	3.	3.	.04	3.04	12.58
HYDROGRAPH AT	GA-2	188.	12.17	16.	4.	4.	.07		
ROUTED TO	GR-2	26.	12.67	14.	4.	4.	.07	2.88	12.67
ROUTED TO	GC-1	26.	12.67	14.	4.	4.	.07		
HYDROGRAPH AT	GA-3	51.	12.17	4.	1.	1.	.02		
ROUTED TO	GR-3	19.	12.42	4.	1.	1.	.02	2.78	12.42
2 COMBINED AT	GP-1	44.	12.50	18.	5.	5.	.09		
HYDROGRAPH AT	GA-4	60.	12.17	5.	1.	1.	.02		
ROUTED TO	GR-4	17.	12.50	5.	1.	1.	.02	2.51	12.50
2 COMBINED AT	GP-2	60.	12.50	23.	7.	7.	.11		
ROUTED TO	GC-2	60.	12.50	23.	7.	7.	.11		
HYDROGRAPH AT	GA-5	93.	12.17	8.	2.	2.	.03		
ROUTED TO	GR-5	27.	12.42	8.	2.	2.	.03	2.94	12.42
2 COMBINED AT	GP-3	87.	12.50	31.	9.	9.	.13		
ROUTED TO	GC-3	87.	12.50	31.	9.	9.	.13		
HYDROGRAPH AT	GA-6	178.	12.17	16.	4.	4.	.05		
ROUTED TO	GR-6	113.	12.25	14.	4.	4.	.05	2.95	12.25
2 COMBINED AT	GP-4	188.	12.33	45.	13.	12.	.19		
ROUTED TO	GC-4	186.	12.33	45.	13.	12.	.19		
HYDROGRAPH AT	GA-7	99.	12.17	9.	2.	2.	.03		
2 COMBINED AT	GP-5	238.	12.25	54.	15.	15.	.22		
HYDROGRAPH AT	HA-1	53.	12.17	5.	1.	1.	.02		
2 COMBINED AT	AD	277.	12.25	58.	17.	16.	.24		
ROUTED TO	ROUTE	276.	12.25	58.	17.	16.	.24		
HYDROGRAPH AT	SW280	44.	12.17	4.	1.	1.	.02		
2 COMBINED AT	ADC127	311.	12.25	62.	18.	17.	.26		

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	INTERPOLATED TO COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
GC-1	MANE	.88	26.41	760.98	2.31	5.00	26.41	760.00	2.31

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8424E+01 EXCESS= .0000E+00 OUTFLOW= .8419E+01 BASIN STORAGE= .5894E-02 PERCENT ERROR= .0

GC-2	MANE	.37	60.38	750.84	2.42	5.00	60.26	750.00	2.42

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1361E+02 EXCESS= .0000E+00 OUTFLOW= .1360E+02 BASIN STORAGE= .2408E-02 PERCENT ERROR= .0

GC-3	MANE	.79	87.06	751.74	2.53	5.00	86.78	750.00	2.53

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1805E+02 EXCESS= .0000E+00 OUTFLOW= .1803E+02 BASIN STORAGE= .2103E-01 PERCENT ERROR= .0

GC-4	MANE	.75	187.72	741.17	2.55	5.00	185.92	740.00	2.55

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2564E+02 EXCESS= .0000E+00 OUTFLOW= .2562E+02 BASIN STORAGE= .1938E-01 PERCENT ERROR= .0

ROUTE	MANE	.38	276.32	735.22	2.59	5.00	276.07	735.00	2.59

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3283E+02 EXCESS= .0000E+00 OUTFLOW= .3282E+02 BASIN STORAGE= .7400E-02 PERCENT ERROR= .0

*** NORMAL END OF HEC-1 ***
Elapsed Time - 00:01:01.73 (61.73 Seconds)
NORMAL END OF HEC-1

HEC1 S/N: HMVersion: 6.00 Data File: c:\scott\g100

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*         SEPTEMBER 1990                *
*          VERSION 4.0                  *
*                                       *
*  RUN DATE  02/17/1992  TIME  11:42:14 *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*         609 SECOND STREET             *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

```
::::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::::
:::                                      :::
:::  Full Microcomputer Implementation   :::
:::                 by                   :::
:::         Haestad Methods, Inc.        :::
:::                                      :::
::::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::::
```

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

    1     ID       REVISED PER GRADING AND GOLF COURSE PLAN
          *DIAGRAM
    2     ID       FOOTHILLS PHASE III          Filename: G50     (Modified for 24hr storm
    3     ID       HYDROLOGY REPORT             Previous FILE: FHG.99I   by SMc 09-27-01)
    4     ID       OFF AND ON-SITE DRAINAGE     100 YEAR STORM
    5     ID
    6     IT       5                    300
    7     IO       3       0

    8     KK       NW       EXISTING DRAINAGE IN NORTHWEST CORNER WHERE GR-1 MAY OUTFALL
    9     BA    0.026
   10     PH                      0.79    1.55    2.72    2.97    3.14    3.45    3.74    4.05
   11     LS       0       89
   12     UD     0.1

   13     KK     GA-1       POST-DEVELOPMENT CONDITIONS FOR REMAINDER OF INPUT
   14     BA   0.0417
   15     LS       0       88
   16     UD     0.1

   17     KK     GR-1       OUTLET 24" RCP TO STATE LAND
   18     RS       1     STOR      -1       0
   19     SV       0        3
   20     SE       0        3
   21     SQ       0       20

   22     KK     GA-2
   23     BA   0.0683
   24     LS       0       88
   25     UD     0.1

   26     KK     GR-2       OUTLET 30" RCP TO GA-3
   27     RS       1     STOR      -1       0
   28     SV       0      5.5
   29     SE       0        3
   30     SQ       0     27.5

   31     KK     GC-1
   32     RK     600   0.005   0.027           TRAP       5       3

   33     KK     GA-3
   34     BA   0.017
   35     LS       0       91
   36     UD     0.1

   37     KK     GR-3       OUTLET 24" RCP TO 24" STORM SEWER
   38     RS       1     STOR      -1       0
   39     SV       0      1.1
   40     SE       0        3
   41     SQ       0       20
```

```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  42          KK    GP-1
  43          HC      2

  44          KK    GA-4
  45          BA    0.02
  46          LS      0      91
  47          UD     0.1

  48          KK    GR-4       OUTFLOW TO STORM SEWER
  49          RS       1    STOR      -1       0
  50          SV       0    1.65
  51          SE       0       3
  52          SQ       0      20

  53          KK    GP-2
  54          HC      2

  55          KK    GC-2
  56          RK    1200   0.025   0.013            CIRC       2

  57          KK    GA-5
  58          BA  0.0285
  59          LS       0      94
  60          UD     0.1

  61          KK    GR-5       OUTFLOW TO CHANNEL
  62          RS       1    STOR      -1       0
  63          SV       0     2.2
  64          SE       0       3
  65          SQ       0    27.5

  66          KK    GP-3
  67          HC      2

  68          KK    GC-3
  69          RK     950   0.005   0.027            TRAP      15       .

  70          KK    GA-6
  71          BA  0.0547
  72          LS       0      94
  73          UD     0.1

  74          KK    GR-6       OUTFLOW TO CHANNEL
  75          RS       1    STOR      -1       0
  76          SV       0     1.1     2.2     3.3
  77          SE       0       1       2       3
  78          SQ       0       1      42     117

  79          KK    GP-4
  80          HC      2
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  81      KK    GC-4
  82      RK     950   0.022   0.035           TRAP      20       4

  83      KK    GA-7
  84      BA  0.0303
  85      LS       0      94
  86      UD     0.1

  87      KK    GP-5
  88      HC       2

  89      KK    HA-1  HA-1 added to this model by SMc 02-07-92
  90      KM          Input data from Carter Assoc. Foothills Phase III report
  91      BA  0.0188
  92      LS             89
  93      UD     0.1

  94      KK      AD  Combine at Prop line with State Lands
  95      HC       2

  96      KK   ROUTE  Route Foothills flow to C127 thru conc collector channel N side of FW.
  97      RK     600   0.011   0.018           TRAP       8       2

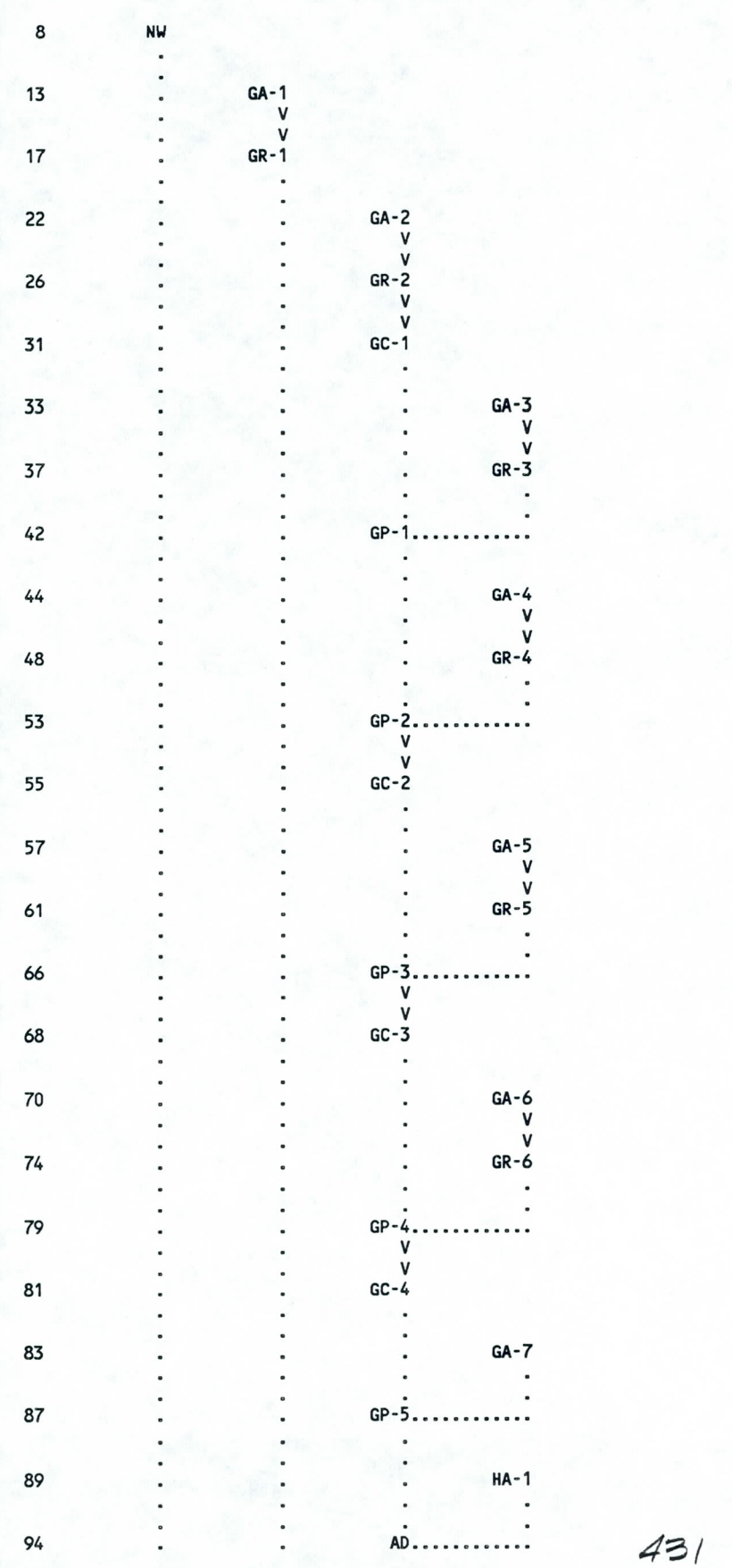
  98      KK   SW280
  99      BA   0.018
 100      LS             85
 101      UD    0.11

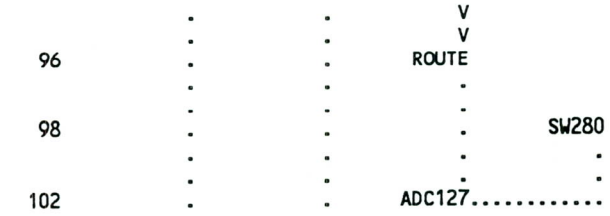
 102      KK  ADC127  Combine flows at C127
 103      HC       2
 104      ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT LINE NO.

(V) ROUTING (.) CONNECTOR (---->) DIVERSION OR PUMP FLOW (<----) RETURN OF DIVERTED OR PUMPED FLOW





(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
HEC1 S/N:                    HMVersion: 6.00    Data File: c:\scott\g100

*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*          SEPTEMBER 1990               *
*           VERSION 4.0                 *
*                                       *
*  RUN DATE  02/17/1992  TIME  11:42:14 *
*                                       *
*****************************************

*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************

                        REVISED PER GRADING AND GOLF COURSE PLAN
                        FOOTHILLS PHASE III        Filename: G50     (Modified for 24hr storm
                        HYDROLOGY REPORT           Previous FILE: FHG.99I   by SMc 09-27-01)
                        OFF AND ON-SITE DRAINAGE   100 YEAR STORM

  7 IO          OUTPUT CONTROL VARIABLES
                      IPRNT          3  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

    IT          HYDROGRAPH TIME DATA
                       NMIN          5  MINUTES IN COMPUTATION INTERVAL
                      IDATE      1   0  STARTING DATE
                      ITIME       0000  STARTING TIME
                         NQ        300  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      2   0  ENDING DATE
                     NDTIME       0055  ENDING TIME
                      ICENT         19  CENTURY MARK

                  COMPUTATION INTERVAL      .08 HOURS
                       TOTAL TIME BASE    24.92 HOURS

          ENGLISH UNITS
               DRAINAGE AREA          SQUARE MILES
               PRECIPITATION DEPTH    INCHES
               LENGTH, ELEVATION      FEET
               FLOW                   CUBIC FEET PER SECOND
               STORAGE VOLUME         ACRE-FEET
               SURFACE AREA           ACRES
               TEMPERATURE            DEGREES FAHRENHEIT


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
  8 KK      *       NW   *          EXISTING DRAINAGE IN NORTHWEST CORNER WHERE GR-1 MAY OUTFALL
            *            *
            **************

               SUBBASIN RUNOFF DATA

  9 BA            SUBBASIN CHARACTERISTICS
                        TAREA        .03  SUBBASIN AREA

                  PRECIPITATION DATA

 10 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                  ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
                  5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                    .79    1.55    2.72    2.97    3.14    3.45    3.74    4.05     .00     .00     .00     .00

                                                 STORM AREA =      .03

 11 LS            SCS LOSS RATE
                        STRTL         .25  INITIAL ABSTRACTION
                        CRVNBR      89.00  CURVE NUMBER
                        RTIMP         .00  PERCENT IMPERVIOUS AREA

 12 UD            SCS DIMENSIONLESS UNITGRAPH
```

```
                    TLAG         .10  LAG

                                                    ***

                                                  UNIT HYDROGRAPH
                                                8 END-OF-PERIOD ORDINATES
              57.       84.       37.       14.        5.        2.        1.        0.

     ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION       NW

   TOTAL RAINFALL =    4.05, TOTAL LOSS =    1.18, TOTAL EXCESS =    2.87

PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR        24-HR        72-HR      24.92-HR
    88.      12.17       (CFS)         7.           2.           2.           2.
                         (INCHES)   2.637        2.870        2.870        2.870
                         (AC-FT)       4.           4.           4.           4.

                      CUMULATIVE AREA =     .03 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
 13 KK    *      GA-1  *           POST-DEVELOPMENT CONDITIONS FOR REMAINDER OF INPUT
          *            *
          **************

             SUBBASIN RUNOFF DATA

 14 BA         SUBBASIN CHARACTERISTICS
                    TAREA         .04  SUBBASIN AREA

               PRECIPITATION DATA

 10 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
               ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
               5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                 .79    1.55    2.72    2.97    3.14    3.45    3.74    4.05     .00     .00     .00     .00

                                                STORM AREA =     .04

 15 LS         SCS LOSS RATE
                    STRTL         .27  INITIAL ABSTRACTION
                   CRVNBR       88.00  CURVE NUMBER
                    RTIMP         .00  PERCENT IMPERVIOUS AREA

 16 UD         SCS DIMENSIONLESS UNITGRAPH
                    TLAG         .10  LAG

                                                    ***

                                                  UNIT HYDROGRAPH
                                                8 END-OF-PERIOD ORDINATES
              91.      135.       59.       23.        9.        3.        1.        0.

     ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION     GA-1

   TOTAL RAINFALL =    4.05, TOTAL LOSS =    1.27, TOTAL EXCESS =    2.78

PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR        24-HR        72-HR      24.92-HR
   137.      12.17       (CFS)        11.           3.           3.           3.
                         (INCHES)   2.554        2.775        2.775        2.775
                         (AC-FT)       6.           6.           6.           6.

                      CUMULATIVE AREA =     .04 SQ MI


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

```
          **************
          *            *
17 KK     *     GR-1   *          OUTLET 24" RCP TO STATE LAND
          *            *
          **************

             HYDROGRAPH ROUTING DATA

18 RS          STORAGE ROUTING
                    NSTPS          1  NUMBER OF SUBREACHES
                     ITYP       STOR  TYPE OF INITIAL CONDITION
                    RSVRIC     -1.00  INITIAL CONDITION
                        X        .00 WORKING R AND D COEFFICIENT

19 SV           STORAGE          .0       3.0

20 SE           ELEVATION       .00      3.00

21 SQ           DISCHARGE        0.       20.
                                                        ***

 WARNING --- ROUTED OUTFLOW (     22.) IS GREATER THAN MAXIMUM OUTFLOW (     20.) IN STORAGE-OUTFLOW TABLE

 WARNING --- ROUTED OUTFLOW (     23.) IS GREATER THAN MAXIMUM OUTFLOW (     20.) IN STORAGE-OUTFLOW TABLE

 WARNING --- ROUTED OUTFLOW (     24.) IS GREATER THAN MAXIMUM OUTFLOW (     20.) IN STORAGE-OUTFLOW TABLE

 WARNING --- ROUTED OUTFLOW (     24.) IS GREATER THAN MAXIMUM OUTFLOW (     20.) IN STORAGE-OUTFLOW TABLE

 WARNING --- ROUTED OUTFLOW (     24.) IS GREATER THAN MAXIMUM OUTFLOW (     20.) IN STORAGE-OUTFLOW TABLE

 WARNING --- ROUTED OUTFLOW (     24.) IS GREATER THAN MAXIMUM OUTFLOW (     20.) IN STORAGE-OUTFLOW TABLE

 WARNING --- ROUTED OUTFLOW (     23.) IS GREATER THAN MAXIMUM OUTFLOW (     20.) IN STORAGE-OUTFLOW TABLE

 WARNING --- ROUTED OUTFLOW (     22.) IS GREATER THAN MAXIMUM OUTFLOW (     20.) IN STORAGE-OUTFLOW TABLE

 WARNING --- ROUTED OUTFLOW (     21.) IS GREATER THAN MAXIMUM OUTFLOW (     20.) IN STORAGE-OUTFLOW TABLE

 WARNING --- ROUTED OUTFLOW (     21.) IS GREATER THAN MAXIMUM OUTFLOW (     20.) IN STORAGE-OUTFLOW TABLE

    ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION     GR-1

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                 6-HR       24-HR       72-HR      24.92-HR
    24.       12.58       (CFS)      11.          3.          3.           3.
                          (INCHES)  2.394       2.747       2.747        2.747
                          (AC-FT)     5.          6.          6.           6.

PEAK STORAGE   TIME                       MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                 6-HR       24-HR       72-HR      24.92-HR
     4.       12.58                   2.          0.          0.           0.

 PEAK STAGE    TIME                       MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                 6-HR       24-HR       72-HR      24.92-HR
    3.64       12.58                 1.61         .46         .45          .45

                    CUMULATIVE AREA =     .04 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
22 KK     *     GA-2   *
          *            *
          **************

             SUBBASIN RUNOFF DATA

23 BA          SUBBASIN CHARACTERISTICS
                    TAREA        .07  SUBBASIN AREA
```

```
            PRECIPITATION DATA

  10 PH                             DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
            ..... HYDRO-35 ......   ............... TP-40 ...............   ............ TP-49 ............
            5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
              .79    1.55    2.72    2.97    3.14    3.45    3.74    4.05     .00     .00     .00     .00

                                            STORM AREA =       .07

  24 LS     SCS LOSS RATE
                  STRTL        .27  INITIAL ABSTRACTION
                 CRVNBR      88.00  CURVE NUMBER
                  RTIMP        .00  PERCENT IMPERVIOUS AREA

  25 UD     SCS DIMENSIONLESS UNITGRAPH
                   TLAG        .10  LAG

                                                       ***

                                                 UNIT HYDROGRAPH
                                              8 END-OF-PERIOD ORDINATES
           150.      221.       97.       38.       14.        6.        2.        1.

      ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION      GA-2

    TOTAL RAINFALL =     4.05, TOTAL LOSS =     1.27, TOTAL EXCESS =     2.77

  PEAK FLOW     TIME                           MAXIMUM AVERAGE FLOW
    (CFS)       (HR)                     6-HR        24-HR        72-HR      24.92-HR
     224.      12.17        (CFS)         19.           5.           5.           5.
                          (INCHES)      2.554        2.775        2.775        2.775
                           (AC-FT)         9.          10.          10.          10.

                         CUMULATIVE AREA =        .07 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***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          *             *
  26 KK   *    GR-2     *            OUTLET 30" RCP TO GA-3
          *             *
          ***************

            HYDROGRAPH ROUTING DATA

  27 RS       STORAGE ROUTING
                  NSTPS          1  NUMBER OF SUBREACHES
                   ITYP       STOR  TYPE OF INITIAL CONDITION
                 RSVRIC      -1.00  INITIAL CONDITION
                      X        .00 WORKING R AND D COEFFICIENT

  28 SV         STORAGE          .0        5.5

  29 SE       ELEVATION         .00       3.00

  30 SQ       DISCHARGE          0.        28.

                                                       ***

WARNING --- ROUTED OUTFLOW (      28.) IS GREATER THAN MAXIMUM OUTFLOW (      28.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (      30.) IS GREATER THAN MAXIMUM OUTFLOW (      28.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (      31.) IS GREATER THAN MAXIMUM OUTFLOW (      28.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (      32.) IS GREATER THAN MAXIMUM OUTFLOW (      28.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (      32.) IS GREATER THAN MAXIMUM OUTFLOW (      28.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (      31.) IS GREATER THAN MAXIMUM OUTFLOW (      28.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (      31.) IS GREATER THAN MAXIMUM OUTFLOW (      28.) IN STORAGE-OUTFLOW TABLE
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WARNING --- ROUTED OUTFLOW (30.) IS GREATER THAN MAXIMUM OUTFLOW (28.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (29.) IS GREATER THAN MAXIMUM OUTFLOW (28.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (29.) IS GREATER THAN MAXIMUM OUTFLOW (28.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (28.) IS GREATER THAN MAXIMUM OUTFLOW (28.) IN STORAGE-OUTFLOW TABLE

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HYDROGRAPH AT STATION GR-2

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
32.	12.67	(CFS)	17.	5.	5.	5.
		(INCHES)	2.257	2.722	2.722	2.722
		(AC-FT)	8.	10.	10.	10.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.92-HR
6.	12.67	3.	1.	1.	1.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.92-HR
3.45	12.67	1.81	.55	.53	.53

CUMULATIVE AREA = .07 SQ MI

*** ***

31 KK

****
* *
* GC-1 *
* *
****

HYDROGRAPH ROUTING DATA

32 RK KINEMATIC WAVE STREAM ROUTING

L	600.	CHANNEL LENGTH
S	.0050	SLOPE
N	.027	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	5.00	BOTTOM WIDTH OR DIAMETER
Z	3.00	SIDE SLOPE
NDXMIN	2	MINIMUM NUMBER OF DX INTERVALS

***

COMPUTED KINEMATIC PARAMETERS
VARIABLE TIME STEP
(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	1.36	1.37	.86	200.00	31.59	760.11	2.72	4.40

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9914E+01 EXCESS= .0000E+00 OUTFLOW= .9908E+01 BASIN STORAGE= .6463E-02 PERCENT ERROR= .0

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	1.36	1.37	5.00	31.59	760.00	2.72

*** *** *** *** ***

HYDROGRAPH AT STATION GC-1

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
32.	12.67	(CFS)	17.	5.	5.	5.
		(INCHES)	2.257	2.720	2.720	2.720

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                    (AC-FT)        8.         10.         10.         10.

                    CUMULATIVE AREA =     .07 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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          *            *
 33 KK    *      GA-3  *
          *            *
          **************

             SUBBASIN RUNOFF DATA

 34 BA         SUBBASIN CHARACTERISTICS
                    TAREA         .02  SUBBASIN AREA

               PRECIPITATION DATA

 10 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
               ..... HYDRO-35 .....   ............. TP-40 .............   ........... TP-49 ...........
               5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                 .79    1.55    2.72    2.97    3.14    3.45    3.74    4.05     .00     .00     .00     .00

                                                 STORM AREA =     .02

 35 LS         SCS LOSS RATE
                    STRTL         .20  INITIAL ABSTRACTION
                   CRVNBR       91.00  CURVE NUMBER
                    RTIMP         .00  PERCENT IMPERVIOUS AREA

 36 UD         SCS DIMENSIONLESS UNITGRAPH
                    TLAG         .10  LAG

                                                    ***

                                                UNIT HYDROGRAPH
                                              8 END-OF-PERIOD ORDINATES
                37.       55.       24.        9.        4.        1.        1.        0.

      ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION     GA-3

     TOTAL RAINFALL =    4.05, TOTAL LOSS =     .98, TOTAL EXCESS =    3.07

PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                    6-HR        24-HR       72-HR     24.92-HR
    60.      12.17        (CFS)         5.          1.          1.          1.
                        (INCHES)      2.805       3.065       3.065       3.065
                        (AC-FT)         3.          3.          3.          3.

                       CUMULATIVE AREA =     .02 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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          *            *
 37 KK    *      GR-3  *          OUTLET 24" RCP TO 24" STORM SEWER
          *            *
          **************

             HYDROGRAPH ROUTING DATA

 38 RS         STORAGE ROUTING
                   NSTPS           1  NUMBER OF SUBREACHES
                    ITYP        STOR  TYPE OF INITIAL CONDITION
                   RSVRIC       -1.00  INITIAL CONDITION
                       X          .00 WORKING R AND D COEFFICIENT

 39 SV           STORAGE          .0       1.1
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 40 SE          ELEVATION          .00      3.00

 41 SQ          DISCHARGE           0.       20.

                                                                  ***

WARNING --- ROUTED OUTFLOW (     22.) IS GREATER THAN MAXIMUM OUTFLOW (     20.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (     22.) IS GREATER THAN MAXIMUM OUTFLOW (     20.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (     21.) IS GREATER THAN MAXIMUM OUTFLOW (     20.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (     20.) IS GREATER THAN MAXIMUM OUTFLOW (     20.) IN STORAGE-OUTFLOW TABLE

      ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION     GR-3

 PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR         24-HR         72-HR      24.92-HR
     22.      12.42       (CFS)        5.            1.            1.            1.
                          (INCHES)   2.794         3.061         3.061         3.061
                          (AC-FT)      3.            3.            3.            3.

 PEAK STORAGE  TIME                              MAXIMUM AVERAGE STORAGE
   (AC-FT)     (HR)                  6-HR         24-HR         72-HR      24.92-HR
      1.       12.42                  0.            0.            0.            0.

 PEAK STAGE    TIME                              MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                  6-HR         24-HR         72-HR      24.92-HR
     3.28     12.42                  .77           .21           .20           .20

                        CUMULATIVE AREA =     .02 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


           **************
           *            *
 42 KK     *      GP-1  *
           *            *
           **************

 43 HC          HYDROGRAPH COMBINATION
                     ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***

      ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION     GP-1

 PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR         24-HR         72-HR      24.92-HR
     52.      12.50       (CFS)       22.           6.            6.            6.
                          (INCHES)   2.350         2.788         2.788         2.788
                          (AC-FT)     11.           13.           13.           13.

                        CUMULATIVE AREA =     .09 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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           *            *
 44 KK     *      GA-4  *
           *            *
           **************

             SUBBASIN RUNOFF DATA

 45 BA          SUBBASIN CHARACTERISTICS
                     TAREA         .02  SUBBASIN AREA
```

PRECIPITATION DATA

10 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			.... TP-40					.... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.79	1.55	2.72	2.97	3.14	3.45	3.74	4.05	.00	.00	.00	.00

STORM AREA = .02

46 LS SCS LOSS RATE
STRTL .20 INITIAL ABSTRACTION
CRVNBR 91.00 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

47 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .10 LAG

***

UNIT HYDROGRAPH
8 END-OF-PERIOD ORDINATES

44. 65. 28. 11. 4. 2. 1. 0.

*** *** *** *** ***

HYDROGRAPH AT STATION GA-4

TOTAL RAINFALL = 4.05, TOTAL LOSS = .98, TOTAL EXCESS = 3.07

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
71.	12.17	(CFS)	6.	2.	2.	2.
		(INCHES)	2.805	3.065	3.065	3.065
		(AC-FT)	3.	3.	3.	3.

CUMULATIVE AREA = .02 SQ MI

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         ***************
         *             *
48 KK    *     GR-4    *          OUTFLOW TO STORM SEWER
         *             *
         ***************
```

HYDROGRAPH ROUTING DATA

49 RS STORAGE ROUTING
NSTPS 1 NUMBER OF SUBREACHES
ITYP STOR TYPE OF INITIAL CONDITION
RSVRIC -1.00 INITIAL CONDITION
X .00 WORKING R AND D COEFFICIENT

50 SV STORAGE .0 1.6

51 SE ELEVATION .00 3.00

52 SQ DISCHARGE 0. 20.

***

*** *** *** *** ***

HYDROGRAPH AT STATION GR-4

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
20.	12.50	(CFS)	6.	2.	2.	2.
		(INCHES)	2.770	3.056	3.056	3.056
		(AC-FT)	3.	3.	3.	3.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
(AC-FT)	(HR)	6-HR	24-HR	72-HR	24.92-HR
2.	12.50	0.	0.	0.	0.

PEAK STAGE TIME MAXIMUM AVERAGE STAGE

```
  (FEET)      (HR)                      6-HR       24-HR       72-HR     24.92-HR
   2.97      12.50                       .89         .25         .24          .24

                           CUMULATIVE AREA =      .02 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


             ***************
             *             *
  53 KK      *     GP-2    *
             *             *
             ***************

  54 HC           HYDROGRAPH COMBINATION
                        ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                ***

      ***            ***            ***            ***            ***

                            HYDROGRAPH AT STATION      GP-2

 PEAK FLOW      TIME                           MAXIMUM AVERAGE FLOW
   (CFS)        (HR)                    6-HR        24-HR       72-HR     24.92-HR
     72.       12.50          (CFS)      27.          8.          8.           8.
                           (INCHES)    2.427       2.839       2.839        2.839
                            (AC-FT)      14.         16.         16.          16.

                           CUMULATIVE AREA =      .11 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


             ***************
             *             *
  55 KK      *     GC-2    *
             *             *
             ***************

                HYDROGRAPH ROUTING DATA

  56 RK           KINEMATIC WAVE STREAM ROUTING
                              L        1200.  CHANNEL LENGTH
                              S        .0250  SLOPE
                              N         .013  CHANNEL ROUGHNESS COEFFICIENT
                             CA          .00  CONTRIBUTING AREA
                          SHAPE         CIRC  CHANNEL SHAPE
                             WD         2.00  BOTTOM WIDTH OR DIAMETER
                              Z          .00  SIDE SLOPE
                        NDXMIN            2  MINIMUM NUMBER OF DX INTERVALS

                                                                ***
                                        COMPUTED KINEMATIC PARAMETERS
                                             VARIABLE TIME STEP
                                           (DT SHOWN IS A MINIMUM)

                  ELEMENT    ALPHA       M         DT        DX       PEAK    TIME TO     VOLUME    MAXIMUM
                                                                               PEAK                 CELERITY
                                                  (MIN)      (FT)     (CFS)    (MIN)       (IN)      (FPS)

                 MAIN        10.98      1.25        .37    400.00     71.71    750.89      2.84      19.97

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1594E+02  EXCESS= .0000E+00 OUTFLOW= .1594E+02 BASIN STORAGE= .2651E-02 PERCENT ERROR=     .0

                                        INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                 MAIN        10.98      1.25       5.00               71.60    750.00      2.84

      ***            ***            ***            ***            ***
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441

HYDROGRAPH AT STATION GC-2

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
72.	12.50	(CFS)	27.	8.	8.	8.
		(INCHES)	2.427	2.839	2.839	2.839
		(AC-FT)	14.	16.	16.	16.

CUMULATIVE AREA = .11 SQ MI

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          *            *
57 KK     *      GA-5  *
          *            *
          **************
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SUBBASIN RUNOFF DATA

58 BA SUBBASIN CHARACTERISTICS
TAREA .03 SUBBASIN AREA

PRECIPITATION DATA

10 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

HYDRO-35			TP-40					TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.79	1.55	2.72	2.97	3.14	3.45	3.74	4.05	.00	.00	.00	.00

STORM AREA = .03

59 LS SCS LOSS RATE
STRTL .13 INITIAL ABSTRACTION
CRVNBR 94.00 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

60 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .10 LAG

***

UNIT HYDROGRAPH
8 END-OF-PERIOD ORDINATES
62. 92. 41. 16. 6. 2. 1. 0.

*** *** *** *** ***

HYDROGRAPH AT STATION GA-5

TOTAL RAINFALL = 4.05, TOTAL LOSS = .68, TOTAL EXCESS = 3.37

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
108.	12.17	(CFS)	9.	3.	2.	2.
		(INCHES)	3.059	3.373	3.373	3.373
		(AC-FT)	5.	5.	5.	5.

CUMULATIVE AREA = .03 SQ MI

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          **************
          *            *
61 KK     *      GR-5  *          OUTFLOW TO CHANNEL
          *            *
          **************
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HYDROGRAPH ROUTING DATA

62 RS STORAGE ROUTING
NSTPS 1 NUMBER OF SUBREACHES 442

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                    ITYP        STOR  TYPE OF INITIAL CONDITION
                  RSVRIC       -1.00  INITIAL CONDITION
                       X         .00 WORKING R AND D COEFFICIENT

 63 SV          STORAGE          .0       2.2

 64 SE        ELEVATION         .00      3.00

 65 SQ        DISCHARGE          0.       28.

                                                        ***

WARNING --- ROUTED OUTFLOW (     30.) IS GREATER THAN MAXIMUM OUTFLOW (     28.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (     31.) IS GREATER THAN MAXIMUM OUTFLOW (     28.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (     31.) IS GREATER THAN MAXIMUM OUTFLOW (     28.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (     31.) IS GREATER THAN MAXIMUM OUTFLOW (     28.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (     29.) IS GREATER THAN MAXIMUM OUTFLOW (     28.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (     28.) IS GREATER THAN MAXIMUM OUTFLOW (     28.) IN STORAGE-OUTFLOW TABLE

     ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION     GR-5

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                 6-HR       24-HR       72-HR     24.92-HR
    31.       12.42       (CFS)       9.          3.          2.           2.
                          (INCHES)  3.021       3.364       3.364        3.364
                          (AC-FT)     5.          5.          5.           5.

PEAK STORAGE   TIME                          MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                 6-HR       24-HR       72-HR     24.92-HR
     3.       12.42                  1.          0.          0.           0.

 PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                 6-HR       24-HR       72-HR     24.92-HR
    3.42      12.42                 1.01         .28         .27          .27

                    CUMULATIVE AREA =     .03 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
 66 KK    *      GP-3  *
          *            *
          **************

 67 HC          HYDROGRAPH COMBINATION
                     ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                        ***

     ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION     GP-3

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                 6-HR       24-HR       72-HR     24.92-HR
    103.      12.50       (CFS)      37.         11.         10.          10.
                          (INCHES)  2.547       2.951       2.951        2.951
                          (AC-FT)    18.         21.         21.          21.

                    CUMULATIVE AREA =     .13 SQ MI


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          *           *
68 KK     *     GC-3  *
          *           *
          ***************

             HYDROGRAPH ROUTING DATA

69 RK          KINEMATIC WAVE STREAM ROUTING
                        L       950.  CHANNEL LENGTH
                        S      .0050  SLOPE
                        N       .027  CHANNEL ROUGHNESS COEFFICIENT
                       CA        .00  CONTRIBUTING AREA
                    SHAPE       TRAP  CHANNEL SHAPE
                       WD      15.00  BOTTOM WIDTH OR DIAMETER
                        Z        .00  SIDE SLOPE
                   NDXMIN          2  MINIMUM NUMBER OF DX INTERVALS

                                                ***
                                    COMPUTED KINEMATIC PARAMETERS
                                         VARIABLE TIME STEP
                                      (DT SHOWN IS A MINIMUM)

                    ELEMENT    ALPHA       M         DT         DX       PEAK    TIME TO      VOLUME     MAXIMUM
                                                                                     PEAK                CELERITY
                                                      (MIN)      (FT)     (CFS)    (MIN)        (IN)      (FPS)

                    MAIN           .64      1.67        .69     316.67    102.88   751.38        2.95       8.15

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2106E+02  EXCESS= .0000E+00 OUTFLOW= .2104E+02 BASIN STORAGE= .2240E-01 PERCENT ERROR=     .0

                                         INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                    MAIN           .64      1.67       5.00                102.54   750.00        2.95

     ***            ***             ***             ***             ***

                          HYDROGRAPH AT STATION     GC-3

 PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR        24-HR        72-HR      24.92-HR
    103.      12.50        (CFS)       37.          11.          10.          10.
                        (INCHES)     2.548        2.948        2.948        2.948
                         (AC-FT)       18.          21.          21.          21.

                         CUMULATIVE AREA =     .13 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          ***************
          *           *
70 KK     *     GA-6  *
          *           *
          ***************

             SUBBASIN RUNOFF DATA

71 BA          SUBBASIN CHARACTERISTICS
                    TAREA         .05  SUBBASIN AREA

               PRECIPITATION DATA

10 PH                                  DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
               ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
               5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                 .79    1.55    2.72    2.97    3.14    3.45    3.74    4.05     .00     .00     .00     .00

                                                STORM AREA =     .05

72 LS          SCS LOSS RATE
                    STRTL         .13  INITIAL ABSTRACTION
                   CRVNBR       94.00  CURVE NUMBER
                    RTIMP         .00  PERCENT IMPERVIOUS AREA
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73 UD          SCS DIMENSIONLESS UNITGRAPH
                     TLAG         .10  LAG

                                                    ***

                                                UNIT HYDROGRAPH
                                             8 END-OF-PERIOD ORDINATES
              120.       177.       78.       30.       12.        4.        2.        1.

     ***              ***              ***              ***              ***

                        HYDROGRAPH AT STATION     GA-6

   TOTAL RAINFALL =    4.05, TOTAL LOSS =     .68, TOTAL EXCESS =    3.37

 PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                    6-HR        24-HR        72-HR      24.92-HR
    207.      12.17       (CFS)         18.          5.           5.           5.
                          (INCHES)     3.059        3.373        3.373        3.373
                          (AC-FT)        9.          10.          10.          10.

                        CUMULATIVE AREA =     .05 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


           **************
           *            *
 74 KK     *      GR-6  *          OUTFLOW TO CHANNEL
           *            *
           **************

              HYDROGRAPH ROUTING DATA

 75 RS          STORAGE ROUTING
                     NSTPS          1  NUMBER OF SUBREACHES
                      ITYP       STOR  TYPE OF INITIAL CONDITION
                     RSVRIC     -1.00  INITIAL CONDITION
                         X       .00 WORKING R AND D COEFFICIENT

 76 SV            STORAGE          .0       1.1       2.2       3.3

 77 SE          ELEVATION         .00      1.00      2.00      3.00

 78 SQ          DISCHARGE          0.        1.       42.      117.

                                                                ***

WARNING --- ROUTED OUTFLOW (    136.) IS GREATER THAN MAXIMUM OUTFLOW (    117.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (    131.) IS GREATER THAN MAXIMUM OUTFLOW (    117.) IN STORAGE-OUTFLOW TABLE

     ***              ***              ***              ***              ***

                        HYDROGRAPH AT STATION     GR-6

 PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                    6-HR        24-HR        72-HR      24.92-HR
    136.      12.25       (CFS)         16.          4.           4.           4.
                          (INCHES)     2.802        3.037        3.037        3.037
                          (AC-FT)        8.          9.           9.           9.

PEAK STORAGE   TIME                                MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                    6-HR        24-HR        72-HR      24.92-HR
      4.      12.25                      1.          1.           1.           1.

 PEAK STAGE    TIME                                MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                    6-HR        24-HR        72-HR      24.92-HR
     3.26      12.25                    1.31         .65          .63          .63

                        CUMULATIVE AREA =     .05 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***
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          **************
          *            *
 79 KK    *      GP-4  *
          *            *
          **************

 80 HC          HYDROGRAPH COMBINATION
                     ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                      ***

     ***            ***             ***             ***             ***

                       HYDROGRAPH AT STATION     GP-4

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                 6-HR       24-HR       72-HR     24.92-HR
    224.      12.33        (CFS)      53.         15.         15.         15.
                         (INCHES)    2.621       2.974       2.974       2.974
                          (AC-FT)      26.         30.         30.         30.

                       CUMULATIVE AREA =     .19 SQ MI



*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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          *            *
 81 KK    *      GC-4  *
          *            *
          **************

             HYDROGRAPH ROUTING DATA

 82 RK          KINEMATIC WAVE STREAM ROUTING
                          L        950.  CHANNEL LENGTH
                          S       .0220  SLOPE
                          N        .035  CHANNEL ROUGHNESS COEFFICIENT
                         CA         .00  CONTRIBUTING AREA
                      SHAPE        TRAP  CHANNEL SHAPE
                         WD       20.00  BOTTOM WIDTH OR DIAMETER
                          Z        4.00  SIDE SLOPE
                     NDXMIN           2  MINIMUM NUMBER OF DX INTERVALS

                                                 ***
                                  COMPUTED KINEMATIC PARAMETERS
                                       VARIABLE TIME STEP
                                    (DT SHOWN IS A MINIMUM)

                      ELEMENT    ALPHA       M         DT         DX       PEAK    TIME TO      VOLUME    MAXIMUM
                                                                                      PEAK                 CELERITY
                                                      (MIN)      (FT)     (CFS)     (MIN)        (IN)      (FPS)

                      MAIN          1.26      1.45        .64     316.67    223.13    740.98        2.97      9.21

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2990E+02  EXCESS= .0000E+00 OUTFLOW= .2988E+02 BASIN STORAGE= .2061E-01 PERCENT ERROR=     .0

                                       INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                      MAIN          1.26      1.45       5.00                 221.44    740.00        2.97

     ***            ***             ***             ***             ***

                       HYDROGRAPH AT STATION     GC-4

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                 6-HR       24-HR       72-HR     24.92-HR
    221.      12.33        (CFS)      53.         15.         15.         15.
                         (INCHES)    2.623       2.973       2.973       2.973
                          (AC-FT)      26.         30.         30.         30.

                       CUMULATIVE AREA =     .19 SQ MI
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*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

          **************
          *            *
83 KK     *      GA-7  *
          *            *
          **************

             SUBBASIN RUNOFF DATA

84 BA          SUBBASIN CHARACTERISTICS
                    TAREA          .03  SUBBASIN AREA

               PRECIPITATION DATA

10 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                                                  TP-40                          TP-49
               ..... HYDRO-35 .....   ..............................   ...........
               5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                 .79    1.55    2.72    2.97    3.14    3.45    3.74    4.05     .00     .00     .00     .00

                                                 STORM AREA =      .03

85 LS          SCS LOSS RATE
                    STRTL          .13  INITIAL ABSTRACTION
                   CRVNBR        94.00  CURVE NUMBER
                    RTIMP          .00  PERCENT IMPERVIOUS AREA

86 UD          SCS DIMENSIONLESS UNITGRAPH
                    TLAG          .10  LAG

                                                        ***

                                                    UNIT HYDROGRAPH
                                                  8 END-OF-PERIOD ORDINATES
                  66.       98.       43.       17.        6.        2.        1.        0.

    ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION     GA-7

   TOTAL RAINFALL =    4.05, TOTAL LOSS =     .68, TOTAL EXCESS =    3.37

PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                    6-HR        24-HR        72-HR      24.92-HR
   115.      12.17        (CFS)         10.           3.           3.           3.
                         (INCHES)     3.059        3.373        3.373        3.373
                          (AC-FT)        5.           5.           5.           5.

                       CUMULATIVE AREA =     .03 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

          **************
          *            *
87 KK     *      GP-5  *
          *            *
          **************

88 HC          HYDROGRAPH COMBINATION
                   ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                        ***

    ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION     GP-5

PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                    6-HR        24-HR        72-HR      24.92-HR
   284.      12.25        (CFS)         63.          18.          17.          17.
                         (INCHES)     2.662        3.029        3.029        3.029
                          (AC-FT)       31.          35.          35.          35.
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                    CUMULATIVE AREA =     .22 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
 89 KK    *      HA-1  *       HA-1 added to this model by SMc 02-07-92
          *            *
          **************
                              Input data from Carter Assoc. Foothills Phase III report

             SUBBASIN RUNOFF DATA

 91 BA         SUBBASIN CHARACTERISTICS
                    TAREA         .02  SUBBASIN AREA

               PRECIPITATION DATA

 10 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
               ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
               5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                 .79    1.55    2.72    2.97    3.14    3.45    3.74    4.05     .00     .00     .00     .00

                                                STORM AREA =     .02

 92 LS         SCS LOSS RATE
                    STRTL         .25  INITIAL ABSTRACTION
                   CRVNBR       89.00  CURVE NUMBER
                    RTIMP         .00  PERCENT IMPERVIOUS AREA

 93 UD         SCS DIMENSIONLESS UNITGRAPH
                    TLAG         .10  LAG

                                                      ***

                                                  UNIT HYDROGRAPH
                                                8 END-OF-PERIOD ORDINATES
                41.       61.       27.       10.        4.        2.        1.        0.

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION     HA-1

   TOTAL RAINFALL =    4.05, TOTAL LOSS =    1.18, TOTAL EXCESS =    2.87

PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                    6-HR       24-HR       72-HR     24.92-HR
    63.      12.17       (CFS)          5.          1.          1.          1.
                        (INCHES)     2.637       2.870       2.870       2.870
                        (AC-FT)         3.          3.          3.          3.

                      CUMULATIVE AREA =     .02 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
 94 KK    *        AD  *       Combine at Prop line with State Lands
          *            *
          **************

 95 HC         HYDROGRAPH COMBINATION
                   ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                      ***

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION       AD

PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
```

PEAK FLOW (CFS)	TIME (HR)		6-HR	24-HR	72-HR	24.92-HR
			MAXIMUM AVERAGE FLOW			
331.	12.25	(CFS)	68.	19.	19.	19.
		(INCHES)	2.658	3.016	3.016	3.016
		(AC-FT)	34.	38.	38.	38.

CUMULATIVE AREA = .24 SQ MI

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**************
*            *
*     ROUTE  *
*            *
**************
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96 KK Route Foothills flow to C127 thru conc collector channel N side of FW.

HYDROGRAPH ROUTING DATA

97 RK KINEMATIC WAVE STREAM ROUTING

L	600.	CHANNEL LENGTH
S	.0110	SLOPE
N	.018	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	8.00	BOTTOM WIDTH OR DIAMETER
Z	2.00	SIDE SLOPE
NDXMIN	2	MINIMUM NUMBER OF DX INTERVALS

***

COMPUTED KINEMATIC PARAMETERS
VARIABLE TIME STEP
(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	2.65	1.42	.21	200.00	330.50	735.42	3.02	15.91

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3822E+02 EXCESS= .0000E+00 OUTFLOW= .3821E+02 BASIN STORAGE= .7835E-02 PERCENT ERROR= .0

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	2.65	1.42	5.00		330.05	735.00	3.02
***	***	***	***		***		

HYDROGRAPH AT STATION ROUTE

PEAK FLOW (CFS)	TIME (HR)		6-HR	24-HR	72-HR	24.92-HR
			MAXIMUM AVERAGE FLOW			
330.	12.25	(CFS)	68.	19.	19.	19.
		(INCHES)	2.659	3.017	3.017	3.017
		(AC-FT)	34.	38.	38.	38.

CUMULATIVE AREA = .24 SQ MI

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*            *
*     SW280  *
*            *
**************
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SUBBASIN RUNOFF DATA

99 BA SUBBASIN CHARACTERISTICS

TAREA	.02	SUBBASIN AREA

449

PRECIPITATION DATA

10 PH

DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.79	1.55	2.72	2.97	3.14	3.45	3.74	4.05	.00	.00	.00	.00

STORM AREA = .02

100 LS SCS LOSS RATE

STRTL	.35	INITIAL ABSTRACTION
CRVNBR	85.00	CURVE NUMBER
RTIMP	.00	PERCENT IMPERVIOUS AREA

101 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	.11	LAG

***

UNIT HYDROGRAPH
9 END-OF-PERIOD ORDINATES

33. 57. 30. 12. 5. 2. 1. 0. 0.

*** *** *** *** ***

HYDROGRAPH AT STATION SW280

TOTAL RAINFALL = 4.05, TOTAL LOSS = 1.55, TOTAL EXCESS = 2.50

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
53.	12.17	(CFS)	4.	1.	1.	1.
		(INCHES)	2.311	2.502	2.502	2.502
		(AC-FT)	2.	2.	2.	2.

CUMULATIVE AREA = .02 SQ MI

*** ***

102 KK

****
* *
* ADC127 *
* *
****

Combine flows at C127

103 HC HYDROGRAPH COMBINATION

ICOMP	2	NUMBER OF HYDROGRAPHS TO COMBINE

***

*** *** *** *** ***

HYDROGRAPH AT STATION ADC127

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
372.	12.25	(CFS)	72.	20.	20.	20.
		(INCHES)	2.634	2.981	2.981	2.981
		(AC-FT)	36.	41.	41.	41.

CUMULATIVE AREA = .26 SQ MI

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	NW	88.	12.17	7.	2.	2.	.03		
HYDROGRAPH AT	GA-1	137.	12.17	11.	3.	3.	.04		
ROUTED TO	GR-1	24.	12.58	11.	3.	3.	.04	3.64	12.58
HYDROGRAPH AT	GA-2	224.	12.17	19.	5.	5.	.07		
ROUTED TO	GR-2	32.	12.67	17.	5.	5.	.07	3.45	12.67
ROUTED TO	GC-1	32.	12.67	17.	5.	5.	.07		
HYDROGRAPH AT	GA-3	60.	12.17	5.	1.	1.	.02		
ROUTED TO	GR-3	22.	12.42	5.	1.	1.	.02	3.28	12.42
2 COMBINED AT	GP-1	52.	12.50	22.	6.	6.	.09		
HYDROGRAPH AT	GA-4	71.	12.17	6.	2.	2.	.02		
ROUTED TO	GR-4	20.	12.50	6.	2.	2.	.02	2.97	12.50
2 COMBINED AT	GP-2	72.	12.50	27.	8.	8.	.11		
ROUTED TO	GC-2	72.	12.50	27.	8.	8.	.11		
HYDROGRAPH AT	GA-5	108.	12.17	9.	3.	2.	.03		
ROUTED TO	GR-5	31.	12.42	9.	3.	2.	.03	3.42	12.42
2 COMBINED AT	GP-3	103.	12.50	37.	11.	10.	.13		
ROUTED TO	GC-3	103.	12.50	37.	11.	10.	.13		
HYDROGRAPH AT	GA-6	207.	12.17	18.	5.	5.	.05		
ROUTED TO	GR-6	136.	12.25	16.	4.	4.	.05	3.26	12.25
2 COMBINED AT	GP-4	224.	12.33	53.	15.	15.	.19		
ROUTED TO	GC-4	221.	12.33	53.	15.	15.	.19		
HYDROGRAPH AT	GA-7	115.	12.17	10.	3.	3.	.03		
2 COMBINED AT	GP-5	284.	12.25	63.	18.	17.	.22		
HYDROGRAPH AT	HA-1	63.	12.17	5.	1.	1.	.02		
2 COMBINED AT	AD	331.	12.25	68.	19.	19.	.24		
ROUTED TO	ROUTE	330.	12.25	68.	19.	19.	.24		
HYDROGRAPH AT	SW280	53.	12.17	4.	1.	1.	.02		
2 COMBINED AT	ADC127	372.	12.25	72.	20.	20.	.26		

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	INTERPOLATED TO COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
GC-1	MANE	.86	31.59	760.11	2.72	5.00	31.59	760.00	2.72

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9914E+01 EXCESS= .0000E+00 OUTFLOW= .9908E+01 BASIN STORAGE= .6463E-02 PERCENT ERROR= .0

GC-2	MANE	.37	71.71	750.89	2.84	5.00	71.60	750.00	2.84

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1594E+02 EXCESS= .0000E+00 OUTFLOW= .1594E+02 BASIN STORAGE= .2651E-02 PERCENT ERROR= .0

GC-3	MANE	.69	102.88	751.38	2.95	5.00	102.54	750.00	2.95

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2106E+02 EXCESS= .0000E+00 OUTFLOW= .2104E+02 BASIN STORAGE= .2240E-01 PERCENT ERROR= .0

GC-4	MANE	.64	223.13	740.98	2.97	5.00	221.44	740.00	2.97

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2990E+02 EXCESS= .0000E+00 OUTFLOW= .2988E+02 BASIN STORAGE= .2061E-01 PERCENT ERROR= .0

ROUTE	MANE	.21	330.50	735.42	3.02	5.00	330.05	735.00	3.02

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3822E+02 EXCESS= .0000E+00 OUTFLOW= .3821E+02 BASIN STORAGE= .7835E-02 PERCENT ERROR= .0

*** NORMAL END OF HEC-1 ***
Elapsed Time - 00:01:03.66 (63.66 Seconds)
NORMAL END OF HEC-1

SEGMENT III
RATIONAL CHECK OF DRAINAGE AREA < 80 ACRES

Price Road GEC PhII
South Mountain Freeway
Hydrology Study

Calculated: SMc
Date: 04-Mar-92

RATIONAL METHOD Q CHECK FOR SUB-BASINS OF AREA LESS THAN 80 ACRES.

DRAINAGE AREA	CURVE No.	C	AVERAGE SLOPE	Tc (min)	i50 (in/hr)	i100 (in/hr)	AREA (acres)	RATIONAL METHOD Q50	RATIONAL METHOD Q100	HEC-1 Q50	HEC-1 Q100
SW90ab	91.5	0.64	0.205	10	6.4	7.4	29.0	118	137	138	161
SW90c	91.5	0.64	0.225	10	6.4	7.4	43.0	175	203	205	240
SW90d	91.5	0.64	0.184	10	6.4	7.4	20.0	81	94	95	111
SW110	85.0	0.37	0.020	32	3.6	4.0	57.0	76	85	134	162
SW120	85.0	0.36	0.021	44	2.9	3.2	74.0	78	86	149	180
SW180	98.0	0.85	0.140	10	6.4	7.4	25.6	139	161	140	160
SW190	88.8	0.63	0.170	13	5.8	6.6	64.0	235	267	261	311
SW200	82.0	0.48	0.154	14	5.7	6.3	70.4	193	213	229	281
SW210	79.5	0.36	0.127	17	5.1	5.8	19.2	35	40	48	60
SW220	82.8	0.48	0.139	18	5.0	5.7	38.4	91	104	109	134
SW230	84.7	0.52	0.134	21	4.6	5.2	38.4	91	103	110	133
SW260	72.2	0.26	0.025	23	4.4	4.9	77.4	90	100	119	155

SEGMENT III
CULVERT DESIGN SHEETS

CULVERT ANALYSIS VERSION 2.0

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-27-19	15:29:08	C101	OCT1491

PERFORMANCE CURVE DISCHARGE RANGE
OF FLOWS ANALYZED

MINUMUM DISCHARGE (CFS)	0
DESIGN DISCHARGE (CFS)	138
MAXIMUM DISCHARGE (CFS)	161

CULV #	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANN. N	INLET TYPE
1	1085.00	1070.00	330.00	1 - RCP	6.00	6.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-27-19	15:29:08	C101	OCT1491

CULVERT NUMBER: 1

CULVERT INVERT DATA

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1085.00
OUTLET STATION (FT)	330.00
OUTLET ELEVATION (FT)	1070.00
NUMBER OF BARRELS	1.00
SLOPE (V-FT/H-FT)	0.0455
CULVERT LENGTH ALONG SLOPE (FT)	330.00

BARREL SHAPE: CIRCULAR 6.00 FT IN DIAMETER
BARREL MATERIAL:
WITH A MANNING'S N OF 0.012
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: SQUARE EDGE WITH HEADWALL
INLET DEPRESSION: NONE

DOWNSTREAM CHANNEL CROSS-SECTION

BOTTOM WIDTH (FT)	10.00
SIDE SLOPE H/V _:1	5.0
CHANNEL SLOPE V/H (FT/FT)	0.028
MANNING'S N (.01-0.1)	0.035
CHANNEL INVERT ELEVATION (FT)	1070.00
CULVERT OUTLET INVERT ELEVATION AT	1070.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-27-19	15:29:08	C101	OCT1491

UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NO.	VEL. (FPS)	SHEAR (PSF)
0.00	1070.00	0.000	0.00	0.00
16.10	1070.39	0.000	3.43	0.69
32.20	1070.58	0.000	4.30	1.01
48.30	1070.73	0.000	4.88	1.27
64.40	1070.85	0.000	5.32	1.48
80.50	1070.96	0.000	5.69	1.67
96.60	1071.05	0.000	6.00	1.84
112.70	1071.14	0.000	6.27	2.00
128.80	1071.23	0.000	6.52	2.14
138.00	1071.27	0.000	6.64	2.22
161.00	1071.37	0.000	6.94	2.40

SELECTED OVERTOPPING CREST

ROADWAY SURFACE:	PAVED
EMBANKMENT TOP WIDTH (FT):	160.00

CONSTANT ROADWAY ELEVATION PROFILE

CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1095.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-27-19	15:29:08	C101	OCT1491

SUMMARY OF CULVERT FLOWS (CFS) FILE: C101 DATE: OCT1491

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1085.00	0	0	0	0	0	0	0	0	0
1086.11	16	16	0	0	0	0	0	0	2
1086.75	32	32	0	0	0	0	0	0	2
1087.32	48	48	0	0	0	0	0	0	2
1087.82	64	64	0	0	0	0	0	0	2
1088.27	81	81	0	0	0	0	0	0	2
1088.68	97	97	0	0	0	0	0	0	2
1089.06	113	113	0	0	0	0	0	0	2
1089.41	129	129	0	0	0	0	0	0	2
1089.61	138	138	0	0	0	0	0	0	2
1090.09	161	161	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	1085.00	1070.00	0.00	-15.00	-15.00	1085.00	0.00	0.00
16	1086.11	1070.39	1.11	-13.41	-13.41	0.00	0.00	11.46
32	1086.75	1070.58	1.75	-12.71	-12.71	0.00	0.00	16.68
48	1087.32	1070.73	2.32	-12.15	-12.15	0.00	0.00	18.87
64	1087.82	1070.85	2.82	-11.68	-11.68	0.00	0.00	20.20
81	1088.27	1070.96	3.27	-11.25	-11.25	0.00	0.00	21.09
97	1088.68	1071.05	3.68	-10.84	-10.84	0.00	0.00	20.80
113	1089.06	1071.14	4.06	-10.46	-10.46	0.00	0.00	21.86
129	1089.41	1071.23	4.41	-10.10	-10.10	0.00	0.00	22.75
138	1089.61	1071.27	4.61	-9.89	-9.89	0.00	0.00	24.85
161	1090.09	1071.37	5.09	-9.41	-9.41	0.00	0.00	24.11

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: C101 DATE: OCT1491

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1085.00	0.00	0	0	0.00
1086.11	0.00	16	0	0.00
1086.75	0.00	32	0	0.00
1087.32	0.00	48	0	0.00
1087.82	0.00	64	0	0.00
1088.27	0.00	81	0	0.00
1088.68	0.00	97	0	0.00
1089.06	0.00	113	0	0.00
1089.41	0.00	129	0	0.00
1089.61	0.00	138	0	0.00
1090.09	0.00	161	0	0.00

CULVERT ANALYSIS VERSION 2.0

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-27-19	15:50:31	C102	OCT1491

PERFORMANCE CURVE DISCHARGE RANGE
OF FLOWS ANALYZED

MINUMUM DISCHARGE (CFS)	0
DESIGN DISCHARGE (CFS)	205
MAXIMUM DISCHARGE (CFS)	240

CULV #	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANN. N	INLET TYPE
1	1103.00	1100.00	260.00	1 - RCP	6.00	6.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-27-19	15:50:31	C102	OCT1491

CULVERT NUMBER: 1

CULVERT INVERT DATA

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1103.00
OUTLET STATION (FT)	260.00
OUTLET ELEVATION (FT)	1100.00
NUMBER OF BARRELS	1.00
SLOPE (V-FT/H-FT)	0.0115
CULVERT LENGTH ALONG SLOPE (FT)	260.00

BARREL SHAPE: CIRCULAR 6.00 FT IN DIAMETER
BARREL MATERIAL:
WITH A MANNING'S N OF 0.012
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: SQUARE EDGE WITH HEADWALL
INLET DEPRESSION: NONE

DOWNSTREAM CHANNEL CROSS-SECTION

BOTTOM WIDTH (FT)	10.00
SIDE SLOPE H/V _:1	5.0
CHANNEL SLOPE V/H (FT/FT)	0.030
MANNING'S N (.01-0.1)	0.035
CHANNEL INVERT ELEVATION (FT)	1100.00
CULVERT OUTLET INVERT ELEVATION AT	1100.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-27-19	15:50:31	C102	OCT1491

UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NO.	VEL. (FPS)	SHEAR (PSF)
0.00	1100.00	0.000	0.00	0.00
24.00	1100.48	0.000	4.00	0.90
48.00	1100.71	0.000	4.99	1.33
72.00	1100.89	0.000	5.64	1.66
96.00	1101.03	0.000	6.14	1.93
120.00	1101.16	0.000	6.54	2.17
144.00	1101.28	0.000	6.89	2.39
168.00	1101.38	0.000	7.20	2.58
192.00	1101.48	0.000	7.47	2.77
205.00	1101.53	0.000	7.61	2.86
240.00	1101.65	0.000	7.95	3.10

SELECTED OVERTOPPING CREST

ROADWAY SURFACE:	PAVED
EMBANKMENT TOP WIDTH (FT):	160.00

CONSTANT ROADWAY ELEVATION PROFILE

CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1117.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-27-19	15:50:31	C102	OCT1491

SUMMARY OF CULVERT FLOWS (CFS) FILE: C102 DATE: OCT1491

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1103.00	0	0	0	0	0	0	0	0	0
1104.54	24	24	0	0	0	0	0	0	2
1105.41	48	48	0	0	0	0	0	0	2
1106.14	72	72	0	0	0	0	0	0	2
1106.77	96	96	0	0	0	0	0	0	2
1107.32	120	120	0	0	0	0	0	0	2
1107.84	144	144	0	0	0	0	0	0	2
1108.33	168	168	0	0	0	0	0	0	2
1108.83	192	192	0	0	0	0	0	0	2
1109.10	205	205	0	0	0	0	0	0	2
1109.89	240	240	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	1103.00	1100.00	0.00	-3.00	-3.00	1103.00	0.00	0.00
24	1104.54	1100.48	1.54	-1.04	-1.04	0.00	0.00	9.47
48	1105.41	1100.71	2.41	-0.16	-0.16	0.00	0.00	10.61
72	1106.14	1100.89	3.14	0.53	0.53	0.00	0.00	12.21
96	1106.77	1101.03	3.77	1.15	1.15	0.00	0.00	13.02
120	1107.32	1101.16	4.32	1.71	1.71	0.00	0.00	13.68
144	1107.84	1101.28	4.84	2.24	2.24	0.00	0.00	14.31
168	1108.33	1101.38	5.33	2.73	2.73	0.00	0.00	14.90
192	1108.83	1101.48	5.83	3.23	3.23	0.00	0.00	15.31
205	1109.10	1101.53	6.10	3.49	3.49	0.00	0.00	15.57
240	1109.89	1101.65	6.89	4.18	4.18	0.00	0.00	16.15

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: C102 DATE: OCT1491

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1103.00	0.00	0	0	0.00
1104.54	0.00	24	0	0.00
1105.41	0.00	48	0	0.00
1106.14	0.00	72	0	0.00
1106.77	0.00	96	0	0.00
1107.32	0.00	120	0	0.00
1107.84	0.00	144	0	0.00
1108.33	0.00	168	0	0.00
1108.83	0.00	192	0	0.00
1109.10	0.00	205	0	0.00
1109.89	0.00	240	0	0.00

CULVERT ANALYSIS VERSION 2.0

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-27-19	16:26:46	C103	OCT1491

PERFORMANCE CURVE DISCHARGE RANGE
OF FLOWS ANALYZED

MINUMUM DISCHARGE (CFS)	0
DESIGN DISCHARGE (CFS)	95
MAXIMUM DISCHARGE (CFS)	111

CULV #	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANN. N	INLET TYPE
1	1115.00	1110.00	200.00	1 - RCP	4.00	4.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-27-19	16:26:46	C103	OCT1491

CULVERT NUMBER: 1

CULVERT INVERT DATA

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1115.00
OUTLET STATION (FT)	200.00
OUTLET ELEVATION (FT)	1110.00
NUMBER OF BARRELS	1.00
SLOPE (V-FT/H-FT)	0.0250
CULVERT LENGTH ALONG SLOPE (FT)	200.00

BARREL SHAPE: CIRCULAR 4.00 FT IN DIAMETER
BARREL MATERIAL:
WITH A MANNING'S N OF 0.012
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: SQUARE EDGE WITH HEADWALL
INLET DEPRESSION: NONE

DOWNSTREAM CHANNEL CROSS-SECTION

BOTTOM WIDTH (FT)	10.00
SIDE SLOPE H/V _:1	5.0
CHANNEL SLOPE V/H (FT/FT)	0.030
MANNING'S N (.01-0.1)	0.035
CHANNEL INVERT ELEVATION (FT)	1110.00
CULVERT OUTLET INVERT ELEVATION AT	1110.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-27-19	16:26:46	C103	OCT1491

UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NO.	VEL. (FPS)	SHEAR (PSF)
0.00	1110.00	0.000	0.00	0.00
11.10	1110.31	0.000	3.09	0.58
22.20	1110.46	0.000	3.90	0.87
33.30	1110.58	0.000	4.45	1.09
44.40	1110.68	0.000	4.87	1.27
55.50	1110.77	0.000	5.21	1.44
66.60	1110.85	0.000	5.51	1.59
77.70	1110.92	0.000	5.77	1.73
88.80	1110.99	0.000	6.00	1.85
95.00	1111.03	0.000	6.12	1.92
111.00	1111.11	0.000	6.40	2.09

SELECTED OVERTOPPING CREST

ROADWAY SURFACE:	PAVED
EMBANKMENT TOP WIDTH (FT):	160.00

CONSTANT ROADWAY ELEVATION PROFILE

CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1124.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-27-19	16:26:46	C103	OCT1491

SUMMARY OF CULVERT FLOWS (CFS) FILE: C103 DATE: OCT1491

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1115.00	0	0	0	0	0	0	0	0	0
1116.17	11	11	0	0	0	0	0	0	2
1116.86	22	22	0	0	0	0	0	0	2
1117.41	33	33	0	0	0	0	0	0	2
1117.89	44	44	0	0	0	0	0	0	2
1118.32	56	56	0	0	0	0	0	0	2
1118.74	67	67	0	0	0	0	0	0	2
1119.17	78	78	0	0	0	0	0	0	2
1119.64	89	89	0	0	0	0	0	0	2
1119.92	95	95	0	0	0	0	0	0	2
1120.72	111	111	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	1115.00	1110.00	0.00	-5.00	-5.00	1115.00	0.00	0.00
11	1116.17	1110.31	1.17	-3.51	-3.51	0.00	0.00	10.42
22	1116.86	1110.46	1.86	-2.85	-2.85	0.00	0.00	11.93
33	1117.41	1110.58	2.41	-2.31	-2.31	0.00	0.00	13.90
44	1117.89	1110.68	2.89	-1.83	-1.83	0.00	0.00	14.95
56	1118.32	1110.77	3.32	-1.38	-1.38	0.00	0.00	15.92
67	1118.74	1110.85	3.74	-0.97	-0.97	0.00	0.00	15.81
78	1119.17	1110.92	4.17	-0.55	-0.55	0.00	0.00	16.21
89	1119.64	1110.99	4.64	-0.14	-0.14	0.00	0.00	16.81
95	1119.92	1111.03	4.92	0.09	0.09	0.00	0.00	16.98
111	1120.72	1111.11	5.72	0.68	0.68	0.00	0.00	17.61

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: C103 DATE: OCT1491

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1115.00	0.00	0	0	0.00
1116.17	0.00	11	0	0.00
1116.86	0.00	22	0	0.00
1117.41	0.00	33	0	0.00
1117.89	0.00	44	0	0.00
1118.32	0.00	56	0	0.00
1118.74	0.00	67	0	0.00
1119.17	0.00	78	0	0.00
1119.64	0.00	89	0	0.00
1119.92	0.00	95	0	0.00
1120.72	0.00	111	0	0.00

CULVERT ANALYSIS VERSION 2.0

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	08:55:17	C104	OCT1491

PERFORMANCE CURVE DISCHARGE RANGE
OF FLOWS ANALYZED

MINUMUM DISCHARGE (CFS)	500
DESIGN DISCHARGE (CFS)	797
MAXIMUM DISCHARGE (CFS)	884

CULV #	A - SITE DATA INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	B - CULVERT SHAPE, MATERIAL, INLET BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANN. N	INLET TYPE
1	1115.50	1114.00	500.00	2 - RCB	10.00	6.00	.013	CONVENTIONAL
2								
3								
4								
5								
6								

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	08:55:17	C104	OCT1491

CULVERT NUMBER: 1

CULVERT INVERT DATA

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1115.50
OUTLET STATION (FT)	500.00
OUTLET ELEVATION (FT)	1114.00
NUMBER OF BARRELS	2.00
SLOPE (V-FT/H-FT)	0.0030
CULVERT LENGTH ALONG SLOPE (FT)	500.00

BARREL SHAPE: 10.00 FT X 6.00 FT BOX
BARREL MATERIAL: CONCRETE
WITH A MANNING'S N OF 0.013
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION: NONE

DOWNSTREAM CHANNEL CROSS-SECTION

BOTTOM WIDTH (FT)	30.00
SIDE SLOPE H/V _:1	5.0
CHANNEL SLOPE V/H (FT/FT)	0.020
MANNING'S N (.01-0.1)	0.035
CHANNEL INVERT ELEVATION (FT)	1114.00
CULVERT OUTLET INVERT ELEVATION AT	1114.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	08:55:17	C104	OCT1491

UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NO.	VEL. (FPS)	SHEAR (PSF)
500.00	1115.72	0.000	7.51	2.15
538.40	1115.80	0.000	7.69	2.24
576.80	1115.87	0.000	7.86	2.33
615.20	1115.93	0.000	8.02	2.41
653.60	1116.00	0.000	8.17	2.50
692.00	1116.06	0.000	8.32	2.58
730.40	1116.13	0.000	8.46	2.65
768.80	1116.19	0.000	8.59	2.73
797.00	1116.23	0.000	8.69	2.78
845.60	1116.30	0.000	8.85	2.87
884.00	1116.36	0.000	8.97	2.94

SELECTED OVERTOPPING CREST

ROADWAY SURFACE:	PAVED
EMBANKMENT TOP WIDTH (FT):	160.00

CONSTANT ROADWAY ELEVATION PROFILE

CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1144.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	08:55:17	C104	OCT1491

SUMMARY OF CULVERT FLOWS (CFS) FILE: C104 DATE: OCT1491

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1120.07	500	500	0	0	0	0	0	0	2
1120.30	538	538	0	0	0	0	0	0	2
1120.49	577	577	0	0	0	0	0	0	2
1120.71	615	615	0	0	0	0	0	0	2
1120.93	654	654	0	0	0	0	0	0	2
1121.14	692	692	0	0	0	0	0	0	2
1121.35	730	730	0	0	0	0	0	0	2
1121.55	769	769	0	0	0	0	0	0	2
1121.70	797	797	0	0	0	0	0	0	2
1121.95	846	846	0	0	0	0	0	0	2
1122.12	884	884	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 2 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
500	1120.07	1115.72	4.15	4.57	4.57	0.00	0.00	9.28
538	1120.30	1115.80	4.36	4.80	4.80	0.00	0.00	9.51
577	1120.49	1115.87	4.56	4.99	4.99	0.00	0.00	9.74
615	1120.71	1115.93	4.76	5.21	5.21	0.00	0.00	9.95
654	1120.93	1116.00	4.96	5.43	5.43	0.00	0.00	10.15
692	1121.14	1116.06	5.16	5.64	5.64	0.00	0.00	10.34
730	1121.35	1116.13	5.36	5.85	5.85	0.00	0.00	10.53
769	1121.55	1116.19	5.55	6.05	6.05	0.00	0.00	10.71
797	1121.70	1116.23	5.70	6.20	6.20	0.00	0.00	10.84
846	1121.95	1116.30	5.95	6.45	6.45	0.00	0.00	11.06
884	1122.12	1116.36	6.14	6.62	6.62	0.00	0.00	11.22

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: C104 DATE: OCT1491

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1120.07	0.00	500	0	0.00
1120.30	0.00	538	0	0.00
1120.49	0.00	577	0	0.00
1120.71	0.00	615	0	0.00
1120.93	0.00	654	0	0.00
1121.14	0.00	692	0	0.00
1121.35	0.00	730	0	0.00
1121.55	0.00	769	0	0.00
1121.70	0.00	797	0	0.00
1121.95	0.00	846	0	0.00
1122.12	0.00	884	0	0.00

CULVERT ANALYSIS VERSION 2.0

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	09:39:42	C105	OCT1491

PERFORMANCE CURVE DISCHARGE RANGE
OF FLOWS ANALYZED

MINUMUM DISCHARGE (CFS)	500
DESIGN DISCHARGE (CFS)	778
MAXIMUM DISCHARGE (CFS)	884

CULV #	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANN. N	INLET TYPE
1	1117.50	1116.50	470.00	2 - RCB	10.00	6.00	.013	CONVENTIONAL
2								
3								
4								
5								
6								

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	09:39:42	C105	OCT1491

CULVERT NUMBER: 1

CULVERT INVERT DATA

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1117.50
OUTLET STATION (FT)	470.00
OUTLET ELEVATION (FT)	1116.50
NUMBER OF BARRELS	2.00
SLOPE (V-FT/H-FT)	0.0021
CULVERT LENGTH ALONG SLOPE (FT)	470.00

BARREL SHAPE: 10.00 FT X 6.00 FT BOX
BARREL MATERIAL: CONCRETE
WITH A MANNING'S N OF 0.013
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION: NONE

DOWNSTREAM CHANNEL CROSS-SECTION

BOTTOM WIDTH (FT)	30.00
SIDE SLOPE H/V _:1	2.0
CHANNEL SLOPE V/H (FT/FT)	0.020
MANNING'S N (.01-0.1)	0.035
CHANNEL INVERT ELEVATION (FT)	1116.50
CULVERT OUTLET INVERT ELEVATION AT	1116.50

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	09:39:42	C105	OCT1491

UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NO.	VEL. (FPS)	SHEAR (PSF)
500.00	1118.31	0.000	8.21	2.26
538.40	1118.39	0.000	8.42	2.36
576.80	1118.47	0.000	8.63	2.46
615.20	1118.55	0.000	8.82	2.55
653.60	1118.62	0.000	9.01	2.64
692.00	1118.69	0.000	9.19	2.73
730.40	1118.76	0.000	9.36	2.82
768.80	1118.83	0.000	9.52	2.91
778.00	1118.85	0.000	9.56	2.93
845.60	1118.96	0.000	9.83	3.07
884.00	1119.03	0.000	9.98	3.15

SELECTED OVERTOPPING CREST

ROADWAY SURFACE:	PAVED
EMBANKMENT TOP WIDTH (FT):	160.00

CONSTANT ROADWAY ELEVATION PROFILE

CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1147.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	09:39:42	C105	OCT1491

SUMMARY OF CULVERT FLOWS (CFS) FILE: C105 DATE: OCT1491

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1122.01	500	500	0	0	0	0	0	0	2
1122.24	538	538	0	0	0	0	0	0	2
1122.46	577	577	0	0	0	0	0	0	2
1122.68	615	615	0	0	0	0	0	0	2
1122.89	654	654	0	0	0	0	0	0	2
1123.11	692	692	0	0	0	0	0	0	2
1123.31	730	730	0	0	0	0	0	0	2
1123.51	769	769	0	0	0	0	0	0	2
1123.56	778	778	0	0	0	0	0	0	2
1123.91	846	846	0	0	0	0	0	0	2
1124.10	884	884	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 2 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
500	1122.01	1118.31	4.15	4.51	4.51	0.00	0.00	9.28
538	1122.24	1118.39	4.36	4.74	4.74	0.00	0.00	9.51
577	1122.46	1118.47	4.56	4.96	4.96	0.00	0.00	9.74
615	1122.68	1118.55	4.77	5.18	5.18	0.00	0.00	9.95
654	1122.89	1118.62	4.97	5.39	5.39	0.00	0.00	10.15
692	1123.11	1118.69	5.16	5.61	5.61	0.00	0.00	10.34
730	1123.31	1118.76	5.36	5.81	5.81	0.00	0.00	10.53
769	1123.51	1118.83	5.55	6.01	6.01	0.00	0.00	10.71
778	1123.56	1118.85	5.60	6.06	6.06	0.00	0.00	10.76
846	1123.91	1118.96	5.95	6.41	6.41	0.00	0.00	11.06
884	1124.10	1119.03	6.15	6.60	6.60	0.00	0.00	11.22

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: C105 DATE: OCT1491

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1122.01	0.00	500	0	0.00
1122.24	0.00	538	0	0.00
1122.46	0.00	577	0	0.00
1122.68	0.00	615	0	0.00
1122.89	0.00	654	0	0.00
1123.11	0.00	692	0	0.00
1123.31	0.00	730	0	0.00
1123.51	0.00	769	0	0.00
1123.56	0.00	778	0	0.00
1123.91	0.00	846	0	0.00
1124.10	0.00	884	0	0.00

CULVERT ANALYSIS VERSION 2.0

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	10:07:26	C106	OCT1191

PERFORMANCE CURVE DISCHARGE RANGE
OF FLOWS ANALYZED

MINUMUM DISCHARGE (CFS)	200
DESIGN DISCHARGE (CFS)	278
MAXIMUM DISCHARGE (CFS)	442

CULV #	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANN. N	INLET TYPE
1	1122.50	1122.00	370.00	1 - RCB	10.00	6.00	.013	CONVENTIONAL
2								
3								
4								
5								
6								

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	10:07:26	C106	OCT1191

CULVERT NUMBER: 1

CULVERT INVERT DATA

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1122.50
OUTLET STATION (FT)	370.00
OUTLET ELEVATION (FT)	1122.00
NUMBER OF BARRELS	1.00
SLOPE (V-FT/H-FT)	0.0014
CULVERT LENGTH ALONG SLOPE (FT)	370.00

BARREL SHAPE: 10.00 FT X 6.00 FT BOX
BARREL MATERIAL: CONCRETE
WITH A MANNING'S N OF 0.013
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION: NONE

DOWNSTREAM CHANNEL CROSS-SECTION

BOTTOM WIDTH (FT)	15.00
SIDE SLOPE H/V _:1	5.0
CHANNEL SLOPE V/H (FT/FT)	0.020
MANNING'S N (.01-0.1)	0.035
CHANNEL INVERT ELEVATION (FT)	1122.00
CULVERT OUTLET INVERT ELEVATION AT	1122.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	10:07:26	C106	OCT1191

UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NO.	VEL. (FPS)	SHEAR (PSF)
200.00	1123.43	0.000	6.29	1.79
224.20	1123.52	0.000	6.51	1.90
248.40	1123.61	0.000	6.70	2.01
272.60	1123.69	0.000	6.89	2.11
278.00	1123.71	0.000	6.93	2.13
321.00	1123.84	0.000	7.22	2.29
345.20	1123.91	0.000	7.37	2.38
369.40	1123.98	0.000	7.51	2.47
393.60	1124.04	0.000	7.65	2.55
417.80	1124.11	0.000	7.77	2.63
442.00	1124.17	0.000	7.90	2.70

SELECTED OVERTOPPING CREST

ROADWAY SURFACE:	PAVED
EMBANKMENT TOP WIDTH (FT):	160.00

CONSTANT ROADWAY ELEVATION PROFILE

CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1147.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	10:07:26	C106	OCT1191

SUMMARY OF CULVERT FLOWS (CFS) FILE: C106 DATE: OCT1191

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1126.44	200	200	0	0	0	0	0	0	2
1126.74	224	224	0	0	0	0	0	0	2
1127.05	248	248	0	0	0	0	0	0	2
1127.33	273	273	0	0	0	0	0	0	2
1127.39	278	278	0	0	0	0	0	0	2
1127.89	321	321	0	0	0	0	0	0	2
1128.15	345	345	0	0	0	0	0	0	2
1128.43	369	369	0	0	0	0	0	0	2
1128.68	394	394	0	0	0	0	0	0	2
1128.92	418	418	0	0	0	0	0	0	2
1129.18	442	442	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
200	1126.44	1123.43	3.57	3.94	3.94	0.00	0.00	8.62
224	1126.74	1123.52	3.86	4.24	4.24	0.00	0.00	8.95
248	1127.05	1123.61	4.13	4.55	4.55	0.00	0.00	9.26
273	1127.33	1123.69	4.40	4.83	4.83	0.00	0.00	9.55
278	1127.39	1123.71	4.46	4.89	4.89	0.00	0.00	9.62
321	1127.89	1123.84	4.91	5.39	5.39	0.00	0.00	10.09
345	1128.15	1123.91	5.16	5.65	5.65	0.00	0.00	10.34
369	1128.43	1123.98	5.40	5.93	5.93	0.00	0.00	10.57
394	1128.68	1124.04	5.65	6.18	6.18	0.00	0.00	10.80
418	1128.92	1124.11	5.90	6.42	6.42	0.00	0.00	11.02
442	1129.18	1124.17	6.15	6.68	6.68	0.00	0.00	11.22

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: C106 DATE: OCT1191

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1126.44	0.00	200	0	0.00
1126.74	0.00	224	0	0.00
1127.05	0.00	248	0	0.00
1127.33	0.00	273	0	0.00
1127.39	0.00	278	0	0.00
1127.89	0.00	321	0	0.00
1128.15	0.00	345	0	0.00
1128.43	0.00	369	0	0.00
1128.68	0.00	394	0	0.00
1128.92	0.00	418	0	0.00
1129.18	0.00	442	0	0.00

CULVERT ANALYSIS VERSION 2.0

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	10:35:37	C107	OCT1191

PERFORMANCE CURVE DISCHARGE RANGE
OF FLOWS ANALYZED

MINUMUM DISCHARGE (CFS)	100
DESIGN DISCHARGE (CFS)	134
MAXIMUM DISCHARGE (CFS)	162

CULV #	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANN. N	INLET TYPE
1	1125.00	1124.50	270.00	1 - RCP	5.50	5.50	.012	CONVENTIONAL
2								
3								
4								
5								
6								

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	10:35:37	C107	OCT1191

CULVERT NUMBER: 1

CULVERT INVERT DATA

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1125.00
OUTLET STATION (FT)	270.00
OUTLET ELEVATION (FT)	1124.50
NUMBER OF BARRELS	1.00
SLOPE (V-FT/H-FT)	0.0019
CULVERT LENGTH ALONG SLOPE (FT)	270.00

BARREL SHAPE: CIRCULAR 5.50 FT IN DIAMETER
BARREL MATERIAL:
WITH A MANNING'S N OF 0.012
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: SQUARE EDGE WITH HEADWALL
INLET DEPRESSION: NONE

DOWNSTREAM CHANNEL CROSS-SECTION

BOTTOM WIDTH (FT)	10.00
SIDE SLOPE H/V _:1	5.0
CHANNEL SLOPE V/H (FT/FT)	0.010
MANNING'S N (.01-0.1)	0.035
CHANNEL INVERT ELEVATION (FT)	1124.50
CULVERT OUTLET INVERT ELEVATION AT	1124.50

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	10:35:37	C107	OCT1191

UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NO.	VEL. (FPS)	SHEAR (PSF)
100.00	1125.90	0.000	4.19	0.87
106.20	1125.95	0.000	4.26	0.90
112.40	1125.99	0.000	4.33	0.93
118.60	1126.03	0.000	4.40	0.95
124.80	1126.07	0.000	4.46	0.98
131.00	1126.11	0.000	4.52	1.00
134.00	1126.13	0.000	4.55	1.01
143.40	1126.18	0.000	4.63	1.05
149.60	1126.22	0.000	4.68	1.07
155.80	1126.25	0.000	4.74	1.09
162.00	1126.29	0.000	4.79	1.12

SELECTED OVERTOPPING CREST

ROADWAY SURFACE:	PAVED
EMBANKMENT TOP WIDTH (FT):	160.00

CONSTANT ROADWAY ELEVATION PROFILE

CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1144.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	10:35:37	C107	OCT1191

SUMMARY OF CULVERT FLOWS (CFS) FILE: C107 DATE: OCT1191

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1129.32	100	100	0	0	0	0	0	0	2
1129.48	106	106	0	0	0	0	0	0	2
1129.63	112	112	0	0	0	0	0	0	2
1129.78	119	119	0	0	0	0	0	0	2
1129.94	125	125	0	0	0	0	0	0	2
1130.08	131	131	0	0	0	0	0	0	2
1130.15	134	134	0	0	0	0	0	0	2
1130.37	143	143	0	0	0	0	0	0	2
1130.53	150	150	0	0	0	0	0	0	2
1130.67	156	156	0	0	0	0	0	0	2
1130.81	162	162	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
100	1129.32	1125.90	4.08	4.32	4.32	0.00	0.00	8.42
106	1129.48	1125.95	4.23	4.48	4.48	0.00	0.00	8.61
112	1129.63	1125.99	4.38	4.63	4.63	0.00	0.00	8.78
119	1129.78	1126.03	4.53	4.78	4.78	0.00	0.00	8.94
125	1129.94	1126.07	4.67	4.94	4.94	0.00	0.00	9.09
131	1130.08	1126.11	4.82	5.08	5.08	0.00	0.00	9.23
134	1130.15	1126.13	4.89	5.15	5.15	0.00	0.00	9.30
143	1130.37	1126.18	5.11	5.37	5.37	0.00	0.00	9.52
150	1130.53	1126.22	5.25	5.53	5.53	0.00	0.00	9.70
156	1130.67	1126.25	5.40	5.67	5.67	0.00	0.00	9.86
162	1130.81	1126.29	5.55	5.81	5.81	0.00	0.00	10.03

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: C107 DATE: OCT1191

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1129.32	0.00	100	0	0.00
1129.48	0.00	106	0	0.00
1129.63	0.00	112	0	0.00
1129.78	0.00	119	0	0.00
1129.94	0.00	125	0	0.00
1130.08	0.00	131	0	0.00
1130.15	0.00	134	0	0.00
1130.37	0.00	143	0	0.00
1130.53	0.00	150	0	0.00
1130.67	0.00	156	0	0.00
1130.81	0.00	162	0	0.00

CULVERT ANALYSIS VERSION 2.0

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	10:56:07	C108	OCT1191

PERFORMANCE CURVE DISCHARGE RANGE
OF FLOWS ANALYZED

MINUMUM DISCHARGE (CFS)	0
DESIGN DISCHARGE (CFS)	149
MAXIMUM DISCHARGE (CFS)	180

CULV #	A - SITE DATA INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	B - CULVERT SHAPE, MATERIAL, INLET BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANN. N	INLET TYPE
1	1127.00	1126.50	250.00	1 - RCP	5.00	5.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	10:56:07	C108	OCT1191

CULVERT NUMBER: 1

CULVERT INVERT DATA

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1127.00
OUTLET STATION (FT)	250.00
OUTLET ELEVATION (FT)	1126.50
NUMBER OF BARRELS	1.00
SLOPE (V-FT/H-FT)	0.0020
CULVERT LENGTH ALONG SLOPE (FT)	250.00

BARREL SHAPE: CIRCULAR 5.00 FT IN DIAMETER
BARREL MATERIAL:
WITH A MANNING'S N OF 0.012
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: SQUARE EDGE WITH HEADWALL
INLET DEPRESSION: NONE

DOWNSTREAM CHANNEL CROSS-SECTION

BOTTOM WIDTH (FT)	10.00
SIDE SLOPE H/V _:1	5.0
CHANNEL SLOPE V/H (FT/FT)	0.010
MANNING'S N (.01-0.1)	0.035
CHANNEL INVERT ELEVATION (FT)	1126.50
CULVERT OUTLET INVERT ELEVATION AT	1126.50

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	10:56:07	C108	OCT1191

UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NO.	VEL. (FPS)	SHEAR (PSF)
0.00	1126.50	0.000	0.00	0.00
18.00	1127.06	0.000	2.51	0.35
36.00	1127.32	0.000	3.12	0.51
54.00	1127.52	0.000	3.52	0.64
72.00	1127.68	0.000	3.82	0.74
90.00	1127.83	0.000	4.07	0.83
108.00	1127.96	0.000	4.28	0.91
126.00	1128.08	0.000	4.47	0.98
144.00	1128.19	0.000	4.64	1.05
149.00	1128.21	0.000	4.68	1.07
180.00	1128.38	0.000	4.93	1.17

SELECTED OVERTOPPING CREST

ROADWAY SURFACE:	PAVED
EMBANKMENT TOP WIDTH (FT):	160.00

CONSTANT ROADWAY ELEVATION PROFILE

CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1141.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	10:56:07	C108	OCT1191

SUMMARY OF CULVERT FLOWS (CFS) FILE: C108 DATE: OCT1191

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1127.00	0	0	0	0	0	0	0	0	0
1128.75	18	18	0	0	0	0	0	0	2
1129.55	36	36	0	0	0	0	0	0	2
1130.17	54	54	0	0	0	0	0	0	2
1130.73	72	72	0	0	0	0	0	0	2
1131.25	90	90	0	0	0	0	0	0	2
1131.74	108	108	0	0	0	0	0	0	2
1132.23	126	126	0	0	0	0	0	0	2
1132.74	144	144	0	0	0	0	0	0	2
1132.88	149	149	0	0	0	0	0	0	2
1133.86	180	180	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	1127.00	1126.50	0.00	-0.50	-0.50	1127.00	0.00	0.00
18	1128.75	1127.06	1.45	1.75	1.75	0.00	0.00	5.24
36	1129.55	1127.32	2.27	2.55	2.55	0.00	0.00	6.32
54	1130.17	1127.52	2.94	3.17	3.17	0.00	0.00	7.10
72	1130.73	1127.68	3.51	3.73	3.73	0.00	0.00	7.82
90	1131.25	1127.83	4.02	4.25	4.25	0.00	0.00	8.42
108	1131.74	1127.96	4.51	4.74	4.74	0.00	0.00	8.93
126	1132.23	1128.08	5.00	5.23	5.23	0.00	0.00	9.51
144	1132.74	1128.19	5.52	5.74	5.74	0.00	0.00	10.02
149	1132.88	1128.21	5.67	5.88	5.88	0.00	0.00	10.15
180	1133.86	1128.38	6.69	6.86	6.86	0.00	0.00	11.18

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: C108 DATE: OCT1191

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1127.00	0.00	0	0	0.00
1128.75	0.00	18	0	0.00
1129.55	0.00	36	0	0.00
1130.17	0.00	54	0	0.00
1130.73	0.00	72	0	0.00
1131.25	0.00	90	0	0.00
1131.74	0.00	108	0	0.00
1132.23	0.00	126	0	0.00
1132.74	0.00	144	0	0.00
1132.88	0.00	149	0	0.00
1133.86	0.00	180	0	0.00

CULVERT ANALYSIS VERSION 2.0

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	11:20:43	C109	OCT1191

PERFORMANCE CURVE DISCHARGE RANGE
OF FLOWS ANALYZED

MINUMUM DISCHARGE (CFS)	200
DESIGN DISCHARGE (CFS)	337
MAXIMUM DISCHARGE (CFS)	411

CULV #	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANN. N	INLET TYPE
1	1131.00	1130.50	210.00	2 - RCB	6.00	6.00	.013	CONVENTIONAL
2								
3								
4								
5								
6								

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	11:20:43	C109	OCT1191

CULVERT NUMBER: 1

CULVERT INVERT DATA

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1131.00
OUTLET STATION (FT)	210.00
OUTLET ELEVATION (FT)	1130.50
NUMBER OF BARRELS	2.00
SLOPE (V-FT/H-FT)	0.0024
CULVERT LENGTH ALONG SLOPE (FT)	210.00

BARREL SHAPE: 6.00 FT X 6.00 FT BOX
BARREL MATERIAL: CONCRETE
WITH A MANNING'S N OF 0.013
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION: NONE

DOWNSTREAM CHANNEL CROSS-SECTION

BOTTOM WIDTH (FT)	20.00
SIDE SLOPE H/V _:1	5.0
CHANNEL SLOPE V/H (FT/FT)	0.010
MANNING'S N (.01-0.1)	0.035
CHANNEL INVERT ELEVATION (FT)	1130.50
CULVERT OUTLET INVERT ELEVATION AT	1130.50

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	11:20:43	C109	OCT1191

UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NO.	VEL. (FPS)	SHEAR (PSF)
200.00	1132.02	0.000	4.75	0.95
221.10	1132.11	0.000	4.90	1.00
242.20	1132.19	0.000	5.04	1.05
263.30	1132.27	0.000	5.16	1.10
284.40	1132.34	0.000	5.28	1.15
305.50	1132.41	0.000	5.40	1.19
326.60	1132.48	0.000	5.50	1.24
337.00	1132.52	0.000	5.55	1.26
368.80	1132.62	0.000	5.70	1.32
389.90	1132.68	0.000	5.79	1.36
411.00	1132.74	0.000	5.88	1.40

SELECTED OVERTOPPING CREST

ROADWAY SURFACE:	PAVED
EMBANKMENT TOP WIDTH (FT):	160.00

CONSTANT ROADWAY ELEVATION PROFILE

CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1140.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	11:20:43	C109	OCT1191

SUMMARY OF CULVERT FLOWS (CFS) FILE: C109 DATE: OCT1191

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1134.44	200	200	0	0	0	0	0	0	2
1134.68	221	221	0	0	0	0	0	0	2
1134.92	242	242	0	0	0	0	0	0	2
1135.14	263	263	0	0	0	0	0	0	2
1135.36	284	284	0	0	0	0	0	0	2
1135.58	306	306	0	0	0	0	0	0	2
1135.78	327	327	0	0	0	0	0	0	2
1135.88	337	337	0	0	0	0	0	0	2
1136.20	369	369	0	0	0	0	0	0	2
1136.39	390	390	0	0	0	0	0	0	2
1136.58	411	411	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 2 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
200	1134.44	1132.02	3.15	3.44	3.44	0.00	0.00	8.11
221	1134.68	1132.11	3.38	3.68	3.68	0.00	0.00	8.38
242	1134.92	1132.19	3.59	3.92	3.92	0.00	0.00	8.64
263	1135.14	1132.27	3.80	4.14	4.14	0.00	0.00	8.89
284	1135.36	1132.34	4.00	4.36	4.36	0.00	0.00	9.12
306	1135.58	1132.41	4.20	4.58	4.58	0.00	0.00	9.34
327	1135.78	1132.48	4.39	4.78	4.78	0.00	0.00	9.55
337	1135.88	1132.52	4.48	4.88	4.88	0.00	0.00	9.65
369	1136.20	1132.62	4.76	5.20	5.20	0.00	0.00	9.94
390	1136.39	1132.68	4.95	5.39	5.39	0.00	0.00	10.13
411	1136.58	1132.74	5.13	5.58	5.58	0.00	0.00	10.31

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: C109 DATE: OCT1191

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1134.44	0.00	200	0	0.00
1134.68	0.00	221	0	0.00
1134.92	0.00	242	0	0.00
1135.14	0.00	263	0	0.00
1135.36	0.00	284	0	0.00
1135.58	0.00	306	0	0.00
1135.78	0.00	327	0	0.00
1135.88	0.00	337	0	0.00
1136.20	0.00	369	0	0.00
1136.39	0.00	390	0	0.00
1136.58	0.00	411	0	0.00

CULVERT ANALYSIS VERSION 2.0

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	12:35:51	C110	OCT1191

PERFORMANCE CURVE DISCHARGE RANGE
OF FLOWS ANALYZED

MINUMUM DISCHARGE (CFS)	0
DESIGN DISCHARGE (CFS)	128
MAXIMUM DISCHARGE (CFS)	157

CULV #	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANN. N	INLET TYPE
1	1134.50	1133.00	215.00	1 - RCP	6.00	6.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	12:35:51	C110	OCT1191

CULVERT NUMBER: 1

CULVERT INVERT DATA

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1134.50
OUTLET STATION (FT)	215.00
OUTLET ELEVATION (FT)	1133.00
NUMBER OF BARRELS	1.00
SLOPE (V-FT/H-FT)	0.0070
CULVERT LENGTH ALONG SLOPE (FT)	215.00

BARREL SHAPE: CIRCULAR 6.00 FT IN DIAMETER
BARREL MATERIAL:
WITH A MANNING'S N OF 0.012
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: SQUARE EDGE WITH HEADWALL
INLET DEPRESSION: NONE

DOWNSTREAM CHANNEL CROSS-SECTION

BOTTOM WIDTH (FT)	10.00
SIDE SLOPE H/V _:1	5.0
CHANNEL SLOPE V/H (FT/FT)	0.020
MANNING'S N (.01-0.1)	0.035
CHANNEL INVERT ELEVATION (FT)	1133.00
CULVERT OUTLET INVERT ELEVATION AT	1133.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	12:35:51	C110	OCT1191

UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NO.	VEL. (FPS)	SHEAR (PSF)
0.00	1133.00	0.000	0.00	0.00
15.70	1133.43	0.000	3.04	0.53
31.40	1133.63	0.000	3.80	0.78
47.10	1133.79	0.000	4.31	0.98
62.80	1133.92	0.000	4.69	1.14
78.50	1134.03	0.000	5.01	1.29
94.20	1134.14	0.000	5.28	1.42
109.90	1134.23	0.000	5.52	1.54
125.60	1134.32	0.000	5.73	1.65
128.00	1134.33	0.000	5.77	1.66
157.00	1134.48	0.000	6.10	1.85

SELECTED OVERTOPPING CREST

ROADWAY SURFACE:	PAVED
EMBANKMENT TOP WIDTH (FT):	160.00

CONSTANT ROADWAY ELEVATION PROFILE

CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1144.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	12:35:51	C110	OCT1191

SUMMARY OF CULVERT FLOWS (CFS) FILE: C110 DATE: OCT1191

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1134.50	0	0	0	0	0	0	0	0	0
1135.71	16	16	0	0	0	0	0	0	2
1136.34	31	31	0	0	0	0	0	0	2
1136.89	47	47	0	0	0	0	0	0	2
1137.39	63	63	0	0	0	0	0	0	2
1137.83	79	79	0	0	0	0	0	0	2
1138.24	94	94	0	0	0	0	0	0	2
1138.61	110	110	0	0	0	0	0	0	2
1138.96	126	126	0	0	0	0	0	0	2
1139.01	128	128	0	0	0	0	0	0	2
1139.62	157	157	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	1134.50	1133.00	0.00	-1.50	-1.50	1134.50	0.00	0.00
16	1135.71	1133.43	1.21	0.07	0.07	0.00	0.00	7.02
31	1136.34	1133.63	1.84	0.76	0.76	0.00	0.00	8.26
47	1136.89	1133.79	2.39	1.31	1.31	0.00	0.00	9.36
63	1137.39	1133.92	2.89	1.78	1.78	0.00	0.00	9.59
79	1137.83	1134.03	3.33	2.20	2.20	0.00	0.00	10.72
94	1138.24	1134.14	3.74	2.60	2.60	0.00	0.00	10.78
110	1138.61	1134.23	4.11	2.98	2.98	0.00	0.00	11.26
126	1138.96	1134.32	4.46	3.33	3.33	0.00	0.00	11.75
128	1139.01	1134.33	4.51	3.38	3.38	0.00	0.00	11.81
157	1139.62	1134.48	5.12	4.01	4.01	0.00	0.00	12.33

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: C110 DATE: OCT1191

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1134.50	0.00	0	0	0.00
1135.71	0.00	16	0	0.00
1136.34	0.00	31	0	0.00
1136.89	0.00	47	0	0.00
1137.39	0.00	63	0	0.00
1137.83	0.00	79	0	0.00
1138.24	0.00	94	0	0.00
1138.61	0.00	110	0	0.00
1138.96	0.00	126	0	0.00
1139.01	0.00	128	0	0.00
1139.62	0.00	157	0	0.00

CULVERT ANALYSIS VERSION 2.0

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	14:05:09	C111	OCT1191

PERFORMANCE CURVE DISCHARGE RANGE
OF FLOWS ANALYZED

MINUMUM DISCHARGE (CFS)	0
DESIGN DISCHARGE (CFS)	140
MAXIMUM DISCHARGE (CFS)	171

CULV #	A - SITE DATA INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	B - CULVERT SHAPE, MATERIAL, INLET BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANN. N	INLET TYPE
1	1137.50	1136.00	255.00	1 - RCP	4.50	4.50	.012	CONVENTIONAL
2								
3								
4								
5								
6								

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	14:05:09	C111	OCT1191

CULVERT NUMBER: 1

CULVERT INVERT DATA

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1137.50
OUTLET STATION (FT)	255.00
OUTLET ELEVATION (FT)	1136.00
NUMBER OF BARRELS	1.00
SLOPE (V-FT/H-FT)	0.0059
CULVERT LENGTH ALONG SLOPE (FT)	255.00

BARREL SHAPE: CIRCULAR 4.50 FT IN DIAMETER
BARREL MATERIAL:
WITH A MANNING'S N OF 0.012
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: SQUARE EDGE WITH HEADWALL
INLET DEPRESSION: NONE

DOWNSTREAM CHANNEL CROSS-SECTION

BOTTOM WIDTH (FT)	10.00
SIDE SLOPE H/V _:1	5.0
CHANNEL SLOPE V/H (FT/FT)	0.020
MANNING'S N (.01-0.1)	0.035
CHANNEL INVERT ELEVATION (FT)	1137.00
CULVERT OUTLET INVERT ELEVATION AT	1137.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	14:05:09	C111	OCT1191

UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NO.	VEL. (FPS)	SHEAR (PSF)
0.00	1137.00	0.000	0.00	0.00
17.10	1137.45	0.000	3.13	0.56
34.20	1137.66	0.000	3.90	0.82
51.30	1137.82	0.000	4.42	1.03
68.40	1137.96	0.000	4.81	1.20
85.50	1138.08	0.000	5.14	1.35
102.60	1138.19	0.000	5.41	1.48
119.70	1138.29	0.000	5.66	1.61
136.80	1138.38	0.000	5.87	1.72
140.00	1138.40	0.000	5.91	1.74
171.00	1138.54	0.000	6.25	1.93

SELECTED OVERTOPPING CREST

ROADWAY SURFACE:	PAVED
EMBANKMENT TOP WIDTH (FT):	160.00

CONSTANT ROADWAY ELEVATION PROFILE

CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1149.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	14:05:09	C111	OCT1191

SUMMARY OF CULVERT FLOWS (CFS) FILE: C111 DATE: OCT1191

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1137.50	0	0	0	0	0	0	0	0	0
1138.98	17	17	0	0	0	0	0	0	2
1139.83	34	34	0	0	0	0	0	0	2
1140.51	51	51	0	0	0	0	0	0	2
1141.09	68	68	0	0	0	0	0	0	2
1141.63	86	86	0	0	0	0	0	0	2
1142.18	103	103	0	0	0	0	0	0	2
1142.78	120	120	0	0	0	0	0	0	2
1143.45	137	137	0	0	0	0	0	0	2
1143.58	140	140	0	0	0	0	0	0	2
1145.06	171	171	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	1137.50	1137.00	0.00	-0.50	-0.50	1137.50	0.00	0.00
17	1138.98	1137.45	1.48	0.39	0.39	0.00	0.00	3.86
34	1139.83	1137.66	2.33	1.11	1.11	0.00	0.00	6.41
51	1140.51	1137.82	3.01	1.78	1.78	0.00	0.00	8.50
68	1141.09	1137.96	3.59	2.37	2.37	0.00	0.00	9.58
86	1141.63	1138.08	4.13	2.91	2.91	0.00	0.00	10.41
103	1142.18	1138.19	4.68	3.45	3.45	0.00	0.00	10.75
120	1142.78	1138.29	5.28	3.98	3.98	0.00	0.00	11.23
137	1143.45	1138.38	5.95	4.52	4.52	0.00	0.00	11.47
140	1143.58	1138.40	6.08	4.62	4.62	0.00	0.00	11.41
171	1145.06	1138.54	7.56	7.07	7.07	0.00	0.00	12.04

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: C111 DATE: OCT1191

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1137.50	0.00	0	0	0.00
1138.98	0.00	17	0	0.00
1139.83	0.00	34	0	0.00
1140.51	0.00	51	0	0.00
1141.09	0.00	68	0	0.00
1141.63	0.00	86	0	0.00
1142.18	0.00	103	0	0.00
1142.78	0.00	120	0	0.00
1143.45	0.00	137	0	0.00
1143.58	0.00	140	0	0.00
1145.06	0.00	171	0	0.00

CULVERT ANALYSIS VERSION 2.0

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	14:22:16	C112	OCT1191

PERFORMANCE CURVE DISCHARGE RANGE
OF FLOWS ANALYZED

MINUMUM DISCHARGE (CFS)	2000
DESIGN DISCHARGE (CFS)	3116
MAXIMUM DISCHARGE (CFS)	3685

CULV #	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANN. N	INLET TYPE
1	1141.50	1140.00	230.00	9 - RCB	10.00	6.00	.013	CONVENTIONAL
2								
3								
4								
5								
6								

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	14:22:16	C112	OCT1191

CULVERT NUMBER: 1

CULVERT INVERT DATA

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1141.50
OUTLET STATION (FT)	230.00
OUTLET ELEVATION (FT)	1140.00
NUMBER OF BARRELS	9.00
SLOPE (V-FT/H-FT)	0.0065
CULVERT LENGTH ALONG SLOPE (FT)	230.00

BARREL SHAPE: 10.00 FT X 6.00 FT BOX
BARREL MATERIAL: CONCRETE
WITH A MANNING'S N OF 0.013
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION: NONE

DOWNSTREAM CHANNEL CROSS-SECTION

BOTTOM WIDTH (FT)	100.00
SIDE SLOPE H/V _:1	5.0
CHANNEL SLOPE V/H (FT/FT)	0.020
MANNING'S N (.01-0.1)	0.035
CHANNEL INVERT ELEVATION (FT)	1140.00
CULVERT OUTLET INVERT ELEVATION AT	1140.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	14:22:16	C112	OCT1191

UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NO.	VEL. (FPS)	SHEAR (PSF)
2000.00	1142.02	0.000	9.02	2.52
2168.50	1142.11	0.000	9.28	2.64
2337.00	1142.21	0.000	9.53	2.76
2505.50	1142.30	0.000	9.77	2.87
2674.00	1142.39	0.000	10.00	2.98
2842.50	1142.48	0.000	10.22	3.09
3011.00	1142.56	0.000	10.43	3.19
3116.00	1142.61	0.000	10.55	3.26
3348.00	1142.72	0.000	10.82	3.40
3516.50	1142.80	0.000	11.01	3.50
3685.00	1142.88	0.000	11.19	3.59

SELECTED OVERTOPPING CREST

ROADWAY SURFACE:	PAVED
EMBANKMENT TOP WIDTH (FT):	160.00

CONSTANT ROADWAY ELEVATION PROFILE

CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1152.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	14:22:16	C112	OCT1191

SUMMARY OF CULVERT FLOWS (CFS) FILE: C112 DATE: OCT1191

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1145.32	2000	2000	0	0	0	0	0	0	2
1145.53	2169	2169	0	0	0	0	0	0	2
1145.74	2337	2337	0	0	0	0	0	0	2
1145.94	2506	2506	0	0	0	0	0	0	2
1146.14	2674	2674	0	0	0	0	0	0	2
1146.34	2843	2843	0	0	0	0	0	0	2
1146.53	3011	3011	0	0	0	0	0	0	2
1146.65	3116	3116	0	0	0	0	0	0	2
1146.91	3348	3348	0	0	0	0	0	0	2
1147.11	3517	3517	0	0	0	0	0	0	2
1147.30	3685	3685	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 9 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
2000	1145.32	1142.02	3.82	2.72	2.72	0.00	0.00	11.03
2169	1145.53	1142.11	4.03	2.96	2.96	0.00	0.00	11.40
2337	1145.74	1142.21	4.24	3.18	3.18	0.00	0.00	11.76
2506	1145.94	1142.30	4.44	3.41	3.41	0.00	0.00	12.11
2674	1146.14	1142.39	4.64	3.62	3.62	0.00	0.00	12.31
2843	1146.34	1142.48	4.84	3.84	3.84	0.00	0.00	12.53
3011	1146.53	1142.56	5.03	4.05	4.05	0.00	0.00	12.76
3116	1146.65	1142.61	5.15	4.17	4.17	0.00	0.00	12.90
3348	1146.91	1142.72	5.41	4.45	4.45	0.00	0.00	13.22
3517	1147.11	1142.80	5.61	4.65	4.65	0.00	0.00	13.37
3685	1147.30	1142.88	5.80	4.84	4.84	0.00	0.00	13.52

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: C112 DATE: OCT1191

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1145.32	0.00	2000	0	0.00
1145.53	0.00	2169	0	0.00
1145.74	0.00	2337	0	0.00
1145.94	0.00	2506	0	0.00
1146.14	0.00	2674	0	0.00
1146.34	0.00	2843	0	0.00
1146.53	0.00	3011	0	0.00
1146.65	0.00	3116	0	0.00
1146.91	0.00	3348	0	0.00
1147.11	0.00	3517	0	0.00
1147.30	0.00	3685	0	0.00

CULVERT ANALYSIS VERSION 2.0

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	15:18:04	C113	OCT1191

PERFORMANCE CURVE DISCHARGE RANGE
OF FLOWS ANALYZED

MINUMUM DISCHARGE (CFS)	500
DESIGN DISCHARGE (CFS)	747
MAXIMUM DISCHARGE (CFS)	882

CULV #	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANN. N	INLET TYPE
1	1152.50	1151.00	210.00	2 - RCB	10.00	6.00	.013	CONVENTIONAL
2								
3								
4								
5								
6								

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	15:18:04	C113	OCT1191

CULVERT NUMBER: 1

CULVERT INVERT DATA

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1152.50
OUTLET STATION (FT)	210.00
OUTLET ELEVATION (FT)	1151.00
NUMBER OF BARRELS	2.00
SLOPE (V-FT/H-FT)	0.0071
CULVERT LENGTH ALONG SLOPE (FT)	210.00

BARREL SHAPE: 10.00 FT X 6.00 FT BOX
BARREL MATERIAL: CONCRETE
WITH A MANNING'S N OF 0.013
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION: NONE

DOWNSTREAM CHANNEL CROSS-SECTION

BOTTOM WIDTH (FT)	20.00
SIDE SLOPE H/V _:1	5.0
CHANNEL SLOPE V/H (FT/FT)	0.012
MANNING'S N (.01-0.1)	0.035
CHANNEL INVERT ELEVATION (FT)	1151.00
CULVERT OUTLET INVERT ELEVATION AT	1151.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	15:18:04	C113	OCT1191

UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NO.	VEL. (FPS)	SHEAR (PSF)
500.00	1153.37	0.000	6.64	1.77
538.20	1153.46	0.000	6.78	1.84
576.40	1153.55	0.000	6.92	1.91
614.60	1153.63	0.000	7.04	1.97
652.80	1153.71	0.000	7.16	2.03
691.00	1153.79	0.000	7.28	2.09
729.20	1153.87	0.000	7.39	2.15
747.00	1153.91	0.000	7.44	2.18
805.60	1154.02	0.000	7.60	2.26
843.80	1154.09	0.000	7.69	2.32
882.00	1154.16	0.000	7.79	2.37

SELECTED OVERTOPPING CREST

ROADWAY SURFACE:	PAVED
EMBANKMENT TOP WIDTH (FT):	160.00

CONSTANT ROADWAY ELEVATION PROFILE

CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1163.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	15:18:04	C113	OCT1191

SUMMARY OF CULVERT FLOWS (CFS) FILE: C113 DATE: OCT1191

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1156.63	500	500	0	0	0	0	0	0	2
1156.84	538	538	0	0	0	0	0	0	2
1157.05	576	576	0	0	0	0	0	0	2
1157.25	615	615	0	0	0	0	0	0	2
1157.45	653	653	0	0	0	0	0	0	2
1157.64	691	691	0	0	0	0	0	0	2
1157.84	729	729	0	0	0	0	0	0	2
1157.93	747	747	0	0	0	0	0	0	2
1158.23	806	806	0	0	0	0	0	0	2
1158.42	844	844	0	0	0	0	0	0	2
1158.62	882	882	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 2 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
500	1156.63	1153.37	4.13	3.07	3.07	0.00	0.00	10.57
538	1156.84	1153.46	4.34	3.30	3.30	0.00	0.00	10.95
576	1157.05	1153.55	4.55	3.52	3.52	0.00	0.00	11.32
615	1157.25	1153.63	4.75	3.74	3.74	0.00	0.00	11.68
653	1157.45	1153.71	4.95	3.95	3.95	0.00	0.00	12.02
691	1157.64	1153.79	5.14	4.17	4.17	0.00	0.00	12.36
729	1157.84	1153.87	5.34	4.37	4.37	0.00	0.00	12.69
747	1157.93	1153.91	5.43	4.47	4.47	0.00	0.00	12.84
806	1158.23	1154.02	5.73	4.78	4.78	0.00	0.00	13.33
844	1158.42	1154.09	5.92	4.97	4.97	0.00	0.00	13.64
882	1158.62	1154.16	6.12	5.17	5.17	0.00	0.00	13.94

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: C113 DATE: OCT1191

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1156.63	0.00	500	0	0.00
1156.84	0.00	538	0	0.00
1157.05	0.00	576	0	0.00
1157.25	0.00	615	0	0.00
1157.45	0.00	653	0	0.00
1157.64	0.00	691	0	0.00
1157.84	0.00	729	0	0.00
1157.93	0.00	747	0	0.00
1158.23	0.00	806	0	0.00
1158.42	0.00	844	0	0.00
1158.62	0.00	882	0	0.00

CULVERT ANALYSIS VERSION 2.0

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	16:07:23	C114	OCT1191

PERFORMANCE CURVE DISCHARGE RANGE
OF FLOWS ANALYZED

MINUMUM DISCHARGE (CFS)	1000
DESIGN DISCHARGE (CFS)	1493
MAXIMUM DISCHARGE (CFS)	1763

CULV #	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANN. N	INLET TYPE
1	1155.50	1155.00	210.00	4 - RCB	10.00	6.00	.013	CONVENTIONAL
2								
3								
4								
5								
6								

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	16:07:23	C114	OCT1191

CULVERT NUMBER: 1

CULVERT INVERT DATA

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1155.50
OUTLET STATION (FT)	210.00
OUTLET ELEVATION (FT)	1155.00
NUMBER OF BARRELS	4.00
SLOPE (V-FT/H-FT)	0.0024
CULVERT LENGTH ALONG SLOPE (FT)	210.00

BARREL SHAPE: 10.00 FT X 6.00 FT BOX
BARREL MATERIAL: CONCRETE
WITH A MANNING'S N OF 0.013
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION: NONE

DOWNSTREAM CHANNEL CROSS-SECTION

BOTTOM WIDTH (FT)	40.00
SIDE SLOPE H/V _:1	5.0
CHANNEL SLOPE V/H (FT/FT)	0.014
MANNING'S N (.01-0.1)	0.035
CHANNEL INVERT ELEVATION (FT)	1155.00
CULVERT OUTLET INVERT ELEVATION AT	1155.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	16:07:23	C114	OCT1191

UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NO.	VEL. (FPS)	SHEAR (PSF)
1000.00	1157.44	0.000	7.87	2.13
1076.30	1157.54	0.000	8.05	2.22
1152.60	1157.63	0.000	8.23	2.30
1228.90	1157.73	0.000	8.39	2.38
1305.20	1157.82	0.000	8.55	2.46
1381.50	1157.91	0.000	8.70	2.54
1457.80	1158.00	0.000	8.85	2.62
1493.00	1158.04	0.000	8.91	2.65
1610.40	1158.16	0.000	9.12	2.76
1686.70	1158.24	0.000	9.25	2.83
1763.00	1158.32	0.000	9.37	2.90

SELECTED OVERTOPPING CREST

ROADWAY SURFACE:	PAVED
EMBANKMENT TOP WIDTH (FT):	160.00

CONSTANT ROADWAY ELEVATION PROFILE

CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1168.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	16:07:23	C114	OCT1191

SUMMARY OF CULVERT FLOWS (CFS) FILE: C114 DATE: OCT1191

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1160.02	1000	1000	0	0	0	0	0	0	2
1160.24	1076	1076	0	0	0	0	0	0	2
1160.46	1153	1153	0	0	0	0	0	0	2
1160.68	1229	1229	0	0	0	0	0	0	2
1160.89	1305	1305	0	0	0	0	0	0	2
1161.10	1382	1382	0	0	0	0	0	0	2
1161.30	1458	1458	0	0	0	0	0	0	2
1161.40	1493	1493	0	0	0	0	0	0	2
1161.70	1610	1610	0	0	0	0	0	0	2
1161.89	1687	1687	0	0	0	0	0	0	2
1162.08	1763	1763	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 4 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
1000	1160.02	1157.44	4.15	4.52	4.52	0.00	0.00	9.28
1076	1160.24	1157.54	4.36	4.74	4.74	0.00	0.00	9.51
1153	1160.46	1157.63	4.56	4.96	4.96	0.00	0.00	9.73
1229	1160.68	1157.73	4.76	5.18	5.18	0.00	0.00	9.94
1305	1160.89	1157.82	4.96	5.39	5.39	0.00	0.00	10.14
1382	1161.10	1157.91	5.16	5.60	5.60	0.00	0.00	10.34
1458	1161.30	1158.00	5.35	5.80	5.80	0.00	0.00	10.53
1493	1161.40	1158.04	5.44	5.90	5.90	0.00	0.00	10.61
1610	1161.70	1158.16	5.74	6.20	6.20	0.00	0.00	10.88
1687	1161.89	1158.24	5.94	6.39	6.39	0.00	0.00	11.05
1763	1162.08	1158.32	6.13	6.58	6.58	0.00	0.00	11.21

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: C114 DATE: OCT1191

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1160.02	0.00	1000	0	0.00
1160.24	0.00	1076	0	0.00
1160.46	0.00	1153	0	0.00
1160.68	0.00	1229	0	0.00
1160.89	0.00	1305	0	0.00
1161.10	0.00	1382	0	0.00
1161.30	0.00	1458	0	0.00
1161.40	0.00	1493	0	0.00
1161.70	0.00	1610	0	0.00
1161.89	0.00	1687	0	0.00
1162.08	0.00	1763	0	0.00

CULVERT ANALYSIS VERSION 2.0

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	17:20:27	C115	OCT1091

PERFORMANCE CURVE DISCHARGE RANGE
OF FLOWS ANALYZED

MINUMUM DISCHARGE (CFS)	800
DESIGN DISCHARGE (CFS)	1043
MAXIMUM DISCHARGE (CFS)	1238

CULV #	A - SITE DATA INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	B - CULVERT SHAPE, MATERIAL, INLET BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANN. N	INLET TYPE
1	1173.50	1173.00	270.00	1 - RCB	16.00	14.00	.013	CONVENTIONAL
2								
3								
4								
5								
6								

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	17:20:27	C115	OCT1091

CULVERT NUMBER: 1

CULVERT INVERT DATA

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1173.50
OUTLET STATION (FT)	270.00
OUTLET ELEVATION (FT)	1173.00
NUMBER OF BARRELS	1.00
SLOPE (V-FT/H-FT)	0.0019
CULVERT LENGTH ALONG SLOPE (FT)	270.00

BARREL SHAPE: 16.00 FT X 14.00 FT BOX
BARREL MATERIAL: CONCRETE
WITH A MANNING'S N OF 0.013
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION: NONE

DOWNSTREAM CHANNEL CROSS-SECTION

BOTTOM WIDTH (FT)	16.00
SIDE SLOPE H/V _:1	3.0
CHANNEL SLOPE V/H (FT/FT)	0.020
MANNING'S N (.01-0.1)	0.025
CHANNEL INVERT ELEVATION (FT)	1173.00
CULVERT OUTLET INVERT ELEVATION AT	1173.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	17:20:27	C115	OCT1091

UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NO.	VEL. (FPS)	SHEAR (PSF)
800.00	1175.60	0.000	12.93	3.24
843.80	1175.67	0.000	13.13	3.34
887.60	1175.75	0.000	13.33	3.43
931.40	1175.82	0.000	13.51	3.52
975.20	1175.89	0.000	13.69	3.60
1019.00	1175.96	0.000	13.87	3.69
1043.00	1175.99	0.000	13.96	3.73
1106.60	1176.09	0.000	14.20	3.85
1150.40	1176.15	0.000	14.36	3.93
1194.20	1176.21	0.000	14.51	4.01
1238.00	1176.27	0.000	14.66	4.08

SELECTED OVERTOPPING CREST

ROADWAY SURFACE:	PAVED
EMBANKMENT TOP WIDTH (FT):	160.00

CONSTANT ROADWAY ELEVATION PROFILE

CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1192.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-26-19	17:20:27	C115	OCT1091

SUMMARY OF CULVERT FLOWS (CFS) FILE: C115 DATE: OCT1091

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1180.66	800	800	0	0	0	0	0	0	2
1180.92	844	844	0	0	0	0	0	0	2
1181.17	888	888	0	0	0	0	0	0	2
1181.42	931	931	0	0	0	0	0	0	2
1181.67	975	975	0	0	0	0	0	0	2
1181.91	1019	1019	0	0	0	0	0	0	2
1182.05	1043	1043	0	0	0	0	0	0	2
1182.39	1107	1107	0	0	0	0	0	0	2
1182.62	1150	1150	0	0	0	0	0	0	2
1182.85	1194	1194	0	0	0	0	0	0	2
1183.08	1238	1238	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
800	1180.66	1175.60	6.53	7.16	7.16	0.00	0.00	11.70
844	1180.92	1175.67	6.78	7.42	7.42	0.00	0.00	11.90
888	1181.17	1175.75	7.02	7.67	7.67	0.00	0.00	12.11
931	1181.42	1175.82	7.26	7.92	7.92	0.00	0.00	12.30
975	1181.67	1175.89	7.49	8.17	8.17	0.00	0.00	12.49
1019	1181.91	1175.96	7.72	8.41	8.41	0.00	0.00	12.68
1043	1182.05	1175.99	7.84	8.55	8.55	0.00	0.00	12.78
1107	1182.39	1176.09	8.16	8.89	8.89	0.00	0.00	13.03
1150	1182.62	1176.15	8.38	9.12	9.12	0.00	0.00	13.20
1194	1182.85	1176.21	8.59	9.35	9.35	0.00	0.00	13.37
1238	1183.08	1176.27	8.80	9.58	9.58	0.00	0.00	13.53

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: C115 DATE: OCT1091

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1180.66	0.00	800	0	0.00
1180.92	0.00	844	0	0.00
1181.17	0.00	888	0	0.00
1181.42	0.00	931	0	0.00
1181.67	0.00	975	0	0.00
1181.91	0.00	1019	0	0.00
1182.05	0.00	1043	0	0.00
1182.39	0.00	1107	0	0.00
1182.62	0.00	1150	0	0.00
1182.85	0.00	1194	0	0.00
1183.08	0.00	1238	0	0.00

CULVERT ANALYSIS VERSION 2.0

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-27-19	09:49:34	C116	OCT1091

PERFORMANCE CURVE DISCHARGE RANGE
OF FLOWS ANALYZED

MINUMUM DISCHARGE (CFS)	1500
DESIGN DISCHARGE (CFS)	1763
MAXIMUM DISCHARGE (CFS)	2087

CULV #	A - SITE DATA INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	B - CULVERT SHAPE, MATERIAL, INLET BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANN. N	INLET TYPE
1	1175.50	1175.00	230.00	5 - RCB	10.00	6.00	.013	CONVENTIONAL
2								
3								
4								
5								
6								

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-27-19	09:49:34	C116	OCT1091

CULVERT NUMBER: 1

CULVERT INVERT DATA

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1175.50
OUTLET STATION (FT)	230.00
OUTLET ELEVATION (FT)	1175.00
NUMBER OF BARRELS	5.00
SLOPE (V-FT/H-FT)	0.0022
CULVERT LENGTH ALONG SLOPE (FT)	230.00

BARREL SHAPE: 10.00 FT X 6.00 FT BOX
BARREL MATERIAL: CONCRETE
WITH A MANNING'S N OF 0.013
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION: NONE

DOWNSTREAM CHANNEL CROSS-SECTION

BOTTOM WIDTH (FT)	50.00
SIDE SLOPE H/V _:1	5.0
CHANNEL SLOPE V/H (FT/FT)	0.030
MANNING'S N (.01-0.1)	0.035
CHANNEL INVERT ELEVATION (FT)	1175.00
CULVERT OUTLET INVERT ELEVATION AT	1175.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-27-19	09:49:34	C116	OCT1091

UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NO.	VEL. (FPS)	SHEAR (PSF)
1500.00	1177.21	0.000	11.12	4.14
1558.70	1177.26	0.000	11.26	4.23
1617.40	1177.31	0.000	11.40	4.32
1676.10	1177.35	0.000	11.53	4.40
1734.80	1177.40	0.000	11.67	4.49
1763.00	1177.42	0.000	11.73	4.53
1852.20	1177.49	0.000	11.92	4.66
1910.90	1177.53	0.000	12.04	4.74
1969.60	1177.58	0.000	12.16	4.82
2028.30	1177.62	0.000	12.27	4.90
2087.00	1177.66	0.000	12.38	4.98

SELECTED OVERTOPPING CREST

ROADWAY SURFACE:	PAVED
EMBANKMENT TOP WIDTH (FT):	160.00

CONSTANT ROADWAY ELEVATION PROFILE

CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1195.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-27-19	09:49:34	C116	OCT1091

SUMMARY OF CULVERT FLOWS (CFS) FILE: C116 DATE: OCT1091

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1180.59	1500	1500	0	0	0	0	0	0	2
1180.73	1559	1559	0	0	0	0	0	0	2
1180.86	1617	1617	0	0	0	0	0	0	2
1180.98	1676	1676	0	0	0	0	0	0	2
1181.11	1735	1735	0	0	0	0	0	0	2
1181.17	1763	1763	0	0	0	0	0	0	2
1181.36	1852	1852	0	0	0	0	0	0	2
1181.48	1911	1911	0	0	0	0	0	0	2
1181.61	1970	1970	0	0	0	0	0	0	2
1181.73	2028	2028	0	0	0	0	0	0	2
1181.85	2087	2087	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 5 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
1500	1180.59	1177.21	4.69	5.09	5.09	0.00	0.00	9.86
1559	1180.73	1177.26	4.81	5.23	5.23	0.00	0.00	9.99
1617	1180.86	1177.31	4.93	5.36	5.36	0.00	0.00	10.12
1676	1180.98	1177.35	5.05	5.48	5.48	0.00	0.00	10.24
1735	1181.11	1177.40	5.17	5.61	5.61	0.00	0.00	10.35
1763	1181.17	1177.42	5.23	5.67	5.67	0.00	0.00	10.41
1852	1181.36	1177.49	5.41	5.86	5.86	0.00	0.00	10.58
1911	1181.48	1177.53	5.53	5.98	5.98	0.00	0.00	10.69
1970	1181.61	1177.58	5.65	6.11	6.11	0.00	0.00	10.80
2028	1181.73	1177.62	5.77	6.23	6.23	0.00	0.00	10.91
2087	1181.85	1177.66	5.89	6.35	6.35	0.00	0.00	11.01

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: C116 DATE: OCT1091

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1180.59	0.00	1500	0	0.00
1180.73	0.00	1559	0	0.00
1180.86	0.00	1617	0	0.00
1180.98	0.00	1676	0	0.00
1181.11	0.00	1735	0	0.00
1181.17	0.00	1763	0	0.00
1181.36	0.00	1852	0	0.00
1181.48	0.00	1911	0	0.00
1181.61	0.00	1970	0	0.00
1181.73	0.00	2028	0	0.00
1181.85	0.00	2087	0	0.00

CULVERT ANALYSIS VERSION 2.0

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-27-19	11:15:34	C117	OCT1091

PERFORMANCE CURVE DISCHARGE RANGE
OF FLOWS ANALYZED

MINUMUM DISCHARGE (CFS)	100
DESIGN DISCHARGE (CFS)	140
MAXIMUM DISCHARGE (CFS)	160

CULV #	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANN. N	INLET TYPE
1	1089.50	1089.00	290.00	1 - RCP	6.00	6.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-27-19	11:15:34	C117	OCT1091

CULVERT NUMBER: 1

CULVERT INVERT DATA

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1089.50
OUTLET STATION (FT)	290.00
OUTLET ELEVATION (FT)	1089.00
NUMBER OF BARRELS	1.00
SLOPE (V-FT/H-FT)	0.0017
CULVERT LENGTH ALONG SLOPE (FT)	290.00

BARREL SHAPE: CIRCULAR 6.00 FT IN DIAMETER
BARREL MATERIAL:
WITH A MANNING'S N OF 0.012
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: SQUARE EDGE WITH HEADWALL
INLET DEPRESSION: NONE

CONSTANT WATER SURFACE ELEVATION
1088.50

SELECTED OVERTOPPING CREST

ROADWAY SURFACE:	PAVED
EMBANKMENT TOP WIDTH (FT):	160.00

CONSTANT ROADWAY ELEVATION PROFILE

CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1115.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-27-19	11:15:34	C117	OCT1091

SUMMARY OF CULVERT FLOWS (CFS) FILE: C117 DATE: OCT1091

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1093.67	100	100	0	0	0	0	0	0	2
1093.81	106	106	0	0	0	0	0	0	2
1093.94	112	112	0	0	0	0	0	0	2
1094.08	118	118	0	0	0	0	0	0	2
1094.21	124	124	0	0	0	0	0	0	2
1094.34	130	130	0	0	0	0	0	0	2
1094.48	136	136	0	0	0	0	0	0	2
1094.56	140	140	0	0	0	0	0	0	2
1094.73	148	148	0	0	0	0	0	0	2
1094.86	154	154	0	0	0	0	0	0	2
1094.98	160	160	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
100	1093.67	1088.50	3.89	4.17	4.17	0.00	0.00	8.23
106	1093.81	1088.50	4.04	4.31	4.31	0.00	0.00	8.38
112	1093.94	1088.50	4.17	4.44	4.44	0.00	0.00	8.53
118	1094.08	1088.50	4.31	4.58	4.58	0.00	0.00	8.67
124	1094.21	1088.50	4.44	4.71	4.71	0.00	0.00	8.79
130	1094.34	1088.50	4.57	4.84	4.84	0.00	0.00	8.94
136	1094.48	1088.50	4.70	4.98	4.98	0.00	0.00	9.09
140	1094.56	1088.50	4.78	5.06	5.06	0.00	0.00	9.18
148	1094.73	1088.50	4.95	5.23	5.23	0.00	0.00	9.35
154	1094.86	1088.50	5.08	5.36	5.36	0.00	0.00	9.48
160	1094.98	1088.50	5.20	5.48	5.48	0.00	0.00	9.59

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: C117 DATE: OCT1091

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1093.67	0.00	100	0	0.00
1093.81	0.00	106	0	0.00
1093.94	0.00	112	0	0.00
1094.08	0.00	118	0	0.00
1094.21	0.00	124	0	0.00
1094.34	0.00	130	0	0.00
1094.48	0.00	136	0	0.00
1094.56	0.00	140	0	0.00
1094.73	0.00	148	0	0.00
1094.86	0.00	154	0	0.00
1094.98	0.00	160	0	0.00

CULVERT ANALYSIS VERSION 2.0

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-27-19	11:48:59	C118	OCT1091

PERFORMANCE CURVE DISCHARGE RANGE
OF FLOWS ANALYZED

MINUMUM DISCHARGE (CFS)	100
DESIGN DISCHARGE (CFS)	261
MAXIMUM DISCHARGE (CFS)	311

CULV #	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANN. N	INLET TYPE
1	1088.50	1088.00	250.00	3 - RCB	6.00	6.00	.013	CONVENTIONAL
2								
3								
4								
5								
6								

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-27-19	11:48:59	C118	OCT1091

CULVERT NUMBER: 1

CULVERT INVERT DATA

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1088.50
OUTLET STATION (FT)	250.00
OUTLET ELEVATION (FT)	1088.00
NUMBER OF BARRELS	3.00
SLOPE (V-FT/H-FT)	0.0020
CULVERT LENGTH ALONG SLOPE (FT)	250.00

BARREL SHAPE: 6.00 FT X 6.00 FT BOX
BARREL MATERIAL: CONCRETE
WITH A MANNING'S N OF 0.013
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION: NONE

CONSTANT WATER SURFACE ELEVATION
1088.50

SELECTED OVERTOPPING CREST

ROADWAY SURFACE:	PAVED
EMBANKMENT TOP WIDTH (FT):	160.00

CONSTANT ROADWAY ELEVATION PROFILE

CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1117.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-27-19	11:48:59	C118	OCT1091

SUMMARY OF CULVERT FLOWS (CFS) FILE: C118 DATE: OCT1091

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1090.16	100	100	0	0	0	0	0	0	2
1090.39	121	121	0	0	0	0	0	0	2
1090.60	142	142	0	0	0	0	0	0	2
1090.81	163	163	0	0	0	0	0	0	2
1091.00	184	184	0	0	0	0	0	0	2
1091.18	206	206	0	0	0	0	0	0	2
1091.36	227	227	0	0	0	0	0	0	2
1091.55	248	248	0	0	0	0	0	0	2
1091.66	261	261	0	0	0	0	0	0	2
1091.88	290	290	0	0	0	0	0	0	2
1092.04	311	311	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 3 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
100	1090.16	1088.50	1.49	1.66	1.66	0.00	0.00	5.62
121	1090.39	1088.50	1.69	1.89	1.89	0.00	0.00	5.99
142	1090.60	1088.50	1.88	2.10	2.10	0.00	0.00	6.32
163	1090.81	1088.50	2.07	2.31	2.31	0.00	0.00	6.62
184	1091.00	1088.50	2.25	2.50	2.50	0.00	0.00	6.89
206	1091.18	1088.50	2.43	2.68	2.68	0.00	0.00	7.15
227	1091.36	1088.50	2.60	2.86	2.86	0.00	0.00	7.39
248	1091.55	1088.50	2.76	3.05	3.05	0.00	0.00	7.61
261	1091.66	1088.50	2.86	3.16	3.16	0.00	0.00	7.74
290	1091.88	1088.50	3.08	3.38	3.38	0.00	0.00	8.02
311	1092.04	1088.50	3.23	3.54	3.54	0.00	0.00	8.21

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: C118 DATE: OCT1091

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1090.16	0.00	100	0	0.00
1090.39	0.00	121	0	0.00
1090.60	0.00	142	0	0.00
1090.81	0.00	163	0	0.00
1091.00	0.00	184	0	0.00
1091.18	0.00	206	0	0.00
1091.36	0.00	227	0	0.00
1091.55	0.00	248	0	0.00
1091.66	0.00	261	0	0.00
1091.88	0.00	290	0	0.00
1092.04	0.00	311	0	0.00

CULVERT ANALYSIS VERSION 2.0

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-27-19	12:05:57	C119	OCT1091

PERFORMANCE CURVE DISCHARGE RANGE
OF FLOWS ANALYZED

MINUMUM DISCHARGE (CFS)	100
DESIGN DISCHARGE (CFS)	229
MAXIMUM DISCHARGE (CFS)	281

CULV #	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANN. N	INLET TYPE
1	1084.50	1084.00	250.00	2 - RCB	8.00	6.00	.013	CONVENTIONAL
2								
3								
4								
5								
6								

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-27-19	12:05:57	C119	OCT1091

CULVERT NUMBER: 1

CULVERT INVERT DATA

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1084.50
OUTLET STATION (FT)	250.00
OUTLET ELEVATION (FT)	1084.00
NUMBER OF BARRELS	2.00
SLOPE (V-FT/H-FT)	0.0020
CULVERT LENGTH ALONG SLOPE (FT)	250.00

BARREL SHAPE: 8.00 FT X 6.00 FT BOX
BARREL MATERIAL: CONCRETE
WITH A MANNING'S N OF 0.013
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION: NONE

CONSTANT WATER SURFACE ELEVATION
1088.50

SELECTED OVERTOPPING CREST

ROADWAY SURFACE:	PAVED
EMBANKMENT TOP WIDTH (FT):	160.00

CONSTANT ROADWAY ELEVATION PROFILE

CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1104.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-27-19	12:05:57	C119	OCT1091

SUMMARY OF CULVERT FLOWS (CFS) FILE: C119 DATE: OCT1091

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1088.56	100	100	0	0	0	0	0	0	2
1088.59	118	118	0	0	0	0	0	0	2
1088.62	136	136	0	0	0	0	0	0	2
1088.65	154	154	0	0	0	0	0	0	2
1088.69	172	172	0	0	0	0	0	0	2
1088.73	191	191	0	0	0	0	0	0	2
1088.77	209	209	0	0	0	0	0	0	2
1088.82	227	227	0	0	0	0	0	0	2
1088.82	229	229	0	0	0	0	0	0	1
1088.92	263	263	0	0	0	0	0	0	2
1088.97	281	281	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE FOR 2 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
100	1088.56	1088.50	1.61	4.06	4.06	0.00	0.00	1.39
118	1088.59	1088.50	1.80	4.09	4.09	0.00	0.00	1.64
136	1088.62	1088.50	1.98	4.12	4.12	0.00	0.00	1.89
154	1088.65	1088.50	2.16	4.15	4.15	0.00	0.00	2.14
172	1088.69	1088.50	2.33	4.19	4.19	0.00	0.00	2.39
191	1088.73	1088.50	2.50	4.23	4.23	0.00	0.00	2.65
209	1088.77	1088.50	2.66	4.27	4.27	0.00	0.00	2.90
227	1088.82	1088.50	2.82	4.32	4.32	0.00	0.00	3.15
229	1088.82	1088.50	2.84	4.32	4.32	0.00	0.00	3.18
263	1088.92	1088.50	3.12	4.42	4.42	0.00	0.00	3.65
281	1088.97	1088.50	3.27	4.47	4.47	0.00	0.00	3.90

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: C119 DATE: OCT1091

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1088.56	0.00	100	0	0.00
1088.59	0.00	118	0	0.00
1088.62	0.00	136	0	0.00
1088.65	0.00	154	0	0.00
1088.69	0.00	172	0	0.00
1088.73	0.00	191	0	0.00
1088.77	0.00	209	0	0.00
1088.82	0.00	227	0	0.00
1088.82	0.01	229	0	0.00
1088.92	0.00	263	0	0.00
1088.97	0.00	281	0	0.00

CULVERT ANALYSIS VERSION 2.0

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-27-19	12:22:34	C120	OCT1091

PERFORMANCE CURVE DISCHARGE RANGE
OF FLOWS ANALYZED

MINUMUM DISCHARGE (CFS)	0
DESIGN DISCHARGE (CFS)	48
MAXIMUM DISCHARGE (CFS)	60

CULV #	A - SITE DATA INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	B - CULVERT SHAPE, MATERIAL, INLET BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANN. N	INLET TYPE
1	1086.50	1085.50	245.00	2 - RCP	2.50	2.50	.012	CONVENTIONAL
2								
3								
4								
5								
6								

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-27-19	12:22:34	C120	OCT1091

CULVERT NUMBER: 1

CULVERT INVERT DATA

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1086.50
OUTLET STATION (FT)	245.00
OUTLET ELEVATION (FT)	1085.50
NUMBER OF BARRELS	2.00
SLOPE (V-FT/H-FT)	0.0043
CULVERT LENGTH ALONG SLOPE (FT)	245.00

BARREL SHAPE: CIRCULAR 2.50 FT IN DIAMETER
BARREL MATERIAL:
WITH A MANNING'S N OF 0.012
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: SQUARE EDGE WITH HEADWALL
INLET DEPRESSION: NONE

CONSTANT WATER SURFACE ELEVATION
1088.50

SELECTED OVERTOPPING CREST

ROADWAY SURFACE:	PAVED
EMBANKMENT TOP WIDTH (FT):	160.00

CONSTANT ROADWAY ELEVATION PROFILE

CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1102.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-27-19	12:22:34	C120	OCT1091

SUMMARY OF CULVERT FLOWS (CFS) FILE: C120 DATE: OCT1091

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1086.50	0	0	0	0	0	0	0	0	0
1088.64	6	6	0	0	0	0	0	0	2
1088.63	12	12	0	0	0	0	0	0	2
1088.74	18	18	0	0	0	0	0	0	2
1088.82	24	24	0	0	0	0	0	0	2
1089.00	30	30	0	0	0	0	0	0	2
1089.28	36	36	0	0	0	0	0	0	2
1089.03	42	42	0	0	0	0	0	0	2
1089.26	48	48	0	0	0	0	0	0	2
1089.55	54	54	0	0	0	0	0	0	2
1089.87	60	60	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 2 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	1088.50	1088.50	0.00	2.00	2.00	1086.50	0.00	0.00
6	1088.64	1088.50	0.70	2.14	2.14	0.00	0.00	0.61
12	1088.63	1088.50	1.09	2.13	2.13	0.00	0.00	1.22
18	1088.74	1088.50	1.41	2.24	2.24	0.00	0.00	1.83
24	1088.82	1088.50	1.69	2.32	2.32	0.00	0.00	2.44
30	1089.00	1088.50	1.94	2.50	2.50	0.00	0.00	3.06
36	1089.28	1088.50	2.17	2.78	2.78	0.00	0.00	3.67
42	1089.03	1088.50	2.40	2.53	2.53	0.00	0.00	3.67
48	1089.26	1088.50	2.63	2.76	2.76	0.00	0.00	3.67
54	1089.55	1088.50	2.89	3.05	3.05	0.00	0.00	3.67
60	1089.87	1088.50	3.16	3.37	3.37	0.00	0.00	3.67

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: C120 DATE: OCT1091

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1086.50	0.00	0	0	0.00
1088.64	0.00	6	0	0.00
1088.63	0.00	12	0	0.00
1088.74	0.00	18	0	0.00
1088.82	0.00	24	0	0.00
1089.00	0.00	30	0	0.00
1089.28	0.00	36	0	0.00
1089.03	0.00	42	0	0.00
1089.26	0.00	48	0	0.00
1089.55	0.00	54	0	0.00
1089.87	0.00	60	0	0.00

CULVERT ANALYSIS VERSION 2.0

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-27-19	14:35:29	C121	OCT1091

PERFORMANCE CURVE DISCHARGE RANGE
OF FLOWS ANALYZED

MINUMUM DISCHARGE (CFS)	0
DESIGN DISCHARGE (CFS)	109
MAXIMUM DISCHARGE (CFS)	134

CULV #	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANN. N	INLET TYPE
1	1087.50	1087.00	220.00	1 - RCB	8.00	6.00	.013	CONVENTIONAL
2								
3								
4								
5								
6								

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-27-19	14:35:29	C121	OCT1091

CULVERT NUMBER: 1

CULVERT INVERT DATA

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1087.50
OUTLET STATION (FT)	220.00
OUTLET ELEVATION (FT)	1087.00
NUMBER OF BARRELS	1.00
SLOPE (V-FT/H-FT)	0.0023
CULVERT LENGTH ALONG SLOPE (FT)	220.00

BARREL SHAPE: 8.00 FT X 6.00 FT BOX
BARREL MATERIAL: CONCRETE
WITH A MANNING'S N OF 0.013
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION: NONE

CONSTANT WATER SURFACE ELEVATION
1087.50

SELECTED OVERTOPPING CREST

ROADWAY SURFACE:	PAVED
EMBANKMENT TOP WIDTH (FT):	160.00

CONSTANT ROADWAY ELEVATION PROFILE

CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1102.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-27-19	14:35:29	C121	OCT1091

SUMMARY OF CULVERT FLOWS (CFS) FILE: C121 DATE: OCT1091

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1087.50	0	0	0	0	0	0	0	0	0
1088.27	13	13	0	0	0	0	0	0	2
1088.68	27	27	0	0	0	0	0	0	2
1089.05	40	40	0	0	0	0	0	0	2
1089.38	54	54	0	0	0	0	0	0	2
1089.68	67	67	0	0	0	0	0	0	2
1089.96	80	80	0	0	0	0	0	0	2
1090.22	94	94	0	0	0	0	0	0	2
1090.48	107	107	0	0	0	0	0	0	2
1090.51	109	109	0	0	0	0	0	0	2
1090.95	134	134	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	1087.50	1087.50	0.00	0.00	0.00	1087.50	0.00	0.00
13	1088.27	1087.50	0.77	0.74	0.74	0.00	0.00	3.35
27	1088.68	1087.50	1.09	1.18	1.18	0.00	0.00	4.75
40	1089.05	1087.50	1.39	1.55	1.55	0.00	0.00	5.44
54	1089.38	1087.50	1.68	1.88	1.88	0.00	0.00	5.98
67	1089.68	1087.50	1.96	2.18	2.18	0.00	0.00	6.45
80	1089.96	1087.50	2.22	2.46	2.46	0.00	0.00	6.85
94	1090.22	1087.50	2.47	2.72	2.72	0.00	0.00	7.21
107	1090.48	1087.50	2.71	2.98	2.98	0.00	0.00	7.54
109	1090.51	1087.50	2.74	3.01	3.01	0.00	0.00	7.58
134	1090.95	1087.50	3.16	3.45	3.45	0.00	0.00	8.12

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: C121 DATE: OCT1091

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1087.50	0.00	0	0	0.00
1088.27	0.00	13	0	0.00
1088.68	0.00	27	0	0.00
1089.05	0.00	40	0	0.00
1089.38	0.00	54	0	0.00
1089.68	0.00	67	0	0.00
1089.96	0.00	80	0	0.00
1090.22	0.00	94	0	0.00
1090.48	0.00	107	0	0.00
1090.51	0.00	109	0	0.00
1090.95	0.00	134	0	0.00

CULVERT ANALYSIS VERSION 2.0

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-27-19	14:54:48	C122	OCT0991

PERFORMANCE CURVE DISCHARGE RANGE
OF FLOWS ANALYZED

MINUMUM DISCHARGE (CFS)	0
DESIGN DISCHARGE (CFS)	110
MAXIMUM DISCHARGE (CFS)	133

CULV #	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANN. N	INLET TYPE
1	1088.50	1088.00	220.00	1 - RCB	8.00	6.00	.013	CONVENTIONAL
2								
3								
4								
5								
6								

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-27-19	14:54:48	C122	OCT0991

CULVERT NUMBER: 1

CULVERT INVERT DATA

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1088.50
OUTLET STATION (FT)	220.00
OUTLET ELEVATION (FT)	1088.00
NUMBER OF BARRELS	1.00
SLOPE (V-FT/H-FT)	0.0023
CULVERT LENGTH ALONG SLOPE (FT)	220.00

BARREL SHAPE: 8.00 FT X 6.00 FT BOX
BARREL MATERIAL: CONCRETE
WITH A MANNING'S N OF 0.013
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION: NONE

CONSTANT WATER SURFACE ELEVATION
1088.50

SELECTED OVERTOPPING CREST

ROADWAY SURFACE:	PAVED
EMBANKMENT TOP WIDTH (FT):	160.00

CONSTANT ROADWAY ELEVATION PROFILE

CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1101.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-27-19	14:54:48	C122	OCT0991

SUMMARY OF CULVERT FLOWS (CFS) FILE: C122 DATE: OCT0991

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1088.50	0	0	0	0	0	0	0	0	0
1089.26	13	13	0	0	0	0	0	0	2
1089.68	27	27	0	0	0	0	0	0	2
1090.04	40	40	0	0	0	0	0	0	2
1090.37	53	53	0	0	0	0	0	0	2
1090.67	67	67	0	0	0	0	0	0	2
1090.94	80	80	0	0	0	0	0	0	2
1091.21	93	93	0	0	0	0	0	0	2
1091.46	106	106	0	0	0	0	0	0	2
1091.53	110	110	0	0	0	0	0	0	2
1091.94	133	133	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	1088.50	1088.50	0.00	0.00	0.00	1088.50	0.00	0.00
13	1089.26	1088.50	0.76	0.74	0.74	0.00	0.00	3.33
27	1089.68	1088.50	1.08	1.18	1.18	0.00	0.00	4.74
40	1090.04	1088.50	1.38	1.54	1.54	0.00	0.00	5.42
53	1090.37	1088.50	1.67	1.87	1.87	0.00	0.00	5.97
67	1090.67	1088.50	1.95	2.17	2.17	0.00	0.00	6.43
80	1090.94	1088.50	2.21	2.44	2.44	0.00	0.00	6.83
93	1091.21	1088.50	2.46	2.71	2.71	0.00	0.00	7.19
106	1091.46	1088.50	2.70	2.96	2.96	0.00	0.00	7.52
110	1091.53	1088.50	2.76	3.03	3.03	0.00	0.00	7.61
133	1091.94	1088.50	3.15	3.44	3.44	0.00	0.00	8.10

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: C122 DATE: OCT0991

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1088.50	0.00	0	0	0.00
1089.26	0.00	13	0	0.00
1089.68	0.00	27	0	0.00
1090.04	0.00	40	0	0.00
1090.37	0.00	53	0	0.00
1090.67	0.00	67	0	0.00
1090.94	0.00	80	0	0.00
1091.21	0.00	93	0	0.00
1091.46	0.00	106	0	0.00
1091.53	0.00	110	0	0.00
1091.94	0.00	133	0	0.00

CULVERT ANALYSIS VERSION 2.0

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-17-19	13:23:25	C123	OCT0991

PERFORMANCE CURVE DISCHARGE RANGE
OF FLOWS ANALYZED

MINUMUM DISCHARGE (CFS)	1000
DESIGN DISCHARGE (CFS)	1339
MAXIMUM DISCHARGE (CFS)	1616

CULV #	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANN. N	INLET TYPE
1	1089.50	1089.00	300.00	6 - RCB	10.00	6.00	.013	CONVENTIONAL
2								
3								
4								
5								
6								

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-17-19	13:23:25	C123	OCT0991

CULVERT NUMBER: 1

CULVERT INVERT DATA

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1089.50
OUTLET STATION (FT)	300.00
OUTLET ELEVATION (FT)	1089.00
NUMBER OF BARRELS	6.00
SLOPE (V-FT/H-FT)	0.0017
CULVERT LENGTH ALONG SLOPE (FT)	300.00

BARREL SHAPE: 10.00 FT X 6.00 FT BOX
BARREL MATERIAL: CONCRETE
WITH A MANNING'S N OF 0.013
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION: NONE

DOWNSTREAM CHANNEL CROSS-SECTION

BOTTOM WIDTH (FT)	40.00
SIDE SLOPE H/V _:1	2.0
CHANNEL SLOPE V/H (FT/FT)	0.002
MANNING'S N (.01-0.1)	0.018
CHANNEL INVERT ELEVATION (FT)	1085.42
CULVERT OUTLET INVERT ELEVATION AT	1089.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-17-19	13:23:25	C123	OCT0991

UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NO.	VEL. (FPS)	SHEAR (PSF)
1000.00	1088.33	0.000	7.49	0.44
1061.60	1088.44	0.000	7.64	0.45
1123.20	1088.54	0.000	7.79	0.47
1184.80	1088.64	0.000	7.93	0.48
1246.40	1088.73	0.000	8.07	0.50
1308.00	1088.83	0.000	8.20	0.51
1339.00	1088.87	0.000	8.26	0.52
1431.20	1089.01	0.000	8.45	0.54
1492.80	1089.10	0.000	8.57	0.55
1554.40	1089.19	0.000	8.69	0.56
1616.00	1089.27	0.000	8.80	0.58

SELECTED OVERTOPPING CREST

ROADWAY SURFACE:	PAVED
EMBANKMENT TOP WIDTH (FT):	160.00

CONSTANT ROADWAY ELEVATION PROFILE

CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1100.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-17-19	13:23:25	C123	OCT0991

SUMMARY OF CULVERT FLOWS (CFS) FILE: C123 DATE: OCT0991

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1092.96	1000	1000	0	0	0	0	0	0	2
1093.09	1062	1062	0	0	0	0	0	0	2
1093.23	1123	1123	0	0	0	0	0	0	2
1093.36	1185	1185	0	0	0	0	0	0	2
1093.49	1246	1246	0	0	0	0	0	0	2
1093.62	1308	1308	0	0	0	0	0	0	2
1093.70	1339	1339	0	0	0	0	0	0	2
1093.89	1431	1431	0	0	0	0	0	0	2
1094.01	1493	1493	0	0	0	0	0	0	2
1094.13	1554	1554	0	0	0	0	0	0	2
1094.25	1616	1616	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE FOR 6 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
1000	1092.96	1088.33	3.15	3.46	3.46	0.00	0.00	8.11
1062	1093.09	1088.44	3.29	3.59	3.59	0.00	0.00	8.27
1123	1093.23	1088.54	3.41	3.73	3.73	0.00	0.00	8.43
1185	1093.36	1088.64	3.54	3.86	3.86	0.00	0.00	8.58
1246	1093.49	1088.73	3.66	3.99	3.99	0.00	0.00	8.73
1308	1093.62	1088.83	3.78	4.12	4.12	0.00	0.00	8.87
1339	1093.70	1088.87	3.84	4.20	4.20	0.00	0.00	8.94
1431	1093.89	1089.01	4.02	4.39	4.39	0.00	0.00	9.14
1493	1094.01	1089.10	4.14	4.51	4.51	0.00	0.00	9.27
1554	1094.13	1089.19	4.25	4.63	4.63	0.00	0.00	9.39
1616	1094.25	1089.27	4.36	4.75	4.75	0.00	0.00	9.52

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: C123 DATE: OCT0991

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1092.96	0.00	1000	0	0.00
1093.09	0.00	1062	0	0.00
1093.23	0.00	1123	0	0.00
1093.36	0.00	1185	0	0.00
1093.49	0.00	1246	0	0.00
1093.62	0.00	1308	0	0.00
1093.70	0.00	1339	0	0.00
1093.89	0.00	1431	0	0.00
1094.01	0.00	1493	0	0.00
1094.13	0.00	1554	0	0.00
1094.25	0.00	1616	0	0.00

CULVERT ANALYSIS VERSION 2.0

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-18-19	08:54:58	C124	OCT0991

PERFORMANCE CURVE DISCHARGE RANGE
OF FLOWS ANALYZED

MINUMUM DISCHARGE (CFS)	200
DESIGN DISCHARGE (CFS)	556
MAXIMUM DISCHARGE (CFS)	685

CULV #	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANN. N	INLET TYPE
1	1102.00	1101.50	225.00	4 - RCB	10.00	6.00	.013	CONVENTIONAL
2								
3								
4								
5								
6								

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-18-19	08:54:58	C124	OCT0991

CULVERT NUMBER: 1

CULVERT INVERT DATA

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1102.00
OUTLET STATION (FT)	225.00
OUTLET ELEVATION (FT)	1101.50
NUMBER OF BARRELS	4.00
SLOPE (V-FT/H-FT)	0.0022
CULVERT LENGTH ALONG SLOPE (FT)	225.00

BARREL SHAPE: 10.00 FT X 6.00 FT BOX
BARREL MATERIAL: CONCRETE
WITH A MANNING'S N OF 0.013
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION: NONE

DOWNSTREAM CHANNEL CROSS-SECTION

BOTTOM WIDTH (FT)	40.00
SIDE SLOPE H/V _:1	10.0
CHANNEL SLOPE V/H (FT/FT)	0.020
MANNING'S N (.01-0.1)	0.035
CHANNEL INVERT ELEVATION (FT)	1101.50
CULVERT OUTLET INVERT ELEVATION AT	1101.50

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-18-19	08:54:58	C124	OCT0991

UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NO.	VEL. (FPS)	SHEAR (PSF)
200.00	1102.35	0.000	4.84	1.06
248.50	1102.46	0.000	5.20	1.20
297.00	1102.56	0.000	5.51	1.33
345.50	1102.66	0.000	5.78	1.45
394.00	1102.75	0.000	6.03	1.56
442.50	1102.83	0.000	6.25	1.66
491.00	1102.91	0.000	6.45	1.76
539.50	1102.98	0.000	6.64	1.85
556.00	1103.01	0.000	6.71	1.88
636.50	1103.12	0.000	6.99	2.02
685.00	1103.19	0.000	7.14	2.10

SELECTED OVERTOPPING CREST

ROADWAY SURFACE:	PAVED
EMBANKMENT TOP WIDTH (FT):	160.00

CONSTANT ROADWAY ELEVATION PROFILE

CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1111.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-18-19	08:54:58	C124	OCT0991

SUMMARY OF CULVERT FLOWS (CFS) FILE: C124 DATE: OCT0991

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1103.54	200	200	0	0	0	0	0	0	2
1103.78	249	249	0	0	0	0	0	0	2
1104.01	297	297	0	0	0	0	0	0	2
1104.22	346	346	0	0	0	0	0	0	2
1104.43	394	394	0	0	0	0	0	0	2
1104.62	443	443	0	0	0	0	0	0	2
1104.81	491	491	0	0	0	0	0	0	2
1104.99	540	540	0	0	0	0	0	0	2
1105.05	556	556	0	0	0	0	0	0	2
1105.34	637	637	0	0	0	0	0	0	2
1105.51	685	685	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 4 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
200	1103.54	1102.35	1.39	1.54	1.54	0.00	0.00	5.43
249	1103.78	1102.46	1.60	1.78	1.78	0.00	0.00	5.84
297	1104.01	1102.56	1.80	2.01	2.01	0.00	0.00	6.19
346	1104.22	1102.66	2.00	2.22	2.22	0.00	0.00	6.51
394	1104.43	1102.75	2.19	2.43	2.43	0.00	0.00	6.81
443	1104.62	1102.83	2.37	2.62	2.62	0.00	0.00	7.07
491	1104.81	1102.91	2.55	2.81	2.81	0.00	0.00	7.32
540	1104.99	1102.98	2.72	2.99	2.99	0.00	0.00	7.56
556	1105.05	1103.01	2.78	3.05	3.05	0.00	0.00	7.63
637	1105.34	1103.12	3.05	3.34	3.34	0.00	0.00	7.98
685	1105.51	1103.19	3.21	3.51	3.51	0.00	0.00	8.18

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: C124 DATE: OCT0991

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1103.54	0.00	200	0	0.00
1103.78	0.00	249	0	0.00
1104.01	0.00	297	0	0.00
1104.22	0.00	346	0	0.00
1104.43	0.00	394	0	0.00
1104.62	0.00	443	0	0.00
1104.81	0.00	491	0	0.00
1104.99	0.00	540	0	0.00
1105.05	0.00	556	0	0.00
1105.34	0.00	637	0	0.00
1105.51	0.00	685	0	0.00

CULVERT ANALYSIS VERSION 2.0

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-18-19	11:21:29	C125	OCT0991

PERFORMANCE CURVE DISCHARGE RANGE
OF FLOWS ANALYZED

MINUMUM DISCHARGE (CFS)	500
DESIGN DISCHARGE (CFS)	1014
MAXIMUM DISCHARGE (CFS)	1211

CULV #	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANN. N	INLET TYPE
1	1121.50	1121.00	200.00	4 - RCB	10.00	6.00	.013	CONVENTIONAL
2								
3								
4								
5								
6								

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-18-19	11:21:29	C125	OCT0991

CULVERT NUMBER: 1

CULVERT INVERT DATA

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1121.50
OUTLET STATION (FT)	200.00
OUTLET ELEVATION (FT)	1121.00
NUMBER OF BARRELS	4.00
SLOPE (V-FT/H-FT)	0.0025
CULVERT LENGTH ALONG SLOPE (FT)	200.00

BARREL SHAPE: 10.00 FT X 6.00 FT BOX
BARREL MATERIAL: CONCRETE
WITH A MANNING'S N OF 0.013
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION: NONE

DOWNSTREAM CHANNEL CROSS-SECTION

BOTTOM WIDTH (FT)	40.00
SIDE SLOPE H/V _:1	10.0
CHANNEL SLOPE V/H (FT/FT)	0.020
MANNING'S N (.01-0.1)	0.035
CHANNEL INVERT ELEVATION (FT)	1121.50
CULVERT OUTLET INVERT ELEVATION AT	1121.50

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-18-19	11:21:29	C125	OCT0991

UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NO.	VEL. (FPS)	SHEAR (PSF)
500.00	1122.92	0.000	6.49	1.77
571.10	1123.03	0.000	6.76	1.91
642.20	1123.13	0.000	7.01	2.03
713.30	1123.22	0.000	7.23	2.15
784.40	1123.31	0.000	7.44	2.26
855.50	1123.40	0.000	7.63	2.37
926.60	1123.48	0.000	7.82	2.47
997.70	1123.56	0.000	7.99	2.57
1014.00	1123.58	0.000	8.03	2.59
1139.90	1123.71	0.000	8.30	2.76
1211.00	1123.78	0.000	8.45	2.85

SELECTED OVERTOPPING CREST

ROADWAY SURFACE:	PAVED
EMBANKMENT TOP WIDTH (FT):	160.00

CONSTANT ROADWAY ELEVATION PROFILE

CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1128.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-18-19	11:21:29	C125	OCT0991

SUMMARY OF CULVERT FLOWS (CFS) FILE: C125 DATE: OCT0991

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1124.35	500	500	0	0	0	0	0	0	2
1124.61	571	571	0	0	0	0	0	0	2
1124.87	642	642	0	0	0	0	0	0	2
1125.12	713	713	0	0	0	0	0	0	2
1125.35	784	784	0	0	0	0	0	0	2
1125.57	856	856	0	0	0	0	0	0	2
1125.79	927	927	0	0	0	0	0	0	2
1126.01	998	998	0	0	0	0	0	0	2
1126.06	1014	1014	0	0	0	0	0	0	2
1126.43	1140	1140	0	0	0	0	0	0	2
1126.63	1211	1211	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 4 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
500	1124.35	1122.92	2.58	2.85	2.85	0.00	0.00	6.51
571	1124.61	1123.03	2.83	3.11	3.11	0.00	0.00	7.04
642	1124.87	1123.13	3.07	3.37	3.37	0.00	0.00	7.54
713	1125.12	1123.22	3.30	3.62	3.62	0.00	0.00	8.02
784	1125.35	1123.31	3.52	3.85	3.85	0.00	0.00	8.48
856	1125.57	1123.40	3.73	4.07	4.07	0.00	0.00	8.81
927	1125.79	1123.48	3.94	4.29	4.29	0.00	0.00	9.05
998	1126.01	1123.56	4.14	4.51	4.51	0.00	0.00	9.28
1014	1126.06	1123.58	4.19	4.56	4.56	0.00	0.00	9.33
1140	1126.43	1123.71	4.53	4.93	4.93	0.00	0.00	9.70
1211	1126.63	1123.78	4.71	5.13	5.13	0.00	0.00	9.89

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: C125 DATE: OCT0991

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1124.35	0.00	500	0	0.00
1124.61	0.00	571	0	0.00
1124.87	0.00	642	0	0.00
1125.12	0.00	713	0	0.00
1125.35	0.00	784	0	0.00
1125.57	0.00	856	0	0.00
1125.79	0.00	927	0	0.00
1126.01	0.00	998	0	0.00
1126.06	0.00	1014	0	0.00
1126.43	0.00	1140	0	0.00
1126.63	0.00	1211	0	0.00

CULVERT ANALYSIS VERSION 2.0

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-18-19	14:04:36	C126	OCT0991

PERFORMANCE CURVE DISCHARGE RANGE
OF FLOWS ANALYZED

MINUMUM DISCHARGE (CFS)	1500
DESIGN DISCHARGE (CFS)	1922
MAXIMUM DISCHARGE (CFS)	2274

CULV #	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANN. N	INLET TYPE
1	1131.00	1130.50	190.00	5 - RCB	10.00	6.00	.013	CONVENTIONAL
2								
3								
4								
5								
6								

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-18-19	14:04:36	C126	OCT0991

CULVERT NUMBER: 1

CULVERT INVERT DATA

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1131.00
OUTLET STATION (FT)	190.00
OUTLET ELEVATION (FT)	1130.50
NUMBER OF BARRELS	5.00
SLOPE (V-FT/H-FT)	0.0026
CULVERT LENGTH ALONG SLOPE (FT)	190.00

BARREL SHAPE: 10.00 FT X 6.00 FT BOX
BARREL MATERIAL: CONCRETE
WITH A MANNING'S N OF 0.013
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION: NONE

DOWNSTREAM CHANNEL CROSS-SECTION

BOTTOM WIDTH (FT)	40.00
SIDE SLOPE H/V _:1	10.0
CHANNEL SLOPE V/H (FT/FT)	0.020
MANNING'S N (.01-0.1)	0.035
CHANNEL INVERT ELEVATION (FT)	1130.50
CULVERT OUTLET INVERT ELEVATION AT	1130.50

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-18-19	14:04:36	C126	OCT0991

UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NO.	VEL. (FPS)	SHEAR (PSF)
1500.00	1133.56	0.000	6.95	3.82
1577.40	1133.64	0.000	7.05	3.91
1654.80	1133.71	0.000	7.14	4.01
1732.20	1133.79	0.000	7.23	4.10
1809.60	1133.86	0.000	7.32	4.19
1887.00	1133.93	0.000	7.40	4.28
1922.00	1133.96	0.000	7.44	4.32
2041.80	1134.07	0.000	7.57	4.45
2119.20	1134.13	0.000	7.65	4.53
2196.60	1134.20	0.000	7.72	4.61
2274.00	1134.26	0.000	7.79	4.69

SELECTED OVERTOPPING CREST

ROADWAY SURFACE:	PAVED
EMBANKMENT TOP WIDTH (FT):	160.00

CONSTANT ROADWAY ELEVATION PROFILE

CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1140.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-18-19	14:04:36	C126	OCT0991

SUMMARY OF CULVERT FLOWS (CFS) FILE: C126 DATE: OCT0991

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1136.10	1500	1500	0	0	0	0	0	0	2
1136.28	1577	1577	0	0	0	0	0	0	2
1136.45	1655	1655	0	0	0	0	0	0	2
1136.62	1732	1732	0	0	0	0	0	0	2
1136.79	1810	1810	0	0	0	0	0	0	2
1136.95	1887	1887	0	0	0	0	0	0	2
1137.03	1922	1922	0	0	0	0	0	0	2
1137.26	2042	2042	0	0	0	0	0	0	2
1137.42	2119	2119	0	0	0	0	0	0	2
1137.58	2197	2197	0	0	0	0	0	0	2
1137.73	2274	2274	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 5 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
1500	1136.10	1133.56	4.69	5.10	5.10	0.00	0.00	9.81
1577	1136.28	1133.64	4.85	5.28	5.28	0.00	0.00	10.03
1655	1136.45	1133.71	5.01	5.45	5.45	0.00	0.00	10.19
1732	1136.62	1133.79	5.17	5.62	5.62	0.00	0.00	10.35
1810	1136.79	1133.86	5.32	5.79	5.79	0.00	0.00	10.50
1887	1136.95	1133.93	5.48	5.95	5.95	0.00	0.00	10.65
1922	1137.03	1133.96	5.55	6.03	6.03	0.00	0.00	10.71
2042	1137.26	1134.07	5.80	6.26	6.26	0.00	0.00	10.93
2119	1137.42	1134.13	5.96	6.42	6.42	0.00	0.00	11.07
2197	1137.58	1134.20	6.12	6.58	6.58	0.00	0.00	11.20
2274	1137.73	1134.26	6.28	6.73	6.73	0.00	0.00	11.33

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: C126 DATE: OCT0991

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1136.10	0.00	1500	0	0.00
1136.28	0.00	1577	0	0.00
1136.45	0.00	1655	0	0.00
1136.62	0.00	1732	0	0.00
1136.79	0.00	1810	0	0.00
1136.95	0.00	1887	0	0.00
1137.03	0.00	1922	0	0.00
1137.26	0.00	2042	0	0.00
1137.42	0.00	2119	0	0.00
1137.58	0.00	2197	0	0.00
1137.73	0.00	2274	0	0.00

CULVERT ANALYSIS VERSION 2.0

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-19-19	07:29:29	C127	OCT0991

PERFORMANCE CURVE DISCHARGE RANGE
OF FLOWS ANALYZED

MINUMUM DISCHARGE (CFS)	0
DESIGN DISCHARGE (CFS)	311
MAXIMUM DISCHARGE (CFS)	372

CULV #	A - SITE DATA			B - CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANN. N	INLET TYPE
1	1144.50	1144.00	250.00	1 - RCB	8.00	6.00	.013	CONVENTIONAL
2								
3								
4								
5								
6								

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-19-19	07:29:29	C127	OCT0991

CULVERT NUMBER: 1

CULVERT INVERT DATA

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1144.50
OUTLET STATION (FT)	250.00
OUTLET ELEVATION (FT)	1144.00
NUMBER OF BARRELS	1.00
SLOPE (V-FT/H-FT)	0.0020
CULVERT LENGTH ALONG SLOPE (FT)	250.00

BARREL SHAPE: 8.00 FT X 6.00 FT BOX
BARREL MATERIAL: CONCRETE
WITH A MANNING'S N OF 0.013
INLET TYPE: CONVENTIONAL
INLET EDGE AND WALL: SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION: NONE

DOWNSTREAM CHANNEL CROSS-SECTION

BOTTOM WIDTH (FT)	30.00
SIDE SLOPE H/V _:1	25.0
CHANNEL SLOPE V/H (FT/FT)	0.020
MANNING'S N (.01-0.1)	0.035
CHANNEL INVERT ELEVATION (FT)	1144.00
CULVERT OUTLET INVERT ELEVATION AT	1144.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-19-19	07:29:29	C127	OCT0991

UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NO.	VEL. (FPS)	SHEAR (PSF)
0.00	1144.00	0.000	0.00	0.00
37.20	1144.36	0.000	2.65	0.45
74.40	1144.53	0.000	3.28	0.66
111.60	1144.65	0.000	3.69	0.81
148.80	1144.76	0.000	4.01	0.95
186.00	1144.85	0.000	4.27	1.06
223.20	1144.93	0.000	4.49	1.16
260.40	1145.01	0.000	4.69	1.26
297.60	1145.08	0.000	4.87	1.34
311.00	1145.10	0.000	4.93	1.37
372.00	1145.20	0.000	5.17	1.50

SELECTED OVERTOPPING CREST

ROADWAY SURFACE:	PAVED
EMBANKMENT TOP WIDTH (FT):	160.00

CONSTANT ROADWAY ELEVATION PROFILE

CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1157.00

CURRENT DATE	CURRENT TIME	FILE NAME	FILE DATE
02-19-19	07:29:29	C127	OCT0991

SUMMARY OF CULVERT FLOWS (CFS) FILE: C127 DATE: OCT0991

ELEV (FT)	TOTAL	1	2	3	4	5	6	OVERTOP	ITER
1144.50	0	0	0	0	0	0	0	0	0
1145.97	37	37	0	0	0	0	0	0	2
1146.83	74	74	0	0	0	0	0	0	2
1147.56	112	112	0	0	0	0	0	0	2
1148.21	149	149	0	0	0	0	0	0	2
1148.80	186	186	0	0	0	0	0	0	2
1149.36	223	223	0	0	0	0	0	0	2
1149.90	260	260	0	0	0	0	0	0	2
1150.39	298	298	0	0	0	0	0	0	2
1150.56	311	311	0	0	0	0	0	0	2
1151.35	372	372	0	0	0	0	0	0	2

CULVERT # 1 PERFORMANCE CURVE
FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	1144.50	1144.00	0.00	-0.50	-0.50	1144.50	0.00	0.00
37	1145.97	1144.36	1.33	1.47	1.47	0.00	0.00	5.30
74	1146.83	1144.53	2.10	2.33	2.33	0.00	0.00	6.68
112	1147.56	1144.65	2.79	3.06	3.06	0.00	0.00	7.64
149	1148.21	1144.76	3.40	3.71	3.71	0.00	0.00	8.41
186	1148.80	1144.85	3.95	4.30	4.30	0.00	0.00	9.06
223	1149.36	1144.93	4.46	4.86	4.86	0.00	0.00	9.63
260	1149.90	1145.01	4.95	5.40	5.40	0.00	0.00	10.14
298	1150.39	1145.08	5.43	5.89	5.89	0.00	0.00	10.60
311	1150.56	1145.10	5.60	6.06	6.06	0.00	0.00	10.75
372	1151.35	1145.20	6.39	6.85	6.85	0.00	0.00	11.42

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: C127 DATE: OCT0991

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1144.50	0.00	0	0	0.00
1145.97	0.00	37	0	0.00
1146.83	0.00	74	0	0.00
1147.56	0.00	112	0	0.00
1148.21	0.00	149	0	0.00
1148.80	0.00	186	0	0.00
1149.36	0.00	223	0	0.00
1149.90	0.00	260	0	0.00
1150.39	0.00	298	0	0.00
1150.56	0.00	311	0	0.00
1151.35	0.00	372	0	0.00

SEGMENT III
CHANNEL DESIGN SHEETS

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c101a

Comment: 627+00 to 632+50 full flow

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0177 ft/ft
Discharge.....	161.00 cfs

Computed Results:

Depth.....	1.35 ft
Velocity.....	11.18 fps
Flow Area.....	14.40 sf
Flow Top Width...	13.39 ft
Wetted Perimeter.	14.02 ft
Critical Depth...	1.96 ft
Critical Slope...	0.0045 ft/ft
Froude Number....	1.90 (flow is Supercritical)

Open Channel Flow Module, Version 3.16 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c101b

Comment: 632+50 to 638+00 full flow

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0160 ft/ft
Discharge.....	161.00 cfs

Computed Results:

Depth.....	1.38 ft
Velocity.....	10.79 fps
Flow Area.....	14.92 sf
Flow Top Width...	13.54 ft
Wetted Perimeter.	14.19 ft
Critical Depth...	1.96 ft
Critical Slope...	0.0045 ft/ft
Froude Number....	1.81 (flow is Supercritical)

Open Channel Flow Module, Version 3.16 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c102a

Comment: 638+00 to 642+40 50% of flow

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0031 ft/ft
Discharge.....	120.00 cfs

Computed Results:

Depth.....	1.85 ft
Velocity.....	5.55 fps
Flow Area.....	21.60 sf
Flow Top Width...	15.39 ft
Wetted Perimeter.	16.26 ft
Critical Depth...	1.65 ft
Critical Slope...	0.0047 ft/ft
Froude Number....	0.83 (flow is Subcritical)

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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c102b

Comment: 642+40 to 645+00 50% of flow

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0030 ft/ft
Discharge.....	120.00 cfs

Computed Results:

Depth.....	1.86 ft
Velocity.....	5.49 fps
Flow Area.....	21.86 sf
Flow Top Width...	15.45 ft
Wetted Perimeter.	16.33 ft
Critical Depth...	1.65 ft
Critical Slope...	0.0047 ft/ft
Froude Number....	0.81 (flow is Subcritical)

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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c102c

Comment: 645+00 to 647+70 50% of flow

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0190 ft/ft
Discharge.....	120.00 cfs

Computed Results:

Depth.....	1.12 ft
Velocity.....	10.46 fps
Flow Area.....	11.47 sf
Flow Top Width...	12.48 ft
Wetted Perimeter.	13.01 ft
Critical Depth...	1.65 ft
Critical Slope...	0.0047 ft/ft
Froude Number....	1.92 (flow is Supercritical)

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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c103

Comment: 647+90 to 653+35 full flow

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0030 ft/ft
Discharge.....	111.00 cfs

Computed Results:

Depth.....	1.79 ft
Velocity.....	5.37 fps
Flow Area.....	20.68 sf
Flow Top Width...	15.15 ft
Wetted Perimeter.	15.99 ft
Critical Depth...	1.58 ft
Critical Slope...	0.0047 ft/ft
Froude Number....	0.81 (flow is Subcritical)

Open Channel Flow Module, Version 3.16 (c) 1990
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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c104

Comment: 653+55 to 659+80 50% of flow

Solve For Depth

Given Input Data:

Bottom Width.....	16.00 ft
Left Side Slope..	2.01:1 (H:V)
Right Side Slope.	2.01:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0025 ft/ft
Discharge.....	442.00 cfs

Computed Results:

Depth.....	2.91 ft
Velocity.....	6.95 fps
Flow Area.....	63.56 sf
Flow Top Width...	27.69 ft
Wetted Perimeter.	29.06 ft
Critical Depth...	2.56 ft
Critical Slope...	0.0039 ft/ft
Froude Number....	0.81 (flow is Subcritical)

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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c105

Comment: 660+00 to 663+00 50% of flow

Solve For Depth

Given Input Data:

Bottom Width.....	14.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0028 ft/ft
Discharge.....	442.00 cfs

Computed Results:

Depth.....	3.00 ft
Velocity.....	7.36 fps
Flow Area.....	60.02 sf
Flow Top Width...	26.00 ft
Wetted Perimeter.	27.42 ft
Critical Depth...	2.74 ft
Critical Slope...	0.0039 ft/ft
Froude Number....	0.85 (flow is Subcritical)

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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c106

Comment: 663+85 to 665+60 50% of flow

Solve For Depth

Given Input Data:

Bottom Width.....	14.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0030 ft/ft
Discharge.....	221.00 cfs

Computed Results:

Depth.....	2.01 ft
Velocity.....	6.12 fps
Flow Area.....	36.14 sf
Flow Top Width...	22.02 ft
Wetted Perimeter.	22.97 ft
Critical Depth...	1.81 ft
Critical Slope...	0.0044 ft/ft
Froude Number....	0.84 (flow is Subcritical)

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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c107

Comment: 665+80 to 672+20 50% of flow

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0033 ft/ft
Discharge.....	81.00 cfs

Computed Results:

Depth.....	1.47 ft
Velocity.....	5.06 fps
Flow Area.....	16.02 sf
Flow Top Width...	13.86 ft
Wetted Perimeter.	14.55 ft
Critical Depth...	1.31 ft
Critical Slope...	0.0049 ft/ft
Froude Number....	0.83 (flow is Subcritical)

Open Channel Flow Module, Version 3.16 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

SLAS

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c108

Comment: 672+40 to 677+00 50% of flow

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0030 ft/ft
Discharge.....	90.00 cfs

Computed Results:

Depth.....	1.59 ft
Velocity.....	5.05 fps
Flow Area.....	17.84 sf
Flow Top Width...	14.38 ft
Wetted Perimeter.	15.13 ft
Critical Depth...	1.40 ft
Critical Slope...	0.0049 ft/ft
Froude Number....	0.80 (flow is Subcritical)

Open Channel Flow Module, Version 3.16 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c109

Comment: 677+20 to 683+00 full flow

Solve For Depth

Given Input Data:

Bottom Width.....	16.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0025 ft/ft
Discharge.....	411.00 cfs

Computed Results:

Depth.....	2.80 ft
Velocity.....	6.81 fps
Flow Area.....	60.37 sf
Flow Top Width...	27.18 ft
Wetted Perimeter.	28.50 ft
Critical Depth...	2.46 ft
Critical Slope...	0.0040 ft/ft
Froude Number....	0.81 (flow is Subcritical)

Open Channel Flow Module, Version 3.16 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c110

Comment: 683+20 to 688+15 full flow

Solve For Depth

Given Input Data:

Bottom Width.....	10.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0030 ft/ft
Discharge.....	157.00 cfs

Computed Results:

Depth.....	1.95 ft
Velocity.....	5.79 fps
Flow Area.....	27.12 sf
Flow Top Width...	17.80 ft
Wetted Perimeter.	18.72 ft
Critical Depth...	1.74 ft
Critical Slope...	0.0045 ft/ft
Froude Number....	0.83 (flow is Subcritical)

Open Channel Flow Module, Version 3.16 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c111

Comment: 688+40 to 690+50 full flow

Solve For Depth

Given Input Data:

Bottom Width.....	10.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0031 ft/ft
Discharge.....	171.00 cfs

Computed Results:

Depth.....	2.03 ft
Velocity.....	6.01 fps
Flow Area.....	28.47 sf
Flow Top Width...	18.10 ft
Wetted Perimeter.	19.06 ft
Critical Depth...	1.83 ft
Critical Slope...	0.0045 ft/ft
Froude Number....	0.84 (flow is Subcritical)

Open Channel Flow Module, Version 3.16 (c) 1990
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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c112a

Comment: 690+70 to 695+00 full flow

Solve For Depth

Given Input Data:

Bottom Width.....	80.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0020 ft/ft
Discharge.....	3685.00 cfs

Computed Results:

Depth.....	4.47 ft
Velocity.....	9.27 fps
Flow Area.....	397.65 sf
Flow Top Width...	97.88 ft
Wetted Perimeter.	99.99 ft
Critical Depth...	3.91 ft
Critical Slope...	0.0032 ft/ft
Froude Number....	0.81 (flow is Subcritical)

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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c112b

Comment: 695+00 to 701+45 full flow

Solve For Depth

Given Input Data:

Bottom Width.....	20.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0115 ft/ft
Discharge.....	2635.00 cfs

Computed Results:

Depth.....	4.59 ft
Velocity.....	19.65 fps
Flow Area.....	134.09 sf
Flow Top Width...	38.38 ft
Wetted Perimeter.	40.54 ft
Critical Depth...	6.51 ft
Critical Slope...	0.0031 ft/ft
Froude Number....	1.85 (flow is Supercritical)

Open Channel Flow Module, Version 3.16 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c113

Comment: 701+65 to 706+80 full flow

Solve For Depth

Given Input Data:

Bottom Width.....	20.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0025 ft/ft
Discharge.....	882.00 cfs

Computed Results:

Depth.....	3.84 ft
Velocity.....	8.31 fps
Flow Area.....	106.13 sf
Flow Top Width...	35.34 ft
Wetted Perimeter.	37.15 ft
Critical Depth...	3.47 ft
Critical Slope...	0.0036 ft/ft
Froude Number....	0.85 (flow is Subcritical)

Open Channel Flow Module, Version 3.16 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c114a

Comment: 707+00 to 710+00 25% of flow

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0071 ft/ft
Discharge.....	441.00 cfs

Computed Results:

Depth.....	2.94 ft
Velocity.....	10.79 fps
Flow Area.....	40.88 sf
Flow Top Width...	19.77 ft
Wetted Perimeter.	21.16 ft
Critical Depth...	3.42 ft
Critical Slope...	0.0039 ft/ft
Froude Number....	1.32 (flow is Supercritical)

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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c114b

Comment: 710+00 to 724+00 25% of flow

Solve For Depth

Given Input Data:

Bottom Width.....	17.00 ft
Left Side Slope..	1.00:1 (H:V)
Right Side Slope.	1.00:1 (H:V)
Manning's n.....	0.020
Channel Slope....	0.0079 ft/ft
Discharge.....	441.00 cfs

Computed Results:

Depth.....	2.28 ft
Velocity.....	10.04 fps
Flow Area.....	43.93 sf
Flow Top Width...	21.56 ft
Wetted Perimeter.	23.45 ft
Critical Depth...	2.61 ft
Critical Slope...	0.0050 ft/ft
Froude Number....	1.24 (flow is Supercritical)

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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c115

Comment: 724+00 to 738+10 25% of flow

Solve For Depth

Given Input Data:

Bottom Width.....	14.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0015 ft/ft
Discharge.....	310.00 cfs

Computed Results:

Depth.....	2.93 ft
Velocity.....	5.32 fps
Flow Area.....	58.24 sf
Flow Top Width...	25.73 ft
Wetted Perimeter.	27.11 ft
Critical Depth...	2.22 ft
Critical Slope...	0.0041 ft/ft
Froude Number....	0.62 (flow is Subcritical)

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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c116a

Comment: 738+30 to 744+50 full flow

Solve For Depth

Given Input Data:

Bottom Width.....	24.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0021 ft/ft
Discharge.....	2087.00 cfs

Computed Results:

Depth.....	5.91 ft
Velocity.....	9.85 fps
Flow Area.....	211.91 sf
Flow Top Width...	47.66 ft
Wetted Perimeter.	50.45 ft
Critical Depth...	5.29 ft
Critical Slope...	0.0032 ft/ft
Froude Number....	0.82 (flow is Subcritical)

Open Channel Flow Module, Version 3.16 (c) 1990
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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c116b

Comment: 774+50 to 748+50 50% of flow

Solve For Depth

Given Input Data:

Bottom Width.....	12.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0021 ft/ft
Discharge.....	1044.00 cfs

Computed Results:

Depth.....	5.37 ft
Velocity.....	8.54 fps
Flow Area.....	122.23 sf
Flow Top Width...	33.49 ft
Wetted Perimeter.	36.03 ft
Critical Depth...	4.73 ft
Critical Slope...	0.0035 ft/ft
Froude Number....	0.79 (flow is Subcritical)

Open Channel Flow Module, Version 3.16 (c) 1990
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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c116c

Comment: 748+50 to 753+00 25% of flow

Solve For Depth

Given Input Data:

Bottom Width.....	10.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0021 ft/ft
Discharge.....	522.00 cfs

Computed Results:

Depth.....	4.04 ft
Velocity.....	7.15 fps
Flow Area.....	72.96 sf
Flow Top Width...	26.15 ft
Wetted Perimeter.	28.05 ft
Critical Depth...	3.47 ft
Critical Slope...	0.0038 ft/ft
Froude Number....	0.75 (flow is Subcritical)

Open Channel Flow Module, Version 3.16 (c) 1990
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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c117a

Comment: 753+00 to 764+50 50% of flow

Solve For Depth

Given Input Data:

Bottom Width.....	17.00 ft
Left Side Slope..	1.00:1 (H:V)
Right Side Slope.	1.00:1 (H:V)
Manning's n.....	0.020
Channel Slope....	0.0294 ft/ft
Discharge.....	80.00 cfs

Computed Results:

Depth.....	0.55 ft
Velocity.....	8.26 fps
Flow Area.....	9.69 sf
Flow Top Width...	18.10 ft
Wetted Perimeter.	18.56 ft
Critical Depth...	0.87 ft
Critical Slope...	0.0065 ft/ft
Froude Number....	1.99 (flow is Supercritical)

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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c117b

Comment: 764+00 to 774+00 full flow

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0200 ft/ft
Discharge.....	160.00 cfs

Computed Results:

Depth.....	1.30 ft
Velocity.....	11.64 fps
Flow Area.....	13.74 sf
Flow Top Width...	13.19 ft
Wetted Perimeter.	13.80 ft
Critical Depth...	1.95 ft
Critical Slope...	0.0045 ft/ft
Froude Number....	2.01 (flow is Supercritical)

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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c117c

Comment: 774+00 to 777+50 full flow

Solve For Depth

Given Input Data:

Bottom Width.....	10.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0030 ft/ft
Discharge.....	160.00 cfs

Computed Results:

Depth.....	1.97 ft
Velocity.....	5.82 fps
Flow Area.....	27.49 sf
Flow Top Width...	17.89 ft
Wetted Perimeter.	18.82 ft
Critical Depth...	1.76 ft
Critical Slope...	0.0045 ft/ft
Froude Number....	0.83 (flow is Subcritical)

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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c118a

Comment: 778+20 to 782+50 50% of flow

Solve For Depth

Given Input Data:

Bottom Width.....	10.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0030 ft/ft
Discharge.....	156.00 cfs

Computed Results:

Depth.....	1.94 ft
Velocity.....	5.78 fps
Flow Area.....	27.00 sf
Flow Top Width...	17.78 ft
Wetted Perimeter.	18.69 ft
Critical Depth...	1.74 ft
Critical Slope...	0.0045 ft/ft
Froude Number....	0.83 (flow is Subcritical)

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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c118b

Comment: 782+50 to 785+50 50% of flow

Solve For Depth

Given Input Data:

Bottom Width.....	14.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0015 ft/ft
Discharge.....	156.00 cfs

Computed Results:

Depth.....	2.00 ft
Velocity.....	4.32 fps
Flow Area.....	36.09 sf
Flow Top Width...	22.02 ft
Wetted Perimeter.	22.96 ft
Critical Depth...	1.46 ft
Critical Slope...	0.0046 ft/ft
Froude Number....	0.59 (flow is Subcritical)

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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c119a

Comment: 785+70 to 789+00 50% of flow

Solve For Depth

Given Input Data:

Bottom Width.....	12.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0018 ft/ft
Discharge.....	141.00 cfs

Computed Results:

Depth.....	1.94 ft
Velocity.....	4.57 fps
Flow Area.....	30.84 sf
Flow Top Width...	19.77 ft
Wetted Perimeter.	20.68 ft
Critical Depth...	1.49 ft
Critical Slope...	0.0046 ft/ft
Froude Number....	0.64 (flow is Subcritical)

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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c119b

Comment: 789+00 to 794+00 50% of flow

Solve For Depth

Given Input Data:

Bottom Width.....	14.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0012 ft/ft
Discharge.....	141.00 cfs

Computed Results:

Depth.....	2.02 ft
Velocity.....	3.88 fps
Flow Area.....	36.35 sf
Flow Top Width...	22.06 ft
Wetted Perimeter.	23.02 ft
Critical Depth...	1.37 ft
Critical Slope...	0.0047 ft/ft
Froude Number....	0.53 (flow is Subcritical)

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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c120

Comment: 794+20 to 798+15 full flow

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0028 ft/ft
Discharge.....	60.00 cfs

Computed Results:

Depth.....	1.30 ft
Velocity.....	4.36 fps
Flow Area.....	13.76 sf
Flow Top Width...	13.20 ft
Wetted Perimeter.	13.81 ft
Critical Depth...	1.09 ft
Critical Slope...	0.0052 ft/ft
Froude Number....	0.75 (flow is Subcritical)

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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c121

Comment: 798+35 to 800+80 full flow

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0023 ft/ft
Discharge.....	134.00 cfs

Computed Results:

Depth.....	2.12 ft
Velocity.....	5.16 fps
Flow Area.....	25.99 sf
Flow Top Width...	16.49 ft
Wetted Perimeter.	17.49 ft
Critical Depth...	1.76 ft
Critical Slope...	0.0046 ft/ft
Froude Number....	0.72 (flow is Subcritical)

Open Channel Flow Module, Version 3.16 (c) 1990
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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c121-c123Rt

Comment: 795+60 to 805+70 Rt combined flow c121-c123

Solve For Depth

Given Input Data:

Bottom Width.....	45.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0024 ft/ft
Discharge.....	1883.00 cfs

Computed Results:

Depth.....	3.95 ft
Velocity.....	9.02 fps
Flow Area.....	208.72 sf
Flow Top Width...	60.78 ft
Wetted Perimeter.	62.65 ft
Critical Depth...	3.58 ft
Critical Slope...	0.0033 ft/ft
Froude Number....	0.86 (flow is Subcritical)

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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c122

Comment: 801+00 to 806+25 full flow

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0033 ft/ft
Discharge.....	133.00 cfs

Computed Results:

Depth.....	1.92 ft
Velocity.....	5.85 fps
Flow Area.....	22.73 sf
Flow Top Width...	15.68 ft
Wetted Perimeter.	16.59 ft
Critical Depth...	1.76 ft
Critical Slope...	0.0046 ft/ft
Froude Number....	0.86 (flow is Subcritical)

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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c123a

Comment: 806+45 to 811+00 full flow

Solve For Depth

Given Input Data:

Bottom Width.....	45.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0020 ft/ft
Discharge.....	1616.00 cfs

Computed Results:

Depth.....	3.81 ft
Velocity.....	8.07 fps
Flow Area.....	200.33 sf
Flow Top Width...	60.23 ft
Wetted Perimeter.	62.03 ft
Critical Depth...	3.25 ft
Critical Slope...	0.0034 ft/ft
Froude Number....	0.78 (flow is Subcritical)

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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c123b

Comment: 811+00 to 816+00 Full flow

Solve For Depth

Given Input Data:

Bottom Width.....	25.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0064 ft/ft
Discharge.....	1616.00 cfs

Computed Results:

Depth.....	3.71 ft
Velocity.....	13.41 fps
Flow Area.....	120.46 sf
Flow Top Width...	39.86 ft
Wetted Perimeter.	41.61 ft
Critical Depth...	4.46 ft
Critical Slope...	0.0033 ft/ft
Froude Number....	1.36 (flow is Supercritical)

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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c123c

Comment: 816+00 to 824+20 50% of flow

Solve For Depth

Given Input Data:

Bottom Width.....	18.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0064 ft/ft
Discharge.....	808.00 cfs

Computed Results:

Depth.....	2.96 ft
Velocity.....	11.40 fps
Flow Area.....	70.87 sf
Flow Top Width...	29.85 ft
Wetted Perimeter.	31.25 ft
Critical Depth...	3.47 ft
Critical Slope...	0.0036 ft/ft
Froude Number....	1.30 (flow is Supercritical)

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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c124a

Comment: 824+70 to 828+00 full flow

Solve For Depth

Given Input Data:

Bottom Width.....	30.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0025 ft/ft
Discharge.....	685.00 cfs

Computed Results:

Depth.....	2.71 ft
Velocity.....	7.14 fps
Flow Area.....	95.88 sf
Flow Top Width...	40.83 ft
Wetted Perimeter.	42.11 ft
Critical Depth...	2.39 ft
Critical Slope...	0.0038 ft/ft
Froude Number....	0.82 (flow is Subcritical)

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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c124b

Comment: 828+00 to 846+50 full flow

Solve For Depth

Given Input Data:

Bottom Width.....	14.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0088 ft/ft
Discharge.....	685.00 cfs

Computed Results:

Depth.....	2.79 ft
Velocity.....	12.55 fps
Flow Area.....	54.59 sf
Flow Top Width...	25.15 ft
Wetted Perimeter.	26.47 ft
Critical Depth...	3.53 ft
Critical Slope...	0.0037 ft/ft
Froude Number....	1.50 (flow is Supercritical)

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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c125a

Comment: 846+75 to 851+00 full flow

Solve For Depth

Given Input Data:

Bottom Width.....	35.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0025 ft/ft
Discharge.....	1211.00 cfs

Computed Results:

Depth.....	3.46 ft
Velocity.....	8.35 fps
Flow Area.....	145.11 sf
Flow Top Width...	48.85 ft
Wetted Perimeter.	50.48 ft
Critical Depth...	3.13 ft
Critical Slope...	0.0035 ft/ft
Froude Number....	0.85 (flow is Subcritical)

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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c125b

Comment: 851+00 to 859+00 full flow

Solve For Depth

Given Input Data:

Bottom Width.....	20.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0081 ft/ft
Discharge.....	1211.00 cfs

Computed Results:

Depth.....	3.30 ft
Velocity.....	13.78 fps
Flow Area.....	87.85 sf
Flow Top Width...	33.21 ft
Wetted Perimeter.	34.77 ft
Critical Depth...	4.18 ft
Critical Slope...	0.0034 ft/ft
Froude Number....	1.49 (flow is Supercritical)

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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c126a

Comment: 859+20 to 864+00 full flow

Solve For Depth

Given Input Data:

Bottom Width.....	60.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0020 ft/ft
Discharge.....	2274.00 cfs

Computed Results:

Depth.....	3.96 ft
Velocity.....	8.45 fps
Flow Area.....	269.11 sf
Flow Top Width...	75.85 ft
Wetted Perimeter.	77.72 ft
Critical Depth...	3.41 ft
Critical Slope...	0.0033 ft/ft
Froude Number....	0.79 (flow is Subcritical)

Open Channel Flow Module, Version 3.16 (c) 1990
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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c126b

Comment: 864+00 to 869+60 50% of flow

Solve For Depth

Given Input Data:

Bottom Width.....	18.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0140 ft/ft
Discharge.....	1137.00 cfs

Computed Results:

Depth.....	2.88 ft
Velocity.....	16.61 fps
Flow Area.....	68.47 sf
Flow Top Width...	29.52 ft
Wetted Perimeter.	30.89 ft
Critical Depth...	4.23 ft
Critical Slope...	0.0035 ft/ft
Froude Number....	1.92 (flow is Supercritical)

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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c127a

Comment: 869+80 to 873+50 full flow

Solve For Depth

Given Input Data:

Bottom Width.....	18.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0025 ft/ft
Discharge.....	372.00 cfs

Computed Results:

Depth.....	2.50 ft
Velocity.....	6.48 fps
Flow Area.....	57.39 sf
Flow Top Width...	27.98 ft
Wetted Perimeter.	29.16 ft
Critical Depth...	2.17 ft
Critical Slope...	0.0041 ft/ft
Froude Number....	0.80 (flow is Subcritical)

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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c127b

Comment: 873+50 to 876+50 Full flow

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0110 ft/ft
Discharge.....	372.00 cfs

Computed Results:

Depth.....	2.41 ft
Velocity.....	12.06 fps
Flow Area.....	30.85 sf
Flow Top Width...	17.63 ft
Wetted Perimeter.	18.77 ft
Critical Depth...	3.12 ft
Critical Slope...	0.0040 ft/ft
Froude Number....	1.61 (flow is Supercritical)

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Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: c127c

Comment: 876+50 to 886+00 50% of flow

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.018
Channel Slope....	0.0083 ft/ft
Discharge.....	186.00 cfs

Computed Results:

Depth.....	1.79 ft
Velocity.....	8.95 fps
Flow Area.....	20.79 sf
Flow Top Width...	15.18 ft
Wetted Perimeter.	16.02 ft
Critical Depth...	2.13 ft
Critical Slope...	0.0044 ft/ft
Froude Number....	1.35 (flow is Supercritical)

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