WATERSHED MANAGEMENT LIBRARY

HYDROLOGY FOR

RIGHT-OF-WAY REQUIREMENTS
for the
SOSSAMAN ROAD DRAINAGE
CHANNEL

A108.701

Sept, 1976

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ENCLOSED INSIDE BACK COVER:

1. Watershed Map
2. Land Use Map
3. TR-20 computer printout

RIGHT-OF-WAY REQUIREMENTS FOR THE SOSSAMAN ROAD DRAINAGE CHANNEL

The Maricopa County Highway Department has recently proposed to improve Sossaman Road between Baseline and Guadalupe Roads. Involved in this improvement would be the realignment of Sossaman Road for ½ mile south of Baseline in order to compensate for approximately 1070 feet of offset in Sossaman Road north and south of Baseline. This type of improvement has already been performed on other major north-south roads in the area such as Powers and Ellsworth Roads.

In addition to the road improvement, it has been proposed to continue a major drainage channel located to the east of Sossaman Road, which essentially ends at Baseline. This drainage channel will parallel Sossaman Road between Baseline and Guadalupe Roads and would eventually tie into the RWCD Floodway to the west.

The Highway Department has requested that the Flood Control District conduct a hydrology study of the area in order to determine right-of-way requirements for the continuation of the drainage channel south of Baseline. This report is the result of that request.

Major Assumptions:

1. All watershed parameters were determined for present conditions with the exception that the proposed Buckhorn Mesa Projects to the north be considered in place with the effect of decreasing the overall drainage area.

2. The proposed Superstition Freeway which would run east-west along the midsection line between Southern and Baseline Roads would have a substantial affect on drainage in the area. However, since the freeway is in the early planning stages and it is not known exactly how drainage will be handled, it is assumed that the freeway not be in place for purposes of determining drainage areas and other watershed parameters.

3. The peak flow of 4150 cfs at the Baseline culvert which would be generated by the 100-year, 3-hour storm will be used as the design flow. It is assumed that this entire 4150 cfs would enter a design channel at a point just south of the Baseline culvert.

4. The assumption of no tailwater in the Baseline Road culvert computations may yield a larger capacity for the culvert than would actually exist with the proposed channel downstream and an improved channel upstream. The fact remains, however, that the capacity of the existing culvert, even under optimum conditions, is substantially less than the 4150 cfs peak flow at that point.

CURVE NUMBERS: (From: SCS TR-55)

Drainage Area	Land Use	Soil Type	Percent Of Area	CN	Weighted CN
1	Residential (R1-6 ave.)	B	8.5	84	
	Commercial	B	2.4	92	
	Streets, Roads, Parking Areas	—	5.6	98	
	Desert Brush (20%)	B	83.5	83	8415/100
			100		84
2	Desert Brush (20%)	B	100	83	
					83
3	Residential (R1-6 ave.)	B	23.5	84	
	Commercial	B	3.0	92	
	Streets, Roads, Parking Areas	—	7.5	98	
	Desert Brush (20%)	B	66.0	83	8463/100
			100		85
4	Residential (R1-6 ave.)	B	25.7	84	
	Streets, Roads	—	7.3	98	
	Desert Brush (20%)	B	67.0	83	8435/100
			100		84
5	Residential (R1-6 ave.)	B	38.4	84	
	Commercial	B	6.4	92	
	Streets, Roads	—	10.3	98	
	Desert Brush (20%)	B	44.9	83	8551/100
			100		86

CURVE NUMBERS = (From: SCS TR-55)

Drainage Area	Land Use	Soil Type	Percent Of Area	CN	Weighted CN
6	Residential (R1-6 ave.)	B	49.5	84	
	Commercial	B	5.1	92	
	Streets, Roads	—	11.4	98	
	Desert Brush (20%)	B	34.0	83	8566/100
			100		86
7	Residential (R1-6 ave.)	B	23.7	84	
	Commercial	B	3.2	92	
	Streets, Roads	—	7.7	98	
	Desert Brush (20%)	B	65.4	83	6468/100
			100		85
8	Residential (R1-6 ave.)	B	61.4	84	
	Golf Course, Open Space	B	6.6	61	
	Streets, Roads	—	11.9	98	
	Desert Brush (20%)	B	20.1	83	8395/100
			100		84
9	Residential (R1-7 ave)	B	23.7	82	
	Agriculture	B	57.0	71	
	Streets, Roads	—	7.1	98	
	Desert Brush (20%)	B	12.2	83	7697/100
			100		77

TIME OF CONCENTRATION:

D.A.	$\frac{L^{1.15}}{7700\ \Delta H^{.38}}$	Tc	Average Flow Velocity
1	$\frac{3310^{1.15}}{7700 \cdot 317^{.38}}$	2.30 hrs	4.00 ft/sec
2	$\frac{9750^{1.15}}{7700 \cdot 82^{.38}}$	.94 hrs	2.88 ft/sec
3	$\frac{3340^{1.15}}{7700 \cdot 294^{.38}}$	2.39 hrs	3.88 ft/sec
4	$\frac{2010^{1.15}}{7700 \cdot 171^{.38}}$	1.64 hrs	3.40 ft/sec
7	$\frac{2895^{1.15}}{7700 \cdot 246^{.38}}$	2.17 hrs	3.71 ft/sec

From: Hydrologic Design for Highway Dra in Arizona Fig 2-7

D.A.	Tc	Average Flow Velocity
5	1.34 hrs	2.55 ft/sec
6	1.41 hrs	2.94 ft/sec

Hydrologic Design. Fig 2-5

D.A.	Overland Flow				Channel Flow		Tc	Average Flow Velocity
	Length (ft)	Slope (%)	Flow Vel.	Time (hrs)	Flow Vel.	Time (hrs)		
8	5150	.80	1.8 ft/sec	.79	5.0 ft/sec	.24	1.03 hrs	2.58 ft/sec
9	1200	.42	1.3 ft/sec	.26	5.0 ft/sec	.63	.89 hrs	3.92 ft/sec

MAIN TIME INCREMENT:

$$\Delta T = \left(\frac{2.30 + .94 + 2.39 + 1.64 + 2.17 + 1.34 + 1.41 + 1.03 + .89}{9}\right) \times .133 \sim .20 \text{ hr}$$

DRAINAGE AREA DATA:

D.A.	(mi²) AREA	(ft) LENGTH	(%) SLOPE	(ft/sec) AVE. FLOW VEL.	(hrs) T_c	CN
1	2.30	33100	.96	4.00	1.75 2.30	84
2	.24	9750	.84	2.88	1.3 .94	83
3	2.35	33400	.88	3.88	1.90 2.39	85
4	1.06	20100	.85	3.40	1.70 1.64	84
5	1.04	12300	1.26	2.55	1.34	86
6	1.37	14900	1.25	2.94	1.41	86
7	3.20	28950	.85	3.71	2.1 2.17	85
8	.72	9550	.64	2.58	1.03	84
9	.95	12550	.61	3.92	.89	77

TOTAL = 13.23

100-YR. RAINFALL AMOUNTS			
1-hr.	2-hr.	3-hr.	6-hr.
2.49 in.	2.62 in.	2.78 in.	3.10 in.

Slope Calculations:

1) $\frac{1782 - 1465}{33100} \times 100 = .96\%$

2) $\frac{1540 - 1458}{9750} \times 100 = .84\%$

3) $\frac{1731 - 1437}{33400} \times 100 = .88\%$

4) $\frac{1581 - 1410}{20100} \times 100 = .85\%$

5) $\frac{1622 - 1467}{12300} \times 100 = 1.26\%$

6) $\frac{1656 - 1470}{14900} \times 100 = 1.25\%$

7) $\frac{1688 - 1442}{28950} \times 100 = .85\%$

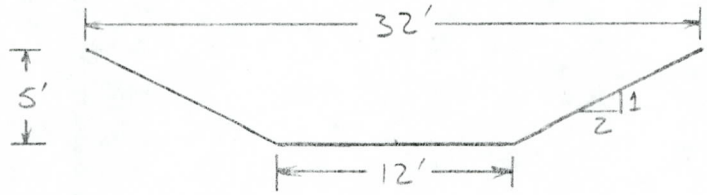
8) $\frac{1466 - 1405}{9550} \times 100 = .64\%$

9) $\frac{1469 - 1393}{12550} \times 100 = .61\%$

CHANNEL CALCULATIONS FOR TR-20 ROUTING:

From: XSECTN 50/60 To: XSECTN 70

Length: 5300 ft



S = .45%

1 ft depth – $A = 1 \times 12 + 1 \times 2 = 14$ $WP = 12 + 2\sqrt{1^2+2^2} = 16.47$

$R = (.84)^{2/3} = .89$ $Q = \frac{1.486}{.035} \times .89 \times .067 \times 14 =$ 35 cfs

3 ft depth – $A = 3 \times 12 + 3 \times 6 = 54$ $WP = 12 + 2\sqrt{3^2+6^2} = 25.42$

$R = (2.12)^{2/3} = 1.65$ $Q = \frac{1.486}{.030} \times 1.65 \times .067 \times 54 =$ 296 cfs

5 ft depth – $A = 5 \times 12 + 5 \times 10 = 110$ $WP = 12 + 2\sqrt{5^2+10^2} = 34.36$

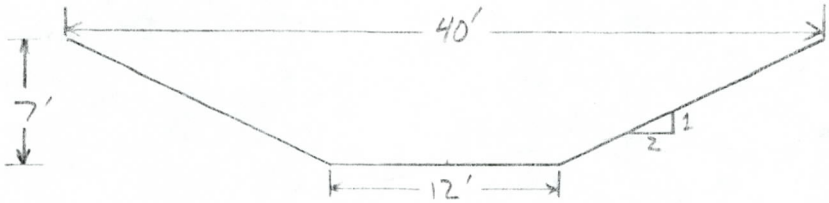
$R = (3.20)^{2/3} = 2.17$ $Q = \frac{1.486}{.025} \times 2.17 \times .067 \times 110 =$ 951 cfs

depth (ft)	End Area (ft^2)	Q (cfs)	
0	0	0	0 ft/sec
1	14	35	2.5 ft/sec
3	54	296	5.48 ft/sec
5	110	951	8.65 ft/sec

CHANNEL CALCULATIONS FOR TR-20 ROUTING:

From: XSECT 10 Through: XSECTN 40

Total Length = 9100 ft



S = .60 %

1 ft depth — $A = 1 \times 12 + 1 \times 2 = 14$ $WP = 12 + 2\sqrt{2^2 + 1^2} = 16.47$

$R = (.84)^{2/3} = .89$ $Q = \frac{1.486}{.040} \times .89 \times .078 \times 14 = 36$ cfs

3 ft depth — $A = 3 \times 12 + 3 \times 6 = 54$ $WP = 12 + 2\sqrt{3^2 + 6^2} = 25.42$

$R = (2.12)^{2/3} = 1.65$ $Q = \frac{1.486}{.035} \times 1.65 \times .078 \times 54 = 295$ cfs

5 ft depth — $A = 5 \times 12 + 5 \times 10 = 110$ $WP = 12 + 2\sqrt{5^2 + 10^2} = 34.36$

$R = (3.20)^{2/3} = 2.17$ $Q = \frac{1.486}{.030} \times 2.17 \times .078 \times 110 = 922$ cfs

7 ft depth — $A = 7 \times 12 + 7 \times 14 = 182$ $WP = 12 + 2\sqrt{7^2 + 14^2} = 43.30$

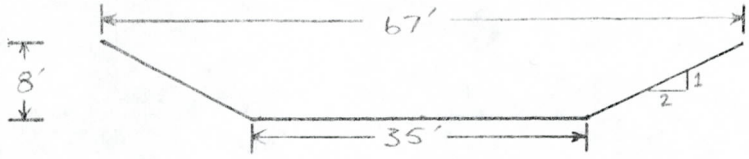
$R = (4.20)^{2/3} = 2.60$ $Q = \frac{1.486}{.030} \times 2.60 \times .078 \times 182 = 1830$

depth (ft)	End Area (ft^2)	Q (cfs)	
0	0	0	0 ft/sec
1	14	36	2.57 ft/sec
3	54	295	5.46 ft/sec
5	110	922	8.38 ft/sec
7	182	1830	10.1 ft/sec

CHANNEL CALCULATIONS FOR TR-20 ROUTING:

From: XSECTN 80 To: XSECTN 90

Length: 3000 ft.



S = .50%

1 ft depth – $A = 1 \times 35 + 1 \times 2 = 37$ $WP = 35 + 2\sqrt{1^2 + 2^2} = 39.47$

$R = (.94)^{2/3} = .96$ $Q = \frac{1.486}{.040} \times .96 \times .071 \times 37 = 94$ cfs

2 ft depth – $A = 2 \times 35 + 2 \times 4 = 78$ $WP = 35 + 2\sqrt{2^2 + 4^2} = 43.94$

$R = (1.78)^{2/3} = 1.47$ $Q = \frac{1.486}{.035} \times 1.47 \times .071 \times 78 = 346$

4 ft depth – $A = 4 \times 35 + 4 \times 8 = 172$ $WP = 35 + 2\sqrt{4^2 + 8^2} = 52.89$

$R = (3.25)^{2/3} = 2.19$ $Q = \frac{1.486}{.030} \times 2.19 \times .071 \times 172 = 1320$

6 ft depth – $A = 6 \times 35 + 6 \times 12 = 282$ $WP = 35 + 2\sqrt{6^2 + 12^2} = 61.83$

$R = (4.56)^{2/3} = 2.75$ $Q = \frac{1.486}{.030} \times 2.75 \times .071 \times 282 = 2730$

8 ft depth – $A = 8 \times 35 + 8 \times 16 = 408$ $WP = 35 + 2\sqrt{8^2 + 16^2} = 70.8$

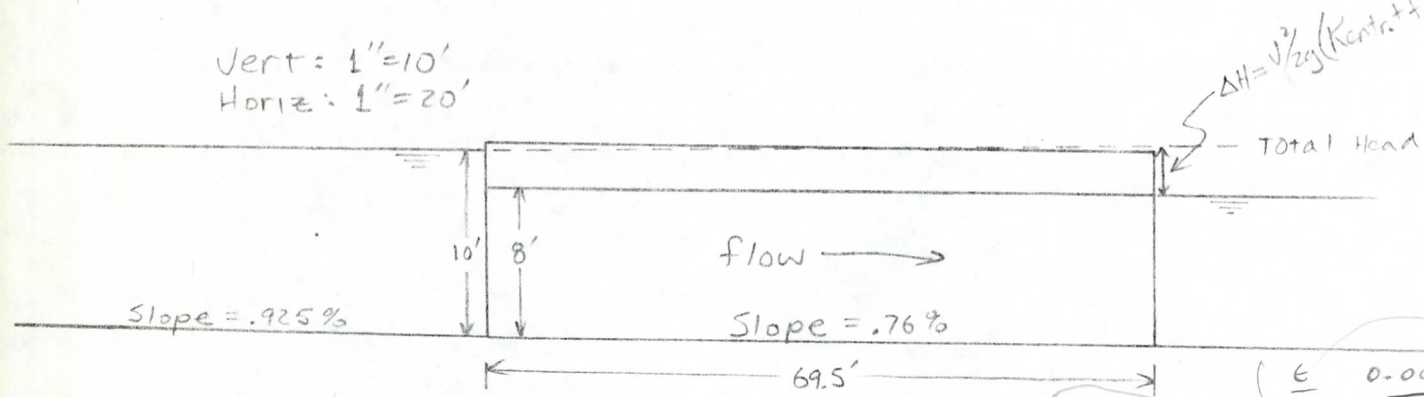
$R = (5.76)^{2/3} = 3.21$ $Q = \frac{1.486}{.030} \times 3.21 \times .071 \times 408 = 4610$

depth (ft)	End Area (ft^2)	Q (cfs)	
0	0	0	0 ft/sec
1	37	94	2.54 ft/sec
2	78	346	4.44 ft/sec
4	172	1320	7.67 ft/sec
6	282	2730	9.7 ft/sec
8	408	4610	11.3 ft/sec

Capacity of 4-8'x10'x69'-6" Box Culvert Under Baseline Road for Optimum Conditions:

Assume no tailwater, all boxes flowing full

Vert: 1"=10'
Horiz: 1"=20'



$\frac{\epsilon}{4R}$ $\frac{0.0009}{8.88} = 1.01 \times 10^{-4}$

$Re_y = 8.36 \times 10^6$

$f = 0.013$

OK per formula below

$$\Delta H = 10' + .0076(69.5') - 8' = \frac{V^2}{64.4}\left(.5 + .0176\frac{69.5}{8.88} + 1.0\right)$$

$$V = \sqrt{\frac{64.4(2.5)}{(.5 + .0176\frac{69.5}{8.88} + 1.0)}} = 9.97 \text{ ft/sec}$$

$$Q = VA = 9.97 \text{ ft/sec} \times 80 \text{ ft}^2 = 798 \text{ cfs}$$

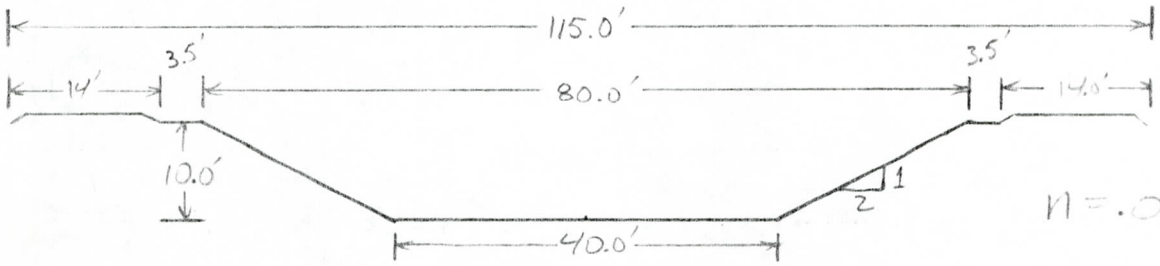
$$Q_{total} = 4 \text{ boxes} \times 798 \text{ cfs/box} = 3190 \text{ cfs}$$

At HW = 11' Q = 3770 cfs
At HW = 11.5 Q = 4028 cfs

V = velocity (ft/sec)
R = hydraulic radius
g = accel. of gravity (ft/sec²)
$K_{entr.}$ = entrance loss coeff. = .5
K_{ext} = exit loss coefficient = 1.0

L = length of culvert (ft)
f = Darcy-Weisbach "f"
$f = 8g/C^2$
$C = \frac{1.486}{n} R^{1/6}$
n = .014 for concrete

PRELIMINARY CHANNEL DESIGN AND CONCLUSIONS:



n = .0225

slope = .000825 ft/ft

$A = 400 + 200 = 600\ ft^2$ $\quad WP = 40 + 2\sqrt{10^2 + 20^2} = 84.7$

$R = (7.08)^{2/3} = 3.69$

$V = \frac{1.486}{.0225} \times 3.69 \times .0287 = 7.0\ ft/sec$

$Q = 7.0\ ft/sec \times 600\ ft^2 = 4200\ cfs$

This preliminary design channel requiring 115 feet of right-of-way including a maintenance road on either side and assumed to be earth cut with a limiting flow velocity of 7.0 ft/sec would be sufficient to handle the peak flow of 4150 cfs.

Such a channel would require a series of drop structures in order to decrease the natural ground slope of .0055 ft/ft to a channel slope of .000825 ft/ft.

It is concluded, then, that 115 feet of right-of-way would be the minimum required.

HYDROLOGY PROGRAM FOR IBM 1130 - DATED JULY, 1968

MARICOPA COUNTY FLOOD DIST. TR-20 ROUTING.

EXECUTIVE CONTROL CARD OPERATION LIST

MARICOPA COUNTY FLOOD DIST.

C TABLE VELOCITY INCREMENT = 0.200

8	0.0000	0.0800	0.1800	0.2500	0.3200
8	0.3700	0.4100	0.4500	0.4900	0.5100
8	0.5400	0.5700	0.5900	0.6100	0.6300
8	0.6500	0.6600	0.6700	0.6900	0.7000
8	0.7100	0.7200	0.7300	0.7400	0.7500
8	0.7600	0.7700	0.7700	0.7800	0.7900
8	0.7900	0.8000	0.8100	0.8100	0.8200
8	0.8200	0.8300	0.8300	0.8400	0.8400
8	0.8400	0.8500	0.8500	0.8600	0.8600
8	0.8600	0.8600	0.8700	0.8700	0.8700
8	0.8800	0.8800	0.8800	0.8900	0.8900
8	0.8900	0.8900	0.8900	0.8900	0.9000
8	0.9000	0.9000	0.9000	0.9000	0.9100
8	0.9100	0.9100	0.9100	0.9100	0.9100
8	0.9200	0.9200	0.9200	0.9200	0.9200
8	0.9200	0.9200	0.9200	0.9300	0.9300
8	0.9300	0.9300	0.9300	0.9300	0.9300
9 ENDTBL					

CROSS SECTION NO. 20 DRAINAGE AREA = 1.00

	ELEVATION	DISCHARGE	END AREA
8	0.0000	0.0000	0.0000
8	1.0000	36.0000	14.0000
8	3.0000	295.0000	54.0000
8	5.0000	922.0001	110.0000
8	7.0000	1830.0002	182.0000
9 ENDTBL			

CROSS SECTION NO. 30 DRAINAGE AREA = 1.00

	ELEVATION	DISCHARGE	END AREA
8	0.0000	0.0000	0.0000
8	1.0000	36.0000	14.0000
8	3.0000	295.0000	54.0000
8	5.0000	922.0001	110.0000
8	7.0000	1830.0002	182.0000
9 ENDTBL			

CROSS SECTION NO. 40 DRAINAGE AREA = 1.00

	ELEVATION	DISCHARGE	END AREA
8	0.0000	0.0000	0.0000
8	1.0000	36.0000	14.0000
8	3.0000	295.0000	54.0000
8	5.0000	922.0001	110.0000

```
8                          7.0000   1830.0002    182.0000
9 ENDTBL

CROSS SECTION NO.  89     DRAINAGE AREA =     1.00

                          ELEVATION   DISCHARGE    END AREA
8                          0.0000       0.0000      0.0000
8                          1.0000      94.0000     37.0000
8                          2.0000     346.0000     78.0000
8                          4.0000    1320.0002    172.0000
8                          6.0000    2730.0004    282.0000
8                          8.0000    4610.0009    408.0000
9 ENDTBL

CROSS SECTION NO.  90     DRAINAGE AREA =     1.00

                          ELEVATION   DISCHARGE    END AREA
8                          0.0000       0.0000      0.0000
8                          1.0000      94.0000     37.0000
8                          2.0000     346.0000     78.0000
8                          4.0000    1320.0002    172.0000
8                          6.0000    2730.0004    282.0000
8                          8.0000    4610.0009    408.0000
9 ENDTBL

DIMENSIONLESS HYDROGRAPH - DELTA T =484.00

8          0.0000     0.0150     0.0750     0.1600     0.2800
8          0.4300     0.6000     0.7700     0.8900     0.9700
8          1.0000     0.9800     0.9200     0.8400     0.7500
8          0.6600     0.5650     0.4900     0.4200     0.3650
8          0.3200     0.2790     0.2400     0.2100     0.1800
8          0.1550     0.1300     0.1130     0.0980     0.0860
8          0.0750     0.0650     0.0560     0.0470     0.0410
8          0.0350     0.0300     0.0260     0.0220     0.0190
8          0.0170     0.0150     0.0130     0.0110     0.0090
8          0.0070     0.0050     0.0030     0.0020     0.0010
8          0.0000     0.0000     0.0000     0.0000     0.0000
8          0.0000     0.0000     0.0000     0.0000     0.0000
9 ENDTBL

RAINFALL TABLE NO. 1      TIME INCREMENT =  0.50

8          0.0000     0.0080     0.0170     0.0260     0.0350
8          0.0450     0.0550     0.0650     0.0760     0.0870
8          0.0990     0.1120     0.1250     0.1400     0.1560
8          0.1740     0.1940     0.2190     0.2540     0.3030
8          0.5150     0.5830     0.6240     0.6540     0.6820
8          0.7050     0.7270     0.7480     0.7670     0.7840
8          0.8000     0.8160     0.8300     0.8440     0.8570
8          0.8700     0.8820     0.8930     0.9050     0.9160
8          0.9260     0.9360     0.9460     0.9550     0.9650
8          0.9740     0.9830     0.9920     1.0000     1.0000
9 ENDTBL

RAINFALL TABLE NO. 2      TIME INCREMENT =  0.02
```

RIGHT-OF-WAY REQUIREMENTS FOR
THE SOSSAMAN RD. DRAINAGE CHANNEL

100-YR 1hr., 2hr., 3hr., 6hr

9-16-76 G.S.B.

```
 8          0.0000     0.0100     0.0200     0.0200     0.0300
 8          0.0400     0.0500     0.0600     0.0700     0.0800
 8          0.1000     0.1100     0.1300     0.1400     0.1700
 8          0.1900     0.2200     0.2700     0.3500     0.4400
 8          0.5200     0.6000     0.6300     0.6600     0.6800
 8          0.7000     0.7200     0.7400     0.7600     0.7700
 8          0.7900     0.8000     0.8200     0.8300     0.8400
 8          0.8500     0.8700     0.8800     0.8900     0.9000
 8          0.9100     0.9200     0.9300     0.9400     0.9500
 8          0.9567     0.9633     0.9700     0.9800     0.9900
 8          1.0000     1.0000     1.0000     1.0000     1.0000
 9 ENDTBL

RAINFALL TABLE NO. 3      TIME INCREMENT =  2.00

 8          0.0000     0.1000     0.7000     1.4000     1.8000
 8          2.0000     2.0000     2.1000     2.3000     2.7000
 8          3.4000     3.9000     4.0000     4.0000     4.0000
 9 ENDTBL

RAINFALL TABLE NO. 4      TIME INCREMENT =  0.03

 8          0.0000     0.0163     0.0320     0.0480     0.0640
 8          0.0800     0.0960     0.1120     0.1300     0.1500
 8          0.1800     0.2170     0.2600     0.3200     0.4000
 8          0.5100     0.6200     0.7000     0.7590     0.8000
 8          0.8370     0.8610     0.8820     0.9000     0.9180
 8          0.9300     0.9410     0.9600     0.9710     0.9830
 8          1.0000     1.0000     1.0000     1.0000     1.0000
 9 ENDTBL
```

STANDARD CONTROL INSTRUCTIONS

			HYDROGRAPHS						OUTPUT OPTIONS					
SUBRTN	XSECTN	STRCT	IN1	IN2	OUT	DATA NO. 1	DATA NO. 2	DATA NO. 3	PK	H	E	V	PH	SM
RUNOFF	10	0	0	0	1	2.300	84.000	2.300	1	1	0	1	0	1
REACH	20	0	1	0	2	1300.000	0.000	0.000	1	0	0	0	0	0
RUNOFF	20	0	0	0	1	0.240	83.000	0.940	1	1	0	1	0	1
ADDHYD	20	0	1	2	3	0.000	0.000	0.000	1	0	0	0	0	0
REACH	30	0	3	0	1	3300.000	0.000	0.000	1	0	0	0	0	0
RUNOFF	30	0	0	0	2	2.350	85.000	2.390	1	1	0	1	0	1
ADDHYD	30	0	1	2	3	0.000	0.000	0.000	1	0	0	0	0	0
REACH	40	0	3	0	1	4500.000	0.000	0.000	1	0	0	0	0	0
RUNOFF	40	0	0	0	2	1.060	84.000	1.640	1	1	0	1	0	1
ADDHYD	40	0	1	2	3	0.000	0.000	0.000	1	0	0	0	0	0
RUNOFF	50	0	0	0	5	1.040	86.000	1.340	1	1	0	1	0	1
RUNOFF	60	0	0	0	6	1.370	86.000	1.410	1	1	0	1	0	1
ADDHYD	60	0	5	6	7	0.000	0.000	0.000	1	0	0	0	0	0
REACH	70	0	7	0	5	5300.000	0.760	0.000	1	0	0	0	0	0
RUNOFF	70	0	0	0	6	3.200	85.000	2.170	1	1	0	1	0	1
ADDHYD	70	0	5	6	7	0.000	0.000	0.000	1	0	0	0	0	0
REACH	80	0	7	0	5	5200.000	0.540	0.000	1	0	0	0	0	0
RUNOFF	80	0	0	0	6	0.720	84.000	1.030	1	1	0	1	0	1
ADDHYD	80	0	5	6	7	0.000	0.000	0.000	1	0	0	0	0	0
ADDHYD	80	0	3	7	1	0.000	0.000	0.000	1	0	0	0	0	0
REACH	89	0	1	0	2	3000.000	0.000	0.000	1	0	0	0	0	0
RUNOFF	89	0	0	0	1	0.950	77.000	0.890	1	1	0	1	0	1
ADDHYD	89	0	1	2	3	0.000	0.000	0.000	1	0	0	0	0	0
REACH	90	0	3	0	1	1.000	0.000	0.000	1	1	0	1	0	1
ENDATA														

END OF LISTING

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EXECUTIVE CONTROL CARD              OPERATION  INCREM,     MAIN TIME INCREMENT=  0.20
EXECUTIVE CONTROL CARD              OPERATION  COMPUT,     FROM XSECTN/STRUCT  10/  0     TO XSECTN/STRUCT  90/  0
        STARTING TIME=  0.00     RAIN DEPTH=  2.49     RAIN DURATION=  1.00     RAIN TABLE NO.= 4     SOIL CONDITION= 2
        ALTERNATE NO.= 0         STORM NO.= 0


SUBROUTINE RUNOFF    CROSS SECTION  10
           AREA=   2.30     INPUT RUNOFF CURVE=  84.0     TIME OF CONCENTRATION=  2.30
           COMPUTED CURVE NO. =   84.0

           PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
               2.03                        756.590                       (RUNOFF)

   TIME                                HYDROGRAPH, TZERO=   0.00        DELTA T= 0.20        DRAINAGE AREA=   2.30
   0.00    DISCHG        0.00      1.21      3.58     45.21     90.94    204.21    320.73    471.85    614.62    692.78
   2.00    DISCHG      755.30    723.93    684.03    602.86    521.62    440.11    364.13    306.81    253.98    214.17
   4.00    DISCHG      177.42    148.37    121.96    101.29     83.20     70.04     58.17     48.50     39.94     33.03
   6.00    DISCHG       27.09     22.44     18.55     15.55     12.99     10.89      8.85      6.87      4.99      3.20
   8.00    DISCHG        1.81      0.72      0.20      0.05      0.00

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=   1.1221        CFS-HRS=     1665.67        ACRE-FT=     137.65


SUBROUTINE REACH     CROSS SECTION  20
           LENGTH=   1300.00     INPUT COEFFICIENT=  0.0000     INPUT ROUTINGS=  0.00

           AVERAGE WATER VELOCITY=   7.381       ROUTING COEFF= 0.8300       MODIFIED COEFFICIENT= 0.9998

           PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
               2.06                        747.173                        4.44


SUBROUTINE RUNOFF    CROSS SECTION  20
           AREA=   0.24     INPUT RUNOFF CURVE=  83.0     TIME OF CONCENTRATION=  0.94
           COMPUTED CURVE NO. =   83.0

           PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
               1.21                        160.917                       (RUNOFF)

   TIME                                HYDROGRAPH, TZERO=   0.20        DELTA T= 0.20        DRAINAGE AREA=   0.24
   0.20    DISCHG        0.00      1.95     19.81     71.28    136.20    160.84    141.31    102.55     68.35     44.19
   2.20    DISCHG       28.02     17.68     11.17      7.08      4.48      2.81      1.55      0.64      0.17      0.02
   4.20    DISCHG        0.00

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=   1.0582        CFS-HRS=      163.90        ACRE-FT=      13.54


SUBROUTINE ADDHYD    CROSS SECTION  20
           INPUT HYDROGRAPHS= 1,2     OUTPUT HYDROGRAPH= 3

           PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
               2.01                        787.097                        4.56


SUBROUTINE REACH     CROSS SECTION  30
```

LENGTH= 3300.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 7.475 ROUTING COEFF= 0.8337 MODIFIED COEFFICIENT= 0.9701

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.13	774.812	4.53

SUBROUTINE RUNOFF CROSS SECTION 30

AREA= 2.35 INPUT RUNOFF CURVE= 85.0 TIME OF CONCENTRATION= 2.39

COMPUTED CURVE NO. = 85.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.07	779.084	(RUNOFF)

HYDROGRAPH, TZERO= 0.00 DELTA T= 0.20 DRAINAGE AREA= 2.35

TIME											
0.00	DISCHG	0.00	2.18	4.36	46.72	91.12	200.08	315.97	461.01	611.03	699.31
2.00	DISCHG	772.72	763.97	728.88	660.54	578.53	497.36	416.63	350.86	294.61	247.96
4.00	DISCHG	208.77	175.02	146.41	121.67	101.38	84.17	71.27	59.60	50.07	41.41
6.00	DISCHG	34.63	28.44	23.88	19.69	16.75	13.96	11.88	9.81	7.84	5.88
8.00	DISCHG	4.11	2.36	1.31	0.27	0.13	0.00	0.00			

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 1.1848 CFS-HRS= 1796.94 ACRE-FT= 148.49

SUBROUTINE ADDHYD CROSS SECTION 30

INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 3

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.09	1552.154	6.38

SUBROUTINE REACH CROSS SECTION 40

LENGTH= 4500.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 9.130 ROUTING COEFF= 0.8600 MODIFIED COEFFICIENT= 0.9645

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.24	1536.935	6.35

SUBROUTINE RUNOFF CROSS SECTION 40

AREA= 1.06 INPUT RUNOFF CURVE= 84.0 TIME OF CONCENTRATION= 1.64

COMPUTED CURVE NO. = 84.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
1.60	457.442	(RUNOFF)

HYDROGRAPH, TZERO= 0.20 DELTA T= 0.20 DRAINAGE AREA= 1.06

TIME											
0.20	DISCHG	0.00	12.52	43.29	115.71	225.45	337.59	436.59	457.43	437.65	384.76
2.20	DISCHG	312.43	248.05	192.38	148.13	116.07	89.48	67.91	52.67	40.88	31.35
4.20	DISCHG	23.87	18.44	14.11	10.76	8.44	6.42	4.59	2.88	1.55	0.63
6.20	DISCHG	0.13	0.03	0.00							

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 1.1225 CFS-HRS= 767.90 ACRE-FT= 63.45

```
SUBROUTINE ADDHYD    CROSS SECTION  40
           INPUT HYDROGRAPHS= 1,2     OUTPUT HYDROGRAPH= 3

           PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
               2.10                        1856.357                        7.05


SUBROUTINE RUNOFF    CROSS SECTION  50
           AREA=   1.04     INPUT RUNOFF CURVE=  86.0     TIME OF CONCENTRATION=  1.34
           COMPUTED CURVE NO. =   86.0

           PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
               1.44                        623.421                       (RUNOFF)

     TIME                          HYDROGRAPH, TZERO=   0.20        DELTA T= 0.20        DRAINAGE AREA=   1.04
     0.20    DISCHG        0.00      8.38     60.03    179.99    355.81    529.86    619.90    588.36    486.13    373.99
     2.20    DISCHG      278.39    204.73    149.42    107.99     77.49     56.82     41.51     30.06     21.67     15.70
     4.20    DISCHG       11.45      8.16      5.21      2.65      0.98      0.26      0.04      0.00

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=   1.2559        CFS-HRS=      842.94        ACRE-FT=      69.66


SUBROUTINE RUNOFF    CROSS SECTION  60
           AREA=   1.37     INPUT RUNOFF CURVE=  86.0     TIME OF CONCENTRATION=  1.41
           COMPUTED CURVE NO. =   86.0

           PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
               1.47                        770.083                       (RUNOFF)

     TIME                          HYDROGRAPH, TZERO=   0.20        DELTA T= 0.20        DRAINAGE AREA=   1.37
     0.20    DISCHG        0.00     14.26     77.72    213.85    421.40    650.71    760.96    746.23    649.37    516.60
     2.20    DISCHG      387.70    289.22    217.12    161.24    118.58     86.88     64.08     47.35     34.89     25.61
     4.20    DISCHG       18.86     13.95     10.10      6.64      3.63      1.49      0.36      0.04      0.00      0.00

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=   1.2536        CFS-HRS=     1108.41        ACRE-FT=      91.59


SUBROUTINE ADDHYD    CROSS SECTION  60
           INPUT HYDROGRAPHS= 5,6     OUTPUT HYDROGRAPH= 7

           PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
               1.46                       1392.886                       (NULL)


SUBROUTINE REACH     CROSS SECTION  70
           LENGTH=   5300.00     INPUT COEFFICIENT=  0.7600     INPUT ROUTINGS=  0.00

           AVERAGE WATER VELOCITY=   5.000       ROUTING COEFF= 0.7600       MODIFIED COEFFICIENT= 0.7207

           PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
               1.77                       1317.708                       (NULL)


SUBROUTINE RUNOFF    CROSS SECTION  70
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```
AREA=   3.20      INPUT RUNOFF CURVE=  85.0      TIME OF CONCENTRATION=  2.17
COMPUTED CURVE NO. =   85.0

PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
    1.93                          1148.857                      (RUNOFF)

TIME                          HYDROGRAPH, TZERO=   0.00      DELTA T= 0.20        DRAINAGE AREA=   3.20
0.00    DISCHG        0.00      1.41     11.73     76.76    174.55    356.60    566.61    815.22   1000.66   1136.47
2.00    DISCHG     1146.02   1101.46    983.64    851.86    716.68    586.07    489.62    400.88    334.10    274.57
4.00    DISCHG      225.93    184.82    150.13    123.94    101.73     84.49     68.33     56.55     45.34     37.51
6.00    DISCHG       30.35     25.31     20.84     17.32     13.93     10.66      7.58      4.60      2.52      0.67
8.00    DISCHG        0.27      0.00

TOTAL WATER, IN INCHES ON DRAINAGE AREA=   1.1869        CFS-HRS=      2451.36        ACRE-FT=      202.58

SUBROUTINE ADDHYD    CROSS SECTION  70
INPUT HYDROGRAPHS= 5,6     OUTPUT HYDROGRAPH= 7

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 6 AND 5 WAS TRUNCATED HERE TO 100 VALUES.

PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
    1.83                          2456.092                      (NULL)

SUBROUTINE REACH     CROSS SECTION  80
LENGTH=   5200.00     INPUT COEFFICIENT=  0.5400     INPUT ROUTINGS=  0.00

AVERAGE WATER VELOCITY=   2.000       ROUTING COEFF= 0.5400       MODIFIED COEFFICIENT= 0.3284

PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
    2.57                          1992.076                      (NULL)

SUBROUTINE RUNOFF    CROSS SECTION  80
AREA=   0.72      INPUT RUNOFF CURVE=  84.0      TIME OF CONCENTRATION=  1.03
COMPUTED CURVE NO. =   84.0

PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
    1.25                          474.561                       (RUNOFF)

TIME                          HYDROGRAPH, TZERO=   0.20      DELTA T= 0.20        DRAINAGE AREA=   0.72
0.20    DISCHG        0.00      7.16     61.96    200.81    374.36    469.51    444.14    344.56    241.38    163.20
2.20    DISCHG      108.40     71.54     47.21     30.87     20.04     13.26      8.80      5.39      2.63      0.90
4.20    DISCHG        0.20      0.00      0.00

TOTAL WATER, IN INCHES ON DRAINAGE AREA=   1.1258        CFS-HRS=       523.15        ACRE-FT=       43.23

SUBROUTINE ADDHYD    CROSS SECTION  80
INPUT HYDROGRAPHS= 5,6     OUTPUT HYDROGRAPH= 7

PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
    2.53                          2044.176                      (NULL)
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SUBROUTINE ADDHYD     CROSS SECTION  80
           INPUT HYDROGRAPHS= 3,7      OUTPUT HYDROGRAPH= 1

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 3 AND 7 WAS TRUNCATED HERE TO 100 VALUES.

           PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
               2.36                          3775.828                       (NULL)


SUBROUTINE REACH      CROSS SECTION  89
           LENGTH=    3000.00      INPUT COEFFICIENT=  0.0000      INPUT ROUTINGS=  0.00

           AVERAGE WATER VELOCITY=    9.979        ROUTING COEFF= 0.8789        MODIFIED COEFFICIENT= 0.9968

           PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
               2.44                          3754.040                        7.08


SUBROUTINE RUNOFF     CROSS SECTION  89
           AREA=    0.95      INPUT RUNOFF CURVE=  77.0      TIME OF CONCENTRATION=  0.89
           COMPUTED CURVE NO. =    77.0

           PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
               1.20                          471.213                      (RUNOFF)

   TIME                                HYDROGRAPH, TZERO=    0.20        DELTA T= 0.20        DRAINAGE AREA=    0.95
   0.20    DISCHG        0.00       1.99      41.83     198.79     393.68     471.11     404.34     285.46     183.92     114.01
   2.20    DISCHG       71.20      44.04      26.70      16.62      10.30       5.91       2.66       0.81       0.13       0.00

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=    0.7421        CFS-HRS=       454.99        ACRE-FT=       37.60


SUBROUTINE ADDHYD     CROSS SECTION  89
           INPUT HYDROGRAPHS= 1,2      OUTPUT HYDROGRAPH= 3

           PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
               2.42                          3794.542                        7.13


SUBROUTINE REACH      CROSS SECTION  90
           LENGTH=       1.00      INPUT COEFFICIENT=  0.0000      INPUT ROUTINGS=  0.00

           AVERAGE WATER VELOCITY=    9.966        ROUTING COEFF= 0.8783        MODIFIED COEFFICIENT= 1.0000

           PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
               2.42                          3794.508                        7.13

   TIME                                HYDROGRAPH, TZERO=    0.00        DELTA T= 0.20        DRAINAGE AREA=   13.22
   0.00    DISCHG        0.00       0.66      17.61     139.28     529.94    1137.52    1729.19    2192.28    2578.01    2978.81
   2.00    DISCHG     3373.17    3673.69    3793.24    3718.69    3482.36    3140.68    2750.75    2353.80    1986.28    1661.70
   4.00    DISCHG     1381.93    1144.42     944.12     775.89     635.23     519.37     424.75     347.57     283.50     230.31
   6.00    DISCHG      186.43     150.86     122.36      99.70      81.63      67.19      55.37      45.38      36.52      28.40
   8.00    DISCHG       21.06      14.60       9.38       5.61       3.14       1.81       1.11       0.71       0.47       0.32
  10.00    DISCHG        0.21       0.14       0.09       0.06       0.04       0.02       0.01       0.01       0.00       0.00
  12.00    DISCHG        0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00
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14.00    DISCHG        0.00       0.00
         TOTAL WATER, IN INCHES ON DRAINAGE AREA=   1.1444        CFS-HRS=     9771.62        ACRE-FT=     807.52
ENDCMP 1
```

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EXECUTIVE CONTROL CARD              OPERATION  COMPUT,     FROM XSECTN/STRUCT  10/  0     TO XSECTN/STRUCT  90/  0
        STARTING TIME=  0.00     RAIN DEPTH=  2.62     RAIN DURATION=  2.00     RAIN TABLE NO.= 4     SOIL CONDITION= 2
        ALTERNATE NO.= 0         STORM NO.= 0


SUBROUTINE RUNOFF    CROSS SECTION  10
           AREA=   2.30     INPUT RUNOFF CURVE=  84.0     TIME OF CONCENTRATION=  2.30
           COMPUTED CURVE NO. =   84.0

           PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
               2.68                        753.702                       (RUNOFF)

   TIME                                HYDROGRAPH, TZERO=   0.40        DELTA T= 0.20        DRAINAGE AREA=   2.30
   0.40    DISCHG          0.00      1.57      4.87     37.27     74.96    169.05    268.56    410.11    546.36    650.82
   2.40    DISCHG        739.59    752.48    751.29    693.78    630.50    547.77    468.07    397.13    331.45    278.91
   4.40    DISCHG        231.13    193.69    159.95    133.29    109.86     91.90     76.06     63.41     52.37     43.50
   6.40    DISCHG         35.86     29.68     24.51     20.40     16.96     14.15     11.62      9.31      7.16      5.14
   8.40    DISCHG          3.47      2.03      1.13      0.55      0.24      0.07      0.01      0.00      0.00

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=   1.2250        CFS-HRS=     1818.44        ACRE-FT=     150.27


SUBROUTINE REACH     CROSS SECTION  20
           LENGTH=   1300.00     INPUT COEFFICIENT=  0.0000     INPUT ROUTINGS=  0.00

           AVERAGE WATER VELOCITY=   7.300       ROUTING COEFF= 0.8300       MODIFIED COEFFICIENT= 0.9998

           PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
               2.70                        756.697                         4.47


SUBROUTINE RUNOFF    CROSS SECTION  20
           AREA=   0.24     INPUT RUNOFF CURVE=  83.0     TIME OF CONCENTRATION=  0.94
           COMPUTED CURVE NO. =   83.0

           PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
               1.74                        143.810                       (RUNOFF)

   TIME                                HYDROGRAPH, TZERO=   0.80        DELTA T= 0.20        DRAINAGE AREA=   0.24
   0.80    DISCHG          0.00     10.85     44.41     96.81    138.03    142.96    125.84    103.31     80.21     57.22
   2.80    DISCHG         38.07     24.42     15.38      9.70      6.18      3.81      2.12      1.06      0.54      0.25
   4.80    DISCHG          0.09      0.01      0.00

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=   1.1636        CFS-HRS=      180.24        ACRE-FT=      14.89


SUBROUTINE ADDHYD    CROSS SECTION  20
           INPUT HYDROGRAPHS= 1,2     OUTPUT HYDROGRAPH= 3

           PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
               2.54                        807.824                         4.63


SUBROUTINE REACH     CROSS SECTION  30
```

LENGTH= 3300.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 7.519 ROUTING COEFF= 0.8359 MODIFIED COEFFICIENT= 0.9712

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.67	806.516	4.63

SUBROUTINE RUNOFF CROSS SECTION 30

AREA= 2.35 INPUT RUNOFF CURVE= 85.0 TIME OF CONCENTRATION= 2.39

COMPUTED CURVE NO. = 85.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.71	791.114	(RUNOFF)

HYDROGRAPH, TZERO= 0.40 DELTA T= 0.20 DRAINAGE AREA= 2.35

TIME											
0.40	DISCHG	0.00	2.50	5.13	38.89	76.00	167.55	268.38	403.89	547.76	656.54
2.40	DISCHG	754.06	784.27	786.80	745.42	681.42	605.21	521.24	445.74	376.82	317.47
4.40	DISCHG	267.17	223.66	187.94	156.52	131.11	108.79	91.78	76.35	64.28	53.19
6.40	DISCHG	44.75	36.87	31.00	25.47	21.59	17.86	15.18	12.54	10.28	8.04
8.40	DISCHG	6.06	4.09	2.72	1.36	0.81	0.32	0.15	0.02	0.00	

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 1.2904 CFS-HRS= 1957.04 ACRE-FT= 161.73

SUBROUTINE ADDHYD CROSS SECTION 30

INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 3

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.69	1595.329	6.48

SUBROUTINE REACH CROSS SECTION 40

LENGTH= 4500.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 9.178 ROUTING COEFF= 0.8600 MODIFIED COEFFICIENT= 0.9651

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.81	1585.281	6.46

SUBROUTINE RUNOFF CROSS SECTION 40

AREA= 1.06 INPUT RUNOFF CURVE= 84.0 TIME OF CONCENTRATION= 1.64

COMPUTED CURVE NO. = 84.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.21	457.462	(RUNOFF)

HYDROGRAPH, TZERO= 0.60 DELTA T= 0.20 DRAINAGE AREA= 1.06

TIME											
0.60	DISCHG	0.00	3.21	25.59	71.76	148.17	259.35	357.66	434.89	457.40	439.50
2.60	DISCHG	398.74	339.83	278.84	223.23	173.96	135.37	104.95	80.41	61.77	48.15
4.60	DISCHG	36.97	28.00	21.67	16.75	12.83	9.84	7.43	5.29	3.41	2.04
6.60	DISCHG	1.13	0.54	0.23	0.08	0.01	0.00				

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 1.2254 CFS-HRS= 838.32 ACRE-FT= 69.27

```
SUBROUTINE ADDHYD    CROSS SECTION  40
           INPUT HYDROGRAPHS= 1,2     OUTPUT HYDROGRAPH= 3

           PEAK TIMES                 PEAK DISCHARGES              PEAK ELEVATIONS
               2.67                       1947.686                       7.25


SUBROUTINE RUNOFF    CROSS SECTION  50
           AREA=   1.04     INPUT RUNOFF CURVE=  86.0     TIME OF CONCENTRATION=  1.34
           COMPUTED CURVE NO. =   86.0

           PEAK TIMES                 PEAK DISCHARGES              PEAK ELEVATIONS
               2.00                       575.504                     (RUNOFF)

  TIME                          HYDROGRAPH, TZERO=   0.60      DELTA T= 0.20        DRAINAGE AREA=   1.04
  0.60    DISCHG        0.00      8.29     40.93    121.22    259.23    427.79    541.93    575.46    546.18    478.82
  2.60    DISCHG      395.40    311.17    234.62    172.74    126.42     92.54     67.52     48.90     35.20     25.35
  4.60    DISCHG       18.36     13.32      9.24      5.91      3.40      1.78      0.88      0.37      0.10      0.01
  6.60    DISCHG        0.00

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=   1.3601       CFS-HRS=      912.92       ACRE-FT=      75.44


SUBROUTINE RUNOFF    CROSS SECTION  60
           AREA=   1.37     INPUT RUNOFF CURVE=  86.0     TIME OF CONCENTRATION=  1.41
           COMPUTED CURVE NO. =   86.0

           PEAK TIMES                 PEAK DISCHARGES              PEAK ELEVATIONS
               2.06                       732.839                     (RUNOFF)

  TIME                          HYDROGRAPH, TZERO=   0.40      DELTA T= 0.20        DRAINAGE AREA=   1.37
  0.40    DISCHG        0.00      1.12     11.11     45.92    137.81    311.83    504.43    655.18    727.76    714.32
  2.40    DISCHG      637.89    535.39    431.56    335.65    253.08    186.44    138.12    103.12     76.41     56.10
  4.40    DISCHG       40.94     29.91     22.29     16.41     11.57      7.56      4.40      2.26      1.22      0.57
  6.40    DISCHG        0.21      0.04      0.00

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=   1.3576       CFS-HRS=     1200.35       ACRE-FT=      99.19


SUBROUTINE ADDHYD    CROSS SECTION  60
           INPUT HYDROGRAPHS= 5,6     OUTPUT HYDROGRAPH= 7

           PEAK TIMES                 PEAK DISCHARGES              PEAK ELEVATIONS
               2.04                       1306.597                      (NULL)


SUBROUTINE REACH     CROSS SECTION  70
           LENGTH=   5300.00     INPUT COEFFICIENT=  0.7600     INPUT ROUTINGS=  0.00

           AVERAGE WATER VELOCITY=   5.000      ROUTING COEFF= 0.7600      MODIFIED COEFFICIENT= 0.7207

           PEAK TIMES                 PEAK DISCHARGES              PEAK ELEVATIONS
               2.35                       1257.530                      (NULL)
```

```
SUBROUTINE RUNOFF     CROSS SECTION  70
           AREA=    3.20      INPUT RUNOFF CURVE=  85.0      TIME OF CONCENTRATION=  2.17
           COMPUTED CURVE NO. =    85.0

           PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
               2.57                          1173.443                      (RUNOFF)

  TIME                                HYDROGRAPH, TZERO=    0.40        DELTA T= 0.20        DRAINAGE AREA=    3.20
  0.40     DISCHG          0.00       2.06      16.00      61.10     145.95     285.69     471.06     692.28     884.81    1065.05
  2.40     DISCHG       1129.75    1172.43    1099.41    1017.80     890.52     765.39     646.41     538.53     447.31     369.62
  4.40     DISCHG        303.46     250.36     203.40     168.76     136.81     114.09      92.42      76.67      62.08      51.19
  6.40     DISCHG         41.64      34.30      28.18      23.19      18.88      14.92      11.38       7.96       5.38       2.97
  8.40     DISCHG          1.80       0.81       0.41       0.13       0.04       0.00

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=    1.2956        CFS-HRS=      2675.73        ACRE-FT=      221.12

SUBROUTINE ADDHYD     CROSS SECTION  70
           INPUT HYDROGRAPHS= 5,6      OUTPUT HYDROGRAPH= 7

           PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
               2.43                          2386.104                      (NULL)

SUBROUTINE REACH      CROSS SECTION  80
           LENGTH=    5200.00      INPUT COEFFICIENT=  0.5400      INPUT ROUTINGS=  0.00

           AVERAGE WATER VELOCITY=    2.000        ROUTING COEFF= 0.5400        MODIFIED COEFFICIENT= 0.3284

           PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
               3.17                          2023.951                      (NULL)

SUBROUTINE RUNOFF     CROSS SECTION  80
           AREA=    0.72      INPUT RUNOFF CURVE=  84.0      TIME OF CONCENTRATION=  1.03
           COMPUTED CURVE NO. =    84.0

           PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
               1.80                          430.044                       (RUNOFF)

  TIME                                HYDROGRAPH, TZERO=    0.60        DELTA T= 0.20        DRAINAGE AREA=    0.72
  0.60     DISCHG          0.00       4.51      33.39     121.30     266.79     393.39     430.01     396.93     335.31     267.77
  2.60     DISCHG        199.90     139.02      92.53      61.65      40.88      26.96      17.77      11.50       6.90       3.67
  4.60     DISCHG          1.86       0.94       0.40       0.12       0.01       0.00

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=    1.2285        CFS-HRS=       570.85        ACRE-FT=       47.17

SUBROUTINE ADDHYD     CROSS SECTION  80
           INPUT HYDROGRAPHS= 5,6      OUTPUT HYDROGRAPH= 7

           PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
               3.11                          2092.992                      (NULL)
```

```
SUBROUTINE ADDHYD     CROSS SECTION  80
          INPUT HYDROGRAPHS= 3,7      OUTPUT HYDROGRAPH= 1

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 3 AND 7 WAS TRUNCATED HERE TO 100 VALUES.

          PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
              2.93                          3921.208                       (NULL)


SUBROUTINE REACH      CROSS SECTION  89
          LENGTH=    3000.00      INPUT COEFFICIENT=  0.0000      INPUT ROUTINGS=  0.00

          AVERAGE WATER VELOCITY=  10.070        ROUTING COEFF= 0.8800        MODIFIED COEFFICIENT= 0.9970

          PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
              3.00                          3900.617                        7.24


SUBROUTINE RUNOFF     CROSS SECTION  89
          AREA=    0.95      INPUT RUNOFF CURVE=  77.0      TIME OF CONCENTRATION=  0.89
          COMPUTED CURVE NO. =   77.0

          PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
              1.76                          412.353                      (RUNOFF)

   TIME                              HYDROGRAPH, TZERO=   0.60        DELTA T= 0.20        DRAINAGE AREA=   0.95
   0.60    DISCHG        0.00      1.02      21.02     106.35     266.37     388.93     411.41     366.48     305.22     236.10
   2.60    DISCHG      162.63    104.59      65.06      39.68      24.73      15.18       8.61       4.47       2.25       1.05
   4.60    DISCHG        0.38      0.07       0.00       0.00

          TOTAL WATER, IN INCHES ON DRAINAGE AREA=   0.8254        CFS-HRS=       506.09        ACRE-FT=       41.82


SUBROUTINE ADDHYD     CROSS SECTION  89
          INPUT HYDROGRAPHS= 1,2      OUTPUT HYDROGRAPH= 3

          PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
              2.96                          3967.979                        7.31


SUBROUTINE REACH      CROSS SECTION  90
          LENGTH=       1.00      INPUT COEFFICIENT=  0.0000      INPUT ROUTINGS=  0.00

          AVERAGE WATER VELOCITY=  10.175        ROUTING COEFF= 0.8800        MODIFIED COEFFICIENT= 1.0000

          PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
              2.96                          3967.868                        7.31

   TIME                              HYDROGRAPH, TZERO=   0.40        DELTA T= 0.20        DRAINAGE AREA=  13.22
   0.40    DISCHG        0.00      0.78       9.50      81.95     326.18     799.93    1381.60    1918.25    2412.03    2898.28
   2.40    DISCHG     3343.83   3701.70    3913.79    3965.62    3858.42    3619.90    3289.43    2908.46    2517.91    2145.39
   4.40    DISCHG     1807.46   1510.16    1253.30    1035.41     851.78     698.87     572.44     468.73     382.93     311.93
   6.40    DISCHG      253.41    205.69     166.91     135.62     110.48      90.35      74.06      60.64      49.21      39.18
```

8.40	DISCHG	30.33	22.54	15.99	10.80	6.95	4.35	2.67	1.61	0.98	0.62
10.40	DISCHG	0.41	0.27	0.18	0.12	0.08	0.05	0.03	0.02	0.01	0.01
12.40	DISCHG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14.40	DISCHG	0.00	0.00	0.00	0.00						

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 1.2478 CFS-HRS= 10654.27 ACRE-FT= 880.46

ENDCMP 1

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EXECUTIVE CONTROL CARD              OPERATION  COMPUT,     FROM XSECTN/STRUCT  10/  0     TO XSECTN/STRUCT  90/  0
        STARTING TIME=  0.00     RAIN DEPTH=  2.78     RAIN DURATION=  3.00     RAIN TABLE NO.= 4     SOIL CONDITION= 2
        ALTERNATE NO.= 0         STORM NO.= 0


SUBROUTINE RUNOFF    CROSS SECTION  10
           AREA=   2.30     INPUT RUNOFF CURVE=  84.0     TIME OF CONCENTRATION=  2.30
           COMPUTED CURVE NO. =   84.0

           PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
              3.21                        772.322                        (RUNOFF)

   TIME                                HYDROGRAPH, TZERO=   0.80        DELTA T= 0.20        DRAINAGE AREA=   2.30
   0.80    DISCHG        0.00      2.07      6.00     30.85     61.74    139.51    224.40    351.96    477.55    593.65
   2.80    DISCHG      695.75    741.87    772.17    749.11    716.06    654.19    589.41    517.33    447.58    382.92
   4.80    DISCHG      322.89    271.73    225.69    188.29    155.60    129.97    107.69     89.86     74.40     61.73
   6.80    DISCHG       50.97     42.22     34.93     29.03     24.11     20.03     16.52     13.44     10.70      8.19
   8.80    DISCHG        6.09      4.22      2.90      1.86      1.20      0.71      0.41      0.18      0.08      0.01
  10.80    DISCHG        0.00

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=   1.3541        CFS-HRS=     2010.00        ACRE-FT=     166.10


SUBROUTINE REACH     CROSS SECTION  20
           LENGTH=   1300.00     INPUT COEFFICIENT=  0.0000     INPUT ROUTINGS=  0.00

           AVERAGE WATER VELOCITY=   7.463       ROUTING COEFF= 0.8331       MODIFIED COEFFICIENT= 0.9998

           PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
              3.24                        767.291                          4.50


SUBROUTINE RUNOFF    CROSS SECTION  20
           AREA=   0.24     INPUT RUNOFF CURVE=  83.0     TIME OF CONCENTRATION=  0.94
           COMPUTED CURVE NO. =   83.0

           PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
              2.26                        136.394                        (RUNOFF)

   TIME                                HYDROGRAPH, TZERO=   1.00        DELTA T= 0.20        DRAINAGE AREA=   0.24
   1.00    DISCHG        0.00      1.77      9.21     30.98     72.47    114.55    135.03    130.90    112.81     93.38
   3.00    DISCHG       77.28     64.21     51.22     37.18     24.77     15.76      9.90      6.14      3.65      2.10
   5.00    DISCHG        1.19      0.68      0.37      0.18      0.06      0.01      0.00

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=   1.2859        CFS-HRS=      199.17        ACRE-FT=      16.46


SUBROUTINE ADDHYD    CROSS SECTION  20
           INPUT HYDROGRAPHS= 1,2     OUTPUT HYDROGRAPH= 3

           PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
              3.18                        830.344                          4.70


SUBROUTINE REACH     CROSS SECTION  30
```

LENGTH= 3300.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 7.587 ROUTING COEFF= 0.8393 MODIFIED COEFFICIENT= 0.9728

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
3.29	822.622	4.68

SUBROUTINE RUNOFF CROSS SECTION 30

AREA= 2.35 INPUT RUNOFF CURVE= 85.0 TIME OF CONCENTRATION= 2.39

COMPUTED CURVE NO. = 85.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
3.25	800.411	(RUNOFF)

HYDROGRAPH, TZERO= 0.80 DELTA T= 0.20 DRAINAGE AREA= 2.35

TIME											
0.80	DISCHG	0.00	2.93	6.17	33.71	65.40	142.95	231.57	353.86	486.94	602.20
2.80	DISCHG	710.12	767.51	798.85	790.08	755.83	702.69	634.88	564.82	492.61	425.21
4.80	DISCHG	363.33	307.29	259.42	216.50	182.04	151.08	127.56	105.95	89.45	74.03
6.80	DISCHG	62.35	51.31	43.29	35.61	30.18	24.88	21.12	17.38	14.47	11.55
8.80	DISCHG	9.15	6.76	5.00	3.29	2.30	1.42	0.93	0.52	0.30	0.12
10.80	DISCHG	0.05	0.01	0.00							

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 1.4225 CFS-HRS= 2157.46 ACRE-FT= 178.29

SUBROUTINE ADDHYD CROSS SECTION 30

INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 3

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
3.27	1622.720	6.54

SUBROUTINE REACH CROSS SECTION 40

LENGTH= 4500.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 9.238 ROUTING COEFF= 0.8619 MODIFIED COEFFICIENT= 0.9664

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
3.40	1612.597	6.52

SUBROUTINE RUNOFF CROSS SECTION 40

AREA= 1.06 INPUT RUNOFF CURVE= 84.0 TIME OF CONCENTRATION= 1.64

COMPUTED CURVE NO. = 84.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.76	451.133	(RUNOFF)

HYDROGRAPH, TZERO= 1.00 DELTA T= 0.20 DRAINAGE AREA= 1.06

TIME											
1.00	DISCHG	0.00	5.36	15.37	55.08	120.22	207.34	310.83	388.90	438.54	450.55
3.00	DISCHG	425.41	389.64	346.27	300.20	253.47	207.73	164.62	129.65	100.42	76.76
5.00	DISCHG	59.73	46.20	35.26	26.91	20.94	16.09	12.18	9.11	6.52	4.38
7.00	DISCHG	2.81	1.85	1.17	0.69	0.39	0.19	0.05	0.00	0.00	

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 1.3541 CFS-HRS= 926.36 ACRE-FT= 76.55

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SUBROUTINE ADDHYD    CROSS SECTION  40
           INPUT HYDROGRAPHS= 1,2     OUTPUT HYDROGRAPH= 3

           PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
               3.27                        1972.512                       7.31


SUBROUTINE RUNOFF    CROSS SECTION  50
           AREA=   1.04     INPUT RUNOFF CURVE=  86.0     TIME OF CONCENTRATION=  1.34
           COMPUTED CURVE NO. =   86.0

           PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
               2.52                        550.505                     (RUNOFF)

   TIME                            HYDROGRAPH, TZERO=   0.80        DELTA T= 0.20        DRAINAGE AREA=   1.04
   0.80    DISCHG        0.00      1.99      9.66     32.84     93.13    208.97    351.18    473.23    541.24    547.53
   2.80    DISCHG      508.26    448.98    389.53    331.80    272.31    213.89    161.52    118.76     86.08     62.22
   4.80    DISCHG       45.42     33.11     24.00     17.13     11.81      7.70      4.76      2.92      1.85      1.12
   6.80    DISCHG        0.61      0.27      0.07      0.00      0.00

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=   1.4912        CFS-HRS=     1000.88        ACRE-FT=      82.71


SUBROUTINE RUNOFF    CROSS SECTION  60
           AREA=   1.37     INPUT RUNOFF CURVE=  86.0     TIME OF CONCENTRATION=  1.41
           COMPUTED CURVE NO. =   86.0

           PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
               2.55                        705.374                     (RUNOFF)

   TIME                            HYDROGRAPH, TZERO=   0.80        DELTA T= 0.20        DRAINAGE AREA=   1.37
   0.80    DISCHG        0.00      2.14      9.09     40.98    119.75    250.86    417.83    584.83    689.35    704.07
   2.80    DISCHG      666.14    599.64    523.22    447.68    373.04    299.73    232.84    175.85    130.31     95.51
   4.80    DISCHG       70.99     52.66     38.85     28.47     20.55     14.29      9.59      6.18      3.88      2.41
   6.80    DISCHG        1.45      0.81      0.40      0.15      0.03      0.00

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=   1.4959        CFS-HRS=     1322.67        ACRE-FT=     109.30


SUBROUTINE ADDHYD    CROSS SECTION  60
           INPUT HYDROGRAPHS= 5,6     OUTPUT HYDROGRAPH= 7

           PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
               2.54                       1255.621                      (NULL)


SUBROUTINE REACH     CROSS SECTION  70
           LENGTH=   5300.00     INPUT COEFFICIENT=  0.7600     INPUT ROUTINGS=  0.00

           AVERAGE WATER VELOCITY=   5.000       ROUTING COEFF= 0.7600       MODIFIED COEFFICIENT= 0.7207

           PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
               2.85                       1219.870                      (NULL)
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SUBROUTINE RUNOFF    CROSS SECTION  70
           AREA=   3.20     INPUT RUNOFF CURVE=  85.0     TIME OF CONCENTRATION=  2.17
           COMPUTED CURVE NO. =   85.0

           PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
               3.07                        1179.961                      (RUNOFF)

   TIME                                HYDROGRAPH, TZERO=   0.80        DELTA T= 0.20        DRAINAGE AREA=   3.20
   0.80    DISCHG          0.00       3.03      16.58      45.58     116.86     221.36     386.67     578.03     776.92     977.24
   2.80    DISCHG       1083.04    1172.86    1159.67    1127.94    1043.40     947.44     834.35     723.35     614.14     517.93
   4.80    DISCHG        427.84     356.05     288.28     240.50     195.01     162.70     132.62     109.59      89.22      73.16
   6.80    DISCHG         59.84      49.03      40.43      32.97      27.12      21.67      17.22      12.92       9.56       6.49
   8.80    DISCHG          4.44       2.78       1.80       1.05       0.55       0.25       0.06       0.01       0.00       0.00

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=   1.4264        CFS-HRS=      2945.84        ACRE-FT=      243.44

SUBROUTINE ADDHYD    CROSS SECTION  70
           INPUT HYDROGRAPHS= 5,6     OUTPUT HYDROGRAPH= 7

           PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
               2.97                        2366.320                      (NULL)


SUBROUTINE REACH     CROSS SECTION  80
           LENGTH=   5200.00     INPUT COEFFICIENT=  0.5400     INPUT ROUTINGS=  0.00

           AVERAGE WATER VELOCITY=   2.000       ROUTING COEFF= 0.5400       MODIFIED COEFFICIENT= 0.3284

           PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
               3.76                        2042.041                      (NULL)


SUBROUTINE RUNOFF    CROSS SECTION  80
           AREA=   0.72     INPUT RUNOFF CURVE=  84.0     TIME OF CONCENTRATION=  1.03
           COMPUTED CURVE NO. =   84.0

           PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
               2.31                        404.474                       (RUNOFF)

   TIME                                HYDROGRAPH, TZERO=   1.00        DELTA T= 0.20        DRAINAGE AREA=   0.72
   1.00    DISCHG          0.00       5.46      25.55      86.76     199.97     323.10     396.49     400.65     359.16     304.13
   3.00    DISCHG        254.77     214.11     173.90     130.76      91.05      60.67      39.99      26.16      16.74      10.40
   5.00    DISCHG          6.26       3.69       2.15       1.23       0.65       0.26       0.06       0.00

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=   1.3491        CFS-HRS=       626.89        ACRE-FT=       51.80

SUBROUTINE ADDHYD    CROSS SECTION  80
           INPUT HYDROGRAPHS= 5,6     OUTPUT HYDROGRAPH= 7

           PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
               3.66                        2150.541                      (NULL)
```

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SUBROUTINE ADDHYD    CROSS SECTION  80
           INPUT HYDROGRAPHS= 3,7     OUTPUT HYDROGRAPH= 1

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 3 AND 7 WAS TRUNCATED HERE TO 100 VALUES.

           PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
               3.49                        4051.872                     (NULL)


SUBROUTINE REACH     CROSS SECTION  89
           LENGTH=   3000.00     INPUT COEFFICIENT=  0.0000     INPUT ROUTINGS=  0.00

           AVERAGE WATER VELOCITY=  10.264       ROUTING COEFF= 0.8800       MODIFIED COEFFICIENT= 0.9973

           PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
               3.57                        4029.163                       7.38


SUBROUTINE RUNOFF    CROSS SECTION  89
           AREA=   0.95     INPUT RUNOFF CURVE=  77.0     TIME OF CONCENTRATION=  0.89
           COMPUTED CURVE NO. =   77.0

           PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
               2.27                        399.646                     (RUNOFF)

   TIME                              HYDROGRAPH, TZERO=   1.20        DELTA T= 0.20        DRAINAGE AREA=   0.95
   1.20    DISCHG        0.00      12.28      68.76     188.92     326.89     394.24     384.58     333.51     277.86     232.99
   3.20    DISCHG      196.80     156.43     110.77      70.90      44.18      27.17      15.91       9.10       5.24       2.91
   5.20    DISCHG        1.57       0.80       0.31       0.05       0.00

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=   0.9333        CFS-HRS=       572.21        ACRE-FT=       47.28


SUBROUTINE ADDHYD    CROSS SECTION  89
           INPUT HYDROGRAPHS= 1,2     OUTPUT HYDROGRAPH= 3

           PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
               3.51                        4150.914                       7.51


SUBROUTINE REACH     CROSS SECTION  90
           LENGTH=      1.00     INPUT COEFFICIENT=  0.0000     INPUT ROUTINGS=  0.00

           AVERAGE WATER VELOCITY=  10.273       ROUTING COEFF= 0.8800       MODIFIED COEFFICIENT= 1.0000

           PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
               3.51                        4151.036                       7.51

   TIME                              HYDROGRAPH, TZERO=   0.80        DELTA T= 0.20        DRAINAGE AREA=  13.22
   0.80    DISCHG        0.00       0.96      11.57      63.37     242.16     613.40    1138.32    1685.76    2197.67    2682.01
   2.80    DISCHG     3153.69    3591.42    3932.64    4124.41    4138.91    4004.89    3766.58    3457.86    3109.23    2743.80
   4.80    DISCHG     2380.69    2036.73    1721.32    1440.68    1196.09     988.48     813.94     668.89     548.45     448.65
   6.80    DISCHG      365.87     297.74     242.14     197.05     160.51     130.96     106.94      87.29      70.96      57.16
```

8.80	DISCHG	45.33	35.14	26.53	19.47	13.89	9.72	6.64	4.44	2.87	1.80
10.80	DISCHG	1.10	0.67	0.41	0.26	0.17	0.11	0.08	0.05	0.03	0.02
12.80	DISCHG	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14.80	DISCHG	0.00	0.00	0.00	0.00	0.00	0.00				

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 1.3770 CFS-HRS= 11757.52 ACRE-FT= 971.64

ENDCMP 1

```
EXECUTIVE CONTROL CARD          OPERATION  COMPUT,     FROM XSECTN/STRUCT  10/  0     TO XSECTN/STRUCT  90/  0
        STARTING TIME=  0.00     RAIN DEPTH=  3.10     RAIN DURATION=  6.00     RAIN TABLE NO.= 2     SOIL CONDITION= 2
        ALTERNATE NO.= 0         STORM NO.= 0


SUBROUTINE RUNOFF    CROSS SECTION  10
           AREA=   2.30     INPUT RUNOFF CURVE=  84.0     TIME OF CONCENTRATION=  2.30
           COMPUTED CURVE NO. =   84.0

           PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
               4.07                        638.834                       (RUNOFF)

   TIME                                HYDROGRAPH, TZERO=   1.60        DELTA T= 0.20        DRAINAGE AREA=   2.30
   1.60    DISCHG        0.00      3.14      8.66     31.35     61.30    126.31    198.68    300.46    399.78    490.73
   3.60    DISCHG      568.65    608.90    636.56    632.70    622.41    598.09    572.53    544.61    517.15    490.48
   5.60    DISCHG      464.54    439.69    415.40    391.86    367.64    342.60    315.07    284.89    253.24    220.21
   7.60    DISCHG      189.19    159.85    134.41    111.89     93.36     77.49     64.50     53.20     43.94     35.72
   9.60    DISCHG       29.18     23.39     19.06     15.30     12.48      9.98      8.10      6.40      5.15      4.01
  11.60    DISCHG        3.19      2.44      1.89      1.39      1.02      0.67      0.45      0.23      0.13      0.03
  13.60    DISCHG        0.01      0.00

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=   1.6190        CFS-HRS=     2403.21        ACRE-FT=     198.60


SUBROUTINE REACH     CROSS SECTION  20
           LENGTH=   1300.00     INPUT COEFFICIENT=  0.0000     INPUT ROUTINGS=  0.00

           AVERAGE WATER VELOCITY=   6.885       ROUTING COEFF= 0.8200       MODIFIED COEFFICIENT= 0.9996

           PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
               4.14                        633.911                         4.08


SUBROUTINE RUNOFF    CROSS SECTION  20
           AREA=   0.24     INPUT RUNOFF CURVE=  83.0     TIME OF CONCENTRATION=  0.94
           COMPUTED CURVE NO. =   83.0

           PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
               3.02                        105.713                       (RUNOFF)

   TIME                                HYDROGRAPH, TZERO=   1.79        DELTA T= 0.20        DRAINAGE AREA=   0.24
   1.79    DISCHG        0.00      3.14     11.71     32.17     65.11     94.40    105.53     99.37     86.95     75.99
   3.80    DISCHG       66.85     59.28     53.25     48.40     45.07     42.54     39.64     36.93     34.78     32.71
   5.80    DISCHG       30.34     28.81     27.60     24.27     18.35     12.31      7.90      4.99      3.08      1.92
   7.80    DISCHG        1.19      0.71      0.41      0.23      0.12      0.04      0.00      0.00

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=   1.5448        CFS-HRS=      239.27        ACRE-FT=      19.77


SUBROUTINE ADDHYD    CROSS SECTION  20
           INPUT HYDROGRAPHS= 1,2     OUTPUT HYDROGRAPH= 3

           PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
               4.07                        691.790                         4.26
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SUBROUTINE REACH      CROSS SECTION  30
          LENGTH=   3300.00      INPUT COEFFICIENT=  0.0000      INPUT ROUTINGS=  0.00

          AVERAGE WATER VELOCITY=   7.068        ROUTING COEFF= 0.8234        MODIFIED COEFFICIENT= 0.9611

          PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
              4.22                          688.089                          4.25


SUBROUTINE RUNOFF     CROSS SECTION  30
          AREA=   2.35      INPUT RUNOFF CURVE=  85.0      TIME OF CONCENTRATION=  2.39
          COMPUTED CURVE NO. =   85.0

          PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
              4.16                          667.811                        (RUNOFF)

   TIME                                HYDROGRAPH, TZERO=   1.60        DELTA T= 0.20        DRAINAGE AREA=   2.35
   1.60    DISCHG        0.00       4.99      10.11      35.39      67.14     131.02     208.12     304.84     411.67     503.04
   3.60    DISCHG      584.58     635.04     661.35     667.48     654.53     634.42     606.09     578.08     550.52     523.66
   5.60    DISCHG      498.01     472.59     447.67     422.44     396.37     369.58     340.27     310.26     276.97     243.79
   7.60    DISCHG      211.43     179.55     153.35     127.36     108.30      89.23      75.91      62.70      52.91      43.37
   9.60    DISCHG       36.13      29.20      24.05      19.26      15.83      12.78      10.47       8.42       6.83       5.45
  11.60    DISCHG        4.36       3.44       2.69       2.07       1.56       1.15       0.81       0.54       0.33       0.18
  13.60    DISCHG        0.08       0.03       0.00

          TOTAL WATER, IN INCHES ON DRAINAGE AREA=   1.6933        CFS-HRS=      2568.20        ACRE-FT=      212.23


SUBROUTINE ADDHYD     CROSS SECTION  30
          INPUT HYDROGRAPHS= 1,2      OUTPUT HYDROGRAPH= 3

          PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
              4.19                         1355.438                          5.95


SUBROUTINE REACH      CROSS SECTION  40
          LENGTH=   4500.00      INPUT COEFFICIENT=  0.0000      INPUT ROUTINGS=  0.00

          AVERAGE WATER VELOCITY=   8.734        ROUTING COEFF= 0.8600        MODIFIED COEFFICIENT= 0.9590

          PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
              4.33                         1349.269                          5.94


SUBROUTINE RUNOFF     CROSS SECTION  40
          AREA=   1.06      INPUT RUNOFF CURVE=  84.0      TIME OF CONCENTRATION=  1.64
          COMPUTED CURVE NO. =   84.0

          PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
              3.51                          357.879                        (RUNOFF)

   TIME                                HYDROGRAPH, TZERO=   1.60        DELTA T= 0.20        DRAINAGE AREA=   1.06
   1.60    DISCHG        0.00       2.22       7.10      22.33      59.54     114.44     189.05     264.43     320.74     355.50
```

3.60	DISCHG	356.58	343.48	323.37	299.80	278.15	258.07	239.65	223.99	210.13	197.38
5.60	DISCHG	185.47	174.36	163.62	153.10	141.80	127.96	111.95	93.44	75.44	59.11
7.60	DISCHG	44.89	34.71	26.62	20.18	15.35	11.74	8.84	6.60	5.02	3.74
9.60	DISCHG	2.72	1.98	1.44	1.00	0.67	0.44	0.25	0.11	0.04	0.01
11.60	DISCHG	0.00									

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 1.6194 CFS-HRS= 1107.86 ACRE-FT= 91.55

SUBROUTINE ADDHYD CROSS SECTION 40
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 3

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
4.21	1642.562	6.58

SUBROUTINE RUNOFF CROSS SECTION 50
AREA= 1.04 INPUT RUNOFF CURVE= 86.0 TIME OF CONCENTRATION= 1.34
COMPUTED CURVE NO. = 86.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
3.26	445.863	(RUNOFF)

HYDROGRAPH, TZERO= 1.60 DELTA T= 0.20 DRAINAGE AREA= 1.04

TIME											
1.60	DISCHG	0.00	4.49	15.53	44.99	105.17	198.35	309.02	403.69	443.53	434.06
3.60	DISCHG	402.90	365.89	331.10	300.74	274.19	250.95	232.24	215.81	200.72	187.23
5.60	DISCHG	175.06	163.84	153.61	143.93	131.63	113.82	92.50	71.16	52.58	38.00
7.60	DISCHG	27.37	19.74	14.24	10.19	7.27	5.13	3.56	2.43	1.62	1.07
9.60	DISCHG	0.68	0.39	0.18	0.05	0.00	0.00				

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 1.7733 CFS-HRS= 1190.26 ACRE-FT= 98.36

SUBROUTINE RUNOFF CROSS SECTION 60
AREA= 1.37 INPUT RUNOFF CURVE= 86.0 TIME OF CONCENTRATION= 1.41
COMPUTED CURVE NO. = 86.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
3.36	565.366	(RUNOFF)

HYDROGRAPH, TZERO= 1.40 DELTA T= 0.20 DRAINAGE AREA= 1.37

TIME											
1.40	DISCHG	0.00	1.78	6.71	20.25	51.27	119.43	235.25	366.93	480.40	549.96
3.40	DISCHG	564.77	535.65	493.50	450.14	409.40	372.60	339.87	313.28	290.45	270.01
5.40	DISCHG	251.60	235.04	219.79	206.47	193.26	177.27	156.26	129.74	101.11	76.45
7.40	DISCHG	56.75	41.71	30.53	22.16	16.08	11.74	8.51	6.09	4.27	2.95
9.40	DISCHG	2.03	1.37	0.88	0.52	0.25	0.07	0.01	0.00		

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 1.7699 CFS-HRS= 1564.86 ACRE-FT= 129.32

SUBROUTINE ADDHYD CROSS SECTION 60
INPUT HYDROGRAPHS= 5,6 OUTPUT HYDROGRAPH= 7

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
3.31	1004.617	(NULL)

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SUBROUTINE REACH      CROSS SECTION  70
          LENGTH=   5300.00      INPUT COEFFICIENT=  0.7600      INPUT ROUTINGS=  0.00

          AVERAGE WATER VELOCITY=    5.000        ROUTING COEFF= 0.7600        MODIFIED COEFFICIENT= 0.7207

          PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
              3.64                          978.877                        (NULL)


SUBROUTINE RUNOFF     CROSS SECTION  70
          AREA=    3.20      INPUT RUNOFF CURVE=  85.0      TIME OF CONCENTRATION=  2.17
          COMPUTED CURVE NO. =    85.0

          PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
              3.96                          961.742                      (RUNOFF)

   TIME                                HYDROGRAPH, TZERO=   1.40        DELTA T= 0.20        DRAINAGE AREA=   3.20
   1.40    DISCHG        0.00       1.82       4.62      22.49      46.82     120.83     204.31     353.30     504.78     664.79
   3.40    DISCHG      806.60     896.61     953.68     961.36     944.90     907.89     863.80     816.38     773.85     732.40
   5.40    DISCHG      693.63     655.24     619.34     583.82     549.52     514.07     476.74     434.96     389.08     340.85
   7.40    DISCHG      291.42     247.04     203.94     170.52     138.49     115.35      93.65      76.98      62.02      50.08
   9.40    DISCHG       40.06      31.96      25.73      20.54      16.62      13.05      10.52       8.14       6.49       4.96
  11.40    DISCHG        3.86       2.89       2.16       1.53       1.03       0.65       0.34       0.17       0.04       0.01
  13.40    DISCHG        0.00

          TOTAL WATER, IN INCHES ON DRAINAGE AREA=    1.6934        CFS-HRS=      3497.29        ACRE-FT=      289.01


SUBROUTINE ADDHYD     CROSS SECTION  70
          INPUT HYDROGRAPHS= 5,6      OUTPUT HYDROGRAPH= 7

          PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
              3.77                         1908.811                        (NULL)


SUBROUTINE REACH      CROSS SECTION  80
          LENGTH=   5200.00      INPUT COEFFICIENT=  0.5400      INPUT ROUTINGS=  0.00

          AVERAGE WATER VELOCITY=    2.000        ROUTING COEFF= 0.5400        MODIFIED COEFFICIENT= 0.3284

          PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
              4.64                         1691.706                        (NULL)


SUBROUTINE RUNOFF     CROSS SECTION  80
          AREA=    0.72      INPUT RUNOFF CURVE=  84.0      TIME OF CONCENTRATION=  1.03
          COMPUTED CURVE NO. =    84.0

          PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
              3.06                          322.714                      (RUNOFF)

   TIME                                HYDROGRAPH, TZERO=   1.60        DELTA T= 0.20        DRAINAGE AREA=   0.72
   1.60    DISCHG        0.00       2.34      10.60      35.94      93.81     184.10     273.64     319.63     310.46     278.82
```

3.60	DISCHG	245.83	216.94	192.30	172.46	156.45	144.27	135.15	126.32	118.00	110.72
5.60	DISCHG	103.67	96.33	90.80	86.84	77.96	61.76	43.76	29.19	19.18	12.50
7.60	DISCHG	8.04	5.22	3.37	2.10	1.28	0.76	0.42	0.18	0.04	0.00

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 1.6235 CFS-HRS= 754.39 ACRE-FT= 62.34

SUBROUTINE ADDHYD CROSS SECTION 80
INPUT HYDROGRAPHS= 5,6 OUTPUT HYDROGRAPH= 7

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
4.59	1834.936	(NULL)

SUBROUTINE ADDHYD CROSS SECTION 80
INPUT HYDROGRAPHS= 3,7 OUTPUT HYDROGRAPH= 1

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 7 AND 3 WAS TRUNCATED HERE TO 100 VALUES.

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
4.44	3441.470	(NULL)

SUBROUTINE REACH CROSS SECTION 89
LENGTH= 3000.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 9.733 ROUTING COEFF= 0.8700 MODIFIED COEFFICIENT= 0.9958

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
4.52	3429.326	6.74

SUBROUTINE RUNOFF CROSS SECTION 89
AREA= 0.95 INPUT RUNOFF CURVE= 77.0 TIME OF CONCENTRATION= 0.89
COMPUTED CURVE NO. = 77.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
3.04	297.632	(RUNOFF)

HYDROGRAPH, TZERO= 1.79 DELTA T= 0.20 DRAINAGE AREA= 0.95

TIME											
1.79	DISCHG	0.00	1.47	16.79	68.49	164.24	257.60	296.15	282.44	251.11	223.94
3.80	DISCHG	200.29	181.39	165.70	152.13	143.66	136.75	128.20	120.29	114.66	108.39
5.80	DISCHG	100.65	96.40	92.98	81.00	58.98	38.27	23.56	14.50	8.86	5.32
7.80	DISCHG	3.13	1.82	1.02	0.52	0.21	0.04	0.00	0.00		

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 1.1552 CFS-HRS= 708.26 ACRE-FT= 58.53

SUBROUTINE ADDHYD CROSS SECTION 89
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 3

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
4.49	3579.353	6.90

SUBROUTINE REACH CROSS SECTION 90
LENGTH= 1.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 9.742 ROUTING COEFF= 0.8700 MODIFIED COEFFICIENT= 1.0000

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
4.49	3579.252	6.90

HYDROGRAPH, TZERO= 1.40 DELTA T= 0.20 DRAINAGE AREA= 13.22

TIME											
1.40	DISCHG	0.00	0.00	4.28	21.56	85.05	258.10	573.11	989.84	1414.97	1815.00
3.40	DISCHG	2215.42	2615.86	2987.03	3285.38	3480.43	3568.55	3567.54	3498.27	3380.01	3234.94
5.40	DISCHG	3080.31	2922.11	2763.86	2613.26	2469.26	2317.42	2149.20	1975.36	1803.11	1633.81
7.40	DISCHG	1464.27	1293.76	1126.04	966.21	818.39	686.08	570.94	472.44	389.55	320.10
9.40	DISCHG	262.06	213.45	173.02	139.54	112.16	89.91	72.04	57.61	45.98	36.58
11.40	DISCHG	29.04	22.98	18.12	14.20	11.04	8.48	6.41	4.73	3.38	2.32
13.40	DISCHG	1.52	0.95	0.57	0.34	0.20	0.12	0.08	0.05	0.03	0.02
15.40	DISCHG	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17.40	DISCHG	0.00	0.00	0.00	0.00	0.00	0.00				

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 1.6433 CFS-HRS= 14031.65 ACRE-FT= 1159.57

ENDCMP 1

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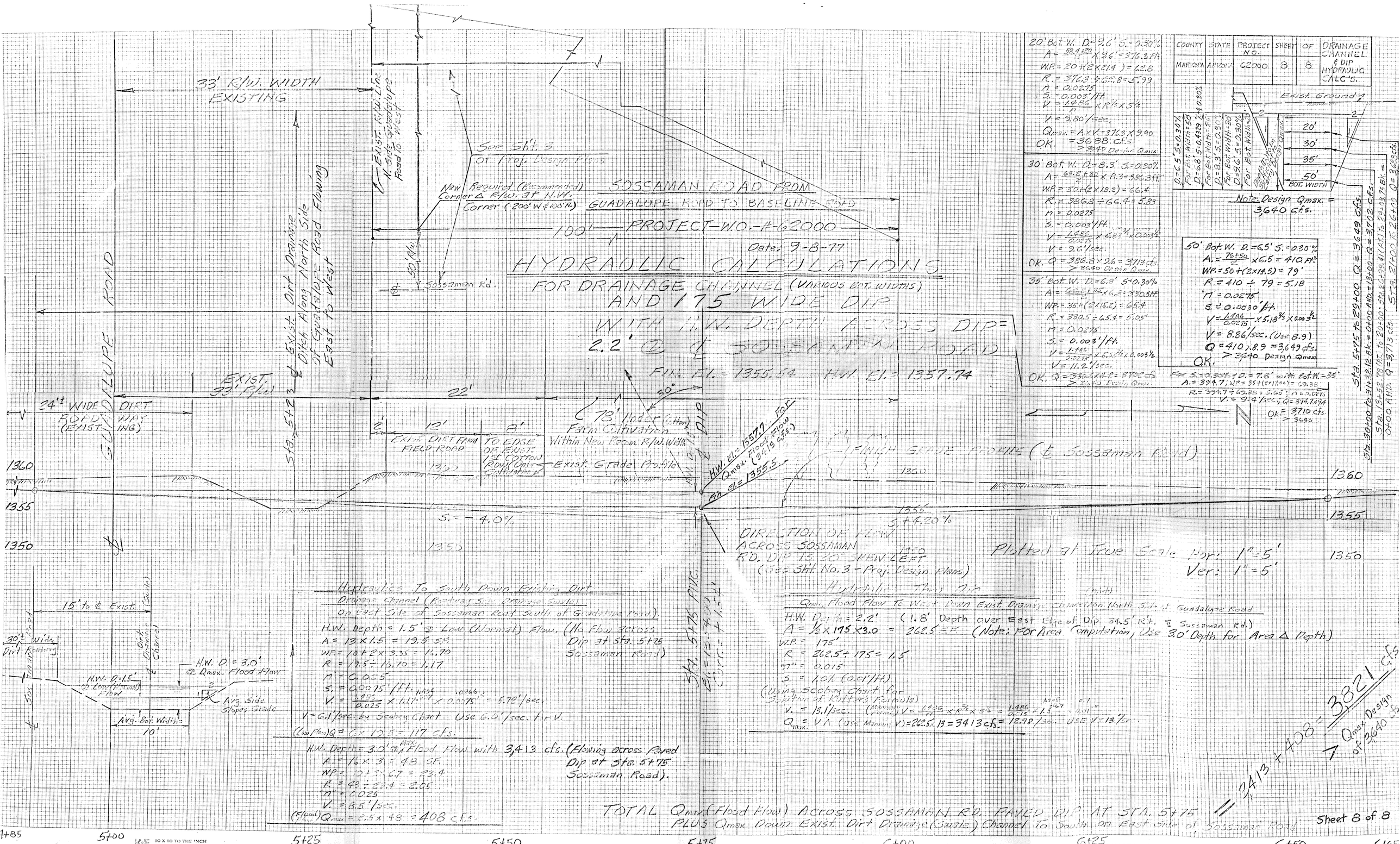
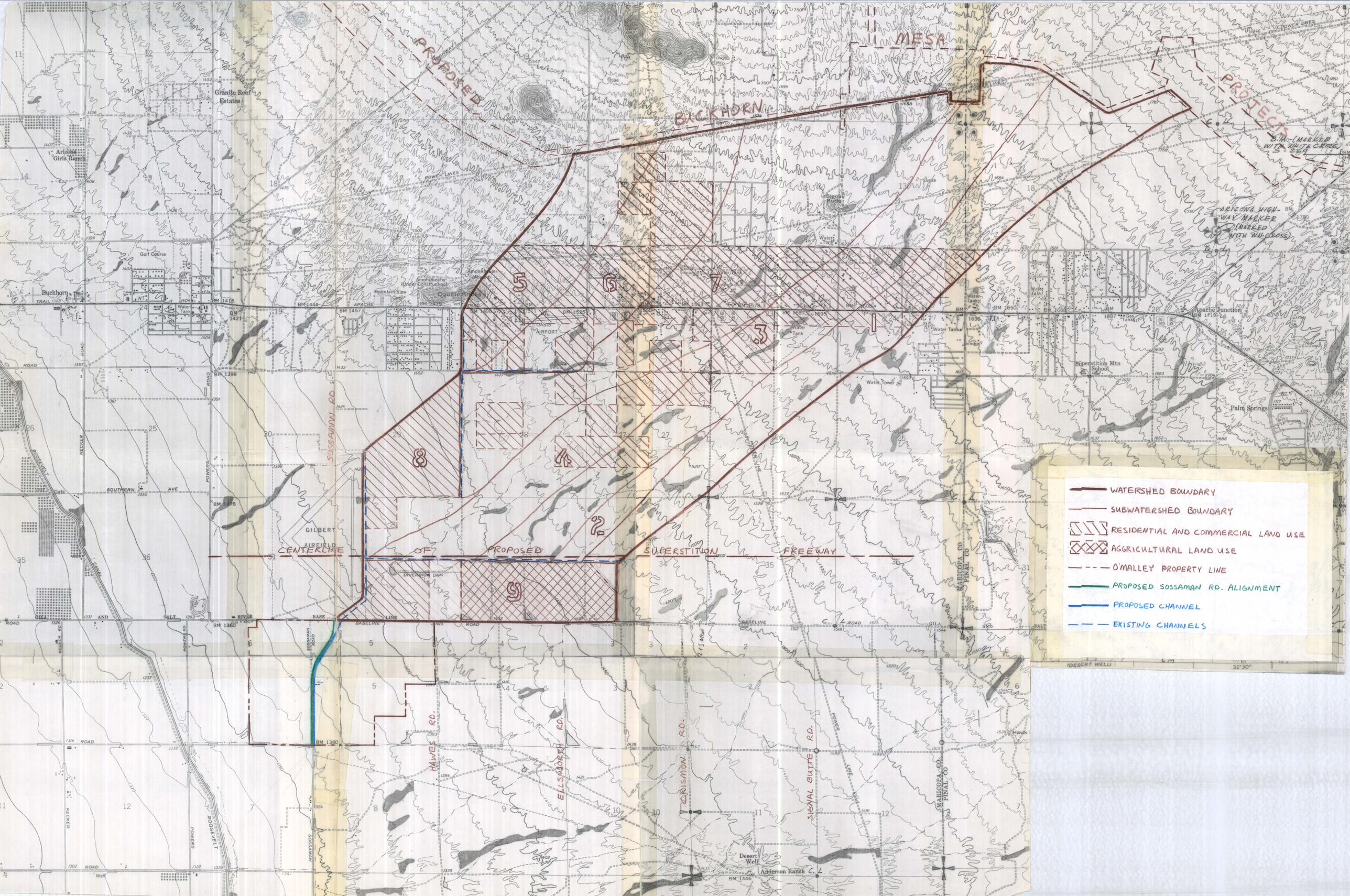
SUMMARY TABLE 1

	ALT	STORM	ID	DA SQ-MI.	RAIN TBLE	AMC	DELTA-T HRS.	TZERO HRS.	PRECIP IN.	PRECIP DURATION	PEAK-Q CFS	PEAK-TIME	PEAK-ELEV	RUNOFF IN.	CSM
	0	0	10X	2.30	4	2	0.20	0.00	2.49	1.13	756.59	2.03	0.00	1.12	328.95
	0	0	20X	0.24	4	2	0.20	0.20	2.49	1.13	160.91	1.21	0.00	1.05	670.48
	0	0	30X	2.35	4	2	0.20	0.00	2.49	1.13	779.08	2.07	0.00	1.18	331.52
	0	0	40X	1.06	4	2	0.20	0.20	2.49	1.13	457.44	1.60	0.00	1.12	431.54
1 hr.	0	0	50X	1.04	4	2	0.20	0.20	2.49	1.13	623.42	1.44	0.00	1.25	599.44
	0	0	60X	1.37	4	2	0.20	0.20	2.49	1.13	770.08	1.47	0.00	1.25	562.10
	0	0	70X	3.20	4	2	0.20	0.00	2.49	1.13	1148.85	1.93	0.00	1.18	359.01
	0	0	80X	0.72	4	2	0.20	0.20	2.49	1.13	474.56	1.25	0.00	1.12	659.11
	0	0	89X	0.95	4	2	0.20	0.20	2.49	1.13	471.21	1.20	0.00	0.74	496.01
	0	0	90X	13.22	4	2	0.20	0.00	2.49	1.13	3794.50	2.42	7.13	1.14	286.81
	0	0	10X	2.30	4	2	0.20	0.40	2.62	2.00	753.70	2.68	0.00	1.22	327.69
	0	0	20X	0.24	4	2	0.20	0.80	2.62	2.00	143.81	1.74	0.00	1.16	599.21
	0	0	30X	2.35	4	2	0.20	0.40	2.62	2.00	791.11	2.71	0.00	1.29	336.64
	0	0	40X	1.06	4	2	0.20	0.60	2.62	2.00	457.46	2.21	0.00	1.22	431.56
2 hr.	0	0	50X	1.04	4	2	0.20	0.60	2.62	2.00	575.50	2.00	0.00	1.36	553.36
	0	0	60X	1.37	4	2	0.20	0.40	2.62	2.00	732.83	2.06	0.00	1.35	534.91
	0	0	70X	3.20	4	2	0.20	0.40	2.62	2.00	1173.44	2.57	0.00	1.29	366.70
	0	0	80X	0.72	4	2	0.20	0.60	2.62	2.00	430.04	1.80	0.00	1.22	597.28
	0	0	89X	0.95	4	2	0.20	0.60	2.62	2.00	412.35	1.76	0.00	0.82	434.05
	0	0	90X	13.22	4	2	0.20	0.40	2.62	2.00	3967.86	2.96	7.31	1.24	299.91
	0	0	10X	2.30	4	2	0.20	0.80	2.78	3.00	772.32	3.21	0.00	1.35	335.79
	0	0	20X	0.24	4	2	0.20	1.00	2.78	3.00	136.39	2.26	0.00	1.28	568.31
	0	0	30X	2.35	4	2	0.20	0.80	2.78	3.00	800.41	3.25	0.00	1.42	340.60
	0	0	40X	1.06	4	2	0.20	1.00	2.78	3.00	451.13	2.76	0.00	1.35	425.59
3 hr.	0	0	50X	1.04	4	2	0.20	0.80	2.78	3.00	550.50	2.52	0.00	1.49	529.33
	0	0	60X	1.37	4	2	0.20	0.80	2.78	3.00	705.37	2.55	0.00	1.49	514.87
	0	0	70X	3.20	4	2	0.20	0.80	2.78	3.00	1179.96	3.07	0.00	1.42	368.73
	0	0	80X	0.72	4	2	0.20	1.00	2.78	3.00	404.47	2.31	0.00	1.34	561.77
	0	0	89X	0.95	4	2	0.20	1.20	2.78	3.00	399.64	2.27	0.00	0.93	420.68
	0	0	90X	13.22	4	2	0.20	0.80	2.78	3.00	4151.03	3.51	7.51	1.37	313.75
	0	0	10X	2.30	2	2	0.20	1.60	3.10	6.00	638.83	4.07	0.00	1.61	277.75
	0	0	20X	0.24	2	2	0.20	1.79	3.10	6.00	105.71	3.02	0.00	1.54	440.47
	0	0	30X	2.35	2	2	0.20	1.60	3.10	6.00	667.81	4.16	0.00	1.69	284.17
	0	0	40X	1.06	2	2	0.20	1.60	3.10	6.00	357.87	3.51	0.00	1.61	337.62
6 hr.	0	0	50X	1.04	2	2	0.20	1.60	3.10	6.00	445.86	3.26	0.00	1.77	428.71
	0	0	60X	1.37	2	2	0.20	1.40	3.10	6.00	565.36	3.36	0.00	1.76	412.67
	0	0	70X	3.20	2	2	0.20	1.40	3.10	6.00	961.74	3.96	0.00	1.69	300.54
	0	0	80X	0.72	2	2	0.20	1.60	3.10	6.00	322.71	3.06	0.00	1.62	448.21
	0	0	89X	0.95	2	2	0.20	1.79	3.10	6.00	297.63	3.04	0.00	1.15	313.29
	0	0	90X	13.22	2	2	0.20	1.40	3.10	6.00	3579.25	4.49	6.90	1.64	270.54

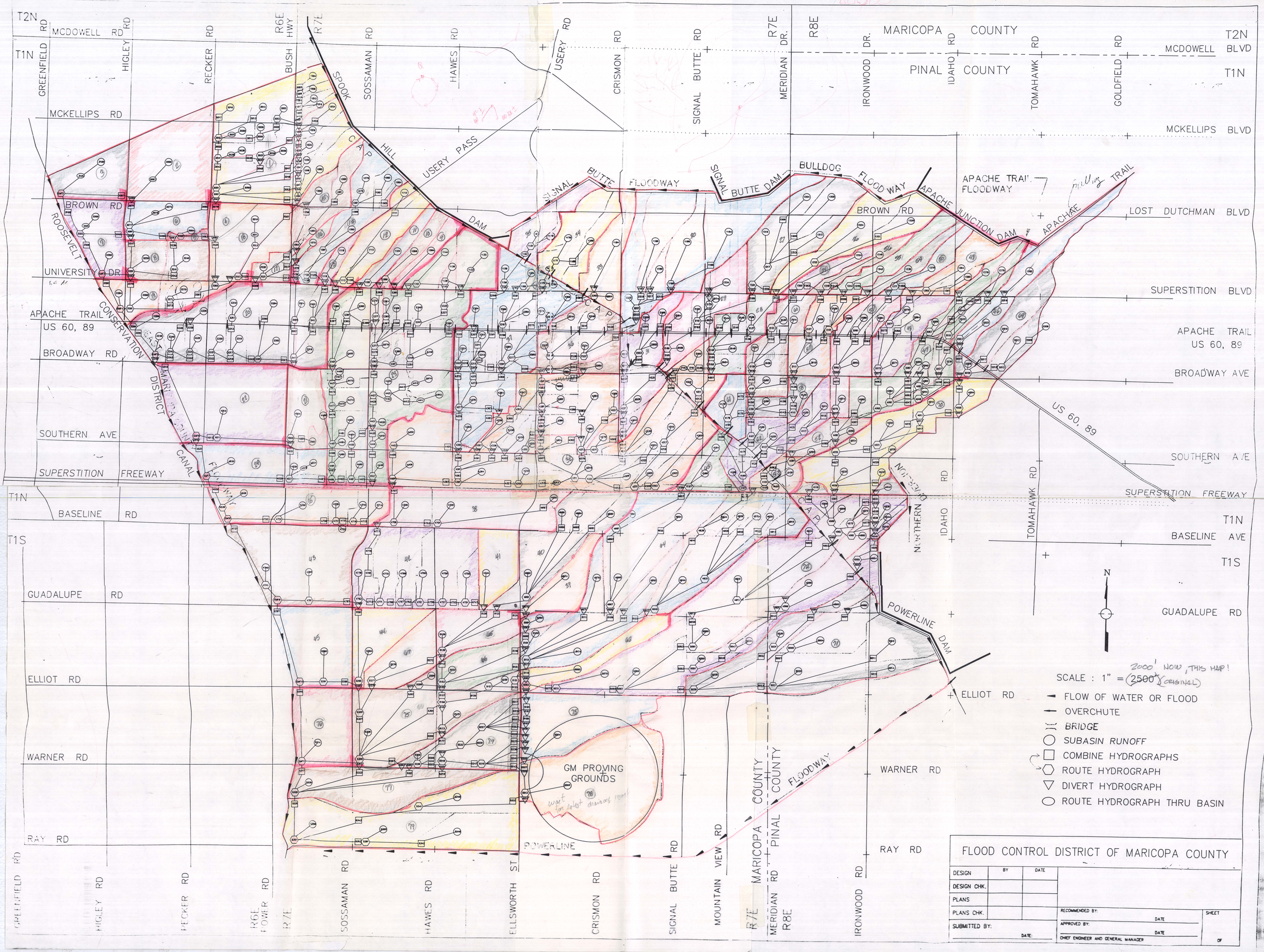
'X' OR 'S' FOLLOWING THE ID REPRESENTS CROSS-SECTION OR STRUCTURE, RESPECTIVELY.

COUNTY	STATE	PROJECT NO.	SHEET	OF	DRAINAGE CHANNEL & DIP HYDRAULIC CALC'S.
MARICOPA	ARIZONA	62000	8	8	




PROPOSED
BUCKHORN
MESA
PROJECTS
Granite Reef Estates
Arizona Girls Ranch
Golf Course
Buckhorn
Mountain View Cem
Ammihester (Under Construction)
Double Cross
OASIS AIRPORT
Signal Butte
Water Tank
Water Tanks
Water Tower
Superstition Mtn School
Apache Junction
Palm Springs
Hawk
Desert Well
Anderson Ranch
GILBERT AIRFIELD
DIVERSION DAM
CENTERLINE OF PROPOSED SUPERSTITION FREEWAY
SOSSAMAN RD
HAWES RD.
ELLSWORTH RD.
CRISMON RD.
SIGNAL BUTTE RD.
MARICOPA CO
PINAL CO
ARIZONA HIGHWAY MARKER (MARKED WITH WH. CROSS)
B.M. (MARKED WITH WHITE CROSS)
WATERSHED BOUNDARY
SUBWATERSHED BOUNDARY
RESIDENTIAL AND COMMERCIAL LAND USE
AGGRICULTURAL LAND USE
O'MALLEY PROPERTY LINE
PROPOSED SOSSAMAN RD. ALIGNMENT
PROPOSED CHANNEL
EXISTING CHANNELS

WATERSHED MAP
WATERSHED BOUNDARY
SUBWATERSHED BOUNDARY
MAJOR DRAINAGEWAY
FLOW PATH
1
2
3
4
5
6
7
8
9
Granite Reef Estates
Arizona Girls Ranch
Golf Course
Buckhorn
Mountain View Park
Amphitheater (Under Construction)
Double Butte
Amphitheater (Shade)
OASIS AIRPORT
Signal Butte
Water Tank
Water Tower
Superstition Mtn School
Apache Junction
Palm Springs
B.M. (MARKED WITH WHITE CROSS) S-269
ARIZONA HIGHWAY MARKER (MARKED WITH W.H. CROSS)
GILBERT AIRFIELD
DIVERSION DAM
SOSSAMAN RD.
HAVEN RD.
ELLSWORTH RD.
CRISMON RD.
SIGNAL BUTTE RD.
MARICOPA CO.
PINAL CO.
Desert Well
Anderson Ranch
Hawk
Well
SOUTHERN AVE
BASELINE
ROOSEVELT
POWERS
RECKER
SALT RIVER
GILA AND
(DESERT WELL)
32'30"


T2N
T1N
T1S
MCDOWELL RD
MCKELLIPS RD
BROWN RD
UNIVERSITY DR
APACHE TRAIL
US 60, 89
BROADWAY RD
SOUTHERN AVE
SUPERSTITION FREEWAY
BASELINE RD
GUADALUPE RD
ELLIOT RD
WARNER RD
RAY RD
GREENFIELD RD
HIGLEY RD
RECKER RD
R6E
BUSH HWY
R7E
SOSSAMAN RD
HAWES RD
USERY RD
CRISMON RD
SIGNAL BUTTE RD
R7E
MERIDIAN DR.
R8E
IRONWOOD DR.
IDAHO RD
TOMAHAWK RD
GOLDFIELD RD
MCDOWELL BLVD
MCKELLIPS BLVD
LOST DUTCHMAN BLVD
SUPERSTITION BLVD
APACHE TRAIL
US 60, 89
BROADWAY AVE
SOUTHERN AVE
SUPERSTITION FREEWAY
BASELINE AVE
GUADALUPE RD
ELLIOT RD
WARNER RD
RAY RD
MARICOPA COUNTY
PINAL COUNTY
SPOOK HILL
CAP
USERY PASS
DAM
SIGNAL BUTTE FLOODWAY
SIGNAL BUTTE DAM
BULLDOG FLOOD WAY
APACHE JUNCTION DAM
APACHE TRAIL FLOODWAY
APACHE TRAIL
ROOSEVELT CONSERVATION DISTRICT
EAST MARICOPA CANAL
FLOODWAY
NORTHERN
POWERLINE DAM
POWERLINE
GM PROVING GROUNDS
wait for latest drawings report
ELLSWORTH ST
MOUNTAIN VIEW RD
N
SCALE : 1" = 2500' (ORIGINAL)
2000' NOW, THIS MAP!
FLOW OF WATER OR FLOOD
OVERCHUTE
BRIDGE
SUBASIN RUNOFF
COMBINE HYDROGRAPHS
ROUTE HYDROGRAPH
DIVERT HYDROGRAPH
ROUTE HYDROGRAPH THRU BASIN
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
DESIGN
BY
DATE
DESIGN CHK.
PLANS
PLANS CHK.
SUBMITTED BY:
DATE:
RECOMMENDED BY:
DATE
APPROVED BY:
DATE
CHIEF ENGINEER AND GENERAL MANAGER
SHEET
OF