ENGINEERING

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2000

STORMWATER DETENTION ANALYSIS
PREPARED BY: BAX ENGINEERING CO., INC.
BAX PROJECT NO.: 96-7230D & 95-7230H
AVONDALE PHASE 2 & 3 – O'FALLON
ORIGINAL REPORT: AUGUST 1997
ADDENDUM: AUGUST 26, 1997
REVISED: OCTOBER 31, 2000
REREVISED: DECEMBER 21, 2000

INTRODUCTION:

The original analysis and report for Avondale Heights Phase 2 and 3 was completed in August of 1997. The basin currently operates as a wet basin. Modifications proposed to the basin will convert it into a dry basin while still providing the equivalent quantity of detention as previously analyzed. Modifications include adding an 8" H.D.P.E. pipe to the structure to act as a low-flow pipe, a 4' wide concrete swale with 6" vertical sides will be added and a small amount of grading will be required to convert the basin to a dry basin. A copy of the original report has been included with this analysis. The basin shall be analyzed as before, using the 2, 5, 15, 25 and 100-year frequency – 20 minute duration storms.

GENERAL SITE DATA AND RUNOFF CALCULATIONS:

TIME OF CONCENTRATION:

BASIN PEAK INFLOWS:

Since the site is unchanged, all of the above information was found from the attached original analysis.

STORM ROUTING CALCULATIONS AND RESULTS:

Storm	Calculated Peak Release Rate cfs	Attenuation Provided cfs	Peak Elevation
2	70.62	70.62	512.34
5	93.67	27.13	512.81
15	134.33	26.67	513.55
25	171.21	27.49	514.16
100	231.26	22.94	514.93

As shown above, the calculated peak release rates and peak elevations are lower than previously analyzed.

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MODIFICATIONS TO EXISTING STRUCTURE AND BASIN:

The existing overflow structure has an overflow sill elevation of 510.19 and a top elevation of 514.69. A 54" pipe connects to the structure and outfalls just to the southwest of the basin. Modifying the structure by adding 15' of 8" H.D.P.E. low-flow pipe to the structure at a 505.25 elevation. The pipe end in the basin will be installed with a trash rack and be set at a 505.60 elevation. The basin itself will also need to be modified including minimal grading and the installation of concrete swales. Grading and layout of swales are shown on the attached Grading Plan sheet.

SUMMARY:

2 year, 20 minute H.W.	512.34
5 year, 20 minute H.W.	512.81
15 year, 20 minute H.W.	513.55
25 year, 20 minute H.W.	514.16
100 year, 20 minute H.W.	514.93
Low Flow Pipe	15' of 8" H.D.P.E.
Low Flow Orifice Elevation	505.60
Emergency Relief Swale Elevation	514.50
Top of Berm	516.00

POND-2 Version: 5.20
S/N:

AVONDALE PHASE THREE
REVISED DETENTION BASIN IN PLAT 3 & 4, IN PROXIMITY TO LOTS 403 & 404. BASIN REVISED TO ACT AS A DRY BASIN RATHER THAN A WET BASIN.

CALCULATED 12-22-2000 10:20:23
DISK FILE: 7230HN2 .VOL

Planimeter scale: 1 inch = 1 ft.

Elevation (ft)	Planimeter (sq.in.)	Area (sq.ft)	A1+A2+sqr(A1*A2) (sq.ft)	* Volume (cubic-ft)	Volume Sum (cubic-ft)
505.60	12.00	12	0	0	0
506.00	805.93	806	916	122	122
508.00	11,108.00	11,108	14,906	9,937	10,059
510.00	13,775.56	13,776	37,254	24,836	34,895
512.00	16,723.28	16,723	45,677	30,451	65,346
514.00	19,936.63	19,937	54,919	36,613	101,959
516.00	23,414.12	23,414	64,956	43,304	145,264

$$IA = (sq.rt(Area1) + ((Ei-E1)/(E2-E1))*(sq.rt(Area2)-sq.rt(Area1)))^2$$

where: E1, E2 = Closest two elevations with planimeter data
Ei = Elevation at which to interpolate area
Area1,Area2 = Areas computed for E1, E2, respectively
IA = Interpolated area for Ei

* Incremental volume computed by the Conic Method for Reservoir Volumes.

Volume = (1/3) * (EL2-EL1) * (Area1 + Area2 + sq.rt.(Area1*Area2))

where: EL1, EL2 = Lower and upper elevations of the increment
Area1,Area2 = Areas computed for EL1, EL2, respectively
Volume = Incremental volume between EL1 and EL2

Outlet Structure File: 7230HN2 .STR

POND-2 Version: 5.20 S/N:
Date Executed: Time Executed:

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AVONDALE HIEGHTS PHASE TWO & THREE,
MODIFIED DETENTION STRUCTURE AND BASIN, WITHIN PROXIMITY TO
LOTS 440,441,403 AND 404. ORIGINAL ANALYSIS: AUGUST 1997
REVISED: OCTOBER 31, 2000, REREVISED: DEC. 21, 2000
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***** COMPOSITE OUTFLOW SUMMARY ****

Elevation (ft)	Q (cfs)	Contributing Structures
505.60	0.0	
506.00	0.4	1
506.40	1.1	1
506.80	1.6	1
507.20	1.9	1
507.60	2.2	1
508.00	2.4	1
508.40	2.6	1
508.80	2.8	1
509.20	3.0	1
509.60	3.2	1
510.00	3.4	1
510.40	5.6	1 +3
510.80	13.7	1 +3
511.20	25.2	1 +3
511.60	39.2	1 +3
512.00	55.3	1 +3
512.40	73.3	1 +3
512.80	93.0	1 +3
513.20	114.2	1 +3
513.60	136.9	1 +3
514.00	160.9	1 +3
514.40	186.3	1 +3
514.80	217.8	1 +3 +4
515.20	258.2	1 +3 +4
515.60	304.1	1 +3 +4
516.00	0.0	

Outlet Structure File: 7230HN2 .STR

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AVONDALE HIEGHTS PHASE TWO & THREE,
MODIFIED DETENTION STRUCTURE AND BASIN, WITHIN PROXIMITY TO
LOTS 440,441,403 AND 404. ORIGINAL ANALYSIS: AUGUST 1997
REVISED: OCTOBER 31, 2000, REREVISED: DEC. 21, 2000
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Outlet Structure File: 7230HN2 .STR
Planimeter Input File: 7230HN2 .VOL
Rating Table Output File: 7230HN2 .PND

Min. Elev.(ft) = 505.6 Max. Elev.(ft) = 516 Incr.(ft) = .4

Additional elevations (ft) to be included in table:
* *

****
SYSTEM CONNECTIVITY
****

Structure	No.	Q Table		Q Table
ORIFICE	1		->	1
WEIR-VR	3		->	3
WEIR-VR	4		->	4

Outflow rating table summary was stored in file:
7230HN2 .PND

Outlet Structure File: 7230HN2 .STR

POND-2 Version: 5.20 S/N:
Date Executed: Time Executed:

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AVONDALE HIEGHTS PHASE TWO & THREE,
MODIFIED DETENTION STRUCTURE AND BASIN, WITHIN PROXIMITY TO
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REVISED: OCTOBER 31, 2000, REREVISED: DEC. 21, 2000

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>>>>>> Structure No. 1 <<<<<<
(Input Data)

ORIFICE
Orifice - Based on Area and Datum Elevation

E1 elev.(ft)?	505.9333
E2 elev.(ft)?	516
Orifice coeff.?	0.6
Invert elev.(ft)?	505.60
Datum elev.(ft) ?	505.9333
Orifice area (sq ft)?	0.348996

Outlet Structure File: 7230HN2 .STR

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Date Executed: Time Executed:

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MODIFIED DETENTION STRUCTURE AND BASIN, WITHIN PROXIMITY TO
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>>>>>> Structure No. 3 <<<<<<
(Input Data)

WEIR-VR
Weir - Vertical Rectangular

E1 elev.(ft)?	510.19
E2 elev.(ft)?	516
Weir coefficient?	3.0
Weir elev.(ft)?	510.19
Length (ft)?	7
Contracted/Suppressed (C/S)?	S

Outlet Structure File: 7230HN2 .STR

POND-2 Version: 5.20 S/N:
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AVONDALE HIEGHTS PHASE TWO & THREE,
MODIFIED DETENTION STRUCTURE AND BASIN, WITHIN PROXIMITY TO
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>>>>>> Structure No. 4 <<<<<<
(Input Data)

WEIR-VR
Weir - Vertical Rectangular

E1 elev.(ft)?	514.50
E2 elev.(ft)?	516
Weir coefficient?	3.0
Weir elev.(ft)?	514.50
Length (ft)?	10
Contracted/Suppressed (C/S)?	S

Outlet Structure File: 7230HN2 .STR

POND-2 Version: 5.20 S/N:
Date Executed: Time Executed:

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AVONDALE HIEGHTS PHASE TWO & THREE,
MODIFIED DETENTION STRUCTURE AND BASIN, WITHIN PROXIMITY TO LOTS 440,441,403 AND 404. ORIGINAL ANALYSIS: AUGUST 1997
REVISED: OCTOBER 31, 2000, REREVISED: DEC. 21, 2000

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Outflow Rating Table for Structure #1
ORIFICE Orifice - Based on Area and Datum Elevation

Elevation (ft)	Q (cfs)	Computation Messages
505.60	0.0	E < E1=505.9333
506.00	0.4	H =.067
506.40	1.1	H =.467
506.80	1.6	H =.867
507.20	1.9	H =1.267
507.60	2.2	H =1.667
508.00	2.4	H =2.067
508.40	2.6	H =2.467
508.80	2.8	H =2.867
509.20	3.0	H =3.267
509.60	3.2	H =3.667
510.00	3.4	H =4.067
510.40	3.6	H =4.467
510.80	3.7	H =4.867
511.20	3.9	H =5.267
511.60	4.0	H =5.667
512.00	4.1	H =6.067
512.40	4.3	H =6.467
512.80	4.4	H =6.867
513.20	4.5	H =7.267
513.60	4.7	H =7.667
514.00	4.8	H =8.067
514.40	4.9	H =8.467
514.80	5.0	H =8.867
515.20	5.1	H =9.267
515.60	5.2	H =9.667
516.00	0.0	E = or > E2=516

C = .6 A = .348996 sq.ft.
H (ft) = Table elev. - Datum elev. (505.9333 ft)
Q (cfs) = C * A * sqr(2g * H)

Outlet Structure File: 7230HN2 .STR

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Date Executed: Time Executed:

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AVONDALE HIEGHTS PHASE TWO & THREE,
MODIFIED DETENTION STRUCTURE AND BASIN, WITHIN PROXIMITY TO LOTS 440,441,403 AND 404. ORIGINAL ANALYSIS: AUGUST 1997
REVISED: OCTOBER 31, 2000, REREVISED: DEC. 21, 2000

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Outflow Rating Table for Structure #3
WEIR-VR Weir - Vertical Rectangular

***** INLET CONTROL ASSUMED *****

Elevation (ft)	Q (cfs)	Computation Messages
505.60	0.0	E < Inv.El.= 510.19
506.00	0.0	E < Inv.El.= 510.19
506.40	0.0	E < Inv.El.= 510.19
506.80	0.0	E < Inv.El.= 510.19
507.20	0.0	E < Inv.El.= 510.19
507.60	0.0	E < Inv.El.= 510.19
508.00	0.0	E < Inv.El.= 510.19
508.40	0.0	E < Inv.El.= 510.19
508.80	0.0	E < Inv.El.= 510.19
509.20	0.0	E < Inv.El.= 510.19
509.60	0.0	E < Inv.El.= 510.19
510.00	0.0	E < Inv.El.= 510.19
510.40	2.0	H =.21
510.80	10.0	H =.61
511.20	21.3	H =1.01
511.60	35.2	H =1.41
512.00	51.1	H =1.81
512.40	69.0	H =2.21
512.80	88.5	H =2.61
513.20	109.7	H =3.01
513.60	132.2	H =3.41
514.00	156.2	H =3.81
514.40	181.4	H =4.21
514.80	207.9	H =4.61
515.20	235.5	H =5.01
515.60	264.3	H =5.41
516.00	0.0	E = or > E2=516

C = 3 L (ft) = 7
H (ft) = Table elev. - Invert elev. (510.19 ft)
Q (cfs) = C * L * (H**1.5) -- Suppressed Weir

Outlet Structure File: 7230HN2 .STR

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Date Executed: Time Executed:

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AVONDALE HIEGHTS PHASE TWO & THREE,
MODIFIED DETENTION STRUCTURE AND BASIN, WITHIN PROXIMITY TO
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REVISED: OCTOBER 31, 2000, REREVISED: DEC. 21, 2000
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Outflow Rating Table for Structure #4
WEIR-VR Weir - Vertical Rectangular

***** INLET CONTROL ASSUMED *****

Elevation (ft)	Q (cfs)	Computation Messages
505.60	0.0	E < Inv.El.= 514.5
506.00	0.0	E < Inv.El.= 514.5
506.40	0.0	E < Inv.El.= 514.5
506.80	0.0	E < Inv.El.= 514.5
507.20	0.0	E < Inv.El.= 514.5
507.60	0.0	E < Inv.El.= 514.5
508.00	0.0	E < Inv.El.= 514.5
508.40	0.0	E < Inv.El.= 514.5
508.80	0.0	E < Inv.El.= 514.5
509.20	0.0	E < Inv.El.= 514.5
509.60	0.0	E < Inv.El.= 514.5
510.00	0.0	E < Inv.El.= 514.5
510.40	0.0	E < Inv.El.= 514.5
510.80	0.0	E < Inv.El.= 514.5
511.20	0.0	E < Inv.El.= 514.5
511.60	0.0	E < Inv.El.= 514.5
512.00	0.0	E < Inv.El.= 514.5
512.40	0.0	E < Inv.El.= 514.5
512.80	0.0	E < Inv.El.= 514.5
513.20	0.0	E < Inv.El.= 514.5
513.60	0.0	E < Inv.El.= 514.5
514.00	0.0	E < Inv.El.= 514.5
514.40	0.0	E < Inv.El.= 514.5
514.80	4.9	H =.3
515.20	17.6	H =.7
515.60	34.6	H =1.1
516.00	0.0	E = or > E2=516

C = 3 L (ft) = 10
H (ft) = Table elev. - Invert elev. (514.5 ft)
Q (cfs) = C * L * (H**1.5) -- Suppressed Weir

POND-2 Version: 5.20 S/N:
EXECUTED: 12-22-2000 09:42:21

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*
* AVONDALE HIEGHTS PHASE TWO & THREE, 2-YEAR 20 MIN. ROUTING *
* MODIFIED DETENTION STRUCTURE AND BASIN, WITHIN PROXIMITY TO *
* LOTS 440,441,403 AND 404. ORIGINAL ANALYSIS: AUGUST 1997 *
* REVISED: OCTOBER 31, 2000, REREVISED: DEC. 21, 2000 *
*
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Inflow Hydrograph: 7230H-2 .HYD
Rating Table file: 7230HN2 .PND

----INITIAL CONDITIONS----
Elevation = 505.60 ft
Outflow = 0.00 cfs
Storage = 0 cu-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
505.60	0.0	0
506.00	0.4	122
506.40	1.1	651
506.80	1.6	1,720
507.20	1.9	3,517
507.60	2.2	6,234
508.00	2.4	10,059
508.40	2.6	14,604
508.80	2.8	19,356
509.20	3.0	24,319
509.60	3.2	29,497
510.00	3.4	34,895
510.40	5.6	40,518
510.80	13.7	46,371
511.20	25.2	52,456
511.60	39.2	58,780
512.00	55.3	65,347
512.40	73.3	72,160
512.80	93.0	79,223
513.20	114.2	86,541
513.60	136.9	94,119
514.00	160.9	101,959
514.40	186.3	110,069
514.80	217.8	118,448
515.20	258.2	127,105
515.60	304.1	136,043

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
4.1	4.5
21.7	22.8
57.3	58.9
117.2	119.1
207.8	210.0
335.2	337.6
486.7	489.3
645.1	647.9
810.5	813.5
983.0	986.2
1162.9	1166.3
1350.3	1355.9
1545.4	1559.1
1748.2	1773.4
1959.0	1998.2
2177.8	2233.1
2404.8	2478.1
2640.2	2733.2
2884.1	2998.3
3136.7	3273.6
3398.0	3558.9
3668.2	3854.5
3947.5	4165.3
4236.0	4494.2
4533.8	4837.9

Time increment (t) = 1.0 min.

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Pond File: 7230HN2 .PND
Inflow Hydrograph: 7230H-2 .HYD
Outflow Hydrograph: OUT .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	0.00	-----	0.0	0.0	0.00	505.60
1.0	8.90	8.9	7.8	8.9	0.57	506.10
2.0	17.90	26.8	32.0	34.6	1.26	506.53
3.0	26.80	44.7	73.4	76.7	1.69	506.92
4.0	35.70	62.5	131.9	135.9	1.96	507.27
5.0	44.60	80.3	207.8	212.2	2.20	507.61
6.0	53.60	98.2	301.3	306.0	2.35	507.90
7.0	62.50	116.1	412.4	417.4	2.51	508.21
8.0	71.40	133.9	541.0	546.3	2.67	508.54
9.0	80.40	151.8	687.1	692.8	2.85	508.91
10.0	89.30	169.7	850.7	856.8	3.05	509.30
11.0	98.20	187.5	1031.7	1038.2	3.26	509.72
12.0	98.20	196.4	1219.8	1228.1	4.12	510.13
13.0	98.20	196.4	1400.2	1416.2	8.00	510.52
14.0	98.20	196.4	1565.2	1596.6	15.71	510.87
15.0	98.20	196.4	1712.5	1761.6	24.57	511.18
16.0	98.20	196.4	1841.6	1908.9	33.64	511.44
17.0	98.20	196.4	1954.1	2038.0	41.93	511.67
18.0	98.20	196.4	2051.2	2150.5	49.64	511.86
19.0	98.20	196.4	2134.9	2247.6	56.37	512.02
20.0	98.20	196.4	2206.3	2331.3	62.51	512.16
21.0	89.30	187.5	2259.6	2393.8	67.10	512.26
22.0	80.40	169.7	2289.8	2429.3	69.71	512.32
23.0	71.40	151.8	2300.4	2441.6	70.62	512.34
24.0	62.50	133.9	2294.1	2434.3	70.08	512.33
25.0	53.60	116.1	2273.6	2410.2	68.31	512.29
26.0	44.60	98.2	2240.8	2371.8	65.49	512.23
27.0	35.70	80.3	2197.6	2321.1	61.77	512.14
28.0	26.80	62.5	2145.5	2260.1	57.28	512.04
29.0	17.90	44.7	2085.5	2190.2	52.36	511.93
30.0	8.90	26.8	2018.3	2112.3	47.02	511.79
31.0	0.00	8.9	1944.8	2027.2	41.19	511.65
32.0	0.00	0.0	1873.0	1944.8	35.88	511.51
33.0	0.00	0.0	1810.2	1873.0	31.41	511.38
34.0	0.00	0.0	1755.2	1810.2	27.49	511.27
35.0	0.00	0.0	1706.8	1755.2	24.23	511.17
36.0	0.00	0.0	1663.5	1706.8	21.63	511.08
37.0	0.00	0.0	1624.9	1663.5	19.30	510.99
38.0	0.00	0.0	1590.5	1624.9	17.23	510.92
39.0	0.00	0.0	1559.7	1590.5	15.38	510.86
40.0	0.00	0.0	1532.2	1559.7	13.73	510.80
41.0	0.00	0.0	1507.0	1532.2	12.63	510.75
42.0	0.00	0.0	1483.7	1507.0	11.62	510.70
43.0	0.00	0.0	1462.3	1483.7	10.70	510.65
44.0	0.00	0.0	1442.6	1462.3	9.84	510.61

POND-2 Version: 5.20 S/N:
EXECUTED: 12-22-2000 09:42:21

Pond File: 7230HN2 .PND
Inflow Hydrograph: 7230H-2 .HYD
Outflow Hydrograph: OUT .HYD

INFLOW HYDROGRAPH

TIME (min)	INFLOW (cfs)
45.0	0.00
46.0	0.00
47.0	0.00
48.0	0.00
49.0	0.00
50.0	0.00
51.0	0.00
52.0	0.00
53.0	0.00
54.0	0.00
55.0	0.00
56.0	0.00
57.0	0.00
58.0	0.00
59.0	0.00
60.0	0.00

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	1424.5	1442.6	9.06	510.57
0.0	1407.9	1424.5	8.34	510.54
0.0	1392.5	1407.9	7.67	510.50
0.0	1378.4	1392.5	7.06	510.47
0.0	1365.4	1378.4	6.50	510.44
0.0	1353.5	1365.4	5.98	510.42
0.0	1342.3	1353.5	5.57	510.39
0.0	1331.4	1342.3	5.44	510.37
0.0	1320.8	1331.4	5.32	510.35
0.0	1310.4	1320.8	5.19	510.33
0.0	1300.3	1310.4	5.07	510.30
0.0	1290.4	1300.3	4.95	510.28
0.0	1280.7	1290.4	4.84	510.26
0.0	1271.2	1280.7	4.73	510.24
0.0	1262.0	1271.2	4.62	510.22
0.0	1253.0	1262.0	4.51	510.20

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: 7230HN2 .PND
Inflow Hydrograph: 7230H-2 .HYD
Outflow Hydrograph: OUT .HYD

Starting Pond W.S. Elevation = 505.60 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow	=	98.20 cfs
Peak Outflow	=	70.62 cfs
Peak Elevation	=	512.34 ft

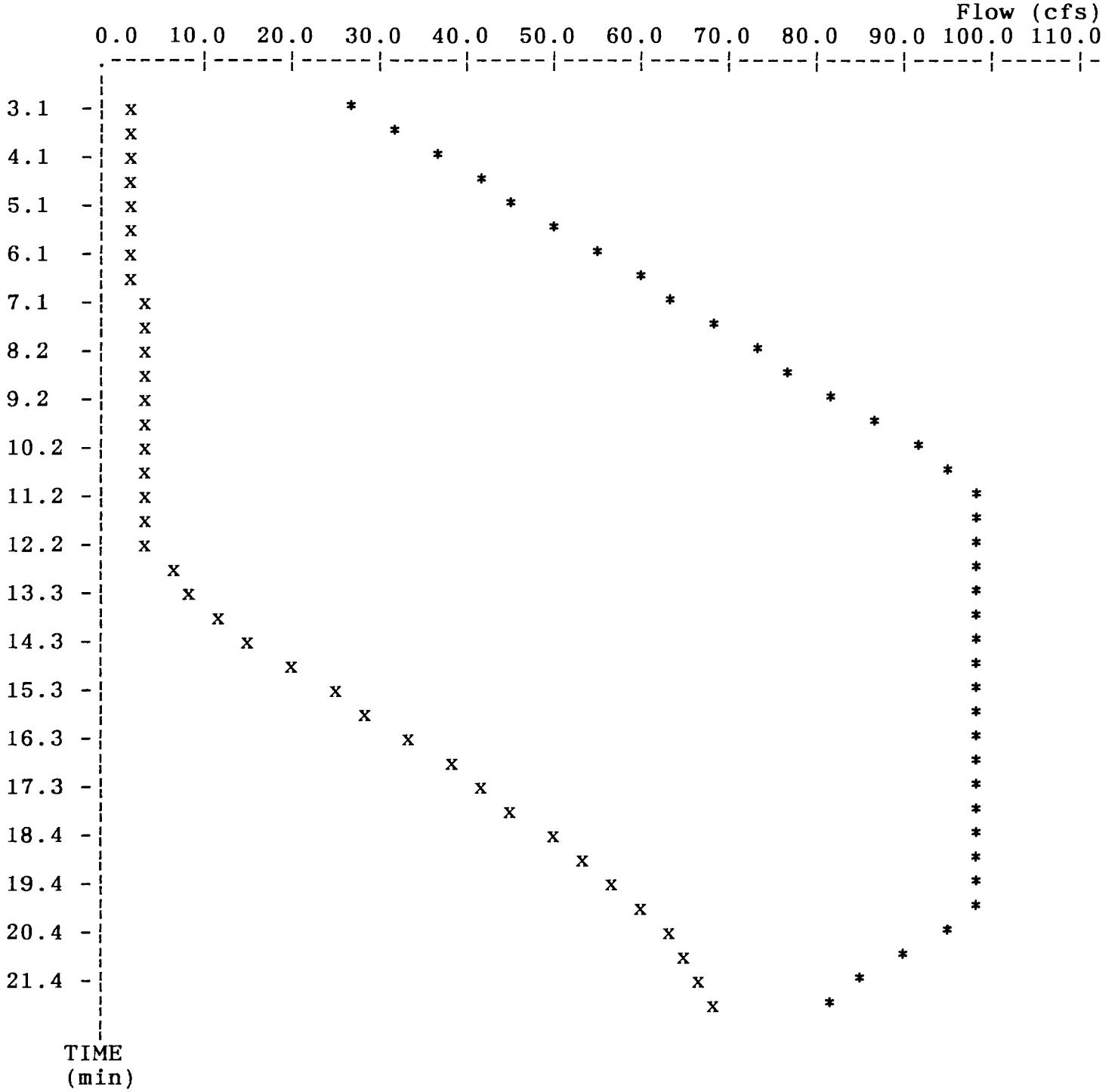
***** Summary of Approximate Peak Storage *****

Initial Storage	=	0 cu-ft
Peak Storage From Storm	=	71,146 cu-ft
Total Storage in Pond	=	71,146 cu-ft

Pond File: 7230HN2 .PND
Inflow Hydrograph: 7230H-2 .HYD
Outflow Hydrograph: OUT .HYD

EXECUTED: 12-22-2000
09:42:21

Peak Inflow = 98.20 cfs
Peak Outflow = 70.62 cfs
Peak Elevation = 512.34 ft



x File: OUT .HYD Qmax = 70.6 cfs
* File: 7230H-2 .HYD Qmax = 98.2 cfs

****
*
* AVONDALE HIEGHTS PHASE TWO & THREE, 5-YEAR 20 MIN. ROUTING *
* MODIFIED DETENTION STRUCTURE AND BASIN, WITHIN PROXIMITY TO *
* LOTS 440,441,403 AND 404. ORIGINAL ANALYSIS: AUGUST 1997 *
* REVISED: OCTOBER 31, 2000, REREVISED: DEC. 21, 2000 *
*
****

Inflow Hydrograph: 7230H-5 .HYD
Rating Table file: 7230HN2 .PND

----INITIAL CONDITIONS----
Elevation = 505.60 ft
Outflow = 0.00 cfs
Storage = 0 cu-ft

GIVEN POND DATA			INTERMEDIATE ROUTING COMPUTATIONS	
ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)	2S/t (cfs)	2S/t + 0 (cfs)
505.60	0.0	0	0.0	0.0
506.00	0.4	122	4.1	4.5
506.40	1.1	651	21.7	22.8
506.80	1.6	1,720	57.3	58.9
507.20	1.9	3,517	117.2	119.1
507.60	2.2	6,234	207.8	210.0
508.00	2.4	10,059	335.2	337.6
508.40	2.6	14,604	486.7	489.3
508.80	2.8	19,356	645.1	647.9
509.20	3.0	24,319	810.5	813.5
509.60	3.2	29,497	983.0	986.2
510.00	3.4	34,895	1162.9	1166.3
510.40	5.6	40,518	1350.3	1355.9
510.80	13.7	46,371	1545.4	1559.1
511.20	25.2	52,456	1748.2	1773.4
511.60	39.2	58,780	1959.0	1998.2
512.00	55.3	65,347	2177.8	2233.1
512.40	73.3	72,160	2404.8	2478.1
512.80	93.0	79,223	2640.2	2733.2
513.20	114.2	86,541	2884.1	2998.3
513.60	136.9	94,119	3136.7	3273.6
514.00	160.9	101,959	3398.0	3558.9
514.40	186.3	110,069	3668.2	3854.5
514.80	217.8	118,448	3947.5	4165.3
515.20	258.2	127,105	4236.0	4494.2
515.60	304.1	136,043	4533.8	4837.9

Time increment (t) = 1.0 min.

POND-2 Version: 5.20 S/N:
EXECUTED: 12-22-2000 09:55:57

Pond File: 7230HN2 .PND
Inflow Hydrograph: 7230H-5 .HYD
Outflow Hydrograph: OUT .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	0.00	-----	0.0	0.0	0.00	505.60
1.0	11.00	11.0	9.7	11.0	0.65	506.14
2.0	22.00	33.0	40.0	42.7	1.38	506.62
3.0	32.90	54.9	91.3	94.9	1.78	507.04
4.0	43.90	76.8	164.0	168.1	2.06	507.42
5.0	54.90	98.8	258.2	262.8	2.28	507.77
6.0	65.90	120.8	374.1	379.0	2.45	508.11
7.0	76.90	142.8	511.6	516.9	2.63	508.47
8.0	87.80	164.7	670.7	676.3	2.83	508.87
9.0	98.80	186.6	851.2	857.3	3.05	509.30
10.0	109.80	208.6	1053.2	1059.8	3.28	509.76
11.0	120.80	230.6	1274.3	1283.8	4.76	510.25
12.0	120.80	241.6	1491.9	1515.9	11.98	510.71
13.0	120.80	241.6	1687.4	1733.5	23.06	511.13
14.0	120.80	241.6	1859.2	1929.0	34.89	511.48
15.0	120.80	241.6	2008.3	2100.8	46.24	511.77
16.0	120.80	241.6	2136.9	2249.9	56.54	512.03
17.0	120.80	241.6	2246.5	2378.5	65.98	512.24
18.0	120.80	241.6	2340.0	2488.1	74.07	512.42
19.0	120.80	241.6	2419.0	2581.6	81.29	512.56
20.0	120.80	241.6	2485.8	2660.6	87.39	512.69
21.0	109.80	230.6	2533.0	2716.4	91.70	512.77
22.0	98.80	208.6	2554.3	2741.6	93.67	512.81
23.0	87.80	186.6	2553.6	2740.9	93.61	512.81
24.0	76.90	164.7	2534.6	2718.3	91.85	512.78
25.0	65.90	142.8	2500.1	2677.4	88.69	512.71
26.0	54.90	120.8	2452.2	2620.9	84.32	512.62
27.0	43.90	98.8	2393.2	2551.0	78.93	512.51
28.0	32.90	76.8	2324.6	2470.0	72.70	512.39
29.0	22.00	54.9	2247.4	2379.5	66.05	512.24
30.0	11.00	33.0	2162.8	2280.4	58.77	512.08
31.0	0.00	11.0	2071.3	2173.8	51.24	511.90
32.0	0.00	0.0	1982.9	2071.3	44.22	511.72
33.0	0.00	0.0	1906.4	1982.9	38.25	511.57
34.0	0.00	0.0	1839.4	1906.4	33.49	511.44
35.0	0.00	0.0	1780.8	1839.4	29.31	511.32
36.0	0.00	0.0	1729.5	1780.8	25.66	511.21
37.0	0.00	0.0	1683.8	1729.5	22.84	511.12
38.0	0.00	0.0	1643.0	1683.8	20.39	511.03
39.0	0.00	0.0	1606.6	1643.0	18.20	510.96
40.0	0.00	0.0	1574.1	1606.6	16.25	510.89
41.0	0.00	0.0	1545.1	1574.1	14.51	510.83
42.0	0.00	0.0	1518.8	1545.1	13.14	510.77
43.0	0.00	0.0	1494.6	1518.8	12.09	510.72
44.0	0.00	0.0	1472.4	1494.6	11.13	510.67

Pond File: 7230HN2 .PND
Inflow Hydrograph: 7230H-5 .HYD
Outflow Hydrograph: OUT .HYD

INFLOW HYDROGRAPH

ROUTING COMPUTATIONS

TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
45.0	0.00	0.0	1451.9	1472.4	10.24	510.63
46.0	0.00	0.0	1433.0	1451.9	9.43	510.59
47.0	0.00	0.0	1415.7	1433.0	8.67	510.55
48.0	0.00	0.0	1399.7	1415.7	7.98	510.52
49.0	0.00	0.0	1385.0	1399.7	7.35	510.49
50.0	0.00	0.0	1371.5	1385.0	6.76	510.46
51.0	0.00	0.0	1359.1	1371.5	6.22	510.43
52.0	0.00	0.0	1347.6	1359.1	5.72	510.41
53.0	0.00	0.0	1336.6	1347.6	5.50	510.38
54.0	0.00	0.0	1325.9	1336.6	5.38	510.36
55.0	0.00	0.0	1315.4	1325.9	5.25	510.34
56.0	0.00	0.0	1305.1	1315.4	5.13	510.31
57.0	0.00	0.0	1295.1	1305.1	5.01	510.29
58.0	0.00	0.0	1285.3	1295.1	4.89	510.27
59.0	0.00	0.0	1275.7	1285.3	4.78	510.25
60.0	0.00	0.0	1266.4	1275.7	4.67	510.23

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: 7230HN2 .PND
Inflow Hydrograph: 7230H-5 .HYD
Outflow Hydrograph: OUT .HYD

Starting Pond W.S. Elevation = 505.60 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow	=	120.80 cfs
Peak Outflow	=	93.67 cfs
Peak Elevation	=	512.81 ft

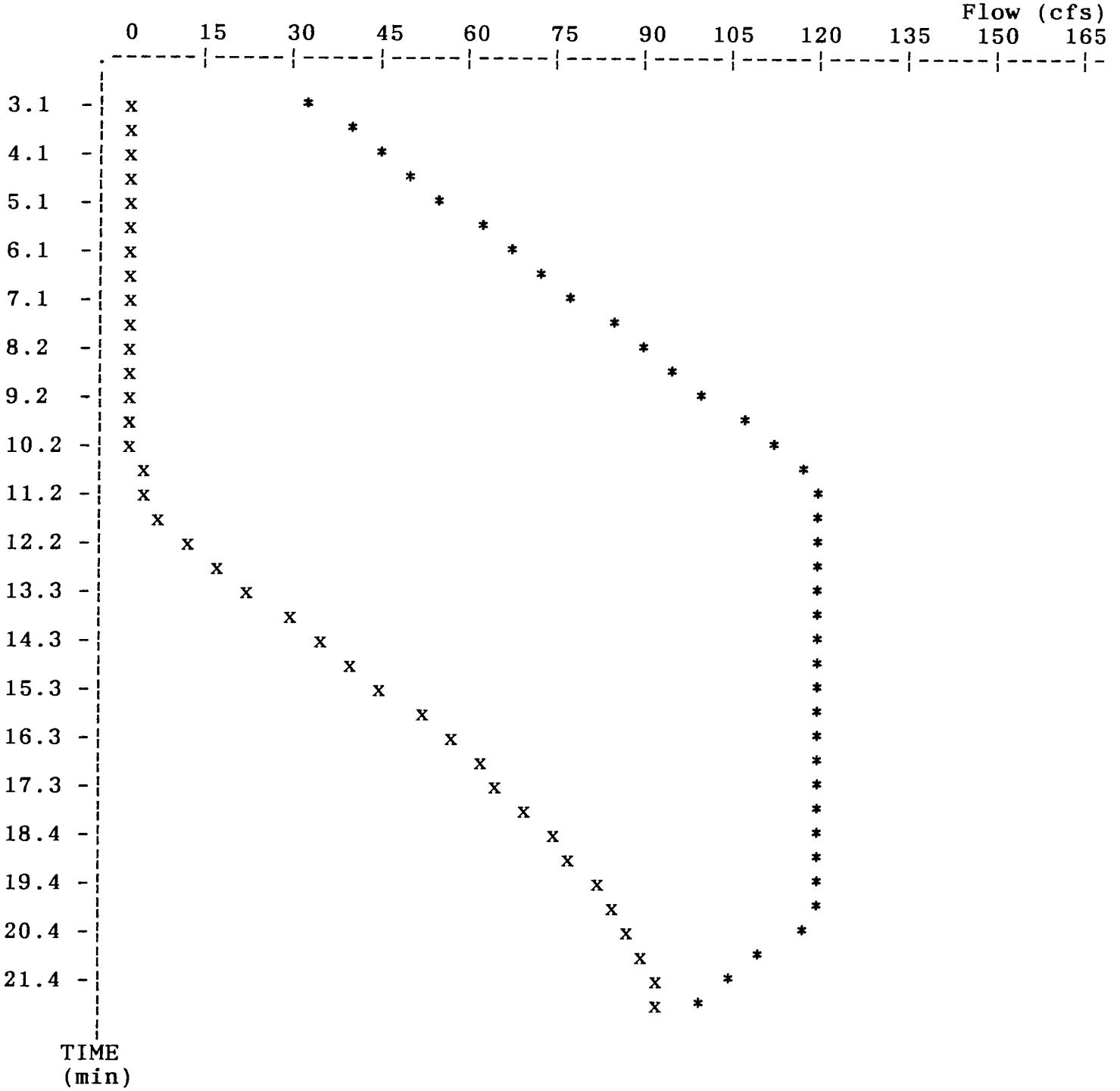
***** Summary of Approximate Peak Storage *****

Initial Storage	=	0 cu-ft
Peak Storage From Storm	=	79,454 cu-ft
Total Storage in Pond	=	79,454 cu-ft

Pond File: 7230HN2 .PND
Inflow Hydrograph: 7230H-5 .HYD
Outflow Hydrograph: OUT .HYD

EXECUTED: 12-22-2000
09:55:57

Peak Inflow = 120.80 cfs
Peak Outflow = 93.67 cfs
Peak Elevation = 512.81 ft



x File: OUT .HYD Qmax = 93.7 cfs
* File: 7230H-5 .HYD Qmax = 120.8 cfs

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**********************************************************************
*                                                                    *
* AVONDALE HIEGHTS PHASE TWO & THREE, 15-YEAR 20 MIN. ROUTING        *
* MODIFIED DETENTION STRUCTURE AND BASIN, WITHIN PROXIMITY TO        *
*   LOTS 440,441,403 AND 404. ORIGINAL ANALYSIS: AUGUST 1997         *
*     REVISED: OCTOBER 31, 2000,   REREVISED: DEC. 21, 2000          *
*                                                                    *
**********************************************************************

 Inflow Hydrograph: 7230H-15.HYD
 Rating Table file: 7230HN2 .PND

 ----INITIAL CONDITIONS----
 Elevation =   505.60 ft
 Outflow   =     0.00 cfs
 Storage   =          0 cu-ft
```

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
505.60	0.0	0
506.00	0.4	122
506.40	1.1	651
506.80	1.6	1,720
507.20	1.9	3,517
507.60	2.2	6,234
508.00	2.4	10,059
508.40	2.6	14,604
508.80	2.8	19,356
509.20	3.0	24,319
509.60	3.2	29,497
510.00	3.4	34,895
510.40	5.6	40,518
510.80	13.7	46,371
511.20	25.2	52,456
511.60	39.2	58,780
512.00	55.3	65,347
512.40	73.3	72,160
512.80	93.0	79,223
513.20	114.2	86,541
513.60	136.9	94,119
514.00	160.9	101,959
514.40	186.3	110,069
514.80	217.8	118,448
515.20	258.2	127,105
515.60	304.1	136,043

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + 0 (cfs)
0.0	0.0
4.1	4.5
21.7	22.8
57.3	58.9
117.2	119.1
207.8	210.0
335.2	337.6
486.7	489.3
645.1	647.9
810.5	813.5
983.0	986.2
1162.9	1166.3
1350.3	1355.9
1545.4	1559.1
1748.2	1773.4
1959.0	1998.2
2177.8	2233.1
2404.8	2478.1
2640.2	2733.2
2884.1	2998.3
3136.7	3273.6
3398.0	3558.9
3668.2	3854.5
3947.5	4165.3
4236.0	4494.2
4533.8	4837.9

Time increment (t) = 1.0 min.

Pond File: 7230HN2 .PND
Inflow Hydrograph: 7230H-15.HYD
Outflow Hydrograph: OUT .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	0.00	-----	0.0	0.0	0.00	505.60
1.0	14.60	14.6	13.0	14.6	0.79	506.22
2.0	29.30	43.9	53.8	56.9	1.57	506.78
3.0	43.90	73.2	123.1	127.0	1.93	507.23
4.0	58.60	102.5	221.2	225.6	2.22	507.65
5.0	73.20	131.8	348.1	353.0	2.42	508.04
6.0	87.80	161.0	503.9	509.1	2.63	508.45
7.0	102.50	190.3	688.5	694.2	2.86	508.91
8.0	117.10	219.6	901.9	908.1	3.11	509.42
9.0	131.80	248.9	1144.0	1150.8	3.38	509.97
10.0	146.40	278.2	1405.7	1422.2	8.24	510.53
11.0	161.00	307.4	1669.2	1713.1	21.97	511.09
12.0	161.00	322.0	1913.6	1991.2	38.77	511.59
13.0	161.00	322.0	2124.7	2235.6	55.49	512.00
14.0	161.00	322.0	2304.7	2446.7	70.99	512.35
15.0	161.00	322.0	2457.1	2626.7	84.77	512.63
16.0	161.00	322.0	2585.8	2779.1	96.67	512.87
17.0	161.00	322.0	2693.9	2907.8	106.96	513.06
18.0	161.00	322.0	2784.6	3015.9	115.65	513.23
19.0	161.00	322.0	2860.3	3106.6	123.13	513.36
20.0	161.00	322.0	2923.6	3182.3	129.38	513.47
21.0	146.40	307.4	2964.2	3231.0	133.39	513.54
22.0	131.80	278.2	2973.7	3242.4	134.33	513.55
23.0	117.10	248.9	2957.2	3222.6	132.70	513.53
24.0	102.50	219.6	2919.0	3176.8	128.92	513.46
25.0	87.80	190.3	2862.6	3109.3	123.35	513.36
26.0	73.20	161.0	2791.0	3023.6	116.28	513.24
27.0	58.60	131.8	2706.5	2922.8	108.16	513.09
28.0	43.90	102.5	2610.9	2809.0	99.06	512.91
29.0	29.30	73.2	2505.7	2684.1	89.20	512.72
30.0	14.60	43.9	2391.9	2549.6	78.82	512.51
31.0	0.00	14.6	2270.5	2406.5	68.04	512.28
32.0	0.00	0.0	2154.4	2270.5	58.05	512.06
33.0	0.00	0.0	2054.6	2154.4	49.91	511.87
34.0	0.00	0.0	1968.4	2054.6	43.07	511.70
35.0	0.00	0.0	1893.7	1968.4	37.35	511.55
36.0	0.00	0.0	1828.3	1893.7	32.70	511.41
37.0	0.00	0.0	1771.1	1828.3	28.62	511.30
38.0	0.00	0.0	1720.9	1771.1	25.08	511.20
39.0	0.00	0.0	1676.2	1720.9	22.39	511.10
40.0	0.00	0.0	1636.2	1676.2	19.98	511.02
41.0	0.00	0.0	1600.5	1636.2	17.84	510.94
42.0	0.00	0.0	1568.7	1600.5	15.92	510.88
43.0	0.00	0.0	1540.3	1568.7	14.21	510.82
44.0	0.00	0.0	1514.4	1540.3	12.95	510.76

Pond File: 7230HN2 .PND
Inflow Hydrograph: 7230H-15.HYD
Outflow Hydrograph: OUT .HYD

INFLOW HYDROGRAPH

ROUTING COMPUTATIONS

TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
45.0	0.00	0.0	1490.5	1514.4	11.92	510.71
46.0	0.00	0.0	1468.6	1490.5	10.97	510.66
47.0	0.00	0.0	1448.4	1468.6	10.09	510.62
48.0	0.00	0.0	1429.8	1448.4	9.29	510.58
49.0	0.00	0.0	1412.7	1429.8	8.55	510.55
50.0	0.00	0.0	1397.0	1412.7	7.86	510.51
51.0	0.00	0.0	1382.5	1397.0	7.24	510.48
52.0	0.00	0.0	1369.2	1382.5	6.66	510.45
53.0	0.00	0.0	1357.0	1369.2	6.13	510.43
54.0	0.00	0.0	1345.7	1357.0	5.64	510.40
55.0	0.00	0.0	1334.7	1345.7	5.48	510.38
56.0	0.00	0.0	1324.0	1334.7	5.35	510.36
57.0	0.00	0.0	1313.5	1324.0	5.23	510.33
58.0	0.00	0.0	1303.3	1313.5	5.11	510.31
59.0	0.00	0.0	1293.3	1303.3	4.99	510.29
60.0	0.00	0.0	1283.6	1293.3	4.87	510.27

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: 7230HN2 .PND
Inflow Hydrograph: 7230H-15.HYD
Outflow Hydrograph: OUT .HYD

Starting Pond W.S. Elevation = 505.60 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow	=	161.00 cfs
Peak Outflow	=	134.33 cfs
Peak Elevation	=	513.55 ft

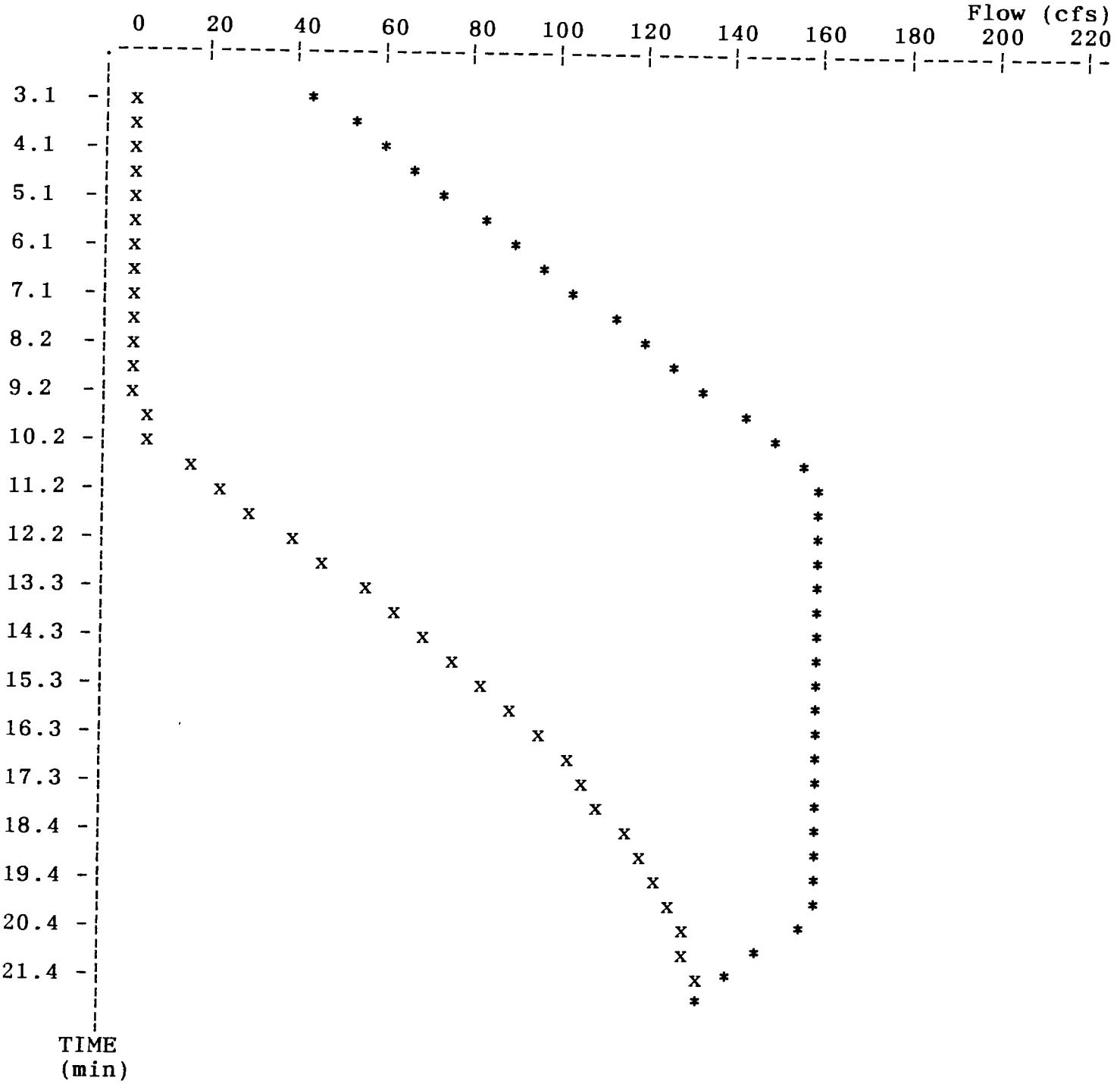
***** Summary of Approximate Peak Storage *****

Initial Storage	=	0 cu-ft
Peak Storage From Storm	=	93,260 cu-ft
Total Storage in Pond	=	93,260 cu-ft

Pond File: 7230HN2 .PND
Inflow Hydrograph: 7230H-15.HYD
Outflow Hydrograph: OUT .HYD

EXECUTED: 12-22-2000
09:58:15

Peak Inflow = 161.00 cfs
Peak Outflow = 134.33 cfs
Peak Elevation = 513.55 ft



x File: OUT .HYD Qmax = 134.3 cfs
* File: 7230H-15.HYD Qmax = 161.0 cfs

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**********************************************************************
*                                                                    *
* AVONDALE HIEGHTS PHASE TWO & THREE, 25-YEAR 20 MIN. ROUTING        *
* MODIFIED DETENTION STRUCTURE AND BASIN, WITHIN PROXIMITY TO        *
*   LOTS 440,441,403 AND 404. ORIGINAL ANALYSIS: AUGUST 1997         *
*     REVISED: OCTOBER 31, 2000,   REREVISED: DEC. 21, 2000          *
*                                                                    *
**********************************************************************

 Inflow Hydrograph: 7230H-25.HYD
 Rating Table file: 7230HN2 .PND

 ----INITIAL CONDITIONS----
 Elevation =   505.60 ft
 Outflow   =     0.00 cfs
 Storage   =          0 cu-ft
```

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
505.60	0.0	0
506.00	0.4	122
506.40	1.1	651
506.80	1.6	1,720
507.20	1.9	3,517
507.60	2.2	6,234
508.00	2.4	10,059
508.40	2.6	14,604
508.80	2.8	19,356
509.20	3.0	24,319
509.60	3.2	29,497
510.00	3.4	34,895
510.40	5.6	40,518
510.80	13.7	46,371
511.20	25.2	52,456
511.60	39.2	58,780
512.00	55.3	65,347
512.40	73.3	72,160
512.80	93.0	79,223
513.20	114.2	86,541
513.60	136.9	94,119
514.00	160.9	101,959
514.40	186.3	110,069
514.80	217.8	118,448
515.20	258.2	127,105
515.60	304.1	136,043

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
4.1	4.5
21.7	22.8
57.3	58.9
117.2	119.1
207.8	210.0
335.2	337.6
486.7	489.3
645.1	647.9
810.5	813.5
983.0	986.2
1162.9	1166.3
1350.3	1355.9
1545.4	1559.1
1748.2	1773.4
1959.0	1998.2
2177.8	2233.1
2404.8	2478.1
2640.2	2733.2
2884.1	2998.3
3136.7	3273.6
3398.0	3558.9
3668.2	3854.5
3947.5	4165.3
4236.0	4494.2
4533.8	4837.9

Time increment (t) = 1.0 min.

Pond File: 7230HN2 .PND
Inflow Hydrograph: 7230H-25.HYD
Outflow Hydrograph: OUT .HYD

INFLOW HYDROGRAPH

TIME (min)	INFLOW (cfs)
0.0	0.00
1.0	18.10
2.0	36.10
3.0	54.20
4.0	72.30
5.0	90.30
6.0	108.40
7.0	126.50
8.0	144.50
9.0	162.60
10.0	180.70
11.0	198.70
12.0	198.70
13.0	198.70
14.0	198.70
15.0	198.70
16.0	198.70
17.0	198.70
18.0	198.70
19.0	198.70
20.0	198.70
21.0	180.70
22.0	162.60
23.0	144.50
24.0	126.50
25.0	108.40
26.0	90.30
27.0	72.30
28.0	54.20
29.0	36.10
30.0	18.10
31.0	0.00
32.0	0.00
33.0	0.00
34.0	0.00
35.0	0.00
36.0	0.00
37.0	0.00
38.0	0.00
39.0	0.00
40.0	0.00
41.0	0.00
42.0	0.00
43.0	0.00
44.0	0.00

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
-----	0.0	0.0	0.00	505.60
18.1	16.3	18.1	0.92	506.30
54.2	67.1	70.5	1.66	506.88
90.3	153.4	157.4	2.03	507.37
126.5	275.3	279.9	2.31	507.82
162.6	432.8	437.9	2.53	508.26
198.7	625.9	631.5	2.78	508.76
234.9	854.7	860.8	3.05	509.31
271.0	1119.0	1125.7	3.35	509.91
307.1	1409.3	1426.1	8.40	510.54
343.3	1704.5	1752.6	24.09	511.16
379.4	1993.7	2083.9	45.07	511.75
397.4	2257.3	2391.1	66.91	512.26
397.4	2480.8	2654.7	86.94	512.68
397.4	2669.0	2878.2	104.60	513.02
397.4	2826.8	3066.4	119.82	513.30
397.4	2958.5	3224.2	132.83	513.53
397.4	3068.3	3355.9	143.83	513.72
397.4	3159.6	3465.7	153.06	513.87
397.4	3235.5	3557.0	160.74	514.00
397.4	3298.4	3632.9	167.26	514.10
379.4	3335.5	3677.8	171.11	514.16
343.3	3336.4	3678.8	171.21	514.16
307.1	3307.2	3643.5	168.17	514.11
271.0	3253.1	3578.2	162.56	514.03
234.9	3178.1	3488.0	154.94	513.90
198.7	3085.6	3376.8	145.58	513.74
162.6	2978.6	3248.2	134.81	513.56
126.5	2859.1	3105.1	123.01	513.36
90.3	2728.8	2949.4	110.29	513.13
54.2	2589.1	2783.0	96.98	512.88
18.1	2440.6	2607.2	83.26	512.60
0.0	2299.5	2440.6	70.54	512.34
0.0	2179.2	2299.5	60.18	512.11
0.0	2076.0	2179.2	51.61	511.91
0.0	1986.9	2076.0	44.53	511.73
0.0	1909.9	1986.9	38.50	511.58
0.0	1842.5	1909.9	33.70	511.44
0.0	1783.5	1842.5	29.50	511.32
0.0	1731.8	1783.5	25.83	511.22
0.0	1685.9	1731.8	22.97	511.12
0.0	1644.9	1685.9	20.50	511.04
0.0	1608.3	1644.9	18.30	510.96
0.0	1575.6	1608.3	16.34	510.89
0.0	1546.4	1575.6	14.59	510.83

Pond File: 7230HN2 .PND
Inflow Hydrograph: 7230H-25.HYD
Outflow Hydrograph: OUT .HYD

INFLOW HYDROGRAPH

TIME (min)	INFLOW (cfs)
45.0	0.00
46.0	0.00
47.0	0.00
48.0	0.00
49.0	0.00
50.0	0.00
51.0	0.00
52.0	0.00
53.0	0.00
54.0	0.00
55.0	0.00
56.0	0.00
57.0	0.00
58.0	0.00
59.0	0.00
60.0	0.00

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	1520.0	1546.4	13.19	510.78
0.0	1495.7	1520.0	12.14	510.72
0.0	1473.4	1495.7	11.17	510.68
0.0	1452.8	1473.4	10.28	510.63
0.0	1433.9	1452.8	9.46	510.59
0.0	1416.5	1433.9	8.71	510.55
0.0	1400.5	1416.5	8.01	510.52
0.0	1385.7	1400.5	7.38	510.49
0.0	1372.1	1385.7	6.79	510.46
0.0	1359.6	1372.1	6.25	510.43
0.0	1348.1	1359.6	5.75	510.41
0.0	1337.1	1348.1	5.51	510.38
0.0	1326.4	1337.1	5.38	510.36
0.0	1315.9	1326.4	5.26	510.34
0.0	1305.6	1315.9	5.13	510.32
0.0	1295.5	1305.6	5.02	510.29

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: 7230HN2 .PND
Inflow Hydrograph: 7230H-25.HYD
Outflow Hydrograph: OUT .HYD

Starting Pond W.S. Elevation = 505.60 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow	=	198.70 cfs
Peak Outflow	=	171.21 cfs
Peak Elevation	=	514.16 ft

***** Summary of Approximate Peak Storage *****

Initial Storage	=	0 cu-ft
Peak Storage From Storm	=	105,249 cu-ft
Total Storage in Pond	=	105,249 cu-ft

Pond File: 7230HN2 .PND
Inflow Hydrograph: 7230H-25.HYD
Outflow Hydrograph: OUT .HYD

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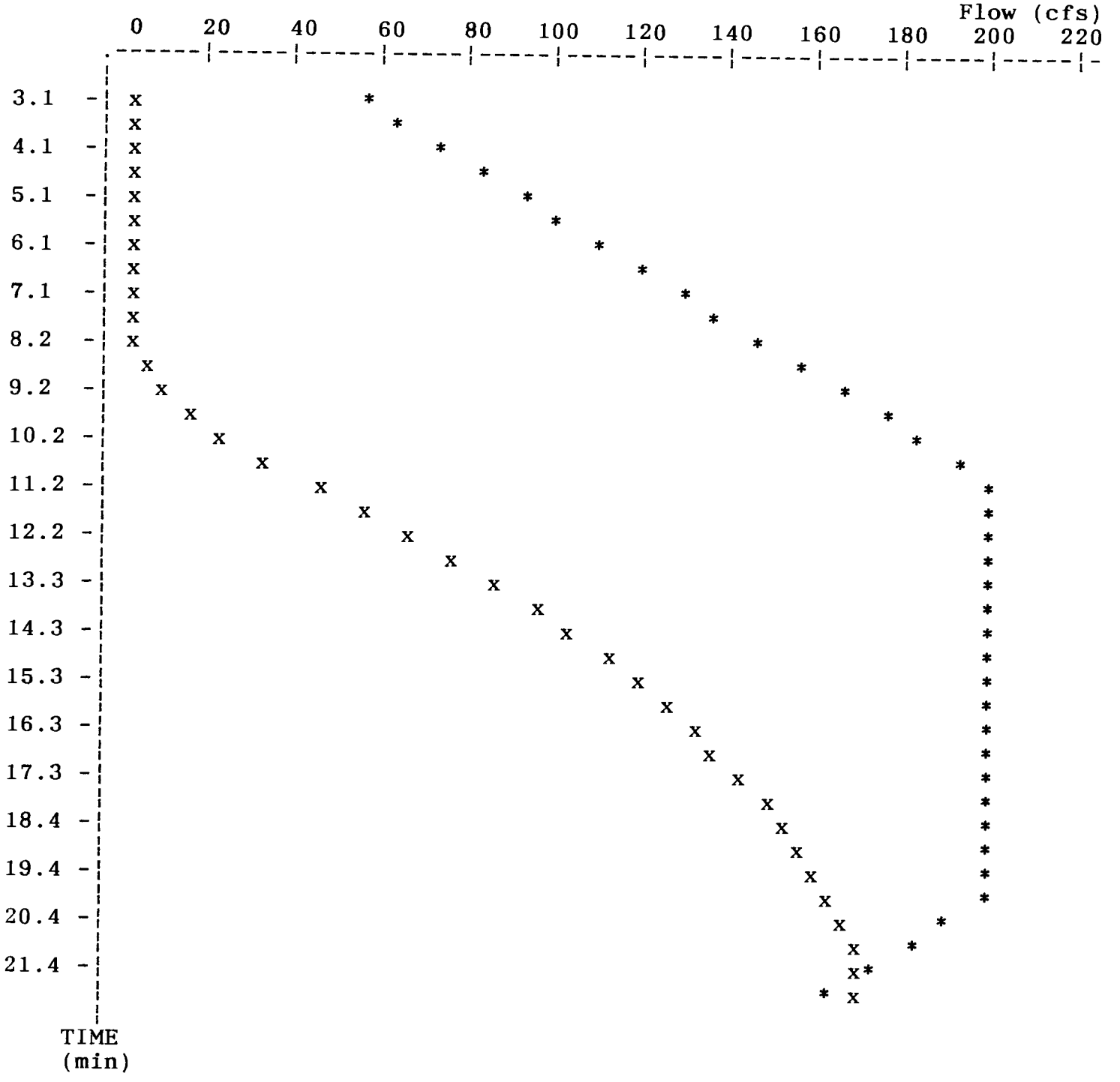
10:02:16

Peak Inflow = 198.70 cfs
Peak Outflow = 171.21 cfs
Peak Elevation = 514.16 ft



x File: OUT .HYD Qmax = 171.2 cfs
* File: 7230H-25.HYD Qmax = 198.7 cfs

AVONDALE HIEGHTS PHASE TWO & THREE, 100-YEAR 20 MIN. ROUTING
MODIFIED DETENTION STRUCTURE AND BASIN, WITHIN PROXIMITY TO
LOTS 440,441,403 AND 404. ORIGINAL ANALYSIS: AUGUST 1997
REVISED: OCTOBER 31, 2000, REREVISED: DEC. 21, 2000

Inflow Hydrograph: 7230H-10.HYD
Rating Table file: 7230HN2 .PND

----INITIAL CONDITIONS----
Elevation = 505.60 ft
Outflow = 0.00 cfs
Storage = 0 cu-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
505.60	0.0	0
506.00	0.4	122
506.40	1.1	651
506.80	1.6	1,720
507.20	1.9	3,517
507.60	2.2	6,234
508.00	2.4	10,059
508.40	2.6	14,604
508.80	2.8	19,356
509.20	3.0	24,319
509.60	3.2	29,497
510.00	3.4	34,895
510.40	5.6	40,518
510.80	13.7	46,371
511.20	25.2	52,456
511.60	39.2	58,780
512.00	55.3	65,347
512.40	73.3	72,160
512.80	93.0	79,223
513.20	114.2	86,541
513.60	136.9	94,119
514.00	160.9	101,959
514.40	186.3	110,069
514.80	217.8	118,448
515.20	258.2	127,105
515.60	304.1	136,043

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + 0 (cfs)
0.0	0.0
4.1	4.5
21.7	22.8
57.3	58.9
117.2	119.1
207.8	210.0
335.2	337.6
486.7	489.3
645.1	647.9
810.5	813.5
983.0	986.2
1162.9	1166.3
1350.3	1355.9
1545.4	1559.1
1748.2	1773.4
1959.0	1998.2
2177.8	2233.1
2404.8	2478.1
2640.2	2733.2
2884.1	2998.3
3136.7	3273.6
3398.0	3558.9
3668.2	3854.5
3947.5	4165.3
4236.0	4494.2
4533.8	4837.9

Time increment (t) = 1.0 min.

Pond File: 7230HN2 .PND
Inflow Hydrograph: 7230H-10.HYD
Outflow Hydrograph: OUT .HYD

INFLOW HYDROGRAPH

ROUTING COMPUTATIONS

TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	0.00	-----	0.0	0.0	0.00	505.60
1.0	23.10	23.1	20.9	23.1	1.10	506.40
2.0	46.20	69.3	86.7	90.2	1.76	507.01
3.0	69.30	115.5	197.8	202.2	2.17	507.57
4.0	92.40	161.7	354.7	359.5	2.43	508.06
5.0	115.60	208.0	557.3	562.7	2.69	508.59
6.0	138.70	254.3	805.6	811.6	3.00	509.20
7.0	161.80	300.5	1099.4	1106.1	3.33	509.87
8.0	184.90	346.7	1427.7	1446.1	9.20	510.58
9.0	208.00	392.9	1764.3	1820.6	28.14	511.28
10.0	231.10	439.1	2096.9	2203.4	53.27	511.95
11.0	254.20	485.3	2419.5	2582.2	81.34	512.56
12.0	254.20	508.4	2710.8	2927.9	108.57	513.09
13.0	254.20	508.4	2954.4	3219.2	132.42	513.52
14.0	254.20	508.4	3157.1	3462.8	152.82	513.87
15.0	254.20	508.4	3325.4	3665.5	170.06	514.14
16.0	254.20	508.4	3464.8	3833.8	184.52	514.37
17.0	254.20	508.4	3576.5	3973.2	198.33	514.55
18.0	254.20	508.4	3665.6	4084.9	209.65	514.70
19.0	254.20	508.4	3736.3	4174.0	218.87	514.81
20.0	254.20	508.4	3789.6	4244.7	227.55	514.90
21.0	231.10	485.3	3812.3	4274.9	231.26	514.93
22.0	208.00	439.1	3794.7	4251.4	228.38	514.90
23.0	184.90	392.9	3746.5	4187.6	220.54	514.83
24.0	161.80	346.7	3672.2	4093.2	210.49	514.71
25.0	138.70	300.5	3576.2	3972.7	198.28	514.55
26.0	115.50	254.2	3461.9	3830.4	184.22	514.37
27.0	92.40	207.9	3328.9	3669.8	170.43	514.15
28.0	69.30	161.7	3180.3	3490.6	155.16	513.90
29.0	46.20	115.5	3018.3	3295.8	138.77	513.63
30.0	23.10	69.3	2844.5	3087.6	121.56	513.33
31.0	0.00	23.1	2660.1	2867.6	103.74	513.00
32.0	0.00	0.0	2485.4	2660.1	87.35	512.69
33.0	0.00	0.0	2337.7	2485.4	73.86	512.41
34.0	0.00	0.0	2211.7	2337.7	62.98	512.17
35.0	0.00	0.0	2104.0	2211.7	53.83	511.96
36.0	0.00	0.0	2011.1	2104.0	46.46	511.78
37.0	0.00	0.0	1930.9	2011.1	40.09	511.62
38.0	0.00	0.0	1860.9	1930.9	35.01	511.48
39.0	0.00	0.0	1799.6	1860.9	30.65	511.36
40.0	0.00	0.0	1745.9	1799.6	26.83	511.25
41.0	0.00	0.0	1698.5	1745.9	23.73	511.15
42.0	0.00	0.0	1656.1	1698.5	21.18	511.06
43.0	0.00	0.0	1618.3	1656.1	18.91	510.98
44.0	0.00	0.0	1584.6	1618.3	16.88	510.91

Pond File: 7230HN2 .PND
Inflow Hydrograph: 7230H-10.HYD
Outflow Hydrograph: OUT .HYD

INFLOW HYDROGRAPH

TIME (min)	INFLOW (cfs)
45.0	0.00
46.0	0.00
47.0	0.00
48.0	0.00
49.0	0.00
50.0	0.00
51.0	0.00
52.0	0.00
53.0	0.00
54.0	0.00
55.0	0.00
56.0	0.00
57.0	0.00
58.0	0.00
59.0	0.00
60.0	0.00

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	1554.4	1584.6	15.07	510.85
0.0	1527.4	1554.4	13.51	510.79
0.0	1502.5	1527.4	12.44	510.74
0.0	1479.6	1502.5	11.44	510.69
0.0	1458.6	1479.6	10.53	510.64
0.0	1439.2	1458.6	9.69	510.60
0.0	1421.3	1439.2	8.92	510.56
0.0	1404.9	1421.3	8.21	510.53
0.0	1389.8	1404.9	7.55	510.50
0.0	1375.9	1389.8	6.95	510.47
0.0	1363.1	1375.9	6.40	510.44
0.0	1351.4	1363.1	5.89	510.41
0.0	1340.3	1351.4	5.55	510.39
0.0	1329.4	1340.3	5.42	510.37
0.0	1318.8	1329.4	5.29	510.34
0.0	1308.5	1318.8	5.17	510.32

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: 7230HN2 .PND
Inflow Hydrograph: 7230H-10.HYD
Outflow Hydrograph: OUT .HYD

Starting Pond W.S. Elevation = 505.60 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow	=	254.20 cfs
Peak Outflow	=	231.26 cfs
Peak Elevation	=	514.93 ft

***** Summary of Approximate Peak Storage *****

Initial Storage	=	0 cu-ft
Peak Storage From Storm	=	121,333 cu-ft
Total Storage in Pond	=	121,333 cu-ft

Pond File: 7230HN2 .PND
Inflow Hydrograph: 7230H-10.HYD
Outflow Hydrograph: OUT .HYD

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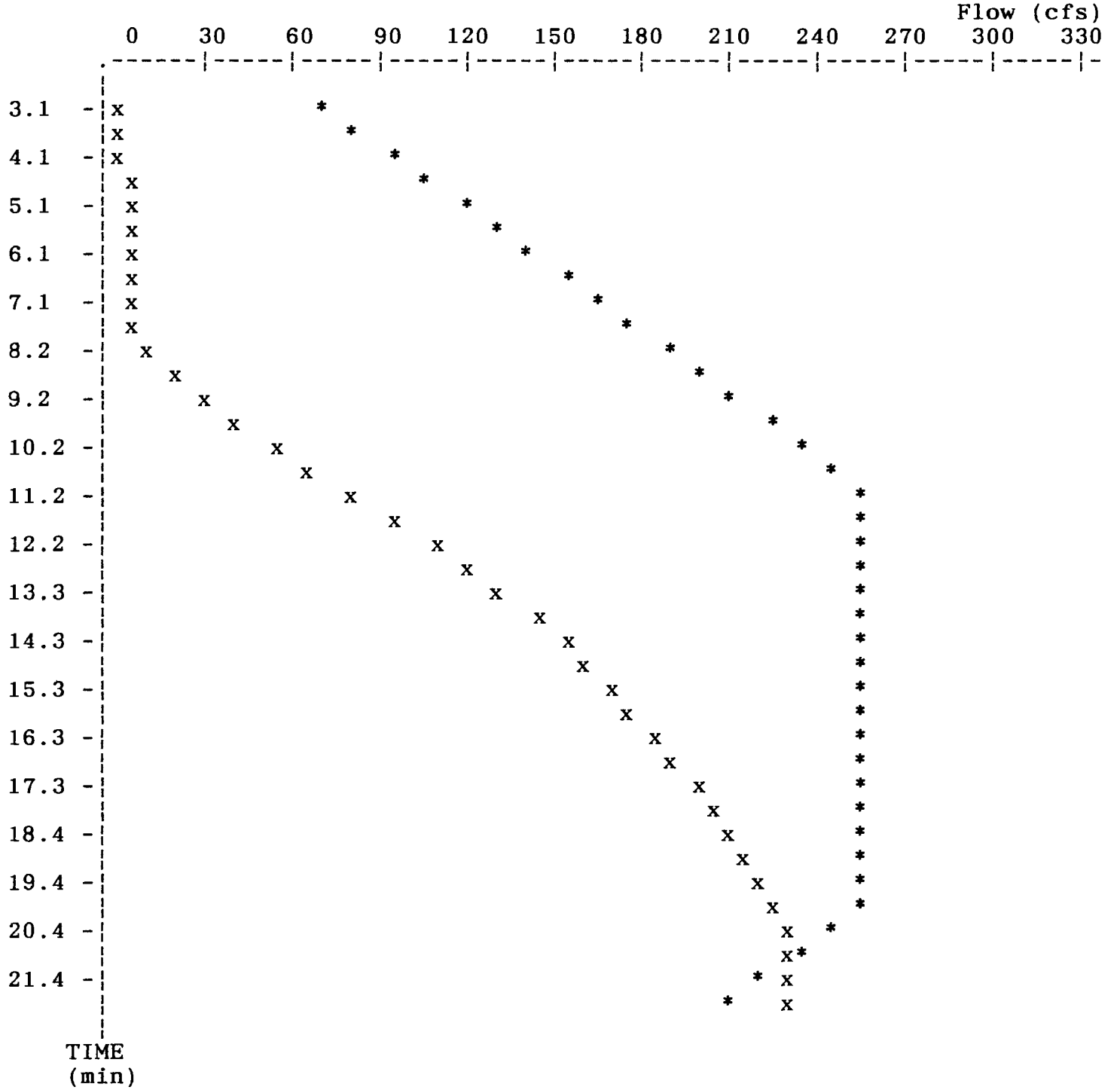
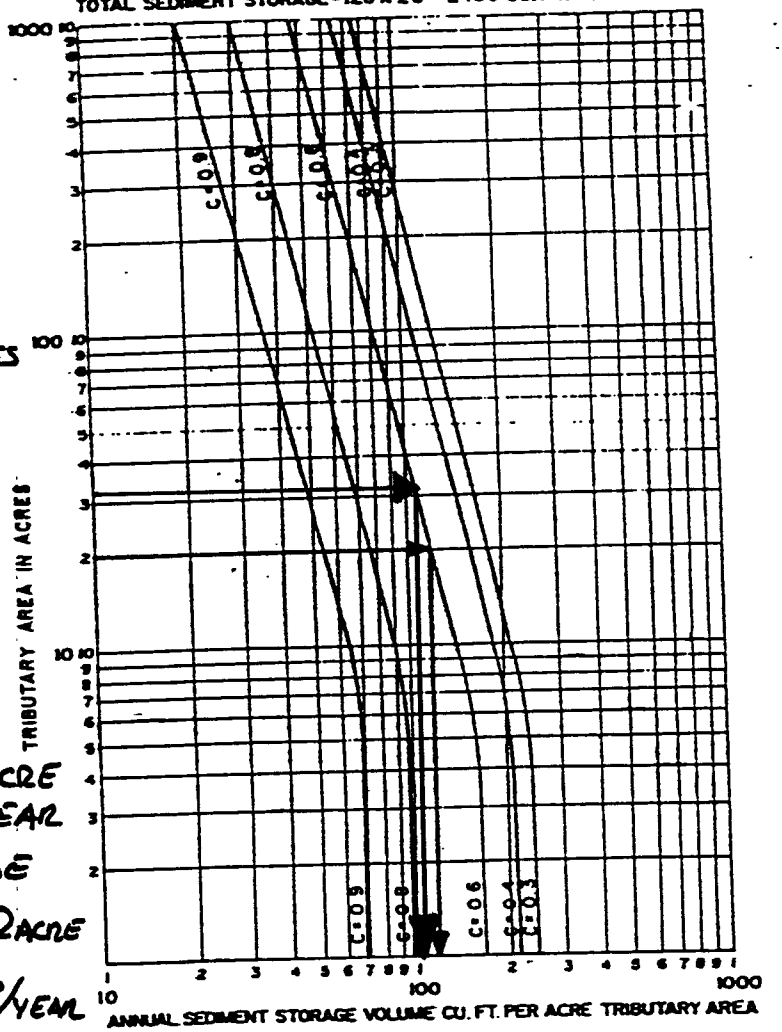
Peak Inflow = 254.20 cfs
Peak Outflow = 231.26 cfs
Peak Elevation = 514.93 ft



x File: OUT .HYD Qmax = 231.3 cfs
* File: 7230H-10.HYD Qmax = 254.2 cfs

EXAMPLE:
TRIBUTARY AREA = 20 ACRES
RATIONAL METHOD RUNOFF COEFFICIENT "C" = 0.6
SEDIMENT STORAGE = 120 CU. FT. PER ACRE PER YEAR
TOTAL SEDIMENT STORAGE = 120 X 20 = 2400 CU. FT. PER YEAR.



ANNUAL SEDIMENT STORAGE

FIG. 6

TRIBUTARY AREA - 32.2 ACRES
RATIONAL METHOD RUNOFF COEFFICIENT "C" = 0.6

SEDIMENT STORAGE REQUIRED - 110 CU. FT. PER ACRE PER YEAR

TOTAL SEDIMENT STORAGE PER YEAR = 110 ft³/ACRE X 32.2 ACRE
= 3,542 ft³/YEAR

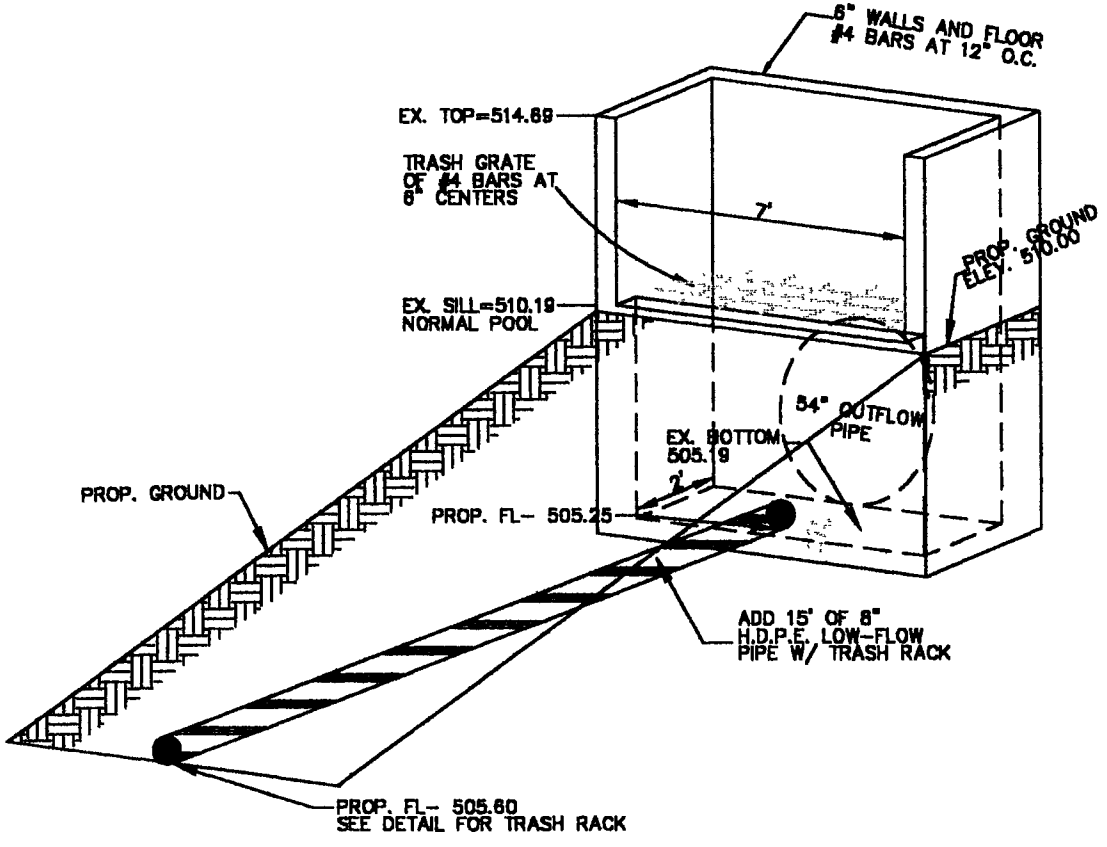
X 2 YEARS = 7,084 ft³ REQ.D

TOTAL VOLUME REQ.D BY 100 YEAR STORM - 98,908 CU. FT.

TOTAL VOLUME REQ.D - 98,908 + 7,084 = 105,992 CU. FT.

TOTAL POND VOLUME = 145,284 ft³ > 105,992 CU. FT.

MODIFIED BASIN WILL OPERATE AS A DRY BASIN.



EX. OUTFALL STRUCTURE 314

NOT TO SCALE

ORIGINAL ANALYSIS AND REPORTS

ENGINEERING

PLANNING

SURVEYING

STORMWATER DETENTION ANALYSIS
PREPARED BY: BAX ENGINEERING CO., INC.
BAX PROJECT NO. **96-7230D**
AVONDALE PHASE 2 - O'FALLON
AUGUST 1997

INTRODUCTION:

The tract of land is presently an undeveloped site located in the City of O'Fallon, Missouri. It is proposed that Phase-2, consisting of 22.73 acres, be developed into a single family residential subdivision. Detention requirements for the entire tract of 98.0 acres have been provided by the basin constructed with Phase-1. A stormwater detention basin shall be constructed near the southwest corner of Phase-2. This basin will provide additional detention for the tract. The basin shall be analyzed for the 25 and 100 year frequency - 20 minute duration design storms.

GENERAL SITE DATA AND RUNOFF CALCULATIONS:

Site area: Phase-2 - 22.7 acres

The P.I. factors to be used for the analysis are:

25 Year-20 minute storm (onsite residential):	3.26 c.f.s./ac.
25 Year-20 minute storm (offsite residential):	3.26 c.f.s./ac.
100 Year-20 minute storm (onsite residential):	4.17 c.f.s./ac.
100 Year-20 minute storm (offsite residential):	4.17 c.f.s./ac.

BAX ENGINEERING CO., INC.
1052 South Cloverleaf Drive
St. Peters, MO 63376-6445
314-928-5552 FAX 928-1718

TIME OF CONCENTRATION:

Of the inflows to the basin, the most remote point of origin lies to the northeast near Knaust Road and the entrance to The Borsheim Tract. Flows will travel approximately 400 feet overland to an area inlet then an additional 3,140 feet via onsite and offsite storm sewer to the detention basin. Time of concentration is estimated as follows:

A) T(overland) : L = 400 feet
Elevation difference = 600 - 594 = 6 feet
T(overland) = 4.0 minutes : See figure 1

B) T(sewer) : L = 3,140 feet
Estimated velocity of 7 ft./sec.
T(sewer) = 449 sec. = 7.47 minutes

Total 11.47 minutes - USE 11 minutes

BASIN PEAK INFLOWS:

Inflows to the basin have been estimated from the drainage area map of Phase-2 of the project. (see sheets 14 - 16 of construction plans)

Onsite areas (assumed 40% impervious - single family)
Total 32.2 acres

Offsite areas (assumed 40% impervious - single family)
Total 28.8 acres

25 year-20 minute storm

Q(onsite)	32.2 x 3.26 =	104.97 cfs
Q(offsite)	28.8 x 3.26 =	93.77 cfs
	Total	198.74 cfs

100 year-20 minute storm

Q(onsite)	32.2 x 4.17 =	134.27 cfs
Q(offsite)	28.8 x 4.17 =	119.94 cfs
	Total	254.21 cfs

ENGINEERING

PLANNING

SURVEYING

STORM ROUTING CALCULATIONS AND RESULTS:

A computer program was used in routing the design 25 and 100 year-20 minute storms through the basin. As found in the routing calculations, the results are as follows:

20 MIN STORM	CALCULATED RELEASE RATE	ATTENUATION PROVIDED	PEAK ELEVATION
25 YEAR	182.01 cfs	16.75 cfs	514.22 ft.
100 YEAR	239.24 cfs	15.05 cfs	514.94 ft.

SUMMARY

Normal Pool (low flow elevation)	510.00 ft.
25 year-20min H.W.	514.22 ft.
100 year-20min H.W.	514.94 ft.
TOP OF BERM	516.00 ft.

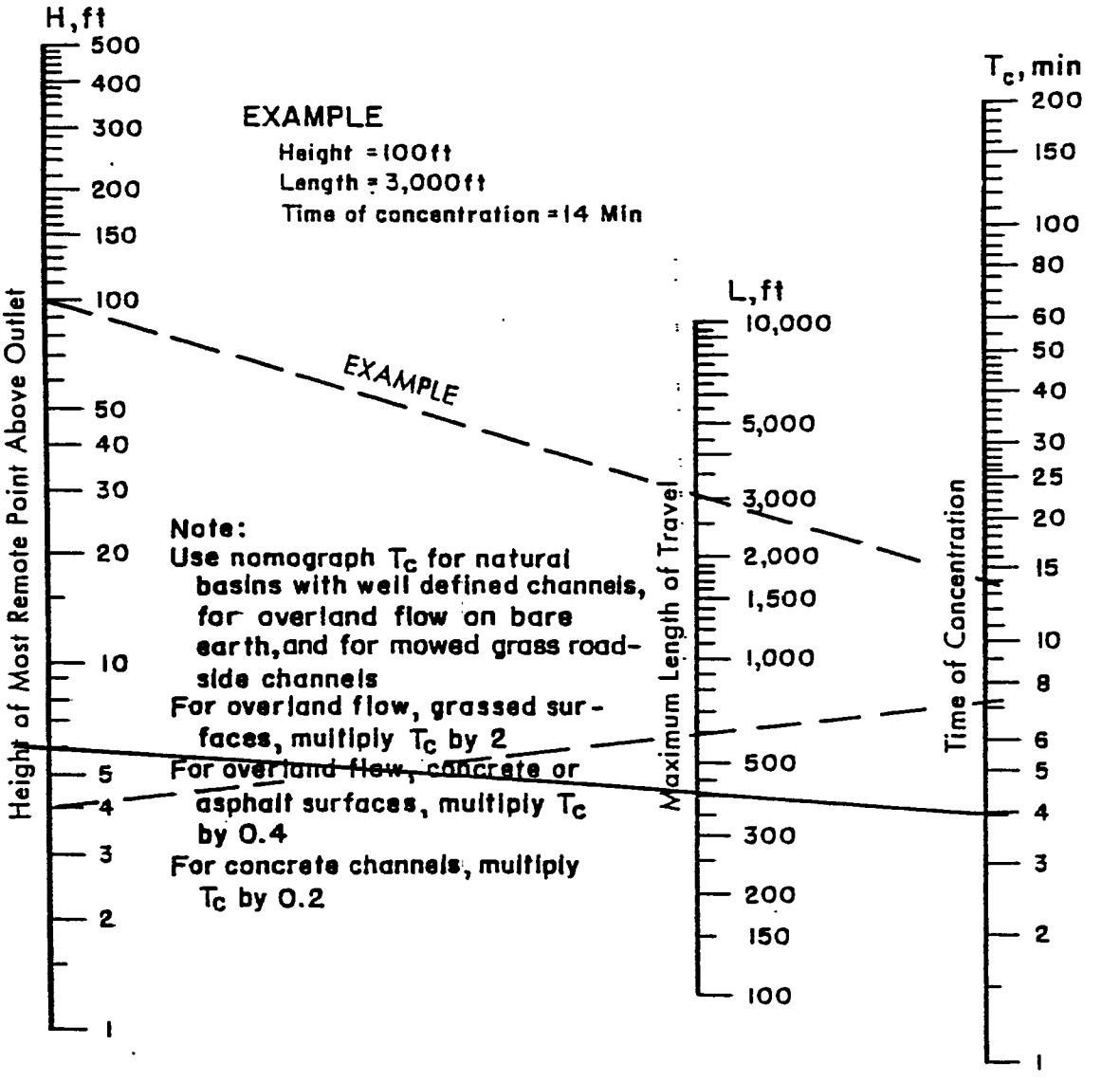
BAX ENGINEERING

SHEET ___ of ___

Project: AVONDALE PHASE 2

Date: 8-97 Project No: 96-7230

Designed: ADJ Checked: ___



Based on study by P.Z. Kirpich,
Civil Engineering, Vol.10, No.6, June 1940, p.362

OVERLAND 4 min

PIPE FLOW 3.140 ÷ 7 ft/sec = 449 sec
= 7.47 min

TOTAL 11.47 min USE 11 min

052 South Cloverleaf Drive
t. Peters, MO 63376-6445
14-928-5552 FAX 928-1718

POND-2 Version: 5.17
S/N:

AVONDALE PHASE 2
DETENTION ANALYSIS
BAX ENGINEERING CO., INC.
AUGUST 1997

CALCULATED 08-12-1997 10:43:22
DISK FILE: 7230 .VOL

Planimeter scale: 1 inch = 1 ft.

Elevation (ft)	Planimeter (sq.in.)	Area (acres)	A1+A2+sqr(A1*A2) (acres)	* Volume (acre-ft)	Volume Sum (acre-ft)
506.00	8,727.46	0.20	0.00	0.00	0.00
508.00	11,108.91	0.26	0.68	0.45	0.45
510.00	13,775.56	0.32	0.86	0.57	1.02
512.00	16,723.28	0.38	1.05	0.70	1.72
514.00	19,936.63	0.46	1.26	0.84	2.56
516.00	23,414.12	0.54	1.49	0.99	3.56

* Incremental volume computed by the Conic Method for Reservoir Volumes.

Volume = (1/3) * (EL2-EL1) * (Area1 + Area2 + sq.rt.(Area1*Area2))

where: EL1, EL2 = Lower and upper elevations of the increment
Area1,Area2 = Areas computed for EL1, EL2, respectively
Volume = Incremental volume between EL1 and EL2

EXECUTED: 08-12-1997 10:39:13 20 MIN Return Freq: 25 years

```
**********************************
*                                *
*       AVONDALE PHASE 2         *
*      DETENTION ANALYSIS        *
*   BAX ENGINEERING CO., INC.    *
*         AUGUST 1997            *
*                                *
**********************************
```

Inflow Hydrograph: 7230-025.HYD
Rating Table file: 7230 .PND

----INITIAL CONDITIONS----
Elevation = 510.00 ft
Outflow = 0.00 cfs
Storage = 1.02 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
510.00	0.0	1.024
510.15	1.2	1.072
510.30	3.5	1.121
510.45	6.3	1.170
510.60	9.8	1.220
510.75	13.6	1.271
510.90	17.9	1.322
511.05	22.6	1.375
511.20	27.6	1.428
511.35	32.9	1.481
511.50	38.6	1.536
511.65	44.5	1.591
511.80	50.7	1.647
511.95	57.2	1.704
512.10	63.9	1.762
512.25	70.9	1.821
512.40	78.1	1.880
512.55	85.5	1.940
512.70	93.2	2.001
512.85	101.0	2.063
513.00	109.1	2.125
513.15	117.4	2.189
513.30	125.9	2.253
513.45	134.6	2.318
513.60	143.4	2.384
513.75	152.5	2.451
513.90	161.7	2.518
514.05	171.2	2.587
514.20	180.8	2.656
514.35	190.5	2.727
514.50	200.5	2.798

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
1487.5	1487.5
1556.9	1558.1
1627.4	1630.9
1698.9	1705.2
1771.5	1781.3
1845.2	1858.8
1920.0	1937.9
1995.9	2018.5
2072.9	2100.5
2151.0	2183.9
2230.2	2268.8
2310.6	2355.1
2392.1	2442.8
2474.7	2531.9
2558.5	2622.4
2643.5	2714.4
2729.7	2807.8
2816.9	2902.4
2905.4	2998.6
2995.1	3096.1
3086.0	3195.1
3178.1	3295.5
3271.3	3397.2
3365.9	3500.5
3461.6	3605.0
3558.6	3711.1
3656.8	3818.5
3756.3	3927.5
3857.0	4037.8
3959.0	4149.5
4062.3	4262.8

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
514.65	212.3	2.870
514.80	225.8	2.943
514.95	240.3	3.016
515.10	255.8	3.091
515.25	272.1	3.167
515.40	289.1	3.243
515.55	306.9	3.320
515.70	325.2	3.399
515.85	344.2	3.478
516.00	363.7	3.558

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
4166.8	4379.1
4272.6	4498.4
4379.7	4620.0
4488.1	4743.9
4597.9	4870.0
4708.9	4998.0
4821.3	5128.2
4935.0	5260.2
5050.0	5394.2
5166.4	5530.1

Time increment (t) = 1.0 min.

Pond File: 7230 .PND
Inflow Hydrograph: 7230-025.HYD
Outflow Hydrograph: 72300025.HYD

INFLOW HYDROGRAPH

TIME (min)	INFLOW (cfs)
0.0	0.00
1.0	18.10
2.0	36.09
3.0	54.19
4.0	72.29
5.0	90.38
6.0	108.38
7.0	126.47
8.0	144.57
9.0	162.57
10.0	180.66
11.0	198.76
12.0	198.70
13.0	198.70
14.0	198.70
15.0	198.70
16.0	198.70
17.0	198.70
18.0	198.70
19.0	198.70
20.0	198.70
21.0	180.68
22.0	162.68
23.0	144.58
24.0	126.59
25.0	108.49
26.0	90.39
27.0	72.40
28.0	54.30
29.0	36.20
30.0	18.21
31.0	0.11
32.0	0.00
33.0	0.00
34.0	0.00
35.0	0.00
36.0	0.00
37.0	0.00
38.0	0.00
39.0	0.00
40.0	0.00

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
-----	1487.5	1487.5	0.00	510.00
18.1	1505.0	1505.6	0.31	510.04
54.2	1556.7	1559.2	1.23	510.15
90.3	1638.8	1647.0	4.11	510.33
126.5	1747.1	1765.3	9.06	510.57
162.7	1877.1	1909.8	16.37	510.85
198.8	2023.6	2075.8	26.10	511.15
234.9	2182.7	2258.5	37.91	511.48
271.0	2350.7	2453.7	51.50	511.82
307.1	2524.7	2657.8	66.60	512.16
343.2	2702.3	2867.9	82.80	512.50
379.4	2882.0	3081.7	99.85	512.83
397.5	3047.3	3279.5	116.08	513.13
397.4	3184.9	3444.7	129.90	513.37
397.4	3299.3	3582.3	141.49	513.57
397.4	3394.2	3696.7	151.27	513.73
397.4	3472.8	3791.6	159.39	513.86
397.4	3537.8	3870.2	166.21	513.97
397.4	3591.4	3935.2	171.87	514.06
397.4	3635.8	3988.8	176.54	514.13
397.4	3672.4	4033.2	180.40	514.19
379.4	3687.7	4051.8	182.01	514.22
343.4	3670.7	4031.1	180.22	514.19
307.3	3626.7	3977.9	175.59	514.12
271.2	3560.7	3897.9	168.62	514.01
235.1	3476.2	3795.7	159.75	513.87
198.9	3376.3	3675.1	149.42	513.70
162.8	3263.4	3539.1	137.85	513.51
126.7	3139.5	3390.1	125.30	513.29
90.5	3006.0	3230.0	111.98	513.05
54.4	2864.1	3060.4	98.14	512.80
18.3	2714.6	2882.4	83.94	512.52
0.1	2572.8	2714.7	70.92	512.25
0.0	2452.4	2572.8	60.23	512.02
0.0	2349.6	2452.4	51.40	511.82
0.0	2261.3	2349.6	44.12	511.64
0.0	2185.1	2261.3	38.10	511.49
0.0	2119.2	2185.1	32.98	511.35
0.0	2061.6	2119.2	28.79	511.23
0.0	2011.1	2061.6	25.23	511.13
0.0	1966.8	2011.1	22.17	511.04

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: 7230 .PND
Inflow Hydrograph: 7230-025.HYD
Outflow Hydrograph: 72300025.HYD

Starting Pond W.S. Elevation = 510.00 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow	=	198.76 cfs
Peak Outflow	=	182.01 cfs
Peak Elevation	=	514.22 ft

***** Summary of Approximate Peak Storage *****

Initial Storage	=	1.02 ac-ft
Peak Storage From Storm	=	1.64 ac-ft
Total Storage in Pond	=	2.67 ac-ft

POND-2 Version: 5.17 S/N:

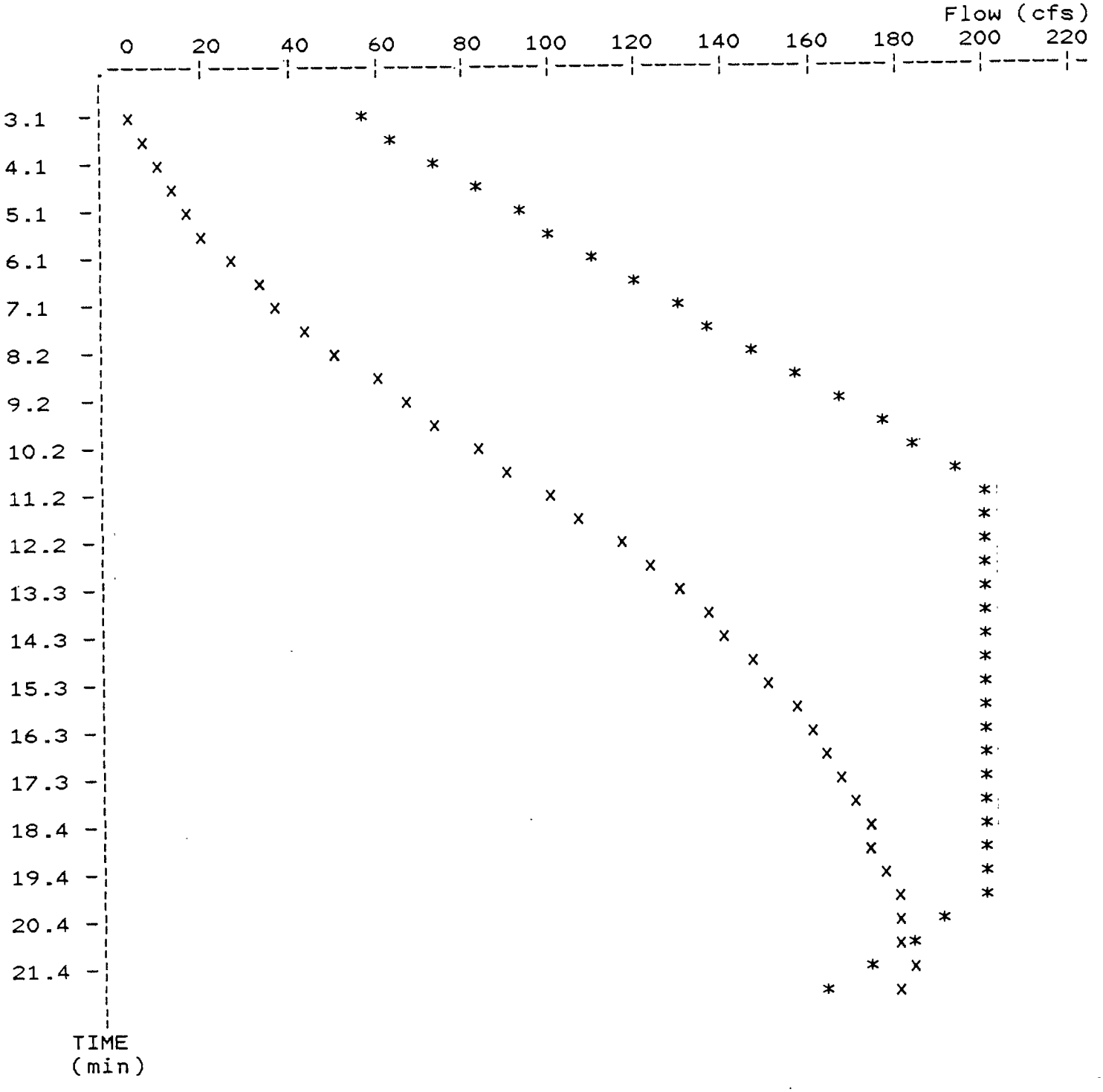
20 MIN

Return Freq: 25 years

Pond File: 7230 .PND
Inflow Hydrograph: 7230-025.HYD
Outflow Hydrograph: 72300025.HYD

EXECUTED: 08-12-1997
10:39:13

Peak Inflow = 198.76 cfs
Peak Outflow = 182.01 cfs
Peak Elevation = 514.22 ft



x File: 7230-025.HYD Qmax = 182.0 cfs
* File: 72300025.HYD Qmax = 198.8 cfs

****
*
* AVONDALE PHASE 2 *
* DETENTION ANALYSIS *
* BAX ENGINEERING CO., INC. *
* AUGUST 1997 *
*
****

Inflow Hydrograph: 7230-100.HYD
Rating Table file: 7230 .PND

----INITIAL CONDITIONS----
Elevation = 510.00 ft
Outflow = 0.00 cfs
Storage = 1.02 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
510.00	0.0	1.024
510.15	1.2	1.072
510.30	3.5	1.121
510.45	6.3	1.170
510.60	9.8	1.220
510.75	13.6	1.271
510.90	17.9	1.322
511.05	22.6	1.375
511.20	27.6	1.428
511.35	32.9	1.481
511.50	38.6	1.536
511.65	44.5	1.591
511.80	50.7	1.647
511.95	57.2	1.704
512.10	63.9	1.762
512.25	70.9	1.821
512.40	78.1	1.880
512.55	85.5	1.940
512.70	93.2	2.001
512.85	101.0	2.063
513.00	109.1	2.125
513.15	117.4	2.189
513.30	125.9	2.253
513.45	134.6	2.318
513.60	143.4	2.384
513.75	152.5	2.451
513.90	161.7	2.518
514.05	171.2	2.587
514.20	180.8	2.656
514.35	190.5	2.727
514.50	200.5	2.798

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
1487.5	1487.5
1556.9	1558.1
1627.4	1630.9
1698.9	1705.2
1771.5	1781.3
1845.2	1858.8
1920.0	1937.9
1995.9	2018.5
2072.9	2100.5
2151.0	2183.9
2230.2	2268.8
2310.6	2355.1
2392.1	2442.8
2474.7	2531.9
2558.5	2622.4
2643.5	2714.4
2729.7	2807.8
2816.9	2902.4
2905.4	2998.6
2995.1	3096.1
3086.0	3195.1
3178.1	3295.5
3271.3	3397.2
3365.9	3500.5
3461.6	3605.0
3558.6	3711.1
3656.8	3818.5
3756.3	3927.5
3857.0	4037.8
3959.0	4149.5
4062.3	4262.8

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
514.65	212.3	2.870
514.80	225.8	2.943
514.95	240.3	3.016
515.10	255.8	3.091
515.25	272.1	3.167
515.40	289.1	3.243
515.55	306.9	3.320
515.70	325.2	3.399
515.85	344.2	3.478
516.00	363.7	3.558

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
4166.8	4379.1
4272.6	4498.4
4379.7	4620.0
4488.1	4743.9
4597.9	4870.0
4708.9	4998.0
4821.3	5128.2
4935.0	5260.2
5050.0	5394.2
5166.4	5530.1

Time increment (t) = 1.0 min.

Pond File: 7230 .PND
Inflow Hydrograph: 7230-100.HYD
Outflow Hydrograph: 72300100.HYD

INFLOW HYDROGRAPH | ROUTING COMPUTATIONS

TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	0.00	-----	1487.5	1487.5	0.00	510.00
1.0	23.15	23.2	1509.9	1510.6	0.39	510.05
2.0	46.17	69.3	1575.4	1579.2	1.87	510.19
3.0	69.33	115.5	1679.4	1690.9	5.76	510.42
4.0	92.49	161.8	1815.8	1841.2	12.74	510.72
5.0	115.63	208.1	1978.0	2023.9	22.93	511.06
6.0	138.66	254.3	2160.0	2232.3	36.15	511.44
7.0	161.80	300.5	2356.5	2460.5	51.99	511.83
8.0	184.96	346.8	2563.2	2703.3	70.05	512.23
9.0	207.99	393.0	2776.5	2956.1	89.79	512.63
10.0	231.14	439.1	2994.0	3215.6	110.80	513.03
11.0	254.29	485.4	3213.8	3479.5	132.83	513.42
12.0	254.21	508.5	3415.4	3722.3	153.46	513.77
13.0	254.21	508.4	3582.0	3923.8	170.88	514.04
14.0	254.21	508.4	3719.7	4090.5	185.37	514.27
15.0	254.21	508.4	3833.2	4228.1	197.44	514.45
16.0	254.21	508.4	3924.7	4341.7	208.50	514.60
17.0	254.21	508.4	3996.3	4433.1	218.41	514.72
18.0	254.21	508.4	4051.6	4504.7	226.55	514.81
19.0	254.21	508.4	4093.7	4560.0	233.14	514.88
20.0	254.21	508.4	4125.8	4602.1	238.17	514.93
21.0	231.16	485.4	4132.7	4611.2	239.24	514.94
22.0	208.13	439.3	4102.8	4572.0	234.57	514.89
23.0	184.98	393.1	4044.9	4496.0	225.52	514.80
24.0	161.95	346.9	3964.4	4391.8	213.74	514.67
25.0	138.80	300.8	3863.6	4265.1	200.74	514.50
26.0	115.64	254.4	3742.5	4118.1	187.77	514.31
27.0	92.63	208.3	3604.3	3950.8	173.23	514.08
28.0	69.47	162.1	3452.0	3766.4	157.24	513.83
29.0	46.31	115.8	3287.2	3567.7	140.26	513.55
30.0	23.29	69.6	3111.8	3356.8	122.52	513.24
31.0	0.14	23.4	2926.8	3135.2	104.20	512.91
32.0	0.00	0.1	2752.0	2926.9	87.46	512.59
33.0	0.00	0.0	2604.4	2752.0	73.80	512.31
34.0	0.00	0.0	2479.3	2604.4	62.57	512.07
35.0	0.00	0.0	2372.6	2479.3	53.36	511.86
36.0	0.00	0.0	2281.1	2372.6	45.74	511.68
37.0	0.00	0.0	2202.2	2281.1	39.44	511.52
38.0	0.00	0.0	2133.9	2202.2	34.13	511.38
39.0	0.00	0.0	2074.5	2133.9	29.73	511.26
40.0	0.00	0.0	2022.5	2074.5	26.02	511.15

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: 7230 .PND
Inflow Hydrograph: 7230-100.HYD
Outflow Hydrograph: 72300100.HYD

Starting Pond W.S. Elevation = 510.00 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow	=	254.29 cfs
Peak Outflow	=	239.24 cfs
Peak Elevation	=	514.94 ft

***** Summary of Approximate Peak Storage *****

Initial Storage	=	1.02 ac-ft
Peak Storage From Storm	=	1.99 ac-ft
Total Storage in Pond	=	3.01 ac-ft

POND-2 Version: 5.17 S/N:

20 MIN

Return Freq: 100 years

Pond File: 7230 .PND
Inflow Hydrograph: 7230-100.HYD
Outflow Hydrograph: 72300100.HYD

EXECUTED: 08-12-1997
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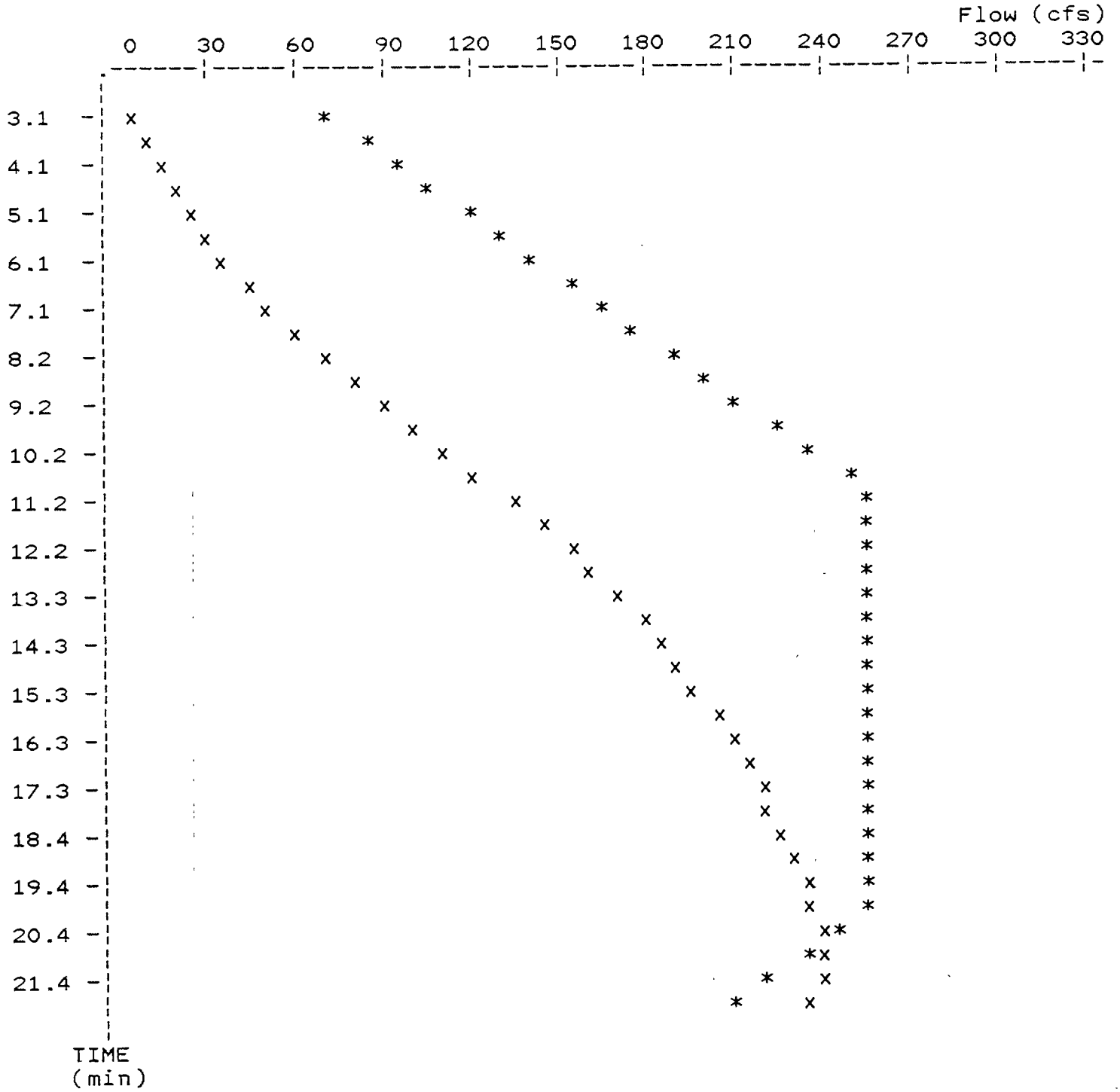
Peak Inflow = 254.29 cfs
Peak Outflow = 239.24 cfs
Peak Elevation = 514.94 ft



x File: 7230-100.HYD Qmax = 239.2 cfs
* File: 72300100.HYD Qmax = 254.3 cfs

Outlet Structure File: 7230 .STR

POND-2 Version: 5.17 S/N:
Date Executed: Time Executed:

****
AVONDALE PHASE 2
DETENTION ANALYSIS
PREPARED BY: BAX ENGINEERING CO., INC.
AUGUST 1997
****

***** COMPOSITE OUTFLOW SUMMARY ****

Elevation (ft)	Q (cfs)	Contributing Structures
510.00	0.0	1
510.15	1.2	1
510.30	3.5	1
510.45	6.3	1
510.60	9.8	1
510.75	13.6	1
510.90	17.9	1
511.05	22.6	1
511.20	27.6	1
511.35	32.9	1
511.50	38.6	1
511.65	44.5	1
511.80	50.7	1
511.95	57.2	1
512.10	63.9	1
512.25	70.9	1
512.40	78.1	1
512.55	85.5	1
512.70	93.2	1
512.85	101.0	1
513.00	109.1	1
513.15	117.4	1
513.30	125.9	1
513.45	134.6	1
513.60	143.4	1
513.75	152.5	1
513.90	161.7	1
514.05	171.2	1
514.20	180.8	1
514.35	190.5	1
514.50	200.5	3 +1
514.65	212.3	3 +1
514.80	225.8	3 +1
514.95	240.3	3 +1
515.10	255.8	3 +1
515.25	272.1	3 +1
515.40	289.1	3 +1
515.55	306.9	3 +1
515.70	325.2	3 +1
515.85	344.2	3 +1
516.00	363.7	3 +1

Outlet Structure File: 7230 .STR

POND-2 Version: 5.17 S/N:
Date Executed: Time Executed:

****
AVONDALE PHASE 2
DETENTION ANALYSIS
PREPARED BY: BAX ENGINEERING CO., INC.
AUGUST 1997
****

Outlet Structure File: 7230 .STR
Planimeter Input File: 7230 .VOL
Rating Table Output File: 7230 .PND

Min. Elev.(ft) = 510 Max. Elev.(ft) = 516 Incr.(ft) = .15

Additional elevations (ft) to be included in table:
* *

****
SYSTEM CONNECTIVITY
****

Structure	No.	Q Table		Q Table
WEIR-VR	3		->	3
WEIR-VR	1		->	1

Outflow rating table summary was stored in file:
7230 .PND

Outlet Structure File: 7230 .STR

POND-2 Version: 5.17 S/N:
Date Executed: Time Executed:

****
AVONDALE PHASE 2
DETENTION ANALYSIS
PREPARED BY: BAX ENGINEERING CO., INC.
AUGUST 1997
****

>>>>>> Structure No. 3 <<<<<<
(Input Data)

WEIR-VR
Weir - Vertical Rectangular

E1 elev.(ft)?	514.5
E2 elev.(ft)?	516.001
Weir coefficient?	3
Weir elev.(ft)?	514.500
Length (ft)?	10
Contracted/Suppressed (C/S)?	S

Outlet Structure File: 7230 .STR

POND-2 Version: 5.17 S/N:
Date Executed: Time Executed:

****
AVONDALE PHASE 2
DETENTION ANALYSIS
PREPARED BY: BAX ENGINEERING CO., INC.
AUGUST 1997
****

>>>>>> Structure No. 1 <<<<<<
(Input Data)

WEIR-VR
Weir - Vertical Rectangular

E1 elev.(ft)? 510
E2 elev.(ft)? 516.001
Weir coefficient? 3
Weir elev.(ft)? 510.00
Length (ft)? 7.00000
Contracted/Suppressed (C/S)? S

Outlet Structure File: 7230 .STR

POND-2 Version: 5.17 S/N:
Date Executed: Time Executed:

****
AVONDALE PHASE 2
DETENTION ANALYSIS
PREPARED BY: BAX ENGINEERING CO., INC.
AUGUST 1997
****

Outflow Rating Table for Structure #3
WEIR-VR Weir - Vertical Rectangular

***** INLET CONTROL ASSUMED *****

Elevation (ft)	Q (cfs)	Computation Messages
510.00	0.0	E < Inv.El.= 514.5
510.15	0.0	E < Inv.El.= 514.5
510.30	0.0	E < Inv.El.= 514.5
510.45	0.0	E < Inv.El.= 514.5
510.60	0.0	E < Inv.El.= 514.5
510.75	0.0	E < Inv.El.= 514.5
510.90	0.0	E < Inv.El.= 514.5
511.05	0.0	E < Inv.El.= 514.5
511.20	0.0	E < Inv.El.= 514.5
511.35	0.0	E < Inv.El.= 514.5
511.50	0.0	E < Inv.El.= 514.5
511.65	0.0	E < Inv.El.= 514.5
511.80	0.0	E < Inv.El.= 514.5
511.95	0.0	E < Inv.El.= 514.5
512.10	0.0	E < Inv.El.= 514.5
512.25	0.0	E < Inv.El.= 514.5
512.40	0.0	E < Inv.El.= 514.5
512.55	0.0	E < Inv.El.= 514.5
512.70	0.0	E < Inv.El.= 514.5
512.85	0.0	E < Inv.El.= 514.5
513.00	0.0	E < Inv.El.= 514.5
513.15	0.0	E < Inv.El.= 514.5
513.30	0.0	E < Inv.El.= 514.5
513.45	0.0	E < Inv.El.= 514.5
513.60	0.0	E < Inv.El.= 514.5
513.75	0.0	E < Inv.El.= 514.5
513.90	0.0	E < Inv.El.= 514.5
514.05	0.0	E < Inv.El.= 514.5
514.20	0.0	E < Inv.El.= 514.5
514.35	0.0	E < Inv.El.= 514.5
514.50	0.0	H =0.0
514.65	1.7	H =.15
514.80	4.9	H =.3
514.95	9.1	H =.45

Outlet Structure File: 7230 .STR

POND-2 Version: 5.17 S/N:
Date Executed: Time Executed:

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Outflow Rating Table for Structure #3
WEIR-VR Weir - Vertical Rectangular

***** INLET CONTROL ASSUMED *****

Elevation (ft)	Q (cfs)	Computation Messages
515.10	13.9	H =.6
515.25	19.5	H =.750
515.40	25.6	H =.9
515.55	32.3	H =1.05
515.70	39.4	H =1.2
515.85	47.1	H =1.35
516.00	55.1	H =1.5

C = 3 L (ft) = 10
H (ft) = Table elev. - Invert elev. (514.5 ft)
Q (cfs) = C * L * (H**1.5) -- Suppressed Weir

Outlet Structure File: 7230 .STR

POND-2 Version: 5.17 S/N:
Date Executed: Time Executed:

****
AVONDALE PHASE 2
DETENTION ANALYSIS
PREPARED BY: BAX ENGINEERING CO., INC.
AUGUST 1997
****

Outflow Rating Table for Structure #1
WEIR-VR Weir - Vertical Rectangular

***** INLET CONTROL ASSUMED *****

Elevation (ft)	Q (cfs)	Computation Messages
510.00	0.0	H =0.0
510.15	1.2	H =.15
510.30	3.5	H =.3
510.45	6.3	H =.45
510.60	9.8	H =.6
510.75	13.6	H =.750
510.90	17.9	H =.9
511.05	22.6	H =1.05
511.20	27.6	H =1.2
511.35	32.9	H =1.35
511.50	38.6	H =1.5
511.65	44.5	H =1.65
511.80	50.7	H =1.8
511.95	57.2	H =1.95
512.10	63.9	H =2.1
512.25	70.9	H =2.25
512.40	78.1	H =2.4
512.55	85.5	H =2.55
512.70	93.2	H =2.7
512.85	101.0	H =2.85
513.00	109.1	H =3.0
513.15	117.4	H =3.15
513.30	125.9	H =3.3
513.45	134.6	H =3.45
513.60	143.4	H =3.6
513.75	152.5	H =3.75
513.90	161.7	H =3.9
514.05	171.2	H =4.05
514.20	180.8	H =4.2
514.35	190.5	H =4.35
514.50	200.5	H =4.5
514.65	210.6	H =4.65
514.80	220.8	H =4.8
514.95	231.3	H =4.95

Outlet Structure File: 7230 .STR

POND-2 Version: 5.17 S/N:
Date Executed: Time Executed:

>>>>> CONTINUED from previous page <<<<<

Outflow Rating Table for Structure #1
WEIR-VR Weir - Vertical Rectangular

***** INLET CONTROL ASSUMED *****

Elevation (ft)	Q (cfs)	Computation Messages
515.10	241.9	H =5.1
515.25	252.6	H =5.25
515.40	263.5	H =5.4
515.55	274.6	H =5.55
515.70	285.8	H =5.7
515.85	297.1	H =5.85
516.00	308.6	H =6.0

C = 3 L (ft) = 7
H (ft) = Table elev. - Invert elev. (510 ft)
Q (cfs) = C * L * (H**1.5) -- Suppressed Weir

ENGINEERING

PLANNING

SURVEYING

AVONDALE PHASE 2 - O'FALLON
BAX ROJECT NO. 96-7230D
August 26, 1997

In addendum to the STORMWATER DETENTION ANALYSIS - AUG. 1997 the 2, 5 and 15 year 20 minute storm routings were calculated as follows.

BASIN PEAK INFLOWS:

2 year-20 minute storm

Q(onsite)	32.2 x 1.61 =	51.84 cfs
Q(offsite)	28.8 x 1.61 =	46.37 cfs
	Total	98.21 cfs

5 year-20 minute storm

Q(onsite)	32.2 x 1.98 =	63.76 cfs
Q(offsite)	28.8 x 1.98 =	57.02 cfs
	Total	120.78 cfs

15 year-20 minute storm

Q(onsite)	32.2 x 2.64 =	85.01 cfs
Q(offsite)	28.8 x 2.64 =	76.03 cfs
	Total	161.04 cfs

STORM ROUTING CALCULATIONS AND RESULTS:

A computer program was used in routing the design 25 and 100 year-20 minute storms through the basin. As found in the routing calculations, the results are as follows:

20 MIN STORM	CALCULATED RELEASE RATE	ATTENUATION PROVIDED	PEAK ELEVATION
2 YEAR	86.86 cfs	11.38 cfs	512.58 ft.
5 YEAR	108.18 cfs	12.64 cfs	512.98 ft.
15 YEAR	146.30 cfs	14.79 cfs	513.65 ft.

BAX ENGINEERING CO., INC.
1052 South Cloverleaf Drive
St. Peters, MO 63376-6445
314-928-5552 FAX 928-1718

POND-2 Version: 5.17 S/N:
EXECUTED: 08-26-1997 10:07:00 20 MIN Return Freq: 2 years

****
*
* AVONDALE PHASE 2 *
* DETENTION ANALYSIS *
* BAX ENGINEERING CO., INC. *
* AUGUST 1997 *
*
****

Inflow Hydrograph: 7230-002.HYD
Rating Table file: 7230 .PND

----INITIAL CONDITIONS----
Elevation = 510.00 ft
Outflow = 0.00 cfs
Storage = 1.02 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
510.00	0.0	1.024
510.15	1.2	1.072
510.30	3.5	1.121
510.45	6.3	1.170
510.60	9.8	1.220
510.75	13.6	1.271
510.90	17.9	1.322
511.05	22.6	1.375
511.20	27.6	1.428
511.35	32.9	1.481
511.50	38.6	1.536
511.65	44.5	1.591
511.80	50.7	1.647
511.95	57.2	1.704
512.10	63.9	1.762
512.25	70.9	1.821
512.40	78.1	1.880
512.55	85.5	1.940
512.70	93.2	2.001
512.85	101.0	2.063
513.00	109.1	2.125
513.15	117.4	2.189
513.30	125.9	2.253
513.45	134.6	2.318
513.60	143.4	2.384
513.75	152.5	2.451
513.90	161.7	2.518
514.05	171.2	2.587
514.20	180.8	2.656
514.35	190.5	2.727
514.50	200.5	2.798

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
1487.5	1487.5
1556.9	1558.1
1627.4	1630.9
1698.9	1705.2
1771.5	1781.3
1845.2	1858.8
1920.0	1937.9
1995.9	2018.5
2072.9	2100.5
2151.0	2183.9
2230.2	2268.8
2310.6	2355.1
2392.1	2442.8
2474.7	2531.9
2558.5	2622.4
2643.5	2714.4
2729.7	2807.8
2816.9	2902.4
2905.4	2998.6
2995.1	3096.1
3086.0	3195.1
3178.1	3295.5
3271.3	3397.2
3365.9	3500.5
3461.6	3605.0
3558.6	3711.1
3656.8	3818.5
3756.3	3927.5
3857.0	4037.8
3959.0	4149.5
4062.3	4262.8

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
514.65	212.3	2.870
514.80	225.8	2.943
514.95	240.3	3.016
515.10	255.8	3.091
515.25	272.1	3.167
515.40	289.1	3.243
515.55	306.9	3.320
515.70	325.2	3.399
515.85	344.2	3.478
516.00	363.7	3.558

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
4166.8	4379.1
4272.6	4498.4
4379.7	4620.0
4488.1	4743.9
4597.9	4870.0
4708.9	4998.0
4821.3	5128.2
4935.0	5260.2
5050.0	5394.2
5166.4	5530.1

Time increment (t) = 1.0 min.

POND-2 Version: 5.17 S/N:
EXECUTED: 08-26-1997 10:07:00

20 MIN

Return Freq: 2 years

Pond File: 7230 .PND
Inflow Hydrograph: 7230-002.HYD
Outflow Hydrograph: 72300002.HYD

INFLOW HYDROGRAPH

ROUTING COMPUTATIONS

TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	0.00	-----	1487.5	1487.5	0.00	510.00
1.0	8.94	8.9	1496.1	1496.4	0.15	510.02
2.0	17.84	26.8	1521.7	1522.9	0.60	510.08
3.0	26.78	44.6	1563.4	1566.3	1.46	510.17
4.0	35.73	62.5	1619.2	1625.9	3.34	510.29
5.0	44.67	80.4	1687.5	1699.6	6.09	510.44
6.0	53.57	98.2	1765.7	1785.7	10.01	510.61
7.0	62.51	116.1	1852.1	1881.7	14.85	510.79
8.0	71.46	134.0	1944.6	1986.0	20.71	510.99
9.0	80.35	151.8	2041.7	2096.4	27.35	511.19
10.0	89.30	169.7	2141.9	2211.4	34.74	511.40
11.0	98.24	187.5	2243.9	2329.4	42.74	511.61
12.0	98.21	196.5	2339.3	2440.4	50.53	511.80
13.0	98.21	196.4	2420.8	2535.7	57.48	511.96
14.0	98.21	196.4	2490.2	2617.2	63.51	512.09
15.0	98.21	196.4	2549.0	2686.6	68.78	512.20
16.0	98.21	196.4	2598.9	2745.4	73.29	512.30
17.0	98.21	196.4	2641.0	2795.3	77.14	512.38
18.0	98.21	196.4	2676.6	2837.4	80.42	512.45
19.0	98.21	196.4	2706.6	2873.0	83.20	512.50
20.0	98.21	196.4	2731.9	2903.0	85.55	512.55
21.0	89.31	187.5	2745.7	2919.5	86.86	512.58
22.0	80.41	169.7	2742.4	2915.5	86.54	512.57
23.0	71.46	151.9	2724.5	2894.2	84.86	512.54
24.0	62.57	134.0	2694.4	2858.6	82.07	512.48
25.0	53.62	116.2	2654.0	2810.6	78.32	512.40
26.0	44.68	98.3	2604.6	2752.3	73.82	512.31
27.0	35.79	80.5	2547.8	2685.1	68.67	512.20
28.0	26.84	62.6	2484.4	2610.4	63.01	512.08
29.0	17.89	44.7	2415.1	2529.1	56.99	511.95
30.0	9.00	26.9	2340.7	2442.0	50.65	511.80
31.0	0.05	9.1	2261.5	2349.8	44.14	511.64
32.0	0.00	0.1	2185.3	2261.5	38.11	511.49
33.0	0.00	0.0	2119.3	2185.3	33.00	511.35
34.0	0.00	0.0	2061.7	2119.3	28.80	511.23
35.0	0.00	0.0	2011.3	2061.7	25.24	511.13
36.0	0.00	0.0	1966.9	2011.3	22.18	511.04
37.0	0.00	0.0	1927.7	1966.9	19.59	510.95
38.0	0.00	0.0	1893.0	1927.7	17.35	510.88
39.0	0.00	0.0	1862.1	1893.0	15.46	510.81
40.0	0.00	0.0	1834.5	1862.1	13.78	510.76

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: 7230 .PND
Inflow Hydrograph: 7230-002.HYD
Outflow Hydrograph: 72300002.HYD

Starting Pond W.S. Elevation = 510.00 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow	=	98.24 cfs
Peak Outflow	=	86.86 cfs
Peak Elevation	=	512.58 ft

***** Summary of Approximate Peak Storage *****

Initial Storage	=	1.02 ac-ft
Peak Storage From Storm	=	0.93 ac-ft
Total Storage in Pond	=	1.95 ac-ft

POND-2 Version: 5.17 S/N:

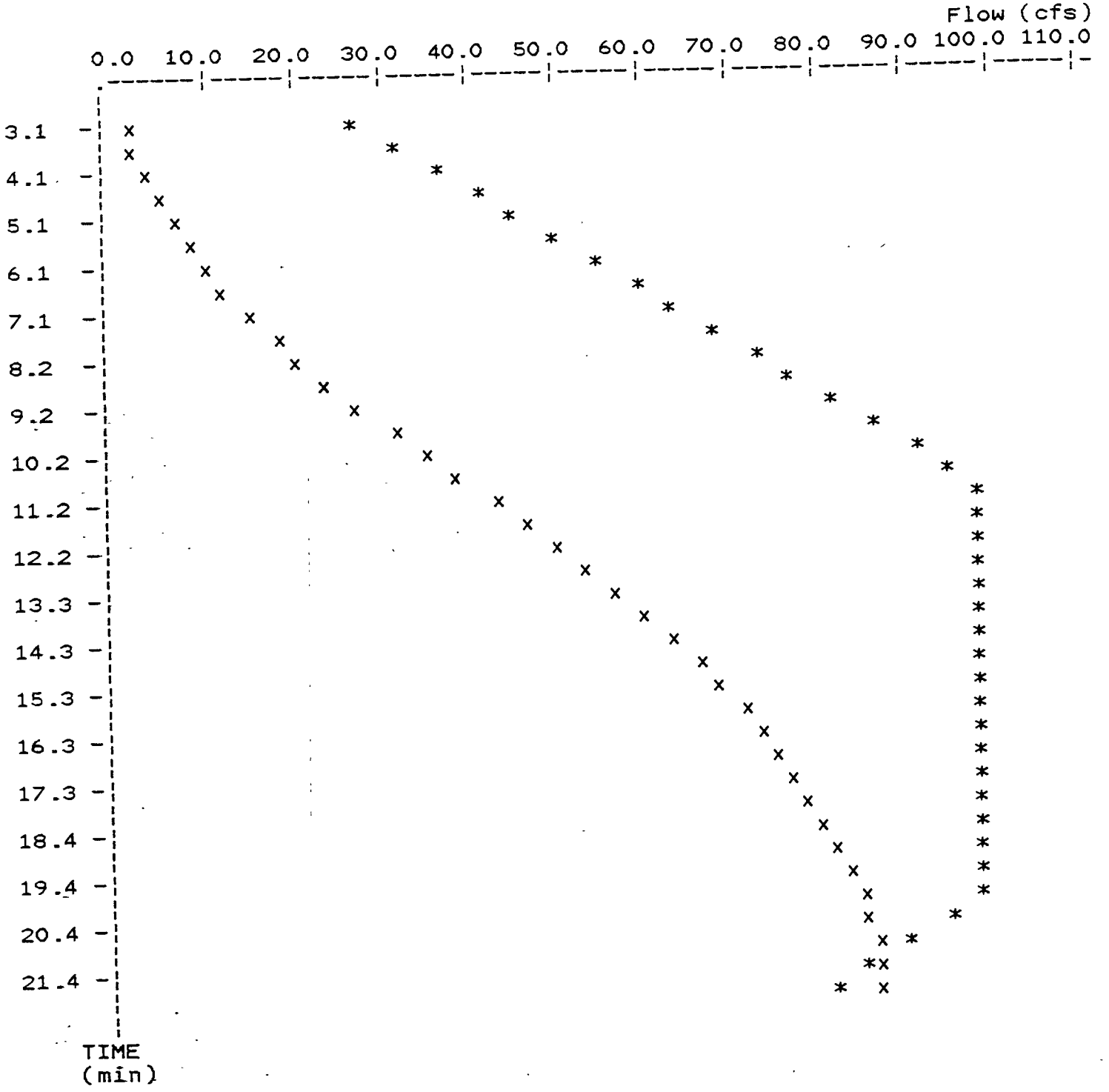
20 MIN

Return Freq: 2 years

Pond File: 7230 .PND
Inflow Hydrograph: 7230-002.HYD
Outflow Hydrograph: 72300002.HYD

EXECUTED: 08-26-1997
10:07:00

Peak Inflow = 98.24 cfs
Peak Outflow = 86.86 cfs
Peak Elevation = 512.58 ft



x File: 7230-002.HYD Qmax = 86.9 cfs
* File: 72300002.HYD Qmax = 98.2 cfs

POND-2 Version: 5.17 S/N:
EXECUTED: 08-26-1997 10:07:00 20 MIN Return Freq: 5 years

```
**********************************
*                                *
*       AVONDALE PHASE 2         *
*      DETENTION ANALYSIS        *
*  BAX ENGINEERING CO., INC.     *
*         AUGUST 1997            *
*                                *
**********************************
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Inflow Hydrograph: 7230-005.HYD
Rating Table file: 7230 .PND

----INITIAL CONDITIONS----
Elevation = 510.00 ft
Outflow = 0.00 cfs
Storage = 1.02 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
510.00	0.0	1.024
510.15	1.2	1.072
510.30	3.5	1.121
510.45	6.3	1.170
510.60	9.8	1.220
510.75	13.6	1.271
510.90	17.9	1.322
511.05	22.6	1.375
511.20	27.6	1.428
511.35	32.9	1.481
511.50	38.6	1.536
511.65	44.5	1.591
511.80	50.7	1.647
511.95	57.2	1.704
512.10	63.9	1.762
512.25	70.9	1.821
512.40	78.1	1.880
512.55	85.5	1.940
512.70	93.2	2.001
512.85	101.0	2.063
513.00	109.1	2.125
513.15	117.4	2.189
513.30	125.9	2.253
513.45	134.6	2.318
513.60	143.4	2.384
513.75	152.5	2.451
513.90	161.7	2.518
514.05	171.2	2.587
514.20	180.8	2.656
514.35	190.5	2.727
514.50	200.5	2.798

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
1487.5	1487.5
1556.9	1558.1
1627.4	1630.9
1698.9	1705.2
1771.5	1781.3
1845.2	1858.8
1920.0	1937.9
1995.9	2018.5
2072.9	2100.5
2151.0	2183.9
2230.2	2268.8
2310.6	2355.1
2392.1	2442.8
2474.7	2531.9
2558.5	2622.4
2643.5	2714.4
2729.7	2807.8
2816.9	2902.4
2905.4	2998.6
2995.1	3096.1
3086.0	3195.1
3178.1	3295.5
3271.3	3397.2
3365.9	3500.5
3461.6	3605.0
3558.6	3711.1
3656.8	3818.5
3756.3	3927.5
3857.0	4037.8
3959.0	4149.5
4062.3	4262.8

POND-2 Version: 5.17 S/N:
EXECUTED: 08-26-1997 10:07:00

20 MIN

Return Freq: 5 years

Pond File: 7230 .PND
Inflow Hydrograph: 7230-005.HYD
Outflow Hydrograph: 72300005.HYD

INFLOW HYDROGRAPH

TIME (min)	INFLOW (cfs)
0.0	0.00
1.0	11.00
2.0	21.94
3.0	32.94
4.0	43.94
5.0	54.94
6.0	65.88
7.0	76.87
8.0	87.88
9.0	98.82
10.0	109.82
11.0	120.82
12.0	120.78
13.0	120.78
14.0	120.78
15.0	120.78
16.0	120.78
17.0	120.78
18.0	120.78
19.0	120.78
20.0	120.78
21.0	109.83
22.0	98.89
23.0	87.89
24.0	76.95
25.0	65.95
26.0	54.94
27.0	44.01
28.0	33.01
29.0	22.00
30.0	11.07
31.0	0.07
32.0	0.00
33.0	0.00
34.0	0.00
35.0	0.00
36.0	0.00
37.0	0.00
38.0	0.00
39.0	0.00
40.0	0.00

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
-----	1487.5	1487.5	0.00	510.00
11.0	1498.1	1498.5	0.19	510.02
32.9	1529.6	1531.1	0.74	510.09
54.9	1580.4	1584.5	2.03	510.20
76.9	1648.3	1657.3	4.49	510.35
98.9	1730.7	1747.2	8.23	510.53
120.8	1825.0	1851.5	13.24	510.74
142.8	1928.5	1967.8	19.64	510.96
164.8	2038.9	2093.3	27.16	511.19
186.7	2154.2	2225.6	35.70	511.42
208.6	2272.8	2362.9	45.05	511.66
230.6	2393.2	2503.4	55.12	511.90
241.6	2505.1	2634.8	64.84	512.12
241.6	2599.9	2746.7	73.39	512.30
241.6	2680.0	2841.4	80.73	512.45
241.6	2747.5	2921.5	87.03	512.58
241.6	2804.2	2989.0	92.43	512.69
241.6	2851.8	3045.7	96.97	512.77
241.6	2891.8	3093.4	100.78	512.85
241.6	2925.3	3133.4	104.05	512.91
241.6	2953.2	3166.8	106.79	512.96
230.6	2967.5	3183.9	108.18	512.98
208.7	2961.1	3176.2	107.56	512.97
186.8	2937.4	3147.9	105.24	512.93
164.8	2899.2	3102.2	101.50	512.86
142.9	2848.8	3042.1	96.68	512.77
120.9	2787.9	2969.7	90.88	512.65
98.9	2718.3	2886.9	84.28	512.53
77.0	2641.0	2795.3	77.14	512.38
55.0	2557.0	2696.0	69.50	512.22
33.1	2467.1	2590.1	61.51	512.05
11.1	2371.7	2478.2	53.28	511.86
0.1	2280.4	2371.7	45.68	511.68
0.0	2201.6	2280.4	39.39	511.52
0.0	2133.4	2201.6	34.09	511.38
0.0	2074.0	2133.4	29.69	511.26
0.0	2022.1	2074.0	25.99	511.15
0.0	1976.4	2022.1	22.82	511.06
0.0	1936.1	1976.4	20.15	510.97
0.0	1900.5	1936.1	17.80	510.90
0.0	1868.8	1900.5	15.87	510.83

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: 7230 .PND
Inflow Hydrograph: 7230-005.HYD
Outflow Hydrograph: 72300005.HYD

Starting Pond W.S. Elevation = 510.00 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow	=	120.82 cfs
Peak Outflow	=	108.18 cfs
Peak Elevation	=	512.98 ft

***** Summary of Approximate Peak Storage *****

Initial Storage	=	1.02 ac-ft
Peak Storage From Storm	=	1.09 ac-ft
Total Storage in Pond	=	2.12 ac-ft

POND-2 Version: 5.17 S/N:

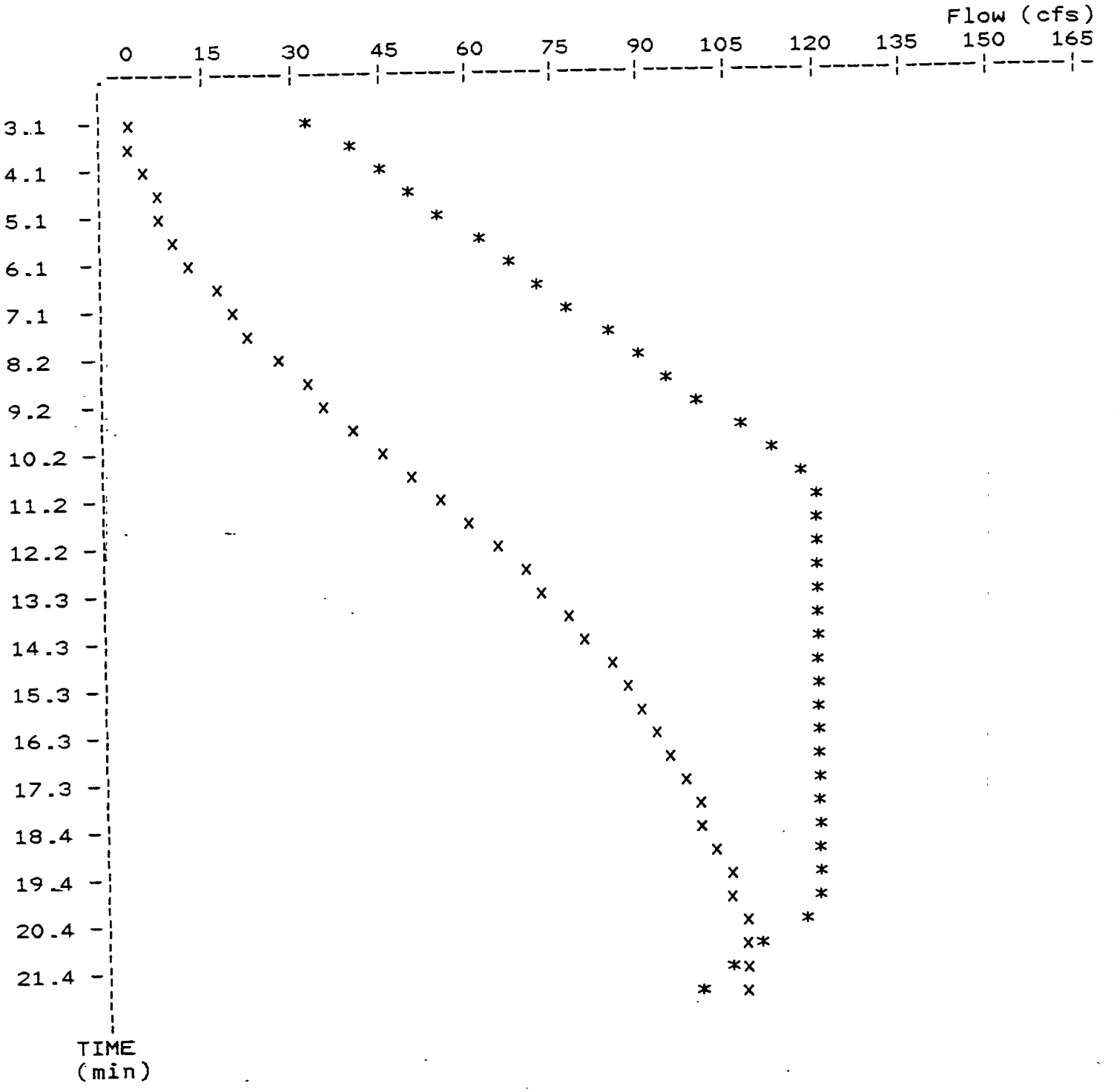
20 MIN

Return Freq: 5 years

Pond File: 7230 .PND
Inflow Hydrograph: 7230-005.HYD
Outflow Hydrograph: 72300005.HYD

EXECUTED: 08-26-1997
10:07:00

Peak Inflow = 120.82 cfs
Peak Outflow = 108.18 cfs
Peak Elevation = 512.98 ft



x File: 7230-005.HYD Qmax = 108.2 cfs
* File: 72300005.HYD Qmax = 120.8 cfs

POND-2 Version: 5.17 S/N:
EXECUTED: 08-26-1997 10:07:00 20 MIN Return Freq: 15 years

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*
* AVONDALE PHASE 2 *
* DETENTION ANALYSIS *
* BAX ENGINEERING CO., INC. *
* AUGUST 1997 *
*
****

Inflow Hydrograph: 7230-015.HYD
Rating Table file: 7230 .PND

----INITIAL CONDITIONS----
Elevation = 510.00 ft
Outflow = 0.00 cfs
Storage = 1.02 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
510.00	0.0	1.024
510.15	1.2	1.072
510.30	3.5	1.121
510.45	6.3	1.170
510.60	9.8	1.220
510.75	13.6	1.271
510.90	17.9	1.322
511.05	22.6	1.375
511.20	27.6	1.428
511.35	32.9	1.481
511.50	38.6	1.536
511.65	44.5	1.591
511.80	50.7	1.647
511.95	57.2	1.704
512.10	63.9	1.762
512.25	70.9	1.821
512.40	78.1	1.880
512.55	85.5	1.940
512.70	93.2	2.001
512.85	101.0	2.063
513.00	109.1	2.125
513.15	117.4	2.189
513.30	125.9	2.253
513.45	134.6	2.318
513.60	143.4	2.384
513.75	152.5	2.451
513.90	161.7	2.518
514.05	171.2	2.587
514.20	180.8	2.656
514.35	190.5	2.727
514.50	200.5	2.798

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
1487.5	1487.5
1556.9	1558.1
1627.4	1630.9
1698.9	1705.2
1771.5	1781.3
1845.2	1858.8
1920.0	1937.9
1995.9	2018.5
2072.9	2100.5
2151.0	2183.9
2230.2	2268.8
2310.6	2355.1
2392.1	2442.8
2474.7	2531.9
2558.5	2622.4
2643.5	2714.4
2729.7	2807.8
2816.9	2902.4
2905.4	2998.6
2995.1	3096.1
3086.0	3195.1
3178.1	3295.5
3271.3	3397.2
3365.9	3500.5
3461.6	3605.0
3558.6	3711.1
3656.8	3818.5
3756.3	3927.5
3857.0	4037.8
3959.0	4149.5
4062.3	4262.8

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DISK FILES: 7230-015.HYD ; 7230 .PND

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
514.65	212.3	2.870
514.80	225.8	2.943
514.95	240.3	3.016
515.10	255.8	3.091
515.25	272.1	3.167
515.40	289.1	3.243
515.55	306.9	3.320
515.70	325.2	3.399
515.85	344.2	3.478
516.00	363.7	3.558

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
4166.8	4379.1
4272.6	4498.4
4379.7	4620.0
4488.1	4743.9
4597.9	4870.0
4708.9	4998.0
4821.3	5128.2
4935.0	5260.2
5050.0	5394.2
5166.4	5530.1

Time increment (t) = 1.0 min.

POND-2 Version: 5.17 S/N:
EXECUTED: 08-26-1997 10:07:00

20 MIN

Return Freq: 15 years

Pond File: 7230 .PND
Inflow Hydrograph: 7230-015.HYD
Outflow Hydrograph: 72300015.HYD

INFLOW HYDROGRAPH

TIME (min)	INFLOW (cfs)
0.0	0.00
1.0	14.67
2.0	29.25
3.0	43.92
4.0	58.59
5.0	73.25
6.0	87.84
7.0	102.50
8.0	117.17
9.0	131.76
10.0	146.43
11.0	161.09
12.0	161.04
13.0	161.04
14.0	161.04
15.0	161.04
16.0	161.04
17.0	161.04
18.0	161.04
19.0	161.04
20.0	161.04
21.0	146.44
22.0	131.85
23.0	117.18
24.0	102.59
25.0	87.93
26.0	73.26
27.0	58.68
28.0	44.01
29.0	29.34
30.0	14.75
31.0	0.09
32.0	0.00
33.0	0.00
34.0	0.00
35.0	0.00
36.0	0.00
37.0	0.00
38.0	0.00
39.0	0.00
40.0	0.00

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
-----	1487.5	1487.5	0.00	510.00
14.7	1501.7	1502.2	0.25	510.03
43.9	1543.6	1545.6	0.99	510.12
73.2	1610.7	1616.8	3.05	510.27
102.5	1699.9	1713.2	6.67	510.47
131.8	1807.2	1831.7	12.27	510.70
161.1	1928.9	1968.2	19.67	510.96
190.3	2061.7	2119.2	28.79	511.23
219.7	2202.4	2281.3	39.46	511.52
248.9	2348.7	2451.3	51.32	511.81
278.2	2498.4	2626.9	64.24	512.11
307.5	2650.0	2805.9	77.96	512.40
322.1	2790.0	2972.1	91.08	512.66
322.1	2907.4	3112.1	102.31	512.87
322.1	3005.6	3229.5	111.95	513.05
322.1	3087.5	3327.7	120.09	513.20
322.1	3155.7	3409.6	126.94	513.32
322.1	3212.4	3477.8	132.69	513.42
322.1	3259.6	3534.5	137.47	513.50
322.1	3298.8	3581.6	141.44	513.57
322.1	3331.3	3620.9	144.76	513.62
307.5	3346.2	3638.8	146.30	513.65
278.3	3334.3	3624.5	145.07	513.63
249.0	3300.2	3583.4	141.58	513.57
219.8	3247.5	3520.0	136.24	513.48
190.5	3179.3	3438.0	129.34	513.36
161.2	3098.2	3340.5	121.16	513.22
131.9	3006.1	3230.1	112.00	513.05
102.7	2904.8	3108.8	102.04	512.87
73.3	2795.0	2978.1	91.56	512.67
44.1	2678.0	2839.1	80.55	512.45
14.8	2554.3	2692.8	69.26	512.21
0.1	2436.7	2554.4	58.86	511.99
0.0	2336.1	2436.7	50.27	511.79
0.0	2249.7	2336.1	43.20	511.62
0.0	2175.1	2249.7	37.32	511.47
0.0	2110.4	2175.1	32.34	511.33
0.0	2053.9	2110.4	28.23	511.22
0.0	2004.4	2053.9	24.76	511.11
0.0	1960.9	2004.4	21.78	511.02
0.0	1922.4	1960.9	19.24	510.94

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: 7230 .PND
Inflow Hydrograph: 7230-015.HYD
Outflow Hydrograph: 72300015.HYD

Starting Pond W.S. Elevation = 510.00 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow	=	161.09 cfs
Peak Outflow	=	146.30 cfs
Peak Elevation	=	513.65 ft

***** Summary of Approximate Peak Storage *****

Initial Storage	=	1.02 ac-ft
Peak Storage From Storm	=	1.38 ac-ft
Total Storage in Pond	=	2.41 ac-ft

POND-2 Version: 5.17 S/N:

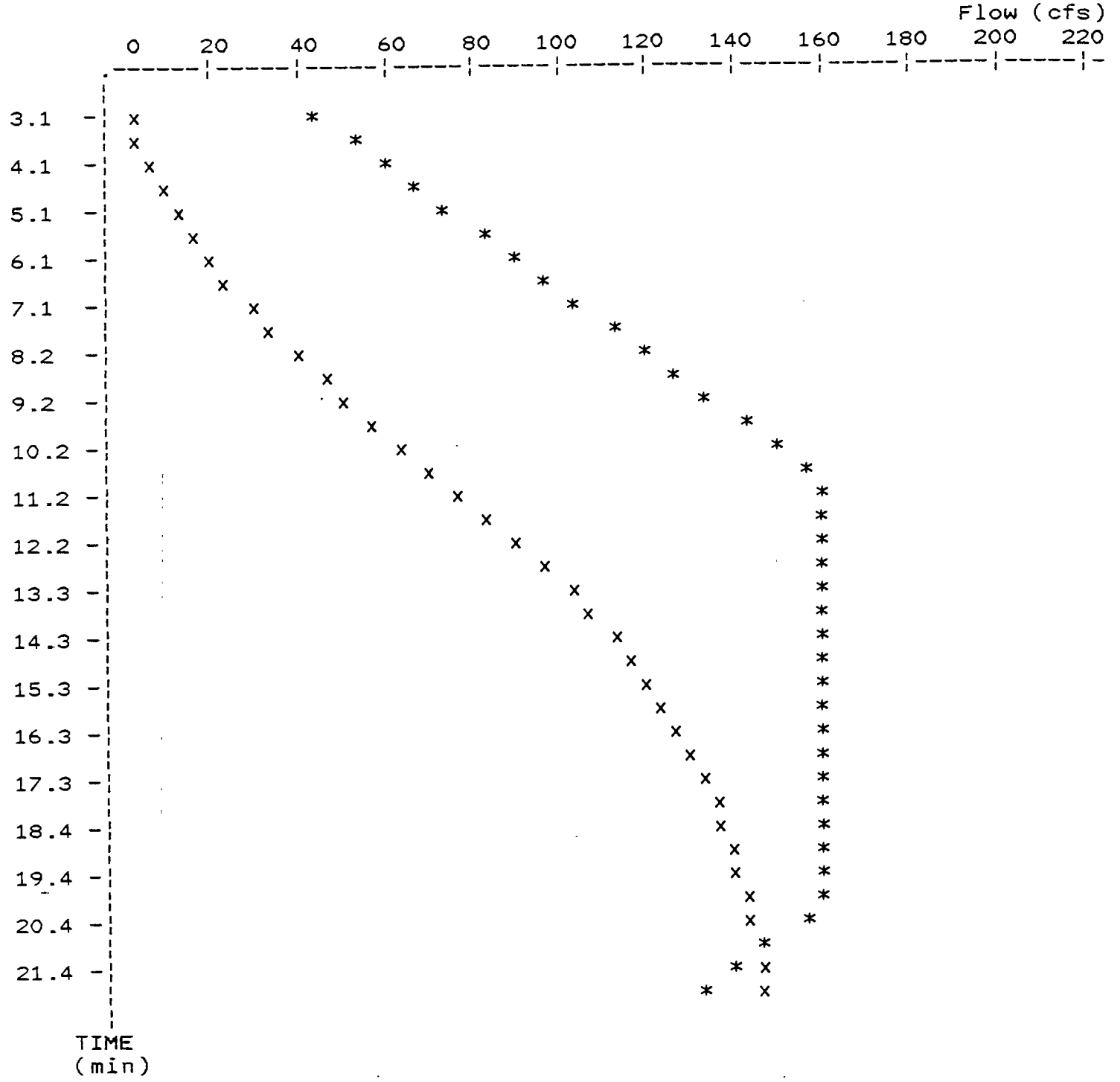
20 MIN

Return Freq: 15 years

Pond File: 7230 .PND
Inflow Hydrograph: 7230-015.HYD
Outflow Hydrograph: 72300015.HYD

EXECUTED: 08-26-1997
10:07:00

Peak Inflow = 161.09 cfs
Peak Outflow = 146.30 cfs
Peak Elevation = 513.65 ft



x File: 7230-015.HYD Qmax = 146.3 cfs
* File: 72300015.HYD Qmax = 161.1 cfs