ENGINEERING

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CIVIC PARK MANOR - AKA Autumn Oaks
STORMWATER DETENTION ANALYSIS

PREPARED BY: BAX ENGINEERING CO., INC.
BAX PROJECT NO. 95-6277
DECEMBER 7, 1995
REVISED JANUARY 15, 1997

INTRODUCTION:

It is proposed that a tract of land consisting of 24.20 acres be developed into a single family residential subdivision. Currently the stormwater runoff discharges from the site through an existing flared end section near the Northeast property corner. It is proposed that a dry stormwater detention basin be constructed along the North property line. The storage volume and outflow rates shall be proportioned to insure that the peak rate of runoff leaving the subwatershed under post-developed conditions is less than or equal to the peak rate of runoff leaving the subwatershed under pre-developed conditions for the required design storm. For this analysis the design storm shall be the 25 year-20 minute duration as required by the City of O'Fallon. A 100 year-20 minutes storm shall also be checked for safe passage through the detention basin. (A 15 year-20 minute storm shall also be routed to determine a highwater elevation for use in the hydraulic calculations.)

GENERAL SITE DATA AND RUNOFF CALCULATIONS:

1. Area of tract : 24.20 Acres

2. The pre-developed P.I. factor to be used for the analysis is (all areas assumed 0% - 5% impervious).

   25 Year-20 Minute Storm : 2.31 c.f.s./Ac

3. The post-developed P.I. factor to be used for the analysis is (areas assumed 40% impervious).

   25 Year-20 Minute Storm : 3.26 c.f.s./Ac

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4. Required attenuation due to full development of the project site is:

   Attenuation = 24.20 Ac x (3.26 c.f.s./Ac - 2.31 c.f.s./Ac)
   = 22.99 c.f.s.

5. From the drainage area map, the 25 year-20 minute inflow to basin is 46.93 c.f.s.

6. The most remote point of origination of inflow to the detention basin lies just offsite near the Southwest property corner. It will flow approximately 665 feet overland to a flared end section where it will travel 634 feet via the storm sewer system to where it will discharge at the detention basin. The time of concentration is therefore estimated as follows:

   A. T_{T665} L = 665 feet
   Elevation Difference = 23 feet

   See Figure 1 Sheet 5 T_{T665} = 4.25 minutes

   B. T_{T634} = 634 feet at approximately 7 feet/second
   T_{T634} = 634 ft/7 ft/sec = 90.6 sec = 1.51 minutes

   C. $T_C = T_{T665} + T_{T634}$
   = 4.25 minutes + 1.51 minutes
   = 5.76 minutes => Use T_C = 6 minutes

7. The permitted release rate of the detention basin is found by subtracting the required attenuation from the peak inflow to the detention basin.

   Permitted Release Rate = 46.93 c.f.s. - 22.99 c.f.s.
   = 23.94 c.f.s.

STORMWATER DETENTION ROUTING CALCULATIONS:

1. A computer program "PONDPACK" was used in routing the design storm through the basin. The results of the analysis are as follows:

25 Year-20 Minute Storm

Peak Release Rate = 23.85 c.f.s.
Peak Elevation = 538.26

* 100 Year-20 Minute Storm

Peak Inflow = 60.09 c.f.s.
Peak Release Rate = 46.09 c.f.s.
Peak Elevation = 538.99

* NOTE The 100 Year-20 Minute Storm was checked only for safe passage through the basin. The peak elevation was 538.99 which allows 2.01 feet of freeboard to the top of the berm.

2. The 100 year-20 minute storm was also checked with the low flow blocked (worst case).

Top of Spillway = 538.29

Check as a Weir:
$Q = CLH^{1.5}$
$Q_{100/20}$ = 60.09 c.f.s.
C = 3.0
L = 11.67 feet

H = 1.44 feet
100 Year Highwater Elevation = 539.73

Check as an Orifice:
$Q = ca(2gh)^{0.5}$
Q = 60.09
c = 0.6
a = 11.67 ft. x 1.167 ft. = 13.62 s.f. (14" throat)
g = 32.2
h = 0.84 feet
100 Year Highwater Elevation = 539.71

DETENTION BASIN CHARACTERISTICS AND SUMMARY:

25 Year - 20 Minute Storm Highwater = 538.26
100 Year - 20 Minute Storm Highwater (worst case) = 539.73
Top of Berm = 541.00
Overflow Structure:
Area inlet 4 sides open with a 14 inch throat
Flowline of Pipe Out (30" R.C.P.) = 531.77
Flowline of Low Slot 12" x 26" = 532.04
Flowline of Overflow Sill = 538.29
Top of Overflow Structure = 539.47

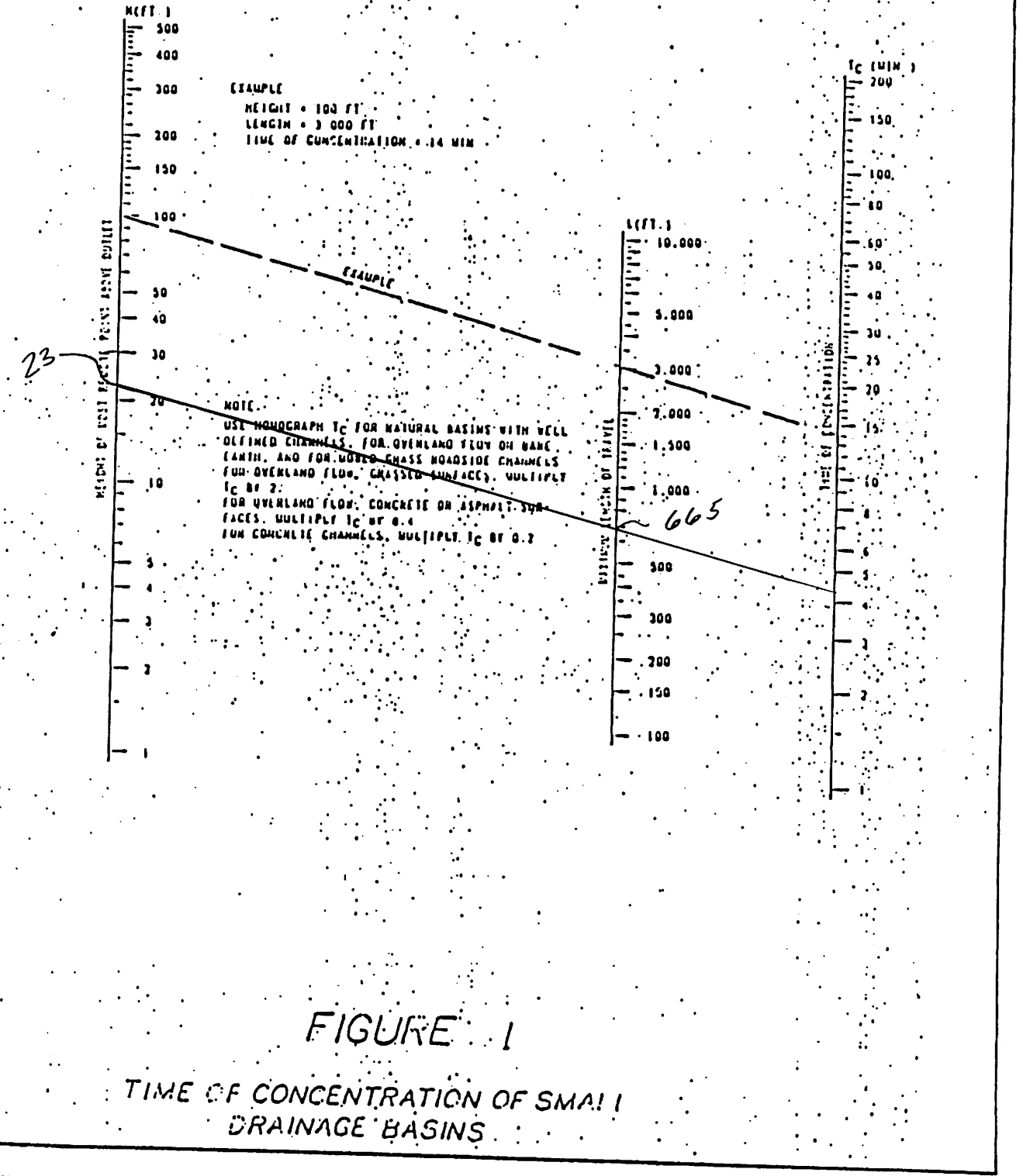

FIGURE 1

TIME OF CONCENTRATION OF SMALL DRAINAGE BASINS

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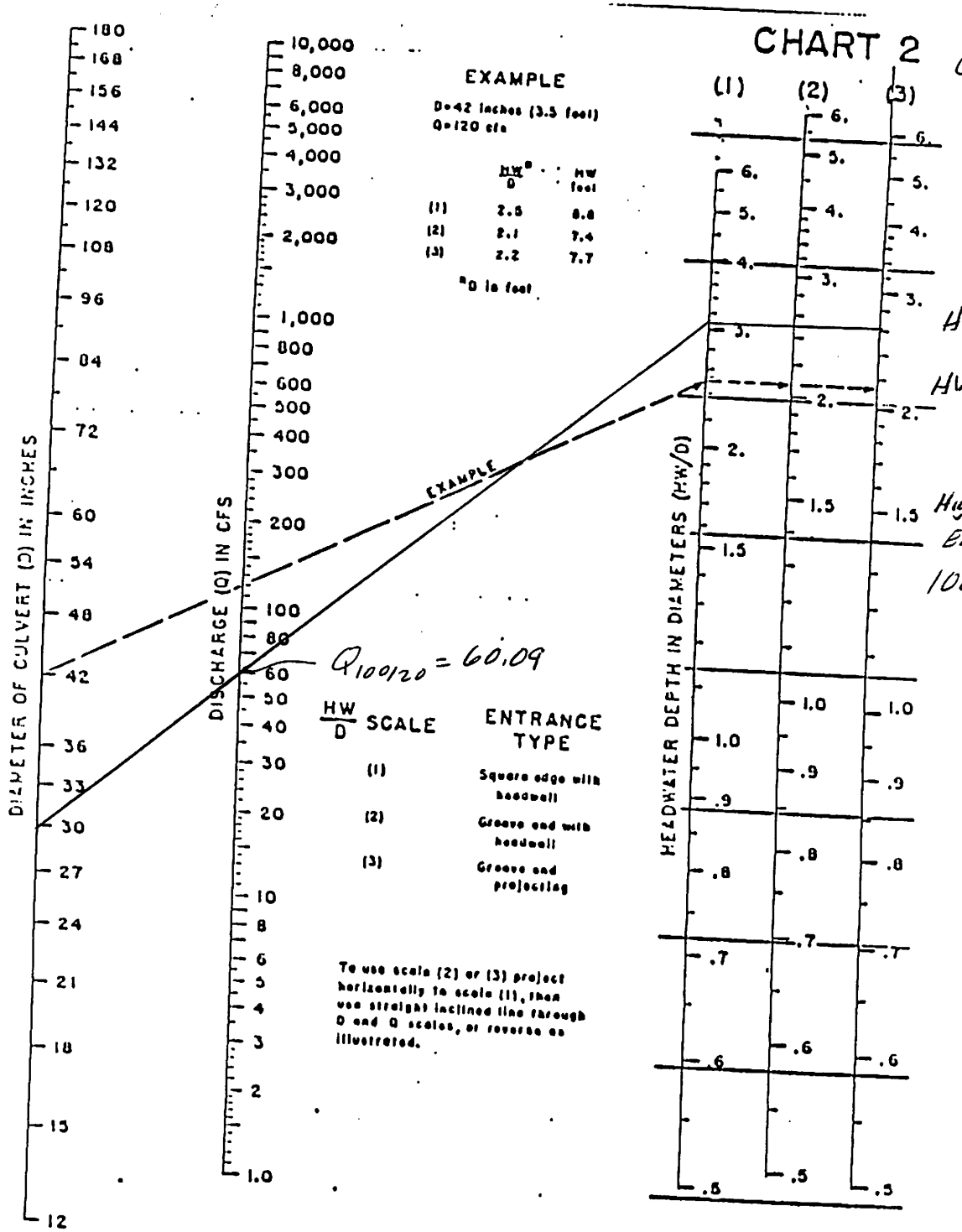
Project: CIVIC PARK MANOR SHEET ___ of ___

Date: _____ Project No: 95-6277

Designed: CLH Checked: _____

CHART 2 OS 222



HW/D = 2.60

HW = 2.60(30/12)

= 6.5'

HIGHWATER ELEVATION

100YR = 539.0

HEADWATER SCALES 283 REVISED MAY 1964

BUREAU OF PUBLIC ROADS JAN. 1963

HEADWATER DEPTH FOR CONCRETE PIPE CULVERTS WITH INLET CONTROL

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St. Charles, MO 63301

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*
* CIVIC PARK MANOR *
* DETENTION ANALYSIS *
* PREPARED BY BAX ENGINEERING CO., INC. *
* DECEMBER 4, 1995 *
*
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Inflow Hydrograph: CIVIC-25.HYD
Rating Table file: CIVIC .PND

----INITIAL CONDITIONS----
Elevation = 532.04 ft
Outflow = 0.00 cfs
Storage = 0.00 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
532.04	0.0	0.000
532.24	0.3	0.000
532.44	0.8	0.001
532.64	1.4	0.002
532.84	2.1	0.004
533.04	3.0	0.009
533.24	3.6	0.015
533.44	5.0	0.024
533.64	6.1	0.035
533.84	7.2	0.051
534.04	8.5	0.069
534.24	9.8	0.090
534.44	11.2	0.111
534.64	12.6	0.134
534.84	13.7	0.157
535.04	14.4	0.181
535.24	15.2	0.206
535.44	15.9	0.232
535.64	16.6	0.259
535.84	17.2	0.287
536.04	17.8	0.316
536.24	18.4	0.347
536.44	19.0	0.378
536.64	19.6	0.411
536.84	20.1	0.445
537.04	20.6	0.480
537.24	21.2	0.516
537.44	21.7	0.554
537.64	22.2	0.593
537.84	22.7	0.633
538.04	23.1	0.675

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
0.1	0.4
0.8	1.6
2.7	4.1
6.4	8.5
12.6	15.6
21.7	25.3
34.5	39.5
51.5	57.6
73.4	80.6
100.6	109.1
130.4	140.2
161.6	172.8
194.0	206.6
227.7	241.4
262.8	277.2
299.3	314.5
337.2	353.1
376.5	393.1
417.2	434.4
459.4	477.2
503.3	521.7
548.9	567.9
596.3	615.9
645.5	665.6
696.5	717.1
749.4	770.6
804.2	825.9
860.9	883.1
919.6	942.3
980.4	1003.5

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
538.24	23.6	0.719
538.44	26.1	0.763
538.64	31.8	0.810
538.84	39.2	0.858
539.04	48.1	0.908
539.24	58.2	0.959
539.44	69.4	1.012
539.64	81.5	1.067
539.84	94.6	1.123
540.04	108.5	1.181
540.24	123.2	1.241
540.44	138.6	1.302
540.60	151.4	1.351

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
1043.3	1066.9
1108.4	1134.5
1175.8	1207.6
1245.6	1284.8
1317.7	1365.8
1392.2	1450.4
1469.2	1538.6
1548.6	1630.1
1630.6	1725.2
1715.2	1823.7
1801.7	1924.9
1889.8	2028.4
1961.5	2112.9

Time increment (t) = 1.0 min.

Pond File: CIVIC .PND
Inflow Hydrograph: CIVIC-25.HYD
Outflow Hydrograph:

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	532.04
1.0	7.80	7.8	3.8	7.8	1.98	532.81
2.0	15.61	23.4	19.7	27.2	3.79	533.27
3.0	23.52	39.1	46.5	58.8	6.16	533.65
4.0	31.31	54.8	85.0	101.3	8.15	533.99
5.0	39.12	70.4	134.5	155.5	10.46	534.33
6.0	46.92	86.0	194.5	220.6	13.04	534.72
7.0	46.93	93.8	259.1	288.3	14.64	535.10
8.0	46.93	93.9	321.1	352.9	15.90	535.44
9.0	46.93	93.9	381.2	415.0	16.92	535.75
10.0	46.93	93.9	439.5	475.0	17.77	536.03
11.0	46.93	93.9	496.2	533.3	18.55	536.29
12.0	46.93	93.9	551.5	590.1	19.28	536.53
13.0	46.93	93.9	605.6	645.4	19.90	536.76
14.0	46.93	93.9	658.6	699.5	20.43	536.97
15.0	46.93	93.9	710.5	752.5	21.00	537.17
16.0	46.93	93.9	761.3	804.3	21.51	537.36
17.0	46.93	93.9	811.3	855.2	21.96	537.54
18.0	46.93	93.9	860.4	905.1	22.39	537.71
19.0	46.93	93.9	908.7	954.2	22.78	537.88
20.0	46.93	93.9	956.3	1002.5	23.09	538.04
21.0	39.16	86.1	995.6	1042.4	23.41	538.16
22.0	31.35	70.5	1018.9	1066.1	23.59	538.24
23.0	23.45	54.8	1026.0	1073.7	23.85	538.26
24.0	15.65	39.1	1018.0	1065.1	23.59	538.23
25.0	7.85	23.5	994.7	1041.5	23.40	538.16
26.0	0.04	7.9	956.4	1002.5	23.09	538.04
27.0	0.00	0.0	910.8	956.4	22.79	537.89
28.0	0.00	0.0	865.9	910.8	22.43	537.73
29.0	0.00	0.0	821.8	865.9	22.05	537.58
30.0	0.00	0.0	778.5	821.8	21.66	537.43
31.0	0.00	0.0	736.0	778.5	21.27	537.27
32.0	0.00	0.0	694.4	736.0	20.81	537.11
33.0	0.00	0.0	653.6	694.4	20.38	536.95
34.0	0.00	0.0	613.6	653.6	19.98	536.79
35.0	0.00	0.0	574.5	613.6	19.57	536.63
36.0	0.00	0.0	536.3	574.5	19.08	536.47
37.0	0.00	0.0	499.1	536.3	18.59	536.30
38.0	0.00	0.0	463.0	499.1	18.10	536.14
39.0	0.00	0.0	427.8	463.0	17.60	535.97
40.0	0.00	0.0	393.5	427.8	17.10	535.81
41.0	0.00	0.0	360.3	393.5	16.61	535.64
42.0	0.00	0.0	328.3	360.3	16.03	535.48
43.0	0.00	0.0	297.4	328.3	15.45	535.31
44.0	0.00	0.0	267.7	297.4	14.83	535.15

Pond File: CIVIC .PND
Inflow Hydrograph: CIVIC-25.HYD
Outflow Hydrograph:

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	239.3	267.7	14.21	534.99
46.0	0.00	0.0	212.0	239.3	13.63	534.83
47.0	0.00	0.0	186.5	212.0	12.77	534.67
48.0	0.00	0.0	162.9	186.5	11.77	534.52
49.0	0.00	0.0	141.4	162.9	10.78	534.38
50.0	0.00	0.0	121.7	141.4	9.85	534.25
51.0	0.00	0.0	103.6	121.7	9.03	534.12
52.0	0.00	0.0	87.1	103.6	8.25	534.00
53.0	0.00	0.0	72.1	87.1	7.50	533.89
54.0	0.00	0.0	58.5	72.1	6.80	533.77
55.0	0.00	0.0	46.3	58.5	6.14	533.65
56.0	0.00	0.0	35.4	46.3	5.41	533.51
57.0	0.00	0.0	26.2	35.4	4.60	533.38
58.0	0.00	0.0	18.9	26.2	3.69	533.25
59.0	0.00	0.0	12.5	18.9	3.20	533.11
60.0	0.00	0.0	7.3	12.5	2.60	532.95

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

Pond File: CIVIC .PND
Inflow Hydrograph: CIVIC-25.HYD
Outflow Hydrograph:

Starting Pond W.S. Elevation = 532.04 ft

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

Peak Inflow	=	46.93 cfs
Peak Outflow	=	23.85 cfs
Peak Elevation	=	538.26 ft

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

Initial Storage	=	0.00 ac-ft
Peak Storage From Storm	=	0.72 ac-ft
Total Storage in Pond	=	0.72 ac-ft

POND-2 Version: 5.17
S/N:

CIVIC PARK MANOR
DETENTION ANALYSIS
25 YEAR-20 MINUTE STORM
DECEMBER 4, 1995

CALCULATED 01-15-1997 15:35:11
DISK FILE: CIVIC .VOL

Planimeter scale: 1 inch = 50 ft.

Elevation (ft)	Planimeter (sq.in.)	Area (acres)	A1+A2+sqr(A1*A2) (acres)	* Volume (acre-ft)	Volume Sum (acre-ft)
532.04	0.00	0.00	0.00	0.00	0.00
534.00	1.74	0.10	0.10	0.07	0.07
536.00	2.56	0.15	0.37	0.25	0.31
538.00	3.68	0.21	0.53	0.36	0.67
540.00	5.12	0.29	0.75	0.50	1.17
541.00	5.62	0.32	0.92	0.31	1.48

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

Outlet Structure File: CIVIC .STR

POND-2 Version: 5.17 S/N:
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CIVIC PARK MANOR
DETENTION ANALYSIS
DECEMBER 4, 1995
****

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

Elevation (ft)	Q (cfs)	Contributing Structures
532.04	0.0	1
532.24	0.3	1
532.44	0.8	1
532.64	1.4	1
532.84	2.1	1
533.04	3.0	1
533.24	3.6	2
533.44	5.0	1
533.64	6.1	1
533.84	7.2	1
534.04	8.5	1
534.24	9.8	1
534.44	11.2	1
534.64	12.6	1
534.84	13.7	2
535.04	14.4	2
535.24	15.2	2
535.44	15.9	2
535.64	16.6	2
535.84	17.2	2
536.04	17.8	2
536.24	18.4	2
536.44	19.0	2
536.64	19.6	2
536.84	20.1	2
537.04	20.6	2
537.24	21.2	2
537.44	21.7	2
537.64	22.2	2
537.84	22.7	2
538.04	23.1	2
538.24	23.6	2
538.44	26.1	2 +3
538.64	31.8	2 +3
538.84	39.2	2 +3
539.04	48.1	2 +3
539.24	58.2	2 +3
539.44	69.4	2 +3
539.64	81.5	2 +3
539.84	94.6	2 +3
540.04	108.5	2 +3
540.24	123.2	2 +3
540.44	138.6	2 +3
540.60	151.4	2 +3

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Date Executed: Time Executed:

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CIVIC PARK MANOR
DETENTION ANALYSIS
DECEMBER 4, 1995

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

Min. Elev.(ft) = 532.04 Max. Elev.(ft) = 540.6 Incr.(ft) = .2

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

****
SYSTEM CONNECTIVITY
****

Structure	No.	Q Table		Q Table
WEIR-VR	1		->	1
ORIFICE	2	? 1	->	A
WEIR-VR	3		->	3

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

Outlet Structure File: CIVIC .STR

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

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CIVIC PARK MANOR
DETENTION ANALYSIS
DECEMBER 4, 1995

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

WEIR-VR
Weir - Vertical Rectangular

E1 elev.(ft)?	532.04
E2 elev.(ft)?	541
Weir coefficient?	3
Weir elev.(ft)?	532.04
Length (ft)?	1.0
Contracted/Suppressed (C/S)?	S

Outlet Structure File: CIVIC .STR

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

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CIVIC PARK MANOR
DETENTION ANALYSIS
DECEMBER 4, 1995

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>>>>>> Structure No. 2 <<<<<<
(Input Data)

ORIFICE
Orifice - Based on Area and Datum Elevation

E1 elev.(ft)?	533.1233
E2 elev.(ft)?	541
Orifice coeff.?	.6
Invert elev.(ft)?	532.04
Datum elev.(ft) ?	533.1233
Orifice area (sq ft)?	2.167

Outlet Structure File: CIVIC .STR

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

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CIVIC PARK MANOR
DETENTION ANALYSIS
DECEMBER 4, 1995

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

WEIR-VR
Weir - Vertical Rectangular

E1 elev.(ft)?	538.29
E2 elev.(ft)?	541
Weir coefficient?	3
Weir elev.(ft)?	538.29
Length (ft)?	11.67
Contracted/Suppressed (C/S)?	S

Outlet Structure File: CIVIC .STR

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

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CIVIC PARK MANOR
DETENTION ANALYSIS
DECEMBER 4, 1995
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Outflow Rating Table for Structure #1
WEIR-VR Weir - Vertical Rectangular

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

Elevation (ft)	Q (cfs)	Computation Messages
532.04	0.0	H =0.0
532.24	0.3	H =.2
532.44	0.8	H =.4
532.64	1.4	H =.6
532.84	2.1	H =.8
533.04	3.0	H =1.0
533.24	3.9	H =1.2
533.44	5.0	H =1.4
533.64	6.1	H =1.6
533.84	7.2	H =1.8
534.04	8.5	H =2.0
534.24	9.8	H =2.2
534.44	11.2	H =2.4
534.64	12.6	H =2.6
534.84	14.1	H =2.8
535.04	15.6	H =3.0
535.24	17.2	H =3.2
535.44	18.8	H =3.4
535.64	20.5	H =3.6
535.84	22.2	H =3.8
536.04	24.0	H =4.0
536.24	25.8	H =4.2
536.44	27.7	H =4.4
536.64	29.6	H =4.6
536.84	31.5	H =4.8
537.04	33.5	H =5.0
537.24	35.6	H =5.2
537.44	37.6	H =5.4
537.64	39.8	H =5.6
537.84	41.9	H =5.8
538.04	44.1	H =6.0
538.24	46.3	H =6.2
538.44	48.6	H =6.4
538.64	50.9	H =6.6

Outlet Structure File: CIVIC .STR

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

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

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

Elevation (ft)	Q (cfs)	Computation Messages
538.84	53.2	H =6.8
539.04	55.6	H =7.0
539.24	58.0	H =7.2
539.44	60.4	H =7.400
539.64	62.9	H =7.6
539.84	65.4	H =7.8
540.04	67.9	H =8.0
540.24	70.4	H =8.200
540.44	73.0	H =8.400
540.60	75.1	H =8.56

C = 3 L (ft) = 1
H (ft) = Table elev. - Invert elev. (532.04 ft)
Q (cfs) = C * L * (H**1.5) -- Suppressed Weir

Outlet Structure File: CIVIC .STR

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

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CIVIC PARK MANOR
DETENTION ANALYSIS
DECEMBER 4, 1995

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Outflow Rating Table for Structure #2
ORIFICE Orifice - Based on Area and Datum Elevation

Elevation (ft)	Q (cfs)	Computation Messages
532.04	0.0	E < E1=533.1233
532.24	0.0	E < E1=533.1233
532.44	0.0	E < E1=533.1233
532.64	0.0	E < E1=533.1233
532.84	0.0	E < E1=533.1233
533.04	0.0	E < E1=533.1233
533.24	3.6	H =.117
533.44	5.9	H =.317
533.64	7.5	H =.517
533.84	8.8	H =.717
534.04	10.0	H =.917
534.24	11.0	H =1.117
534.44	12.0	H =1.317
534.64	12.8	H =1.517
534.84	13.7	H =1.717
535.04	14.4	H =1.917
535.24	15.2	H =2.117
535.44	15.9	H =2.317
535.64	16.6	H =2.517
535.84	17.2	H =2.717
536.04	17.8	H =2.917
536.24	18.4	H =3.117
536.44	19.0	H =3.317
536.64	19.6	H =3.517
536.84	20.1	H =3.717
537.04	20.6	H =3.917
537.24	21.2	H =4.117
537.44	21.7	H =4.317
537.64	22.2	H =4.517
537.84	22.7	H =4.717
538.04	23.1	H =4.917
538.24	23.6	H =5.117
538.44	24.1	H =5.317
538.64	24.5	H =5.517

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Outflow Rating Table for Structure #2
ORIFICE Orifice - Based on Area and Datum Elevation

Elevation (ft)	Q (cfs)	Computation Messages
538.84	24.9	H =5.717
539.04	25.4	H =5.917
539.24	25.8	H =6.117
539.44	26.2	H =6.317
539.64	26.6	H =6.517
539.84	27.0	H =6.717
540.04	27.4	H =6.917
540.24	27.8	H =7.117
540.44	28.2	H =7.317
540.60	28.5	H =7.477

C = .6 A = 2.167 sq.ft.
H (ft) = Table elev. - Datum elev. (533.1233 ft)
Q (cfs) = C * A * sqr(2g * H)

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

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

Elevation (ft)	Q (cfs)	Computation Messages
532.04	0.0	E < Inv.El.= 538.29
532.24	0.0	E < Inv.El.= 538.29
532.44	0.0	E < Inv.El.= 538.29
532.64	0.0	E < Inv.El.= 538.29
532.84	0.0	E < Inv.El.= 538.29
533.04	0.0	E < Inv.El.= 538.29
533.24	0.0	E < Inv.El.= 538.29
533.44	0.0	E < Inv.El.= 538.29
533.64	0.0	E < Inv.El.= 538.29
533.84	0.0	E < Inv.El.= 538.29
534.04	0.0	E < Inv.El.= 538.29
534.24	0.0	E < Inv.El.= 538.29
534.44	0.0	E < Inv.El.= 538.29
534.64	0.0	E < Inv.El.= 538.29
534.84	0.0	E < Inv.El.= 538.29
535.04	0.0	E < Inv.El.= 538.29
535.24	0.0	E < Inv.El.= 538.29
535.44	0.0	E < Inv.El.= 538.29
535.64	0.0	E < Inv.El.= 538.29
535.84	0.0	E < Inv.El.= 538.29
536.04	0.0	E < Inv.El.= 538.29
536.24	0.0	E < Inv.El.= 538.29
536.44	0.0	E < Inv.El.= 538.29
536.64	0.0	E < Inv.El.= 538.29
536.84	0.0	E < Inv.El.= 538.29
537.04	0.0	E < Inv.El.= 538.29
537.24	0.0	E < Inv.El.= 538.29
537.44	0.0	E < Inv.El.= 538.29
537.64	0.0	E < Inv.El.= 538.29
537.84	0.0	E < Inv.El.= 538.29
538.04	0.0	E < Inv.El.= 538.29
538.24	0.0	E < Inv.El.= 538.29
538.44	2.0	H =.15
538.64	7.2	H =.35

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

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

Elevation (ft)	Q (cfs)	Computation Messages
538.84	14.3	H =.55
539.04	22.7	H =.750
539.24	32.4	H =.95
539.44	43.2	H =1.15
539.64	54.9	H =1.35
539.84	67.6	H =1.55
540.04	81.0	H =1.75
540.24	95.3	H =1.95
540.44	110.4	H =2.15
540.60	122.9	H =2.31

C = 3 L (ft) = 11.67
H (ft) = Table elev. - Invert elev. (538.29 ft)
Q (cfs) = C * L * (H**1.5) -- Suppressed Weir

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Outflow Rating Table A
Table A = 1 ? 2

Elevation (ft)	Q (cfs)	Contributing Structures
532.04	0.0	1
532.24	0.3	1
532.44	0.8	1
532.64	1.4	1
532.84	2.1	1
533.04	3.0	1
533.24	3.6	2
533.44	5.0	1
533.64	6.1	1
533.84	7.2	1
534.04	8.5	1
534.24	9.8	1
534.44	11.2	1
534.64	12.6	1
534.84	13.7	2
535.04	14.4	2
535.24	15.2	2
535.44	15.9	2
535.64	16.6	2
535.84	17.2	2
536.04	17.8	2
536.24	18.4	2
536.44	19.0	2
536.64	19.6	2
536.84	20.1	2
537.04	20.6	2
537.24	21.2	2
537.44	21.7	2
537.64	22.2	2
537.84	22.7	2
538.04	23.1	2
538.24	23.6	2
538.44	24.1	2
538.64	24.5	2
538.84	24.9	2
539.04	25.4	2
539.24	25.8	2
539.44	26.2	2
539.64	26.6	2
539.84	27.0	2
540.04	27.4	2
540.24	27.8	2
540.44	28.2	2
540.60	28.5	2