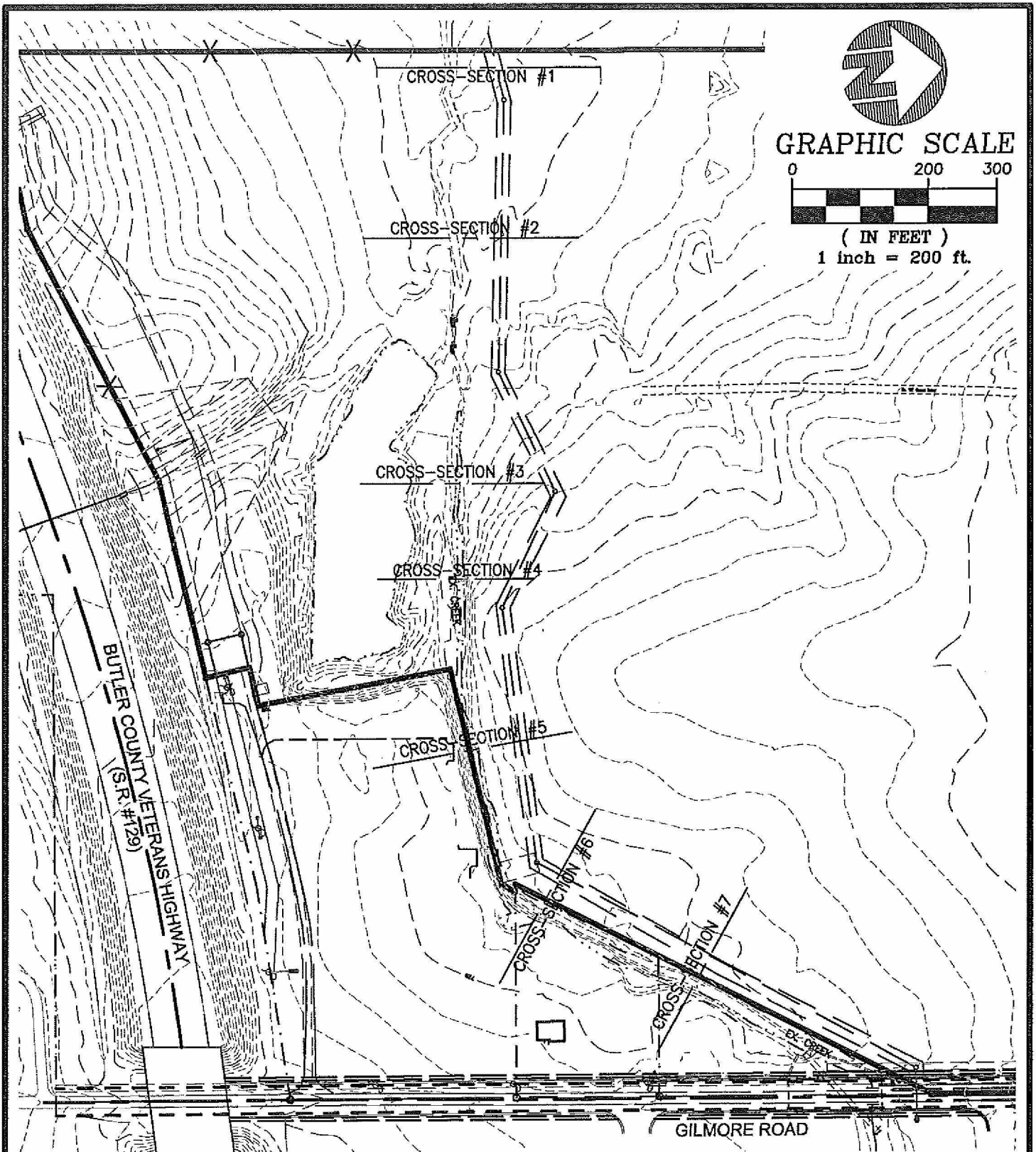




PRE-DEVELOPED 100-YEAR
FLOOD ELEVATIONS IN THE
EXISTING CREEK

THE FOUNTAINS OF
FAIRFIELD TOWNSHIP

Prepared: 7-18-08



Drawing:
07M097-000 GRADING
Scale
1"=200'

Drawn by:
GJK

Checked By:

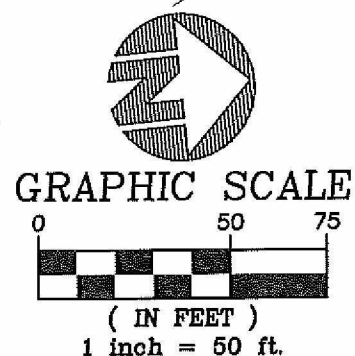
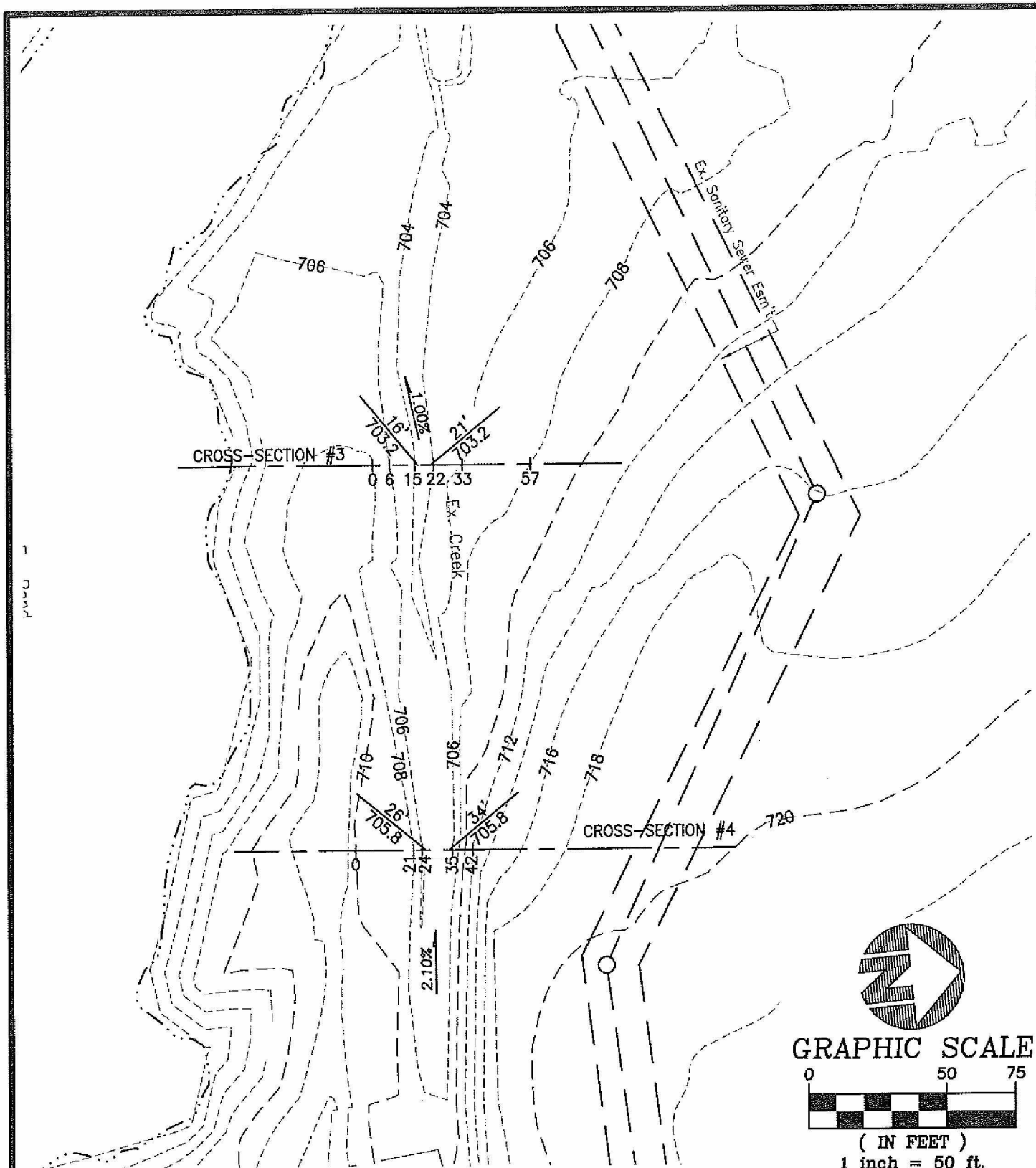
Issue Date:
7-21-08

THE FOUNTAINS OF FAIRFIELD TOWNSHIP

2865 PRINCETON ROAD
SECTION 25, TOWN 2, RANGE 3
FAIRFIELD TOWNSHIP, BUTLER COUNTY OHIO
CREEK CROSS-SECTIONS

**bayer
becker**

6900 Tylersville Road, Suite A
Mason, OH 45040 - 513.336.6600

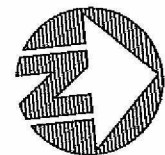


Drawing:
 07M097-000 GRADING
 Scale
 1"=50'
 Drawn by:
 GJK
 Checked By:
 Issue Date:
 7-21-08

**THE FOUNTAINS OF
 FAIRFIELD TOWNSHIP**
 2865 PRINCETON ROAD
 SECTION 25, TOWN 2, RANGE 3
 FAIRFIELD TOWNSHIP, BUTLER COUNTY OHIO
CROSS-SECTIONS #3 & #4

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 becker**

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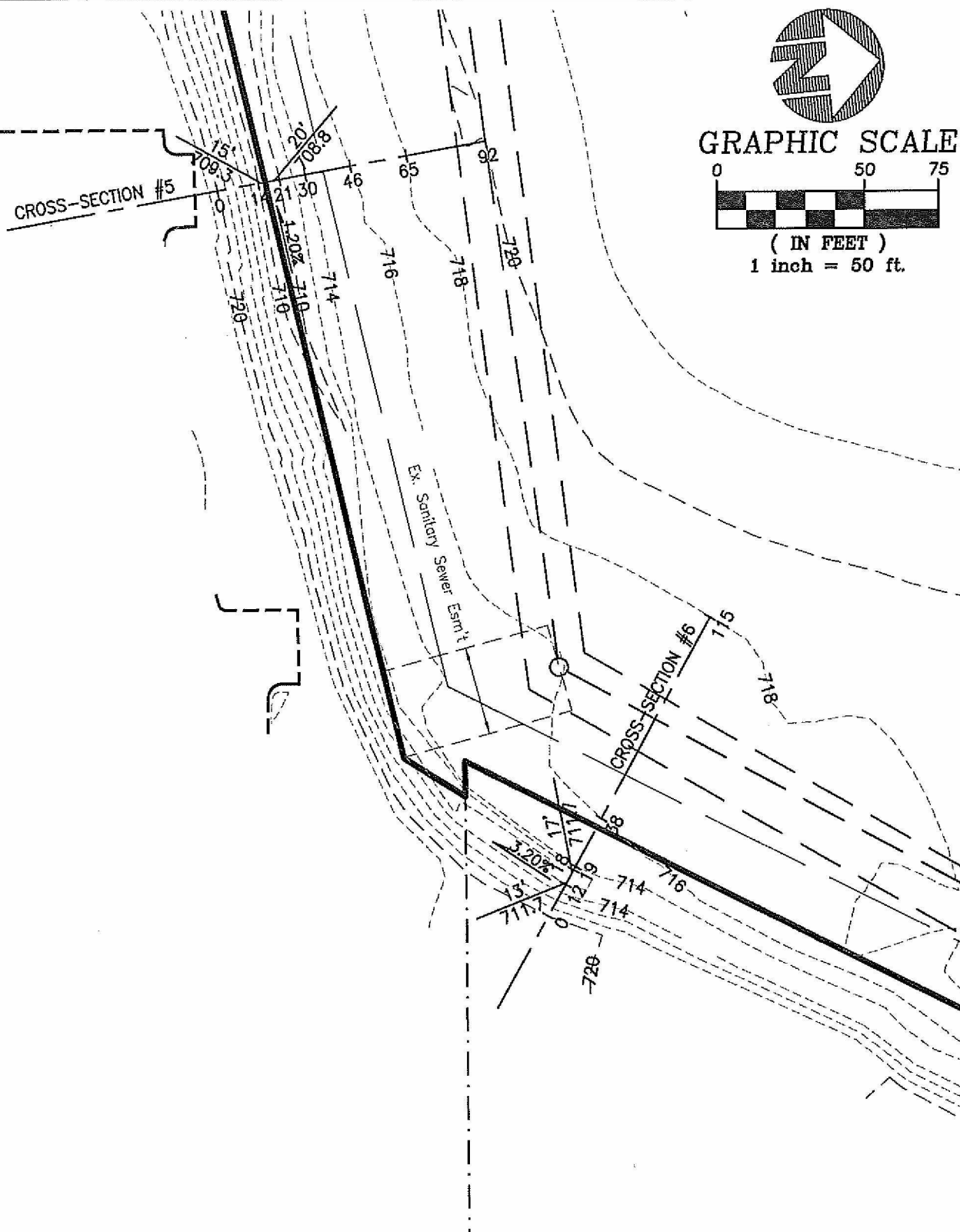


GRAPHIC SCALE



(IN FEET)

1 inch = 50 ft.



Drawing:
07M097-000 GRADING
Scale

1"=50'

Drawn by:
GJK

Checked By:

Issue Date:
7-21-08

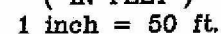
THE FOUNTAINS OF FAIRFIELD TOWNSHIP

2865 PRINCETON ROAD
SECTION 25, TOWN 2, RANGE 3
FAIRFIELD TOWNSHIP, BUTLER COUNTY OHIO

CROSS-SECTIONS #5 & #6

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The Fountains of Fairfield Township

Cross Section #1

Natural Channels -- English Units

Civil Tools for Windows

(07-21-2008, 11:59:46)

Flow Elevation = 697.54 ft
Flow Rate = 826.86 cfs
Channel Slope = .0100 ft/ft
Solving for = Flow Elevation
Y = 697.54 ft
A = 189.18 sf
P = 141.88 ft
V = 4.37 fps
F = 0.67 sub-critical flow

Dist	Elev	Coeff
0	700	.06
43	698	.06
102	696	.06
109	694	.06
111	693.2	.04
117	693.2	.04
118	694	.06
139	696	.06
215	698	.06
328	700	.06

G' BOTTOM

$n = 0.06$

The Fountains of Fairfield Township

Cross Section #2

Natural Channels -- English Units

Civil Tools for Windows
(07-21-2008, 12:03:31)

Flow Elevation = 700.51 ft
Flow Rate = 826.86 cfs
Channel Slope = .014 ft/ft
Solving for = Flow Elevation
Y = 700.51 ft
A = 182.32 sf
P = 179.77 ft
V = 4.54 fps
F = 0.79 sub-critical flow

Dist	Elev	Coeff
0	702	.06
68	700	.06
127	698	.06
129	697.1	.04
138	697.1	.04
139	698	.06
150	700	.06
201	700	.06
315	702	.06

9' Bottom

$n = 0.04$

The Fountains of Fairfield Township

Cross Section #3

Natural Channels -- English Units

Civil Tools for Windows

(07-21-2008, 13:40:06)

Flow Elevation = 707.40 ft

Flow Rate = 490.51 cfs

Channel Slope = .010 ft/ft

Solving for = Flow Elevation

Y = 707.40 ft

A = 91.32 sf

P = 49.25 ft

V = 5.37 fps

F = 0.69 sub-critical flow

Dist	Elev	Coeff
0	708	.06
6	706	.06
15	704	.06
16	703.2	.04
21	703.2	.04
22	704	.06
33	706	.06
57	708	.06

5' BOTTOM

The Fountains of Fairfield Township

Cross Section #4

Natural Channels -- English Units

Civil Tools for Windows

(07-21-2008, 12:22:44)

Flow Elevation = 709.15 ft
Flow Rate = 490.51 cfs
Channel Slope = .021 ft/ft
Solving for = Flow Elevation
Y = 709.15 ft
A = 55.97 sf
P = 31.84 ft
V = 8.76 fps
F = 1.13 super-critical flow

Dist	Elev	Coeff
0	710	.06
21	708	.06
24	706	.06
26	705.8	.04
35	705.8	.04
35	706	.06
42	712	.06

9' BOTTOM

The Fountains of Fairfield Township

Cross Section #5

Natural Channels -- English Units

Civil Tools for Windows

(07-21-2008, 12:12:52)

Flow Elevation = 714.08 ft

Flow Rate = 490.51 cfs

Channel Slope = .012 ft/ft

Solving for = Flow Elevation

Y = 714.08 ft

A = 64.74 sf

P = 25.36 ft

V = 7.58 fps

F = 0.79 sub-critical flow

Dist	Elev	Coeff
0	720	.06
14	710	.06
15	709.3	.04
20	708.8	.04
21	710	.06
30	714	.06
46	716	.06
65	718	.06
92	720	.06

≈ 5' BOTTOM

≈ 3-4' BOTTOM
FIELD REVIEW

The Fountains of Fairfield Township

Cross Section #6

Natural Channels -- English Units

Civil Tools for Windows

(07-21-2008, 12:20:51)

Flow Elevation = 715.67 ft
Flow Rate = 490.51 cfs
Channel Slope = .032 ft/ft
Solving for = Flow Elevation
Y = 715.67 ft
A = 49.64 sf
P = 30.93 ft
V = 9.88 fps
F = 1.32 super-critical flow

Dist	Elev	Coeff
0	720	.06
12	712	.06
13	711.7	.04
17	711.7	.04
18	712	.06
19	714	.06
38	716	.06
115	718	.06

4' BOTTOM

The Fountains of Fairfield Township

Cross Section #7

Natural Channels -- English Units

Civil Tools for Windows

(07-21-2008, 12:26:43)

Flow Elevation = 717.40 ft

Flow Rate = 490.51 cfs

Channel Slope = .021 ft/ft

Solving for = Flow Elevation

Y = 717.40 ft

A = 56.83 sf

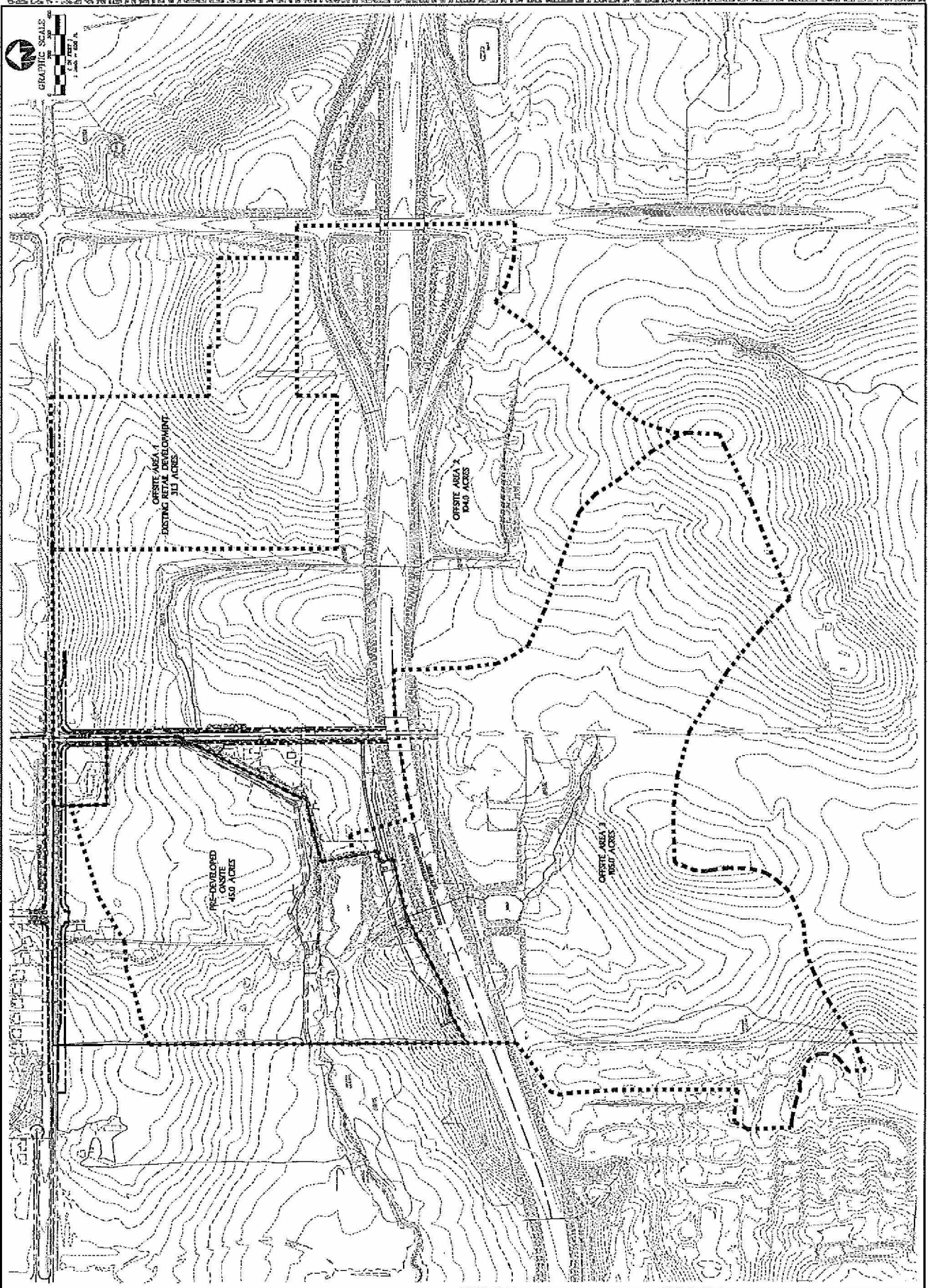
P = 28.50 ft

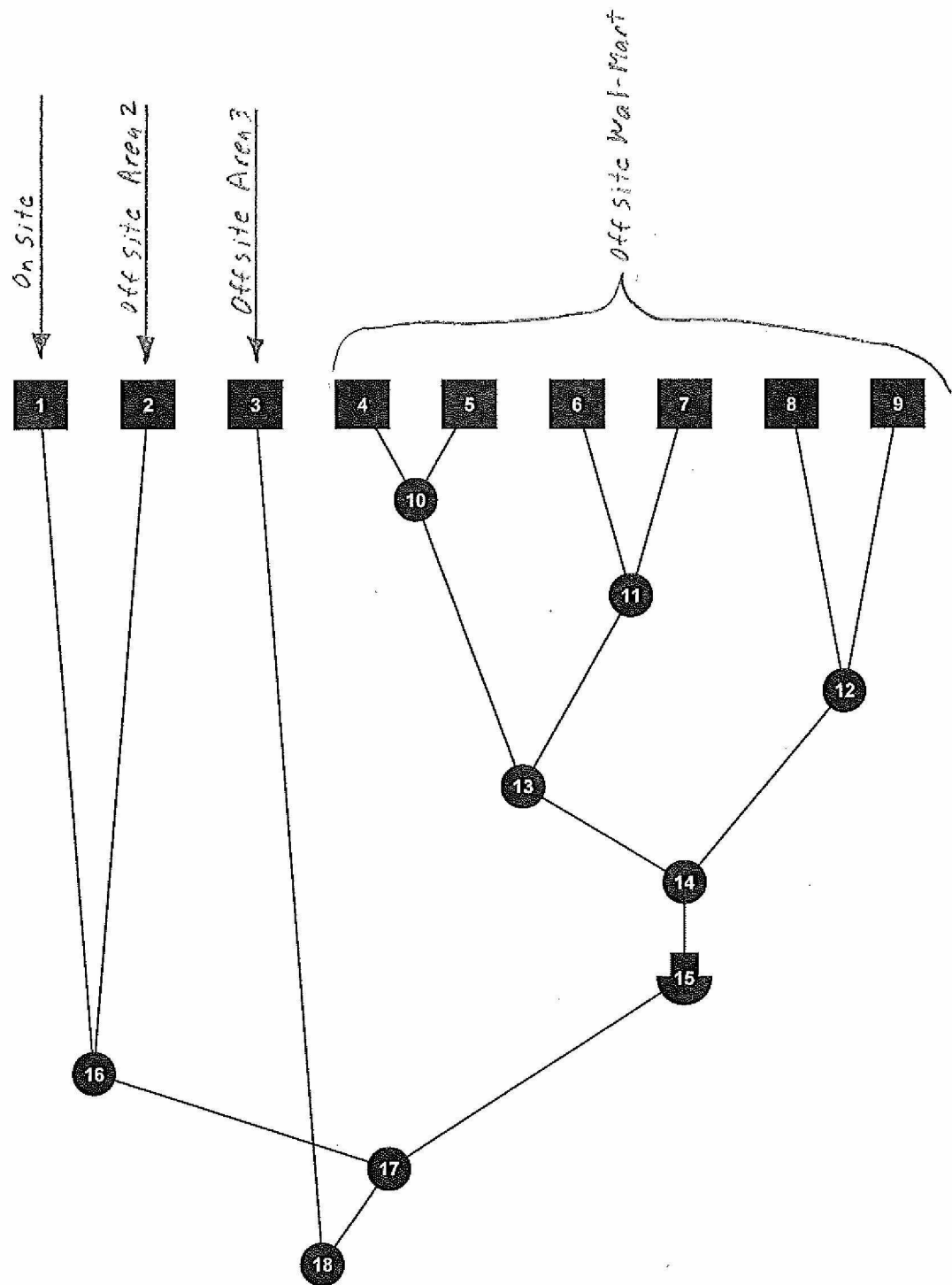
V = 8.63 fps

F = 1.05 super-critical flow

Dist	Elev	Coeff
0	720	.06
13	714	.06
14	713.7	.04
20	713.7	.04
21	714	.06
25	716	.06
36	718	.06
100	720	.06

G' Bottom





Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Return period (yrs)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	152.33	2	728	558,639	100	---	-----	-----	Pre-Developed Onsi
2	SCS Runoff	321.66	2	730	1,285,367	100	---	-----	-----	Offsite Area 2
3	SCS Runoff	336.35	2	730	1,343,177	100	---	-----	-----	Offsite Area 3
4	SCS Runoff	66.98	2	720	181,936	100	---	-----	-----	WM Store/ Area Beh
5	SCS Runoff	35.24	2	720	100,079	100	---	-----	-----	Lowes Outlots
6	SCS Runoff	45.71	2	720	137,045	100	---	-----	-----	Lowes Parking Lot
7	SCS Runoff	11.73	2	720	35,184	100	---	-----	-----	Area Around Lowes
8	SCS Runoff	22.45	2	720	67,328	100	---	-----	-----	Lowes Store
9	SCS Runoff	27.93	2	720	72,879	100	---	-----	-----	Detention Area
10	Combine	102.21	2	720	282,015	100	4 + 5	-----	-----	Add 4 + 5
11	Combine	57.44	2	720	172,229	100	6 + 7	-----	-----	Add 6 & 7
12	Combine	50.38	2	720	140,208	100	8 + 9	-----	-----	Add 8 & 9
13	Combine	159.65	2	720	454,244	100	10 + 11	-----	-----	Add 10 & 11
14	Combine	210.03	2	720	594,452	100	12 + 13	-----	-----	Add 13 & 12
15	Reservoir	18.64	2	756	592,575	100	14	744.92	299,876	Offsite Area 3 Wal
16	Combine	472.62	2	730	1,844,006	100	1 + 2	-----	-----	Add 1 & 2
17	Combine	490.51	2	730	2,436,577	100	16 + 15	-----	-----	Add 15 & 16
18	Combine	826.86	2	730	3,779,754	100	3 + 17	-----	-----	Add 3 & 17

Hydrograph Report

Page 1

English

Hyd. No. 17

Add 15 & 16

Hydrograph type = Combine
Storm frequency = 100 yrs
1st inflow hyd. No. = 16

Peak discharge = 490.51 cfs
Time interval = 2 min
2nd inflow hyd. No. = 15

Total Volume = 2,436,577 cuft

Hydrograph Discharge Table

Time (hrs)	1st Inflow cfs	+	2nd Inflow cfs	=	Outflow cfs
11.13	19.14		5.63		24.77
11.17	19.78		5.68		25.46
11.20	20.47		5.74		26.21
11.23	21.22		5.81		27.02
11.27	22.03		5.86		27.90
11.30	22.98		5.92		28.90
11.33	24.10		5.98		30.08
11.37	25.30		6.05		31.35
11.40	26.57		6.04		32.60
11.43	27.91		5.98		33.89
11.47	29.32		5.93		35.25
11.50	30.79		6.00		36.79
11.53	32.61		6.17		38.78
11.57	34.98		6.37		41.34
11.60	38.24		6.58		44.82
11.63	42.77		6.85		49.62
11.67	48.99		7.19		56.17
11.70	57.34		7.60		64.95
11.73	68.31		8.10		76.40
11.77	82.51		8.65		91.16
11.80	101.07		9.29		110.36
11.83	125.07		10.02		135.09
11.87	155.78		10.85		166.62
11.90	194.41		11.74		206.15
11.93	239.83		12.72		252.55
11.97	288.10		13.75		301.86
12.00	335.11		14.76		349.87
12.03	378.20		15.68		393.89
12.07	415.92		16.46		432.38
12.10	445.99		17.09		463.08
12.13	465.83		17.55		483.38
12.17	472.62 <<		17.89		490.51 <<
12.20	464.75		18.12		482.87
12.23	444.57		18.27		462.85
12.27	417.33		18.37		435.70
12.30	387.52		18.43		405.96

100 Year Flow for
Cross Sections 3, 4, 5, 6, & 7

Continues on next page...

Hydrograph Report

Page 1

English

Hyd. No. 18

Add 3 & 17

Hydrograph type = Combine
Storm frequency = 100 yrs
1st inflow hyd. No. = 3

Peak discharge = 826.86 cfs
Time interval = 2 min
2nd inflow hyd. No. = 17

Total Volume = 3,779,754 cuft

Hydrograph Discharge Table

Time (hrs)	1st Inflow cfs	+	2nd Inflow cfs	=	Outflow cfs
11.20	15.38		26.21		41.59
11.23	15.93		27.02		42.95
11.27	16.52		27.90		44.41
11.30	17.16		28.90		46.06
11.33	17.97		30.08		48.06
11.37	18.83		31.35		50.18
11.40	19.75		32.60		52.35
11.43	20.71		33.89		54.60
11.47	21.73		35.25		56.98
11.50	22.79		36.79		59.58
11.53	24.10		38.78		62.88
11.57	25.78		41.34		67.12
11.60	28.07		44.82		72.89
11.63	31.24		49.62		80.86
11.67	35.55		56.17		91.73
11.70	41.32		64.95		106.27
11.73	48.87		76.40		125.27
11.77	58.61		91.16		149.77
11.80	71.40		110.36		181.75
11.83	87.89		135.09		222.98
11.87	109.00		166.62		275.62
11.90	135.54		206.15		341.69
11.93	166.72		252.55		419.27
11.97	199.94		301.86		501.80
12.00	232.47		349.87		582.34
12.03	262.57		393.89		656.46
12.07	289.55		432.38		721.92
12.10	311.97		463.08		775.05
12.13	328.17		483.38		811.55
12.17	336.35 <<		490.51 <<		826.86 <<
12.20	334.55		482.87		817.42
12.23	323.31		462.85		786.15
12.27	306.02		435.70		741.72
12.30	286.22		405.96		692.18
12.33	265.89		375.62		641.51
12.37	245.14		344.92		590.06

100 Year Flow for
Cross Sections 1 & 2

Continues on next page...