SITE PLAN

AND

DRAINAGE CALCULATIONS

FOR
PROPOSED DETENTION PONDS
IN
LOT 2, BLOCK 1, FAIRFIELD ESTATES

PREPARED BY
PROFESSIONAL ENGINEEERING CONSULTANTS, P.A.
ENGINEERS
WICHITA, KANSAS

APRIL 3, 1989

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1440 EAST ENGLISH
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ZIP CODE / 67211

Date 3-31-89 Page 1 of 7

Project Fairfield, Lot 2 Block1

Item Drainage

ELEV.	STAGE	(Ft) Δd	(Ac) Area	(Ac-Ft) Δ Vol	(Ac-Ft) Σ Vol
177.75	0.00	0.00	0.311	0.00	0.00
178.5	0.75	0.75	0.311	0.248	0.248
179.0	1.25	0.50	0.443	0.194	0.442
180.0	2.25	1.00	0.443	0443	0.885
180.5	2.75	0.50	0.479	0.230	1.115
181.0	3.25	0.50	0.506	0.246	1.361
181.5	3.75	0.50	0.625	0.282	1.643
182.0	4.25	0.50	0.882	0.375	2.018
182.5	4.75	0.50	1.331	0.549	2.567

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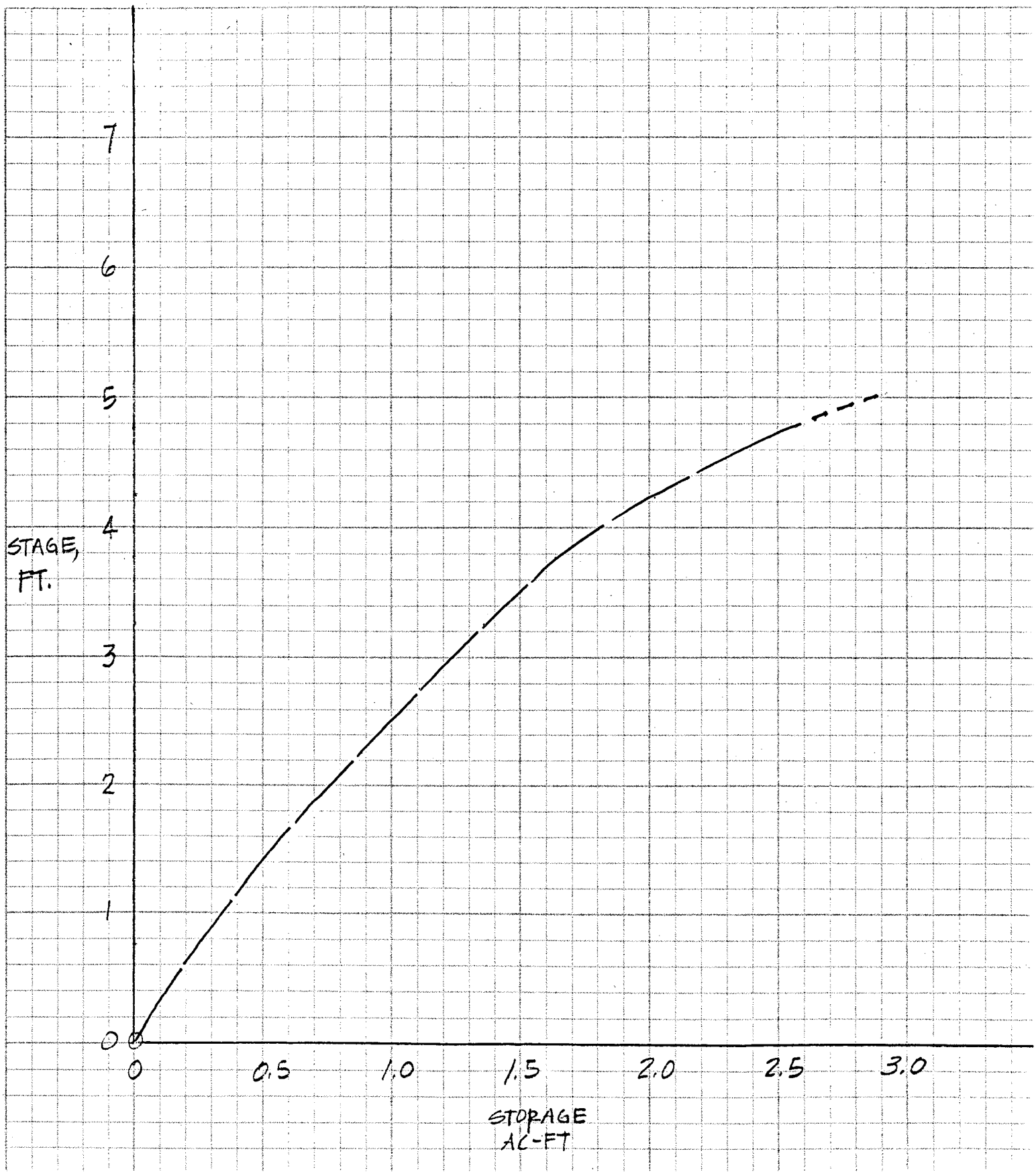
Project Fairfield Lot 2, Block 1

Item Drainage



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Project Fairfield - Lot 2, Block 1

Item Drainage

STAGE	ELEV	STORAGE S (AC-FT)	STORAGE S (AC-IN)	OUTFLOW O (CFS)	2S	2S/Δt	2S/Δt + O
0	177.75	0	0	0	0	0	0
1	178.75	0.34	4.08	9	8.16	97.96	107
2	179.75	0.76	9.12	26	18.24	218.97	245
3	180.75	1.23	14.76	44	29.52	354.38	398
4	181.75	1.80	21.60	57	43.20	518.61	576
5	182.75	2.85	34.20	69	68.40	821.13	890

Δt = 5 min = 0.0833 hr.

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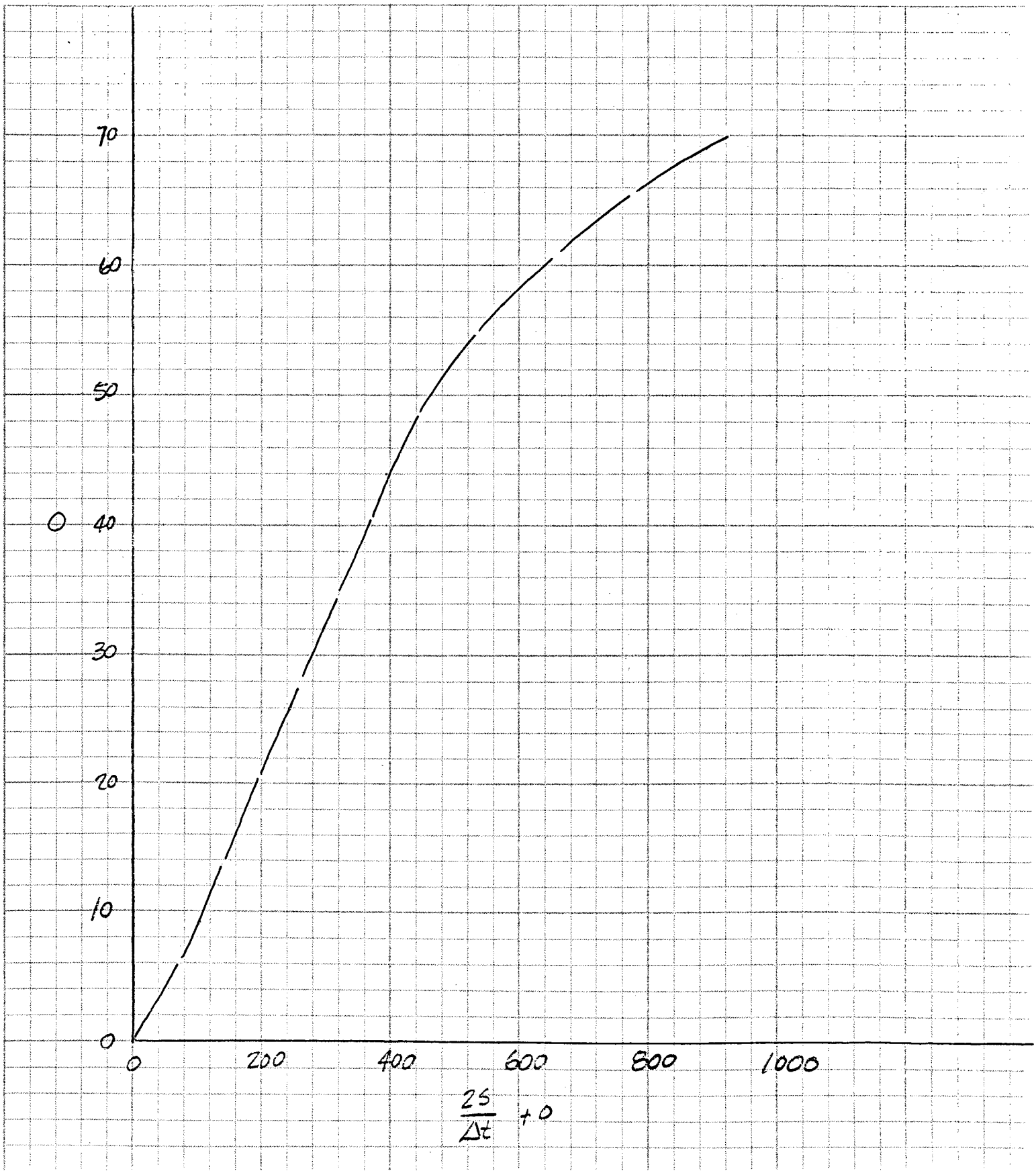
Project Fairfield - Lot 2, Block 1

Item Drainage



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Project Fairfield - Lot 2, Block 1

Item Drainage

Time (hr)	I_n (cfs)	$I_n + I_{n+1}$ (cfs)	$\frac{2S}{\Delta t} - O$	$\frac{2S}{\Delta t} + O$	O		HW	Elev.
0	0	62	0	0	0		0	177.7
0.0833	62	186	52	62	5		0.8	178.5
0.167	124	309	188	238	25		2.0	179.7
0.250	185	329	393	497	52		3.6	181.3
0.333	144	248	594	722	64		4.6	182.3
0.417	104	167	706	842	68		4.8	182.5
0.500	63	85	735	873	69	PEAK	4.8	182.5
0.583	22	22	686	820	67		4.8	182.5
0.666	0	0	582	708	63		4.5	182.2
0.750	0	0	468	582	57		4.0	181.7
0.833	0	0	368	468	50		3.5	181.2
0.916	0	0	288	368	40		2.8	180.5
1.000	0	0	226	288	31		2.3	180.0
1.083	0	0	178	226	24		1.9	179.6
1.167	0	0	140	178	19		1.6	179.3
1.250	0	0	112	140	14		1.3	179.0
1.333	0	0	92	112	10		1.0	178.7
1.417	0	0	76	92	8		0.9	178.6
1.500	0	0	62	76	7		0.8	178.5
1.583	0	0	52	62	5		0.6	178.3

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Project FAIRFIELD - Lot 2, Block 1

Item Drainage

Time (hr)	I_n (cfs)	$I_n + I_{n+1}$ (cfs)	$\frac{2S}{\Delta t} - O$	$\frac{2S}{\Delta t} + O$	O	HW	Elev
1.666	0	0	44	52	4	0.5	178.2
1.750	0	0	38	44	3	0.3	178.0
1.833	0	0	32	38	3	0.3	178.0
1.917	0	0	26	32	3	0.3	178.0
2.000	0	0	22	26	2	0.2	177.9
2.083	0	0	18	22	2	0.2	177.9
2.167	0	0	14	18	2	0.2	177.9
2.250	0	0	12	14	1	0.1	177.8
2.333	0	0	10	12	1	0.1	177.8
2.416	0	0	8	10	1	0.1	177.8
2.500	0	0	6	8	1	0.1	177.8
2.583	0	0	4	6	1	0.1	177.8
2.666	0	0	2	4	1	0.1	177.8
2.750	0	0	0	2	1	0.1	177.8
2.833	0	0	0	0	0	0.0	177.7

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Date 4.2.89 Page 7 of 7

Project Fairfield - Lot 2 Block 1

Item Drainage

SUMMARY

Q_{100} exist. = 70 cfs
Q_{100} proposed (before detention) = 185 cfs
} see Fairfield Drainage Plan (dated Nov. 8, 1985)

Q_{100} proposed (after detention) = 69 cfs

Pond Data: Static Pool = 177.7 ±

DWS_{100} = 182.5 ±

Volume = 2.57 Ac-Ft
(Includes Volume in Parking Lot & In other pond)

PROFESSIONAL
ENGINEERING
CONSULTANTS
PROFESSIONAL ASSOCIATION

April 3, 1989

Mr. Michael E. Lindebak, P.E.
City Engineer
7th Floor - City Hall
455 North Main
Wichita, Kansas 67202

Attention: Ms. Vicky Huang, P.E.

Reference: Fairfield Estates
Lot 2, Block 1 Drainage
PEC File No. 36-89123-2373

Dear Ms. Huang:

Transmitted herewith for your review are two (2) copies of drainage calculations for a proposed storm water detention system in Lot 2, Block 1, Fairfield Estates. These calculations are based on the enclosed site grading plan prepared by the architect, Jeff Krehbiel and Associates.

As you will note, this development plan utilizes retaining walls to create "ponds" for the primary storm water storage. Some additional storage is provided on the parking lot pavement.

The calculations utilize the same inflow hydrograph and the same stage-discharge curve as developed in the Drainage Plan for Fairfield Estates which was prepared by PEC on November 8, 1985. The stage-storage relationship is based on the new site grading plan enclosed. With this combined data, the peak Q_{100} is calculated to be 69 cfs with the Design Water Surface (DWS) at 182.50 City Datum. This discharge and elevation are essentially the same as those shown in the November 1985 Drainage Plan.

Please review the enclosed calculations as soon as possible and return your comments to our office. Upon your approval, the area will be replatted so that the ponds and parking lots will be located in reserves which will allow drainage.

If you have any questions or need any additional information concerning this item, please advise.

Very truly yours,

PROFESSIONAL ENGINEERING CONSULTANTS, P.A.

Charles S. Brown

Charles S. Brown, P.E.
Project Engineer

CSB/cas

cc: Jeff Krehbiel, A.I.A.

1440 EAST ENGLISH
WICHITA, KANSAS 67211
(316) 262-2691

SITE PLAN

AND

DRAINAGE CALCULATIONS

FOR
PROPOSED DETENTION PONDS
IN
LOT 2, BLOCK 1, FAIRFIELD ESTATES

PREPARED BY
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ENGINEERS
WICHITA, KANSAS

APRIL 3, 1989

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Project Fairfield, Lot 2 Block1

Item Drainage

ELEV.	STAGE	(Ft) Δd	(Ac) Area	(Ac-Ft) Δ Vol	(Ac-Ft) Σ Vol
177.75	0.00	0.00	0.311	0.00	0.00
178.5	0.75	0.75	0.311	0.248	0.248
179.0	1.25	0.50	0.443	0.194	0.442
180.0	2.25	1.00	0.443	0443	0.885
180.5	2.75	0.50	0.479	0.230	1.115
181.0	3.25	0.50	0.506	0.246	1.361
181.5	3.75	0.50	0.625	0.282	1.643
182.0	4.25	0.50	0.882	0.375	2.018
182.5	4.75	0.50	1.331	0.549	2.567

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Date 3-31-89 Page 2 of 7

Project Fairfield Lot 2, Block 1

Item Drainage

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Project Fairfield - Lot 2, Block 1

Item Drainage

STAGE	ELEV	STORAGE S (AC-FT)	STORAGE S (AC-IN)	OUTFLOW O (CFS)	2S	2S/Δt	2S/Δt + O
0	177.75	0	0	0	0	0	0
1	178.75	0.34	4.08	9	8.16	97.96	107
2	179.75	0.76	9.12	26	18.24	218.97	245
3	180.75	1.23	14.76	44	29.52	354.38	398
4	181.75	1.80	21.60	57	43.20	519.61	576
5	182.75	2.85	34.20	69	68.40	821.13	890

Δt = 5 min = 0.0833 hr.

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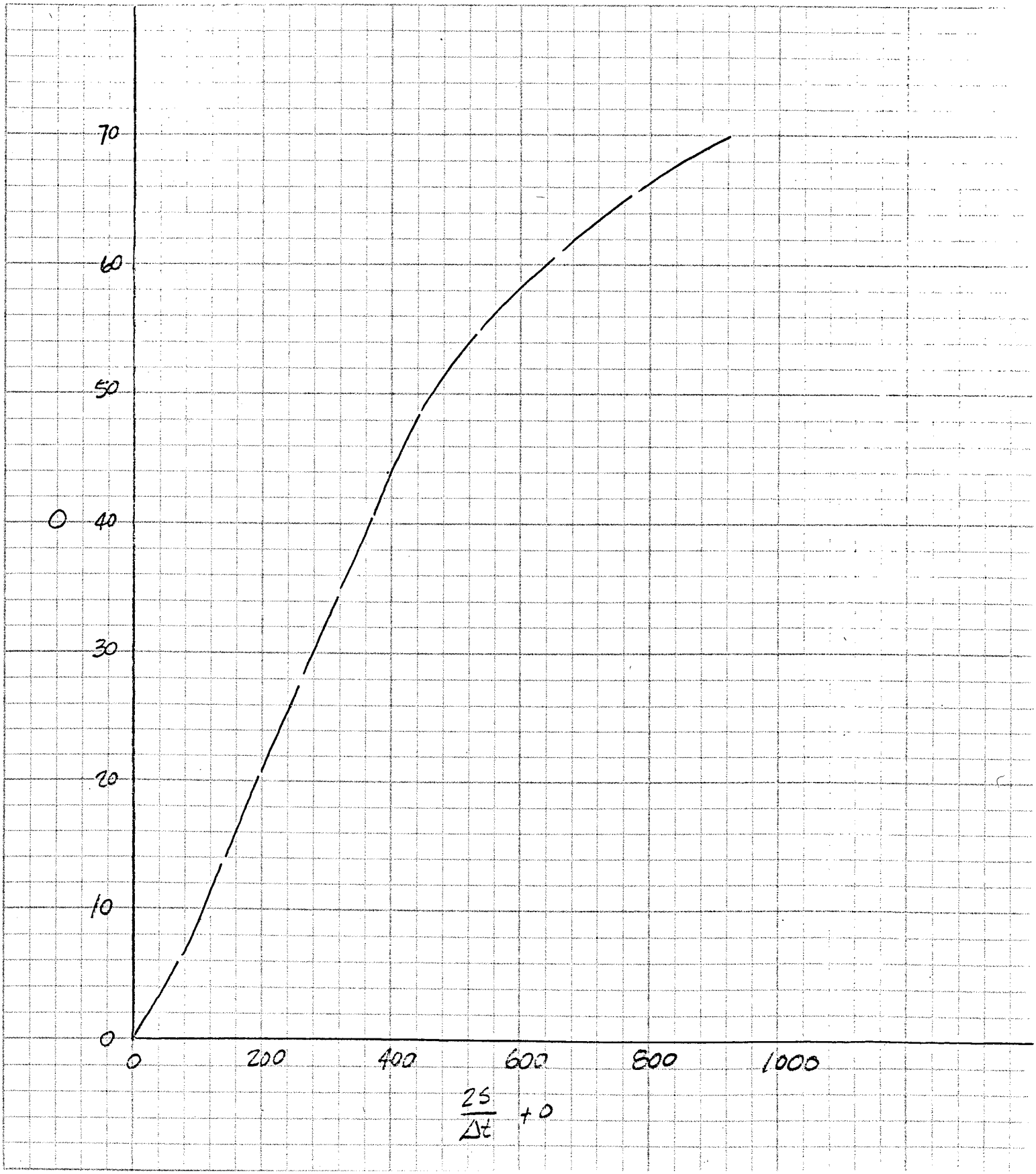
Project Fairfield - Lot 2, Block 1

Item Drainage



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Date 3-31-89 Page 5 of 7

Project Fairfield - Lot 2, Block 1

Item Drainage

Time (hr)	I_n (cfs)	$I_n + I_{n+1}$ (cfs)	$\frac{2S}{\Delta t} - O$	$\frac{2S}{\Delta t} + O$	O	HW	Elev.
0	0	62	0	0	0	0	177.1
0.0833	62	186	52	62	5	0.8	178.5
0.167	124	309	188	238	25	2.0	179.7
0.250	185	329	393	497	52	3.6	181.3
0.333	144	248	594	722	64	4.6	182.3
0.417	104	167	706	842	68	4.8	182.5
0.500	63	85	735	873	69 PEAK	4.8	182.5
0.583	22	22	686	820	67	4.8	182.5
0.666	0	0	582	708	63	4.5	182.2
0.750	0	0	468	582	57	4.0	181.7
0.833	0	0	368	468	50	3.5	181.2
0.916	0	0	288	368	40	2.8	180.5
1.000	0	0	226	288	31	2.3	180.0
1.083	0	0	178	226	24	1.9	179.6
1.167	0	0	140	178	19	1.6	179.3
1.250	0	0	112	140	14	1.3	179.0
1.333	0	0	92	112	10	1.0	178.7
1.417	0	0	76	92	8	0.9	178.6
1.500	0	0	62	76	7	0.8	178.5
1.583	0	0	52	62	5	0.6	178.3

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Project FAIRFIELD - Lot 2, Block 1

Item Drainage

Time (hr)	I_n (cfs)	$I_n + I_{n+1}$ (cfs)	$\frac{2S}{\Delta t} - O$	$\frac{2S}{\Delta t} + O$	O	HW	Elev
1.666	0	0	44	52	4	0.5	178.2
1.750	0	0	38	44	3	0.3	178.0
1.833	0	0	32	38	3	0.3	178.0
1.917	0	0	26	32	3	0.3	178.0
2.000	0	0	22	26	2	0.2	177.9
2.083	0	0	18	22	2	0.2	177.9
2.167	0	0	14	18	2	0.2	177.9
2.250	0	0	12	14	1	0.1	177.8
2.333	0	0	10	12	1	0.1	177.8
2.416	0	0	8	10	1	0.1	177.8
2.500	0	0	6	8	1	0.1	177.8
2.583	0	0	4	6	1	0.1	177.8
2.666	0	0	2	4	1	0.1	177.8
2.750	0	0	0	2	1	0.1	177.8
2.833	0	0	0	0	0	0.0	177.7

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Date 4.2.89 Page 7 of 7

Project Fairfield - Lot 2 Block 1

Item Drainage

SUMMARY

Q_{100} exist. = 70 cfs
Q_{100} proposed (before detention) = 185 cfs
} See Fairfield Drainage Plan (dated Nov. 8, 1985)

Q_{100} proposed (after detention) = 69 cfs

Pond Data: Static Pool = 177.7 ±

DWS_{100} = 182.5 ±

Volume = 2.57 Ac-Ft
(Includes Volume in Parking Lot & In other pond)

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Date June 13, 1989 Page 1 of 7

Project Polo Club Office Park

Item Drainage Plan

ELEV	STAGE	(SF) AREA	(Ac) AREA	Δd	Ac-Ft Δ Vol	Σ Vol
177.75	0	16,762	0.385	0	0	0
178.0	0.25	16,762	0.385	0.25'	0.096	0.096
180.0	2.25	16,762	0.385	2.00	0.770	0.866
180.5	2.75	17,740	0.407	0.50	0.198	1.064
181.0	3.25	18,749	0.430	0.50	0.209	1.273
181.5	3.75	22,723	0.522	0.50	0.238	1.511
182.0	4.25	30,888	0.709	0.50	0.307	1.818
182.5	4.75	48,283	1.108	0.50	0.451	2.269

BASED ON SITE GRADING PLAN ENCLOSED.

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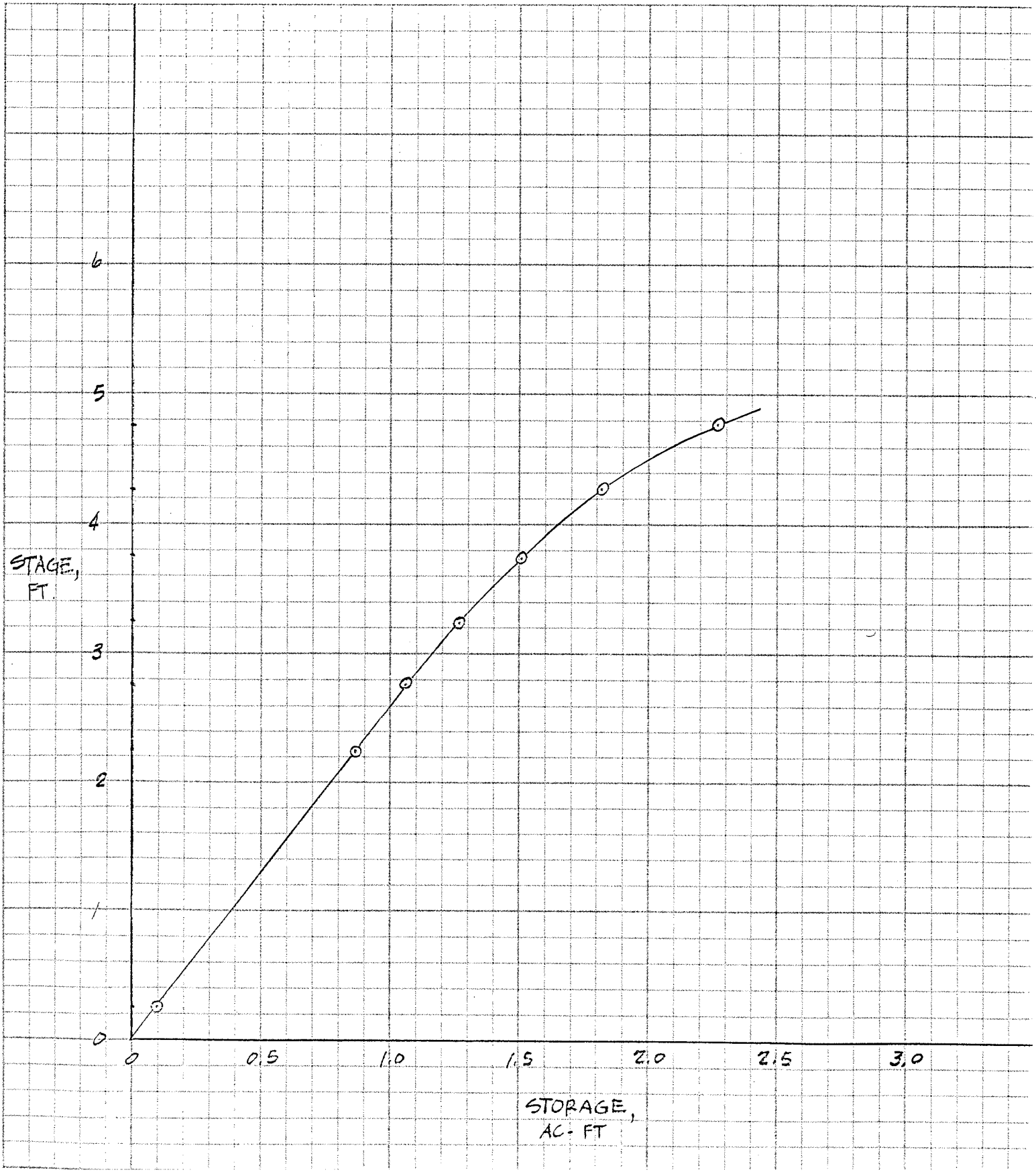
Project Polo Club Office Park

Item Drainage Plan



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Project Polo Club Office Park

Item Drainage Plan

STAGE	ELEV	STORAGE S (AC-FT)	STORAGE S (AC-IN)	OUTFLOW O (CFS) *	2S	$\frac{2S}{\Delta T}$	$\frac{2S}{\Delta T} + O$
0	177.75	0	0	0	0	0	0
1	178.75	0.34	4.08	9	8.16	98	107
2	179.75	0.76	9.12	26	18.24	219	245
3	180.75	1.17	14.04	44	28.08	337	381
4	181.75	1.65	19.80	57	39.60	475	532
5	182.75	2.52	30.24	69	60.48	726	795

ΔT = 5 Min = 0.0833 hr.

* See Fairfield Drainage Plan (11.5.85)

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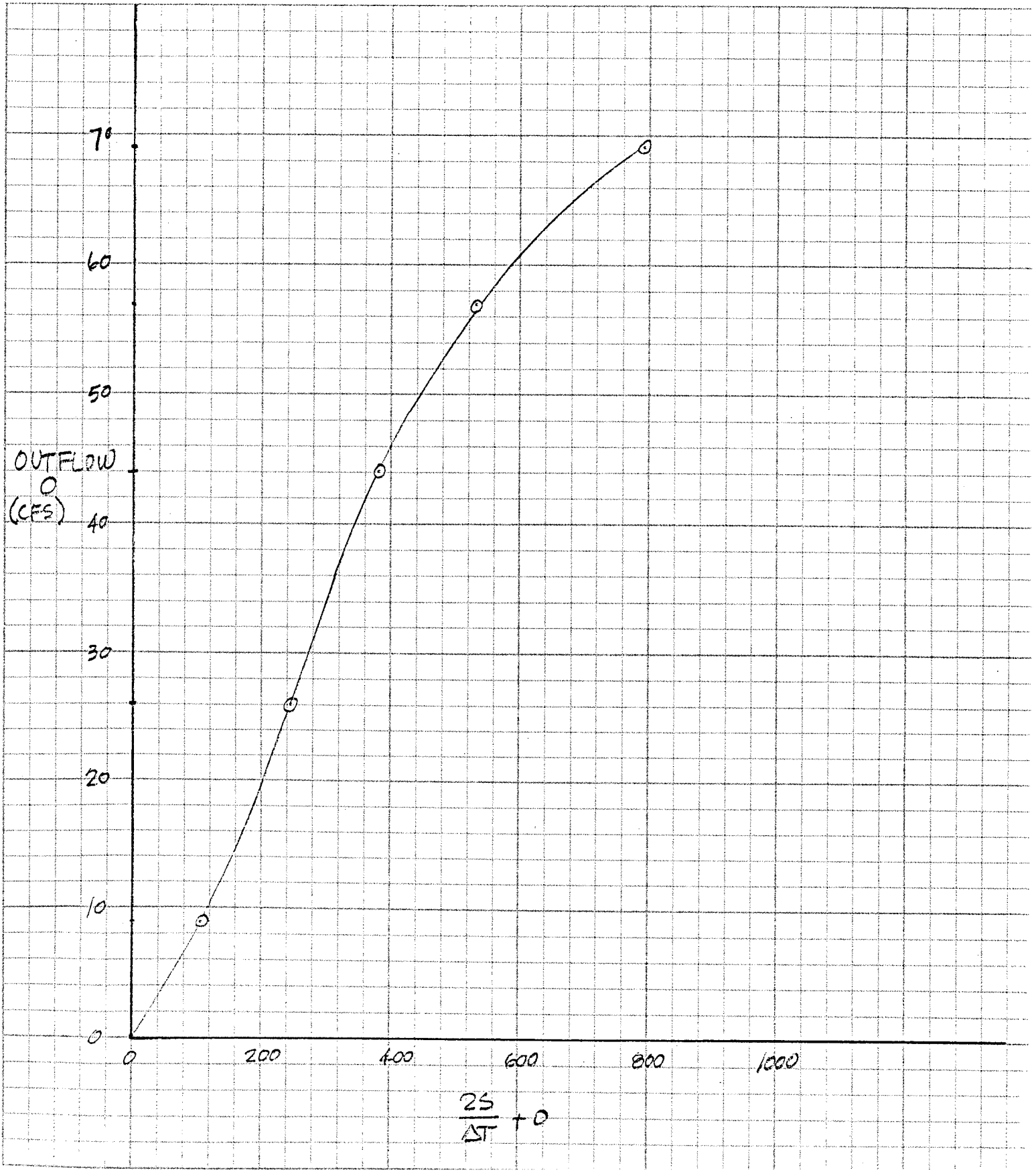
Project Polo Club Office Park

Item Drainage Plan



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Project Polo Club Office Park

Item Drainage Plan

Time (Hr)	I_n (cfs)	$I_n + I_{n+1}$ (cfs)	$\frac{2S}{\Delta T} - O$	$\frac{2S}{\Delta t} + O$	O (cfs)	HW (FT)	ELEV.
0	0	62	0	0	0	0	177.7
0.083	62	186	52	62	5	0.8	178.5
0.167	124	309	188	238	25	2.0	179.7
0.250	185	329	389	497	54	3.7	181.4
0.333	144	248	586	718	66	4.7	182.4
0.417	104	167	694	834	70	4.9	182.6
0.500	63	85	721	861	70	4.9	182.6
0.583	22	22	668	806	69	4.8	182.5
0.666	0	0	560	690	65	4.6	182.3
0.750	0	0	444	560	58	4.1	181.8
0.833	0	0	344	444	50	3.5	181.2
0.916	0	0	264	344	40	2.8	180.5
1.000	0	0	206	264	29	2.2	179.9
1.083	0	0	166	206	20	1.7	179.4
1.167	0	0	136	166	15	1.3	179.0
1.250	0	0	112	136	12	1.1	178.8
1.333	0	0	94	112	9	1.0	178.7
1.417	0	0	78	94	8	0.9	178.6
1.500	0	0	64	78	7	0.8	178.5
1.583	0	0	54	64	5	0.6	178.3
1.666	0	0	44	54	5	0.6	178.3

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Project Polo Club Office Park

Item Drainage Plan

1.750	0	6	36	44	4	0.5	178.2
1.833	0	0	30	36	3	0.3	178.0
1.916	0	0	24	30	3	0.3	176.0
2.000	0	0	20	24	2	0.2	177.9
2.083	0	0	16	20	2	0.2	177.9
2.167	0	0	12	16	2	0.2	177.9
2.250	0	0	10	12	1	0.1	177.8
2.333	0	0	8	10	1	0.1	177.8
2.416	0	0	6	8	1	0.1	177.8
2.500	0	0	4	6	1	0.1	177.8
2.583	0	0	2	4	1	0.1	177.8
2.666	0	0	0	2	1	0.1	177.8
2.750	0	0	0	0	0	0.0	177.7

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Project Polo Club Office Park

Item Drainage Plan

SUMMARY

Q_{100} (Existing) = 70 cfs
Q_{100} (Proposed) = 185 cfs
Before Detention

} See, Fairfield Drainage Plan (dated Nov. 8, 1985)

Q_{100} (Proposed) = 70 cfs
After Detention

Pond Data: Static Pool = 177.7 ±

DWS_{100} = 182.6 ±

Volume = 2.4 ac Ft ±
(Includes Storage on Parking Lot)