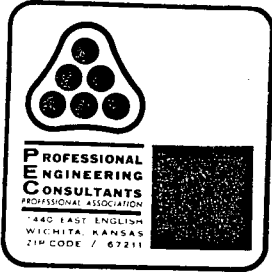


MEMO



TO: SEDGWICK COUNTY BUREAU
OF PUBLIC SERVICES

PROJECT NO. 36-85516-1964

PROJECT: GOLF PARK WEST

COPIES TO:

ATTN: MR. JIM WEBER

DATE: JUNE 4, 1986

CARL GIPSON, CITY OF WICHITA
W/ENCLOSURE)

FROM: CHARLES S. BROWN, P.E.

FORREST NAGLEY, MAPD

REFERENCE: DRAINAGE PLAN

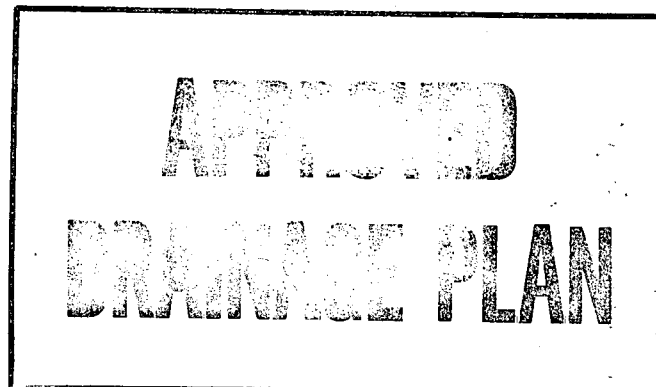
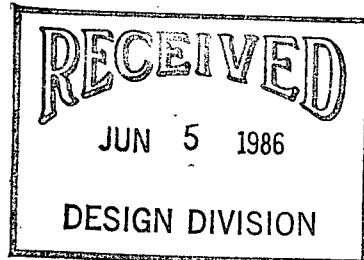
PLEASE ADVISE IMMEDIATELY OF ANY MISCONCEPTIONS OR OMISSIONS YOU BELIEVE TO BE CONTAINED HEREIN.

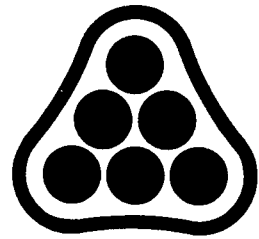
TRANSMITTED HERewith IS ONE COPY OF THE "DRAINAGE PLAN AND SUPPORTING CALCULATIONS" FOR THE PROPOSED GOLD PARK WEST ADDITION TO SEDGWICK COUNTY.

THE FINAL PLAT WILL BE SUBMITTED TO THE PLANNING DEPARTMENT ON FRIDAY, JUNE 6, 1986 TO BE HEARD BY THE SUBDIVISION COMMITTEE ON JUNE 19, 1986.

IF YOU HAVE ANY QUESTIONS OR NEED ANY ADDITIONAL INFORMATION, PLEASE ADVISE.

What about the tract to the West?





PROFESSIONAL
ENGINEERING
CONSULTANTS
PROFESSIONAL ASSOCIATION

DRAINAGE PLAN
AND
SUPPORTING CALCULATIONS

FOR
GOLF PARK WEST
AN ADDITION TO SEDGWICK COUNTY, KANSAS

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

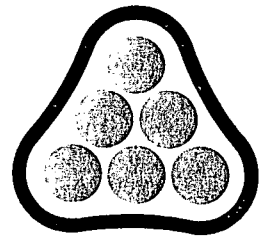
JUNE 4, 1986

DRAINAGE PLAN
AND
SUPPORTING CALCULATIONS

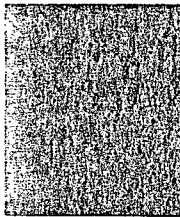
FOR
GOLF PARK WEST
AN ADDITION TO SEDGWICK COUNTY, KANSAS

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

JUNE 4, 1986



PROFESSIONAL
ENGINEERING
CONSULTANTS
PROFESSIONAL ASSOCIATION



DRAINAGE PLAN
AND
SUPPORTING CALCULATIONS

FOR
GOLF PARK WEST
AN ADDITION TO SEDGWICK COUNTY, KANSAS

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

JUNE 4, 1986



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



Date May 29, 1986 Page 1 of 5

Project Golf Park West Addition

Item Drainage Plan

PROPOSED CONDITIONS - 5 YR

$$D.A. = 725' \times 1,220' = 20.3 \text{ Ac.}$$

Use Rational Formula $Q = CIA$

where $Q =$ runoff, cfs
 $C =$ coef. of runoff
 $I =$ intensity
 $A =$ Drainage Area

① Determine runoff coefficient

Assume 50% of Area = Business, 70% Imp. $c = 0.69$

" 50% " " = Open Space Type B Soil $c = 0.22$

$$\text{Composite } c = \frac{(0.5 \times 0.69) + (0.5 \times 0.22)}{1.0} = 0.46$$

② Determine time of concentration

avg land slope = 1%

600' paved @ 1% = 600' @ 1.4 fps = 7.1 min.

600' avg lawn @ 1% = 600' @ 0.28 fps = 35.7

TOTAL 42.8 min
use 43 min.

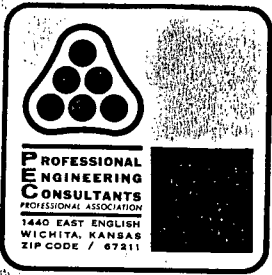
③ Determine I_5

From chart (Hydro-35) $I_5 = 2.64$

④ Q_5

$$Q = 0.46 \times 2.64 \times 20.3$$

= 25 cfs



Date May 29, 1986 Page 2 of 5

Project Golf Park West Addition

Item Drainage Plan

PROPOSED CONDITIONS - 100-YR

D. A. = 20.3 Ac.

Use Rational Formula $Q = CIA$ where $Q =$ runoff, cfs
 $C =$ coef. of runoff
 $I =$ Intensity
 $A =$ Drainage Area, Ac.

① Determine runoff coefficient

Assume 50% of Area = Business, 70% Imp. $C = 0.80$

Assume 50% of Area = Open Space, Type B $C = 0.41$

$$\text{Composite } C = \frac{(0.5 \times 0.8) + (0.5 \times 0.41)}{1.0} = 0.61$$

② Determine time of concentration

see page 1 $t_c = 43 \text{ min.}$

③ Determine I_{100}

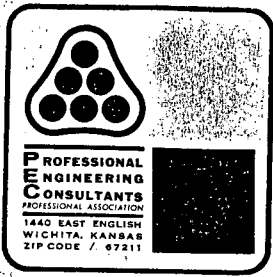
From Hydro-35 $I_{100} = 4.49$

④ Q

$$Q_{100} = C I_{100} A$$

$$= 0.61 \times 4.49 \times 20.3 \text{ Ac.}$$

$$= 56 \text{ cfs.}$$



Date May 29, 1986 Page 3 of 5

Project Golf Park West Addition

Item Drainage Plan

EXISTING CONDITIONS 5-YR

$$D.A. = 20.3$$

Use Rational Formula $Q = CIA$ where $Q = \text{runoff, cfs}$
 $C = \text{coef. of runoff}$
 $I = \text{Intensity}$
 $A = \text{Drainage Area}$

① Determine coefficient of runoff.

Soil Type B Slope = 1% $C = 0.22$
w/ cultivation add $\frac{0.04}{C = 0.26}$

② Determine time of concentration

$$1300' @ 0.28 \text{ fps} = 77 \text{ min.}$$

③ Determine Intensity

From Hydro-35, $I_5 = 1.83$

④ Q

$$\begin{aligned} Q_5 &= C I_5 A \\ &= 0.26 \times 1.83 \times 20.3 \\ &= 10 \text{ cfs} \end{aligned}$$



Date May 29, 1986 Page 4 of 5

Project Golf Park West Addition

Item Drainage Plan

EXISTING CONDITIONS - 100-YEAR

$$D.A. = 20.3$$

Use Rational Formula $Q = CIA$ where $Q =$ runoff, cfs
 $c =$ coef. of runoff
 $I =$ Intensity
 $A =$ Drainage Area

① Determine coef. of runoff

Soil Type B, 1% slope	$c = 0.41$
w/ Cultivation add	<u>0.04</u>
Composite c	$= 0.45$

② Determine time of concentration

see Page 3 $t_c = 77 \text{ min.}$

③ Determine Intensity

From Hydro-35, $I_{100} = 3.24$

④ Q

$$\begin{aligned} Q_{100} &= c I_{100} A \\ &= 0.45 \times 3.24 \times 20.3 \\ &= 30 \text{ cfs} \end{aligned}$$



Date May 29, 1986 Page 5 of 5

Project Golf Park West Addition

Item Drainage Plan

HYDROLOGY SUMMARY

	<u>Exist.</u>	<u>Prop.</u>
<u>5-Year</u>	<u>10 cfs</u>	<u>25 cfs</u>
<u>100-Year</u>	<u>30 cfs</u>	<u>50 cfs</u>

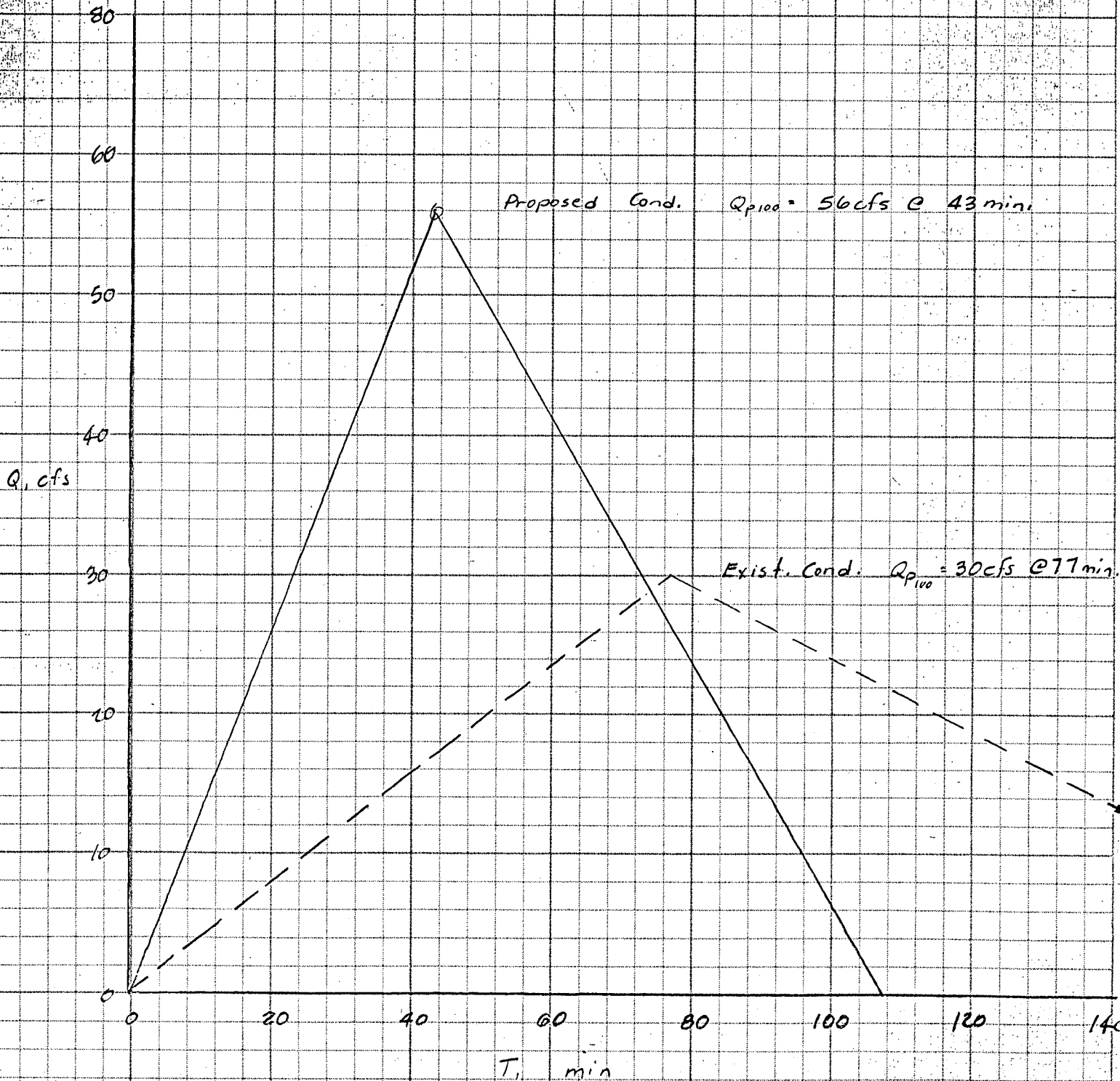


Date June 2, 1986 Page 1 of 10

Project Golf Park West

Item Drainage Plan

Hydrographs For Detention Basin (100-yr)





Date May 29, 1986 Page 2 of 10

Project Golf Park West

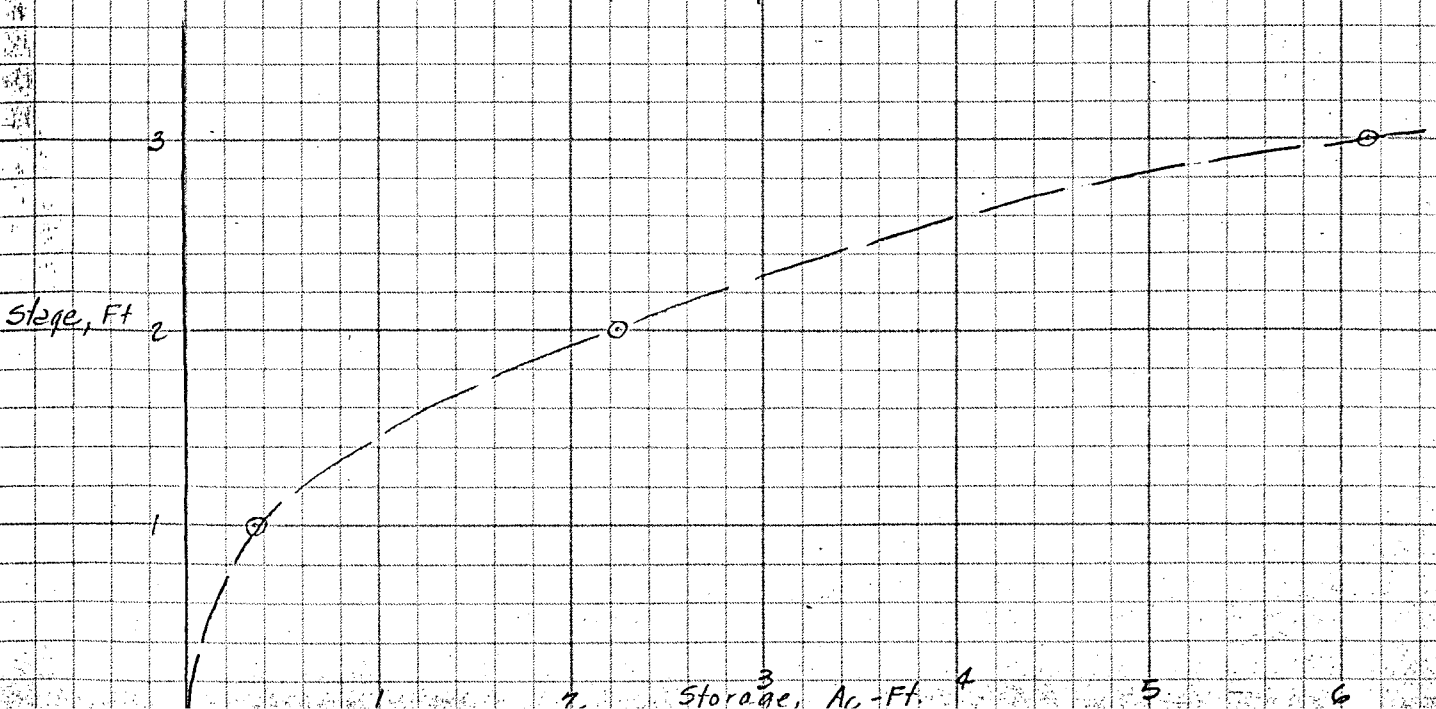
Item Drainage Plan.

A berm is planned around the east, west, and south sides of the subject property for landscaping, screening, etc. This berm will also be utilized for detention of storm water runoff.

From preliminary grading plan,

Stage	Contour	Area SF	Area Ac.	Volume	Σ Volume
0	1346.0	0	0	0	0
1	1347.0	46,500	1.07	0.36	0.36
2	1348.0	124,700	2.86	1.89	2.25
3	1349.0	218,400	5.01	3.89	6.14

STAGE STORAGE





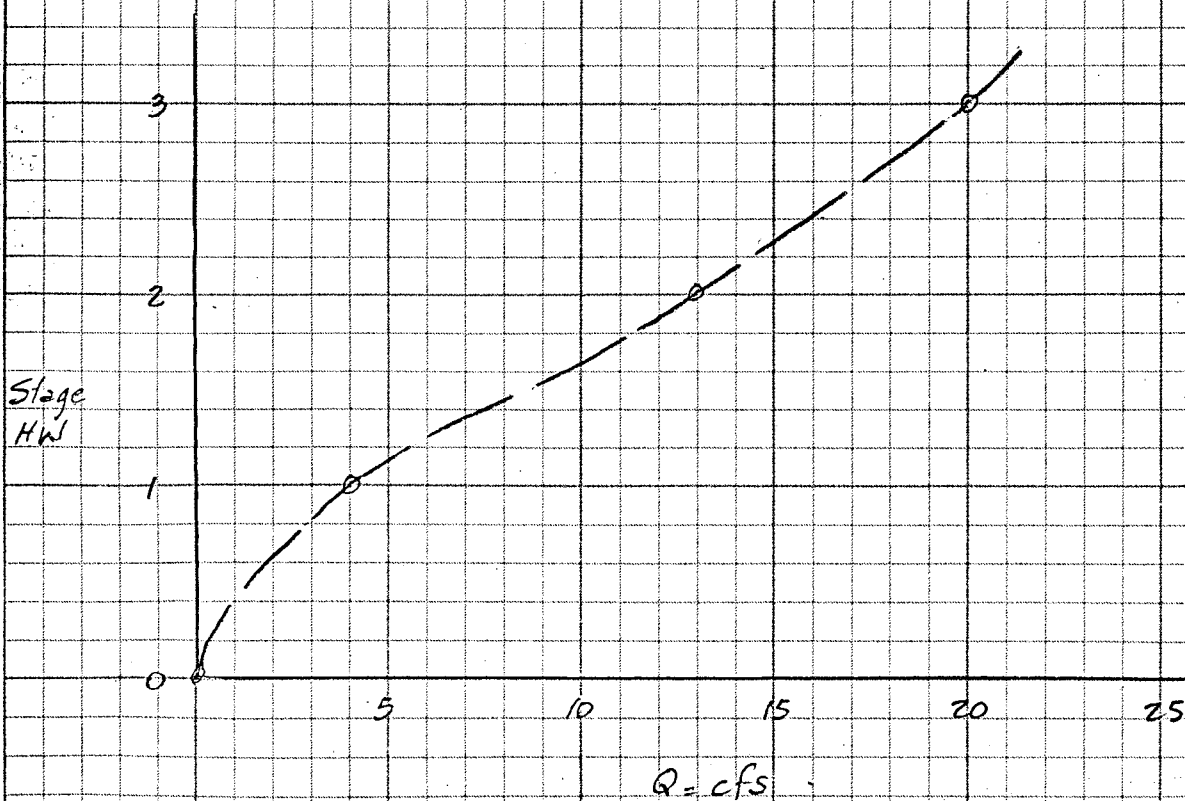
Date June 2, 1986 Page 3 of 10

Project Golf Park West

Item Drainage Plan

Stage Discharge 24" RCP

Stage (HW)	D	H/W/D	Q
0	2.0	0	0
1	2.0	0.5	4
2	2.0	1.0	13
3	2.0	1.5	20





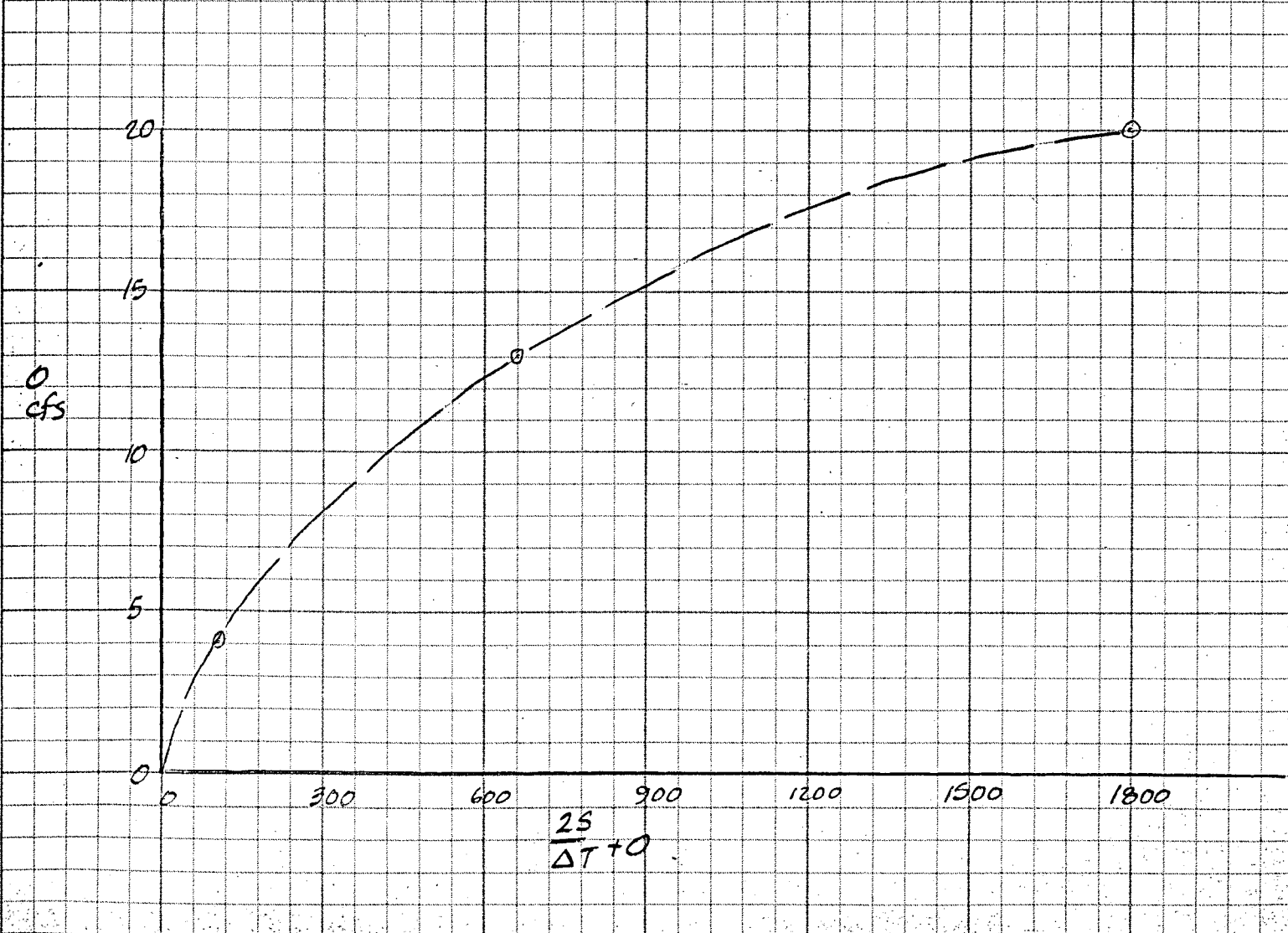
Date June 2, 1986 Page 4 of 10

Project Golf Park West

Item Drainage Plan

STAGE	ELEV.	STORAGE AC·FT	STORAGE S AC-IN	OUTFLOW O CFS	2S	$\frac{2S}{\Delta T}$	$\frac{2S}{\Delta T} + O$
0	1346	0	0	0	0	0	0
1	1347	0.36	4.32	4	8.64	104.1	108.1
2	1348	2.25	27.00	13	54.00	650.6	663.6
3	1349	6.14	73.68	20	147.36	1,775.4	1,795.4

$\Delta T = 5 \text{ min} = 0.083 \text{ hr.}$





Date June 2, 1986 Page 5 of 10

Project Golf Park West

Item Drainage Plan

T	I _n	I _n + I _{net}	$\frac{2S}{\Delta T} + 0$	$\frac{2S}{\Delta T} + 0$	O	HW	Elev.
0	0	6	0	0	0	0	1346.0
0.083	6	19	6	6	0	0	1346.0
0.167	13	32	23	25	1	0.4	1346.4
0.250	19	45	49	55	3	0.8	1346.8
0.333	26	59	86	94	4	1.0	1347.0
0.417	33	72	135	145	5	1.1	1347.1
0.500	39	84	195	207	6	1.3	1347.3
0.583	45	97	263	279	8	1.4	1347.4
0.667	52	107	342	360	9	1.5	1347.5
0.750	55	105	429	449	10	1.6	1347.6
0.833	50	95	510	534	12	1.9	1347.9
0.917	45	86	579	605	13	2.0	1348.0
1.000	41	78	639	665	13	2.0	1348.0
1.083	37	70	689	717	14	2.2	1348.2
1.167	33	62	731	759	14	2.2	1348.2
1.250	29	53	765	793	14	2.2	1348.2
1.333	24	44	790	818	14	2.2	1348.2
1.417	20	35	804	834	15	2.3	1348.3
1.500	15	25	809	839	15	2.3	1348.3
1.583	10	16	804	834	15	2.3	1348.3
1.667	6	8	792	820	14	2.2	1348.2



Date June 2, 1986 Page 6 of 10

Project Golf Park West

Item Drainage Plan

<u>T</u>	<u>I_n</u>	<u>I_n + I_{int}</u>	<u>$\frac{2S}{\Delta T} - 0$</u>	<u>$\frac{2S}{\Delta T} + 0$</u>	<u>0</u>	<u>HW</u>	<u>Elev.</u>
1.667	6	8	792	820	14	2.2	1348.2
1.750	2	2	772	800	14	2.2	1348.2
1.833	0	0	746	774	14	2.2	1348.2
1.917	0	0	718	746	14	2.2	1348.2
2.000	0	0	690	718	14	2.2	1348.2
2.083	0	0	662	690	14	2.2	1348.2
2.167	0	0	636	662	13	2.0	1348.0
2.250	0	0	610	636	13	2.0	1348.0
2.333	0	0	584	610	13	2.0	1348.0
2.417	0	0	558	584	13	2.0	1348.0
2.500	0	0	532	558	13	2.0	1348.0
2.583	0	0	508	532	12	1.9	1347.9
2.667	0	0	486	508	11	1.8	1347.8
2.750	0	0	464	486	11	1.8	1347.8
2.833	0	0	442	464	11	1.8	1347.8
2.917	0	0	422	442	10	1.6	1347.6
3.000	0	0	402	422	10	1.6	1347.6
3.083	0	0	382	402	10	1.6	1347.6
3.167	0	0	364	382	9	1.5	1347.5
3.250	0	0	346	364	9	1.5	1347.5
3.333	0	0	328	346	9	1.5	1347.5



Date June 2, 1986 Page 6 of 10

Project Golf Park West

Item Drainage Plan

<u>T</u>	<u>In</u>	<u>In + Int</u>	$\frac{2S}{\Delta T} - 0$	$\frac{2S}{\Delta T} + 0$	<u>0</u>	<u>HW</u>	<u>Elev.</u>
1.667	6	8	792	820	14	2.2	1348.2
1.750	2	2	772	800	14	2.2	1348.2
1.833	0	0	746	774	14	2.2	1348.2
1.917	0	0	718	746	14	2.2	1348.2
2.000	0	0	690	718	14	2.2	1348.2
2.083	0	0	662	690	14	2.2	1348.2
2.167	0	0	636	662	13	2.0	1348.0
2.250	0	0	610	636	13	2.0	1348.0
2.333	0	0	584	610	13	2.0	1348.0
2.417	0	0	558	584	13	2.0	1348.0
2.500	0	0	532	558	13	2.0	1348.0
2.583	0	0	508	532	12	1.9	1347.9
2.667	0	0	486	508	11	1.8	1347.8
2.750	0	0	464	486	11	1.8	1347.8
2.833	0	0	442	464	11	1.8	1347.8
2.917	0	0	422	442	10	1.6	1347.6
3.000	0	0	402	422	10	1.6	1347.6
3.083	0	0	382	402	10	1.6	1347.6
3.167	0	0	364	382	9	1.5	1347.5
3.250	0	0	346	364	9	1.5	1347.5
3.333	0	0	328	346	9	1.5	1347.5



Date June 2, 1986 Page 7 of 10

Project Golf Park West

Item Drainage Plan

<u>T</u>	<u>I_n</u>	<u>I_n + I_{int}</u>	<u>$\frac{2S}{\Delta T} - 0$</u>	<u>$\frac{2S}{\Delta T} + 0$</u>	<u>0</u>	<u>HW</u>	<u>Elev.</u>
3.333	0	0	328	346	9	1.5	1347.5
3.417	0	0	310	328	9	1.5	1347.5
3.500	0	0	294	310	8	1.4	1347.4
3.583	0	0	278	294	8	1.4	1347.4
3.667	0	0	262	278	8	1.4	1347.4
3.750	0	0	246	262	8	1.4	1347.4
3.833	0	0	232	246	7	1.4	1347.4
3.917	0	0	218	232	7	1.4	1347.4
4.000	0	0	204	218	7	1.4	1347.4
4.083	0	0	190	204	7	1.4	1347.4
4.167	0	0	178	190	6	1.3	1347.3
4.250	0	0	166	178	6	1.3	1347.3
4.333	0	0	154	166	6	1.3	1347.3
4.417	0	0	144	154	5	1.1	1347.1
4.500	0	0	134	144	5	1.1	1347.1
4.583	0	0	124	134	5	1.1	1347.1
4.667	0	0	114	124	5	1.1	1347.1
4.750	0	0	106	114	4	1.0	1347.0
4.833	0	0	98	106	4	1.0	1347.0
4.917	0	0	90	98	4	1.0	1347.0
5.000	0	0	82	90	4	1.0	1347.0



Date June 2, 1986 Page 8 of 10

Project Golf Park West

Item Drainage Plan

<u>T</u>	<u>I_n</u>	<u>I_n+I_{n+1}</u>	<u>$\frac{25}{\Delta T} - 0$</u>	<u>$\frac{25}{\Delta T} + 0$</u>	<u>0</u>	<u>HW</u>	<u>Elev.</u>
5.000	0	0	82	90	4	1.0	1347.0
5.083	0	0	74	82	4	1.0	1347.0
5.167	0	0	68	74	3	0.8	1346.8
5.250	0	0	62	68	3	0.8	1346.8
5.333	0	0	56	62	3	0.8	1346.8
5.417	0	0	50	56	3	0.8	1346.8
5.500	0	0	44	50	3	0.8	1346.8
5.583	0	0	38	44	3	0.8	1346.8
5.667	0	0	34	38	2	0.6	1346.6
5.750	0	0	30	34	2	0.6	1346.6
5.833	0	0	26	30	2	0.6	1346.6
5.917	0	0	22	26	2	0.6	1346.6
6.000	0	0	18	22	2	0.6	1346.6
6.083	0	0	16	18	1	0.4	1346.4
6.167	0	0	14	16	1	0.4	1346.4
6.250	0	0	12	14	1	0.4	1346.4
6.333	0	0	10	12	1	0.4	1346.4
6.417	0	0	8	10	1	0.4	1346.4
6.500	0	0	6	8	1	0.4	1346.4
6.583	0	0	4	6	1	0.4	1346.4
6.667	0	0	2	4	1	0.4	1346.4
6.750	0	0	0	2	1	0.4	1346.4
6.833	0	0	0	0	0	0.0	1346.0

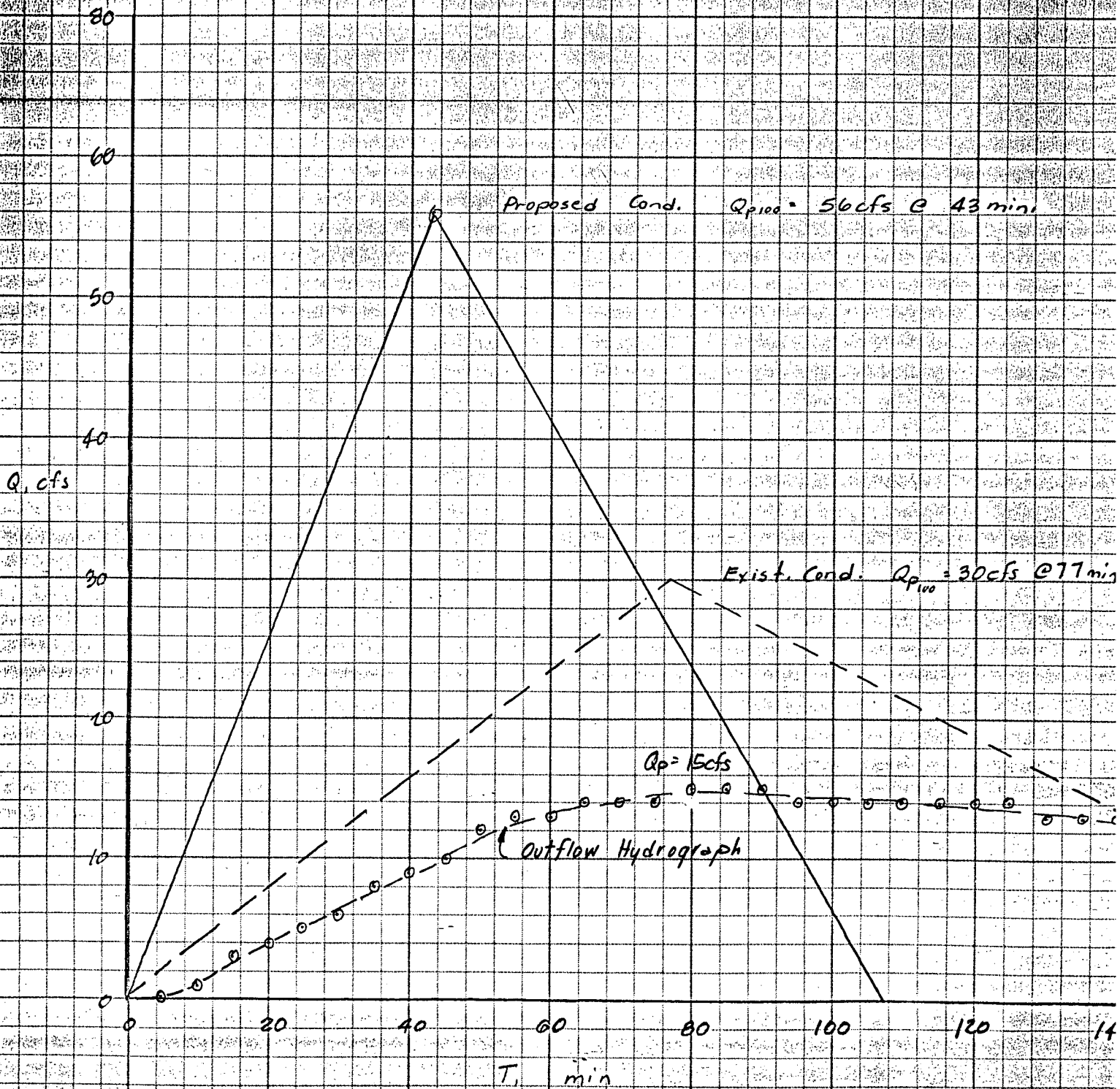


Date June 2, 1986 Page 9 of 10

Project Golf Park West

Item Drainage Plan

Hydrographs For Detention Basin (100-yr)





Date June 2, 1986 Page 10 of 10

Project Golf Park West

Item Drainage Plan

SUMMARY - 100-YR STORM

Exist. Q_{100} 30 cfs

Proposed Q_{100} into
detention area 56 cfs

Proposed Q_{100} out
of detention area 15 cfs

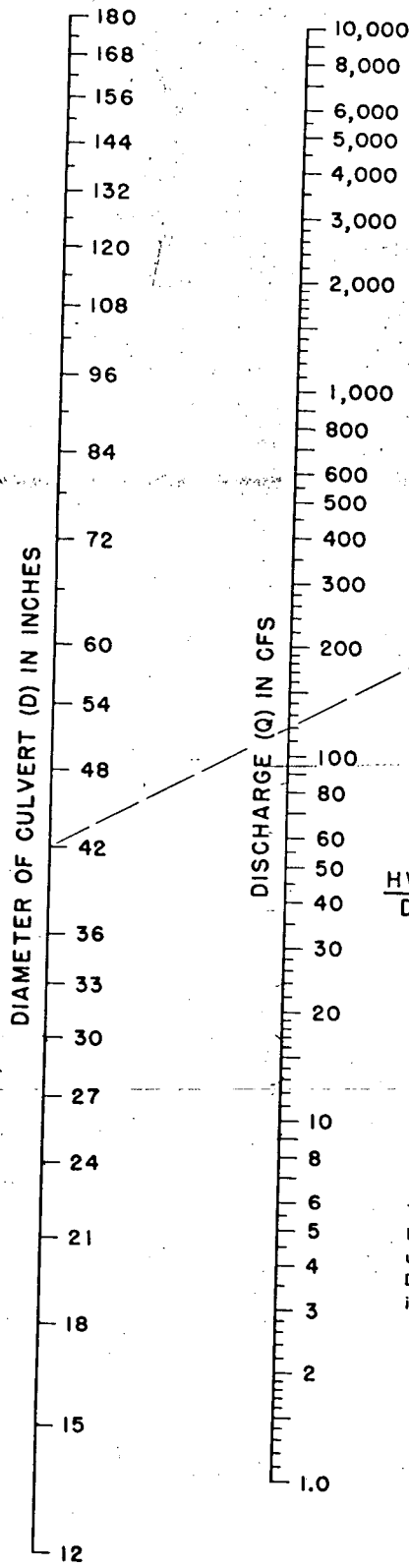
DWS₁₀₀ 1348.3

FE outlet pipe (24") 1346.0

Top Berm (Min.) 1349.3

Total Time to Discharge 6.833 hr

CHART 2



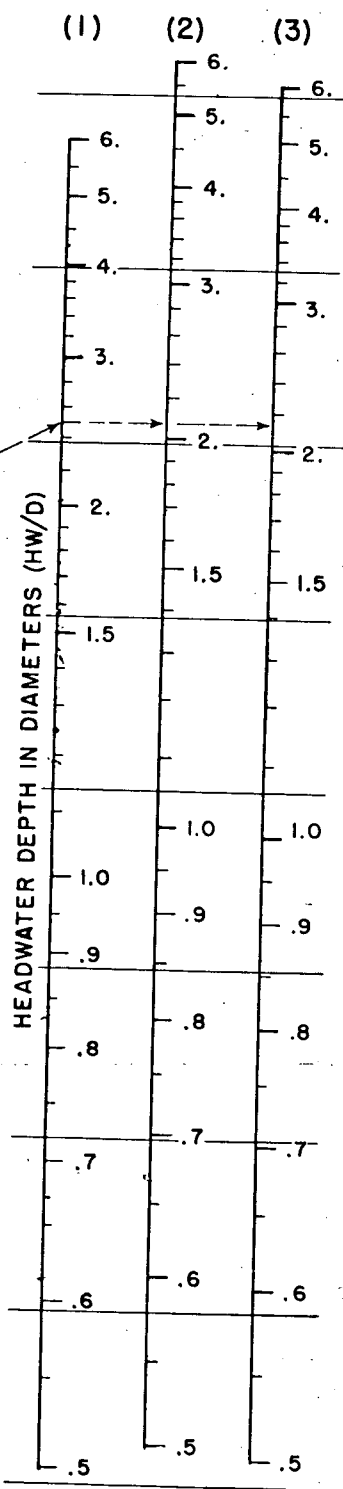
EXAMPLE
 D=42 inches (3.5 feet)
 Q=120 cfs

	HW* D	HW feet
(1)	2.5	8.8
(2)	2.1	7.4
(3)	2.2	7.7

*D in feet

HW D	SCALE	ENTRANCE TYPE
(1)		Square edge with headwall
(2)		Groove end with headwall
(3)		Groove end projecting

To use scale (2) or (3) project horizontally to scale (1), then use straight inclined line through D and Q scales, or reverse as illustrated.



HEADWATER DEPTH FOR CONCRETE PIPE CULVERTS WITH INLET CONTROL

HEADWATER SCALES 283
 REVISED MAY 1964

BUREAU OF PUBLIC ROADS JAN. 1963

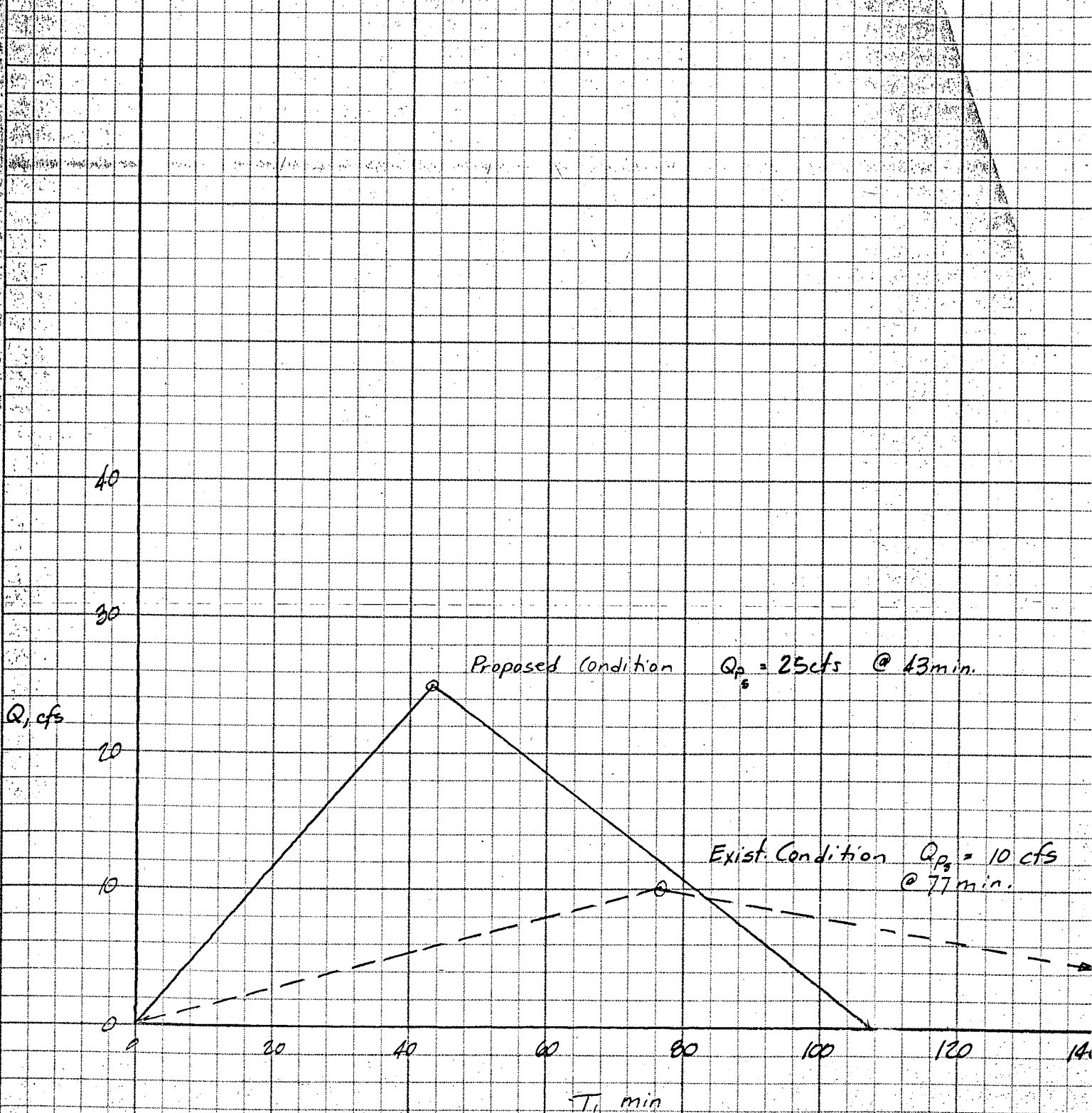


Date June 2, 1986 Page 1 of 8

Project Golf Park West

Item Drainage Plan

Hydrographs for Detention Basin (5-year)





Date May 29, 1986 Page 2 of 8

Project Golf Park West

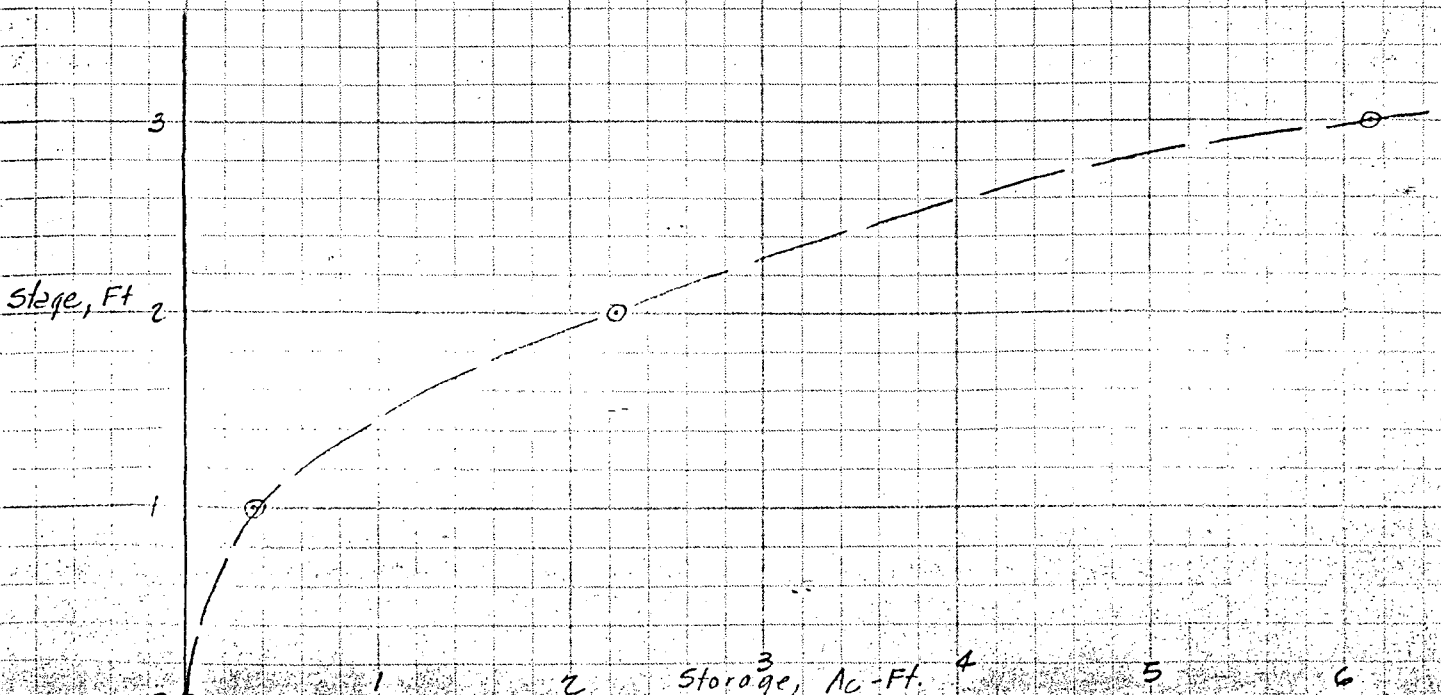
Item Drainage Plan

A berm is planned around the east, west, and south sides of the subject property for landscaping, screening, etc. This berm will also be utilized for detention of storm water runoff.

From preliminary grading plan,

Stage	Contour	Area SF	Area Ac.	Volume	Σ Volume
0	1346.0	0	0	0	0
1	1347.0	46,500	1.07	0.36	0.36
2	1348.0	124,700	2.86	1.89	2.25
3	1349.0	218,400	5.01	3.89	6.14

STAGE STORAGE



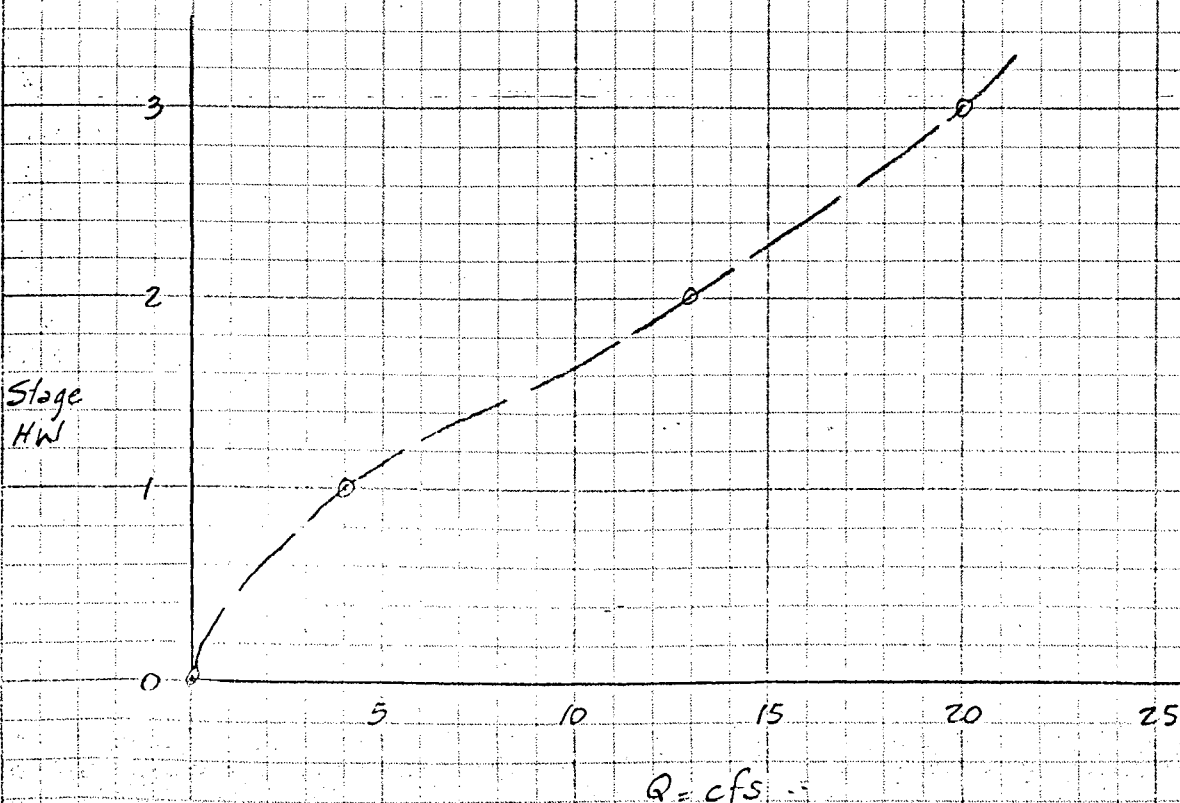


Date June 2, 1986 Page 3 of 8

Project Golf Park West

Item Drainage Plan

Stage		Discharge		24" RCP
Stage (HW)	D	H/W/D	Q	
0	2.0	0	0	
1	2.0	0.5	4	
2	2.0	1.0	13	
3	2.0	1.5	20	





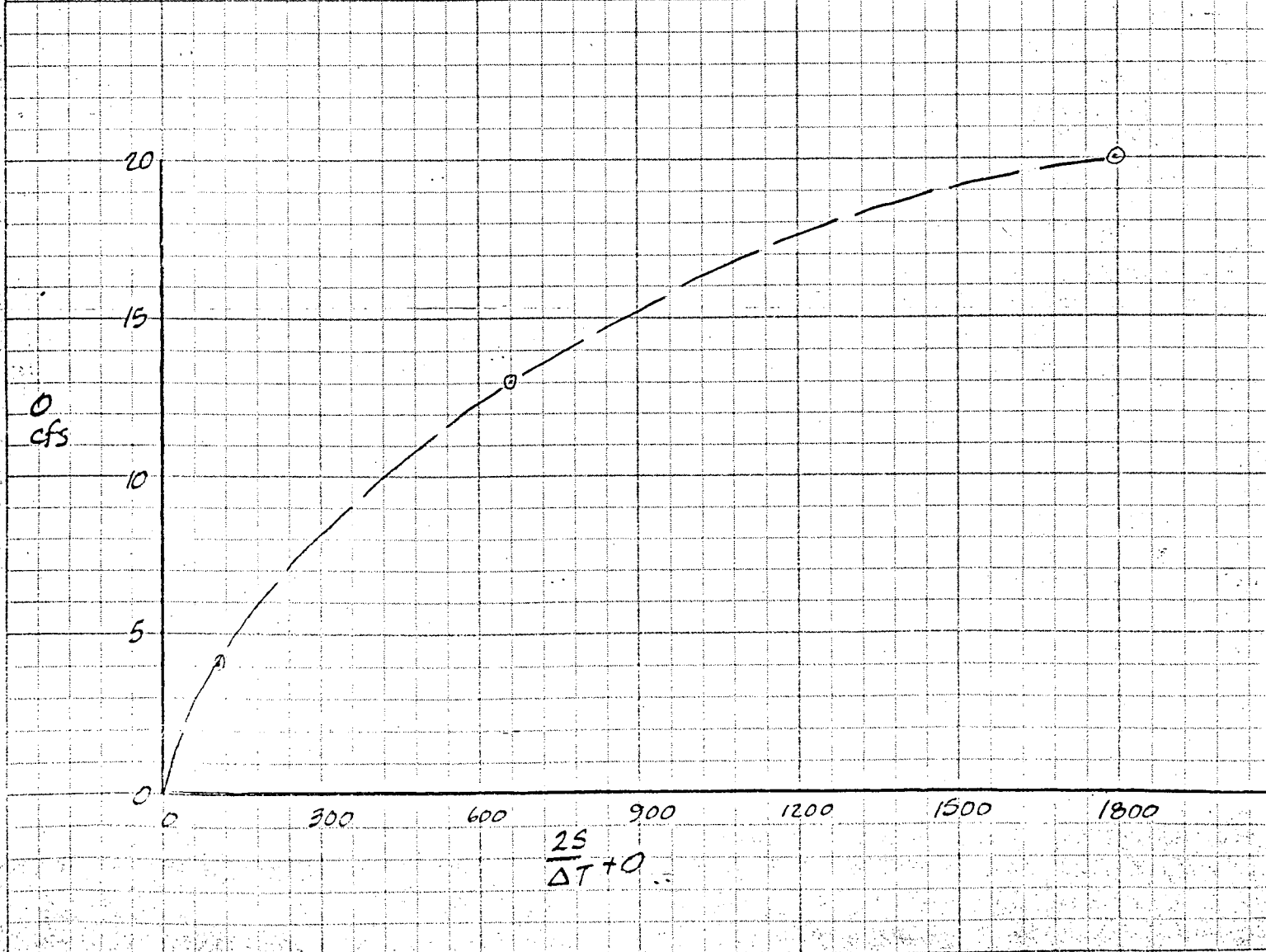
Date June 2, 1986 Page 4 of 8

Project Golf Park West

Item Drainage Plan

STAGE	ELEV.	STORAGE AC·FT	STORAGE	OUTFLOW	2S	2S/ ΔT	$\frac{2S}{\Delta T} + 0$
			S AC-IN	O CFS			
0	1346	0	0	0	0	0	0
1	1347	0.36	4.32	4	8.64	104.1	108.1
2	1348	2.25	27.00	13	54.00	650.6	663.6
3	1349	6.14	73.68	20	147.36	1,775.4	1,795.4

$\Delta T = 5 \text{ min} = 0.083 \text{ hr.}$





Date June 2, 1986 Page 5 of 8

Project Golf Park West

Item Drainage Plan

<u>T</u>	<u>I_n</u>	<u>I_n + I_{int}</u>	<u>$\frac{25}{\Delta T} - 0$</u>	<u>$\frac{25}{\Delta T} + 0$</u>	<u>0</u>	<u>HW</u>	<u>Elev.</u>
0	0	3	0	0	0	0	1346.0
0.083	3	9	3	3	0	0	1346.0
0.167	6	15	10	12	1	0.4	1346.4
0.250	9	21	23	25	1	0.4	1346.4
0.333	12	27	40	44	2	0.6	1346.6
0.417	15	33	61	67	3	0.8	1346.8
0.500	18	39	86	94	4	1.0	1347.0
0.583	21	44	115	125	5	1.1	1347.1
0.667	23	48	149	159	5	1.1	1347.1
0.750	25	48	185	197	6	1.3	1347.3
0.833	23	44	219	233	7	1.4	1347.4
0.917	21	40	247	263	8	1.5	1347.5
1.000	19	36	271	287	8	1.5	1347.5
1.083	17	32	291	307	8	1.5	1347.5
1.167	15	28	305	323	9	1.6	1347.6
1.250	13	24	315	333	9	1.6	1347.6
1.333	11	20	321	339	9	1.6	1347.6
1.417	9	16	303	341	9	1.6	1347.6
1.500	7	12	301	319	9	1.6	1347.6
1.583	5	8	297	313	8	1.5	1347.5
1.667	3	4	289	305	8	1.5	1347.5



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Project Golf Park West

Item Drainage Plan

<u>T</u>	<u>I_n</u>	<u>I_n + I_{n+1}</u>	<u>$\frac{25}{\Delta T} - 0$</u>	<u>$\frac{25}{\Delta T} + 0$</u>	<u>0</u>	<u>HW</u>	<u>Elev.</u>
1.667	3	4	289	305	8	1.5	1347.5
1.750	1	1	277	293	8	1.5	1347.5
1.833	0	0	261	278	8	1.5	1347.5
1.917	0	0	245	261	8	1.5	1347.5
2.000	0	0	231	245	7	1.4	1347.4
2.083	0	0	217	231	7	1.4	1347.4
2.167	0	0	203	217	7	1.4	1347.4
2.250	0	0	191	203	6	1.3	1347.3
2.333	0	0	179	191	6	1.3	1347.3
2.417	0	0	167	179	6	1.3	1347.3
2.500	0	0	155	167	6	1.3	1347.3
2.667	0	0	145	155	5	1.1	1347.1
2.750	0	0	135	145	5	1.1	1347.1
2.833	0	0	125	135	5	1.1	1347.1
2.917	0	0	115	125	5	1.1	1347.1
3.000	0	0	107	115	4	1.0	1347.0
3.083	0	0	99	107	4	1.0	1347.0
3.167	0	0	91	99	4	1.0	1347.0
3.250	0	0	83	91	4	1.0	1347.0
3.333	0	0	75	83	4	1.0	1347.0
3.417	0	0	67	75	4	1.0	1347.0



Date June 2, 1986 Page 7 of 8

Project Golf Park West

Item Drainage Plan

<u>T</u>	<u>I_n</u>	<u>I_n + I_{n+1}</u>	<u>$\frac{2S}{\Delta T} - 0$</u>	<u>$\frac{2S}{\Delta T} + 0$</u>	<u>0</u>	<u>HW</u>	<u>Elev.</u>
3.417	0	0	67	75	4	1.0	1347.0
3.500	0	0	61	67	3	0.8	1346.8
3.583	0	0	55	61	3	0.8	1346.8
3.667	0	0	49	55	3	0.8	1346.8
3.750	0	0	43	49	3	0.8	1346.8
3.833	0	0	39	43	2	0.6	1346.6
3.917	0	0	35	39	2	0.6	1346.6
4.000	0	0	31	35	2	0.6	1346.6
4.083	0	0	27	31	2	0.6	1346.6
4.167	0	0	23	27	2	0.6	1346.6
4.250	0	0	19	23	2	0.6	1346.6
4.333	0	0	17	19	1	0.4	1346.4
4.417	0	0	15	17	1	0.4	1346.4
4.500	0	0	13	15	1	0.4	1346.4
4.583	0	0	11	13	1	0.4	1346.4
4.667	0	0	9	11	1	0.4	1346.4
4.750	0	0	7	9	1	0.4	1346.4
4.833	0	0	5	7	1	0.4	1346.4
4.917	0	0	3	5	1	0.4	1346.4
5.000	0	0	1	3	1	0.4	1346.4
5.083	0	0	0	1	0	0.0	1346.0



Date June 3, 1986 Page 8 of 8

Project Golf Park West

Item Drainage Plan

SUMMARY - 5-YR STORM

Exist. Q_{100}	10 cfs
Proposed Q_{100} into detention pond	25 cfs
Proposed Q_{100} out of detention pond	9 cfs
DWS _s	1347.6
FE Outlet Pipe (24")	1346.0
Top Berm (Min.)	1349.3
Total Time to Discharge	5.083 hr.



Date June 3, 1986 Page 1 of 6

Project Golf Park West

Item Drainage Plan

DETERMINE EFFECT OF DISCHARGING
GOLF PARK WEST DRAINAGE INTO EXISTING
STORM SEWER IN 19TH STREET (APPROX.
200' SOUTH OF SOUTH LINE OF PROPOSED PLAT.)

From design calculations received from City
Engineering Department, it appears that
the 19th St. Storm Sewer was designed for
the 100-year storm, based on outdated
Intensity-Duration-Frequency curves (see page
3). The 100-year storm on the old data
roughly corresponds to a 50 year storm
per new I-D-F data (Hydro-35 - see page 3).
pages 4-6)

It is proposed to discharge Golf Park West
drainage via 24" RCP & connect to the 60"
storm sewer in 19th St.

At this connection point, the existing 60" pipe



Date June 4, 1986 Page 2 of 6

Project Golf Park West

Item Drainage Plan

has the following capacities + actual discharges:

Total Capacity 60" @ 0.5% (Flowing Full) = 180 cfs

Design Discharge using 100-yr + old I-D-F
 $Q = 0.5 \times 5.4 \times 45.52 = 123 \text{ cfs}$
($t_c = 28.7 \text{ min}$)

Discharge using new design procedures
2-yr storm
 $Q_2 = 0.5 \times 2.74 \times 45.52 = 62 \text{ cfs}$
($t_c = 28.7 \text{ min}$)

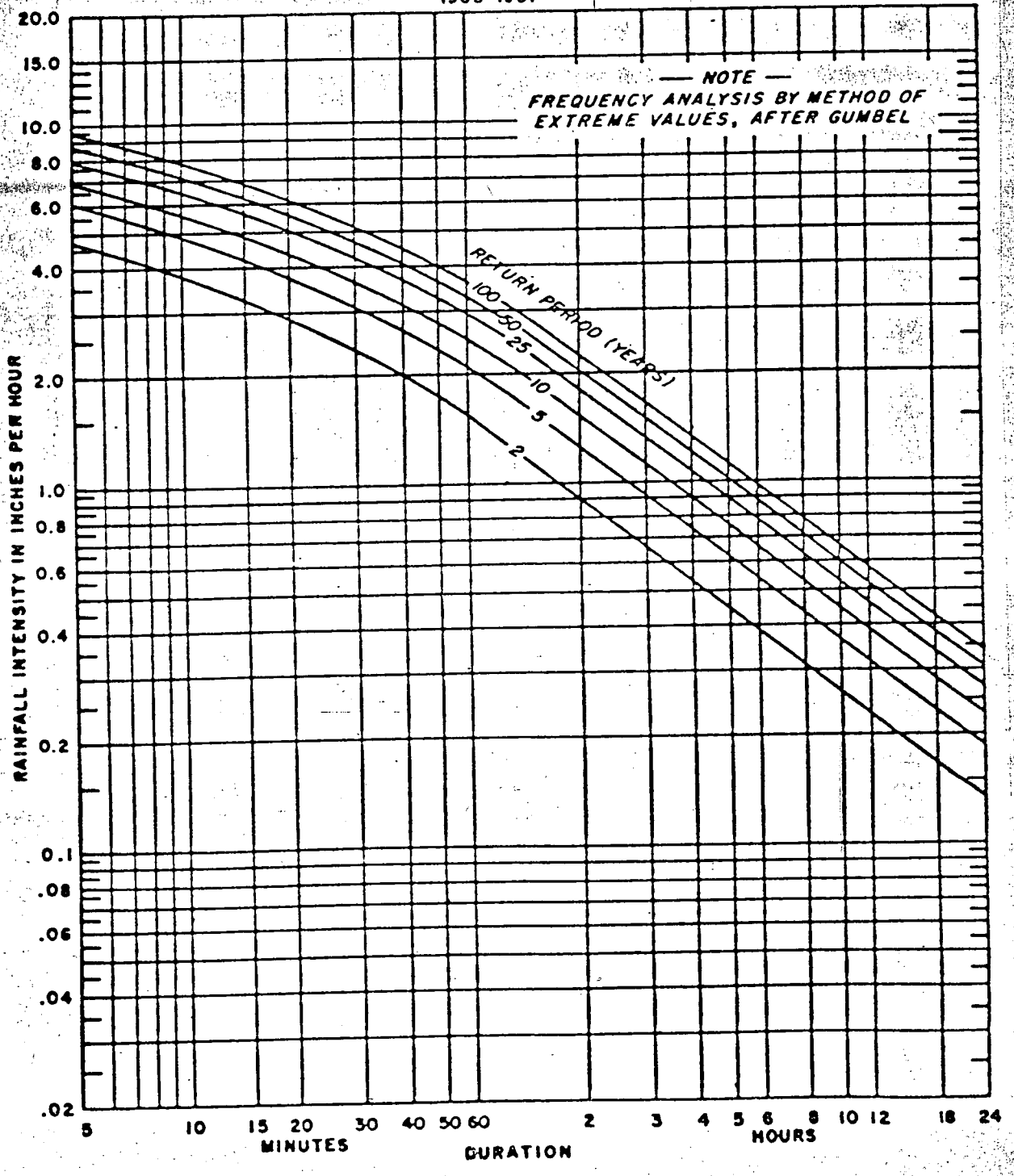
Excess capacity (100 yr)
(Total capacity - Q_2 normal design) = 118 cfs

Discharge From Golf Park West 100 yr = 15 cfs

Discharge From Golf Park West 5 yr = 9 cfs

It is felt that discharging Golf Park West drainage into the existing storm sewer will have very little or no effect on the performance of the storm sewer.

WICHITA, KANSAS 1903-1951



April 15, 1986

ATTACHMENT A
DRAINAGE CRITERIA MANUAL

CITY OF WICHITA, KANSAS

RAINFALL INTENSITY TABLE FOR SEDGWICK COUNTY, KANSAS

The following tabulation contains rainfall intensity in inches per hour as derived from ESSA Weather Bureau Technical Paper 40 Modified to NWS Hydro-35, 1977 During First Hour

DURATION IN MINUTES	RETURN PERIODS OF						
	1-YR	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
5	4.18	5.57	6.53	7.41	8.52	9.48	10.32
6	3.99	5.32	6.25	7.09	8.16	9.09	9.89
7	3.81	5.09	5.99	6.81	7.84	8.74	9.50
8	3.66	4.89	5.75	6.55	7.55	8.42	9.15
9	3.52	4.70	5.54	6.31	7.28	8.13	8.83
10	3.39	4.52	5.34	6.09	7.04	7.86	8.54
11	3.27	4.36	5.16	5.89	6.81	7.61	8.27
12	3.18	4.21	4.99	5.71	6.60	7.38	8.02
13	3.05	4.08	4.84	5.53	6.41	7.17	7.79
14	2.96	3.95	4.69	5.37	6.23	6.97	7.57
15	2.87	3.83	4.56	5.22	6.06	6.78	7.37
16	2.78	3.72	4.43	5.08	5.90	6.60	7.18
17	2.71	3.61	4.31	4.95	5.75	6.44	7.00
18	2.63	3.51	4.20	4.83	5.61	6.29	6.84
19	2.56	3.42	4.10	4.71	5.47	6.14	6.68
20	2.50	3.33	4.00	4.60	5.35	6.00	6.53
21	2.44	3.25	3.90	4.50	5.23	5.87	6.39
22	2.38	3.17	3.81	4.40	5.12	5.75	6.26
23	2.32	3.10	3.73	4.31	5.01	5.63	6.13
24	2.27	3.03	3.65	4.22	4.91	5.52	6.01
25	2.22	2.96	3.57	4.13	4.81	5.41	5.90
26	2.20	2.90	3.50	4.05	4.72	5.31	5.79
27	2.16	2.84	3.43	3.98	4.63	5.21	5.69
28	2.14	2.78	3.37	3.90	4.55	5.12	5.59
29	2.11	2.72	3.30	3.83	4.47	5.03	5.49
30	2.08	2.67	3.24	3.76	4.39	4.94	5.40
31	2.05	2.62	3.19	3.70	4.32	4.86	5.32
32	2.02	2.57	3.10	3.63	4.25	4.79	5.22
33	1.99	2.52	3.05	3.57	4.18	4.71	5.14
34	1.96	2.48	3.01	3.51	4.11	4.63	5.07
35	1.93	2.44	2.98	3.46	4.05	4.56	5.00
36	1.91	2.39	2.93	3.41	3.99	4.50	4.93
37	1.89	2.35	2.88	3.36	3.93	4.43	4.86
38	1.87	2.32	2.84	3.31	3.87	4.37	4.79
39	1.85	2.28	2.80	3.26	3.82	4.31	4.73
40	1.83	2.24	2.76	3.22	3.76	4.25	4.66
41	1.81	2.21	2.72	3.17	3.71	4.19	4.60
42	1.79	2.18	2.68	3.13	3.66	4.13	4.54
43	1.77	2.14	2.64	3.09	3.61	4.08	4.49
44	1.75	2.11	2.61	3.05	3.57	4.03	4.43
45	1.73	2.08	2.57	3.01	3.52	3.98	4.38

ATTACHMENT A CONTINUED
Page 2

DURATION IN MINUTES	RETURN PERIODS OF						
	1-YR	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
46	1.70	2.05	2.54	2.97	3.48	3.93	4.33
47	1.67	2.02	2.50	2.93	3.44	3.88	4.28
48	1.66	2.00	2.47	2.90	3.39	3.84	4.23
49	1.64	1.97	2.44	2.86	3.35	3.79	4.18
50	1.61	1.95	2.41	2.83	3.32	3.75	4.13
51	1.59	1.92	2.38	2.79	3.28	3.71	4.09
52	1.56	1.89	2.35	2.76	3.24	3.67	4.05
53	1.54	1.86	2.33	2.73	3.20	3.63	4.00
54	1.52	1.84	2.30	2.70	3.17	3.59	3.96
55	1.50	1.81	2.27	2.67	3.14	3.55	3.92
56	1.47	1.79	2.25	2.64	3.10	3.51	3.88
57	1.45	1.76	2.22	2.61	3.07	3.48	3.84
58	1.43	1.74	2.20	2.59	3.04	3.44	3.81
59	1.42	1.72	2.18	2.56	3.01	3.41	3.77
60	1.40	1.69	2.15	2.53	2.98	3.37	3.73
61	1.38	1.67	2.13	2.51	2.95	3.34	3.70
62	1.36	1.65	2.11	2.48	2.92	3.31	3.67
63	1.34	1.63	2.09	2.46	2.89	3.28	3.63
64	1.33	1.61	2.07	2.44	2.86	3.25	3.60
65	1.31	1.59	2.05	2.41	2.84	3.22	3.57
66	1.30	1.57	2.03	2.39	2.81	3.19	3.54
67	1.28	1.56	2.01	2.37	2.79	3.16	3.51
68	1.26	1.54	1.99	2.35	2.76	3.13	3.48
69	1.25	1.52	1.97	2.33	2.74	3.10	3.45
70	1.24	1.50	1.95	2.31	2.71	3.08	3.42
71	1.22	1.49	1.93	2.28	2.69	3.05	3.39
72	1.21	1.47	1.92	2.26	2.67	3.02	3.36
73	1.20	1.46	1.90	2.25	2.64	3.00	3.34
74	1.18	1.44	1.88	2.23	2.63	2.98	3.31
75	1.17	1.43	1.86	2.21	2.61	2.95	3.29
76	1.16	1.41	1.85	2.19	2.58	2.93	3.26
77	1.15	1.40	1.83	2.17	2.55	2.90	3.24
78	1.13	1.38	1.82	2.15	2.53	2.88	3.22
79	1.12	1.37	1.80	2.14	2.50	2.86	3.19
80	1.11	1.36	1.79	2.12	2.48	2.84	3.16
81	1.10	1.34	1.77	2.10	2.46	2.82	3.13
82	1.09	1.33	1.76	2.08	2.43	2.79	3.10
83	1.08	1.32	1.74	2.06	2.41	2.76	3.07
84	1.07	1.31	1.73	2.04	2.39	2.74	3.04
85	1.06	1.30	1.72	2.02	2.37	2.71	3.01
86	1.05	1.28	1.70	2.00	2.34	2.69	2.99
87	1.04	1.27	1.69	1.99	2.32	2.66	2.96
88	1.03	1.26	1.68	1.97	2.30	2.64	2.93
89	1.02	1.25	1.68	1.95	2.28	2.62	2.91
90	1.01	1.24	1.66	1.93	2.26	2.59	2.88

ATTACHMENT A CONTINUED
Page 3

DURATION IN MINUTES	RETURN PERIODS OF						
	1-YR	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
91	1.00	1.23	1.65	1.92	2.24	2.57	2.86
92	1.00	1.22	1.63	1.90	2.22	2.55	2.83
93	0.99	1.21	1.62	1.89	2.20	2.53	2.81
94	0.98	1.20	1.61	1.87	2.19	2.51	2.79
95	0.97	1.19	1.59	1.85	2.17	2.49	2.76
96	0.96	1.18	1.58	1.84	2.15	2.46	2.74
97	0.96	1.17	1.57	1.82	2.13	2.44	2.72
98	0.95	1.16	1.56	1.81	2.12	2.42	2.70
99	0.94	1.15	1.54	1.80	2.10	2.41	2.67
100	0.93	1.14	1.53	1.78	2.08	2.39	2.65
101	0.93	1.13	1.52	1.77	2.07	2.39	2.65
102	0.92	1.13	1.51	1.75	2.05	2.35	2.61
103	0.91	1.12	1.50	1.74	2.04	2.33	2.59
104	0.90	1.11	1.49	1.73	2.02	2.31	2.57
105	0.90	1.10	1.47	1.72	2.01	2.30	2.55
106	0.89	1.09	1.46	1.70	1.99	2.28	2.54
107	0.88	1.09	1.45	1.69	1.98	2.26	2.52
108	0.88	1.08	1.44	1.68	1.96	2.25	2.50
109	0.87	1.07	1.43	1.67	1.95	2.23	2.48
110	0.87	1.06	1.42	1.65	1.93	2.21	2.46
111	0.86	1.06	1.41	1.64	1.92	2.20	2.45
112	0.85	1.05	1.40	1.63	1.91	2.18	2.43
113	0.85	1.04	1.39	1.62	1.89	2.17	2.41
114	0.84	1.03	1.38	1.61	1.88	2.15	2.40
115	0.84	1.03	1.37	1.60	1.87	2.14	2.38
116	0.83	1.02	1.36	1.59	1.86	2.12	2.36
117	0.82	1.01	1.36	1.58	1.84	2.11	2.35
118	0.82	1.01	1.35	1.57	1.83	2.09	2.33
119	0.81	1.00	1.34	1.56	1.82	2.08	2.32
120	0.81	0.99	1.33	1.55	1.81	2.07	2.30

DURATION IN HOURS	RETURN PERIODS OF						
	1-YR	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
2	0.81	0.99	1.33	1.55	1.81	2.07	2.30
3	0.59	0.72	0.97	1.13	1.32	1.51	1.68
4	0.47	0.58	0.78	0.91	1.06	1.21	1.35
5	0.40	0.49	0.66	0.77	0.89	1.02	1.14
6	0.35	0.42	0.57	0.67	0.78	0.89	0.99
8	0.28	0.34	0.46	0.53	0.62	0.71	0.79
10	0.23	0.29	0.39	0.45	0.52	0.60	0.67
12	0.20	0.25	0.33	0.39	0.45	0.52	0.58
18	0.15	0.18	0.24	0.28	0.33	0.38	0.42
24	0.12	0.15	0.20	0.23	0.27	0.31	0.34

