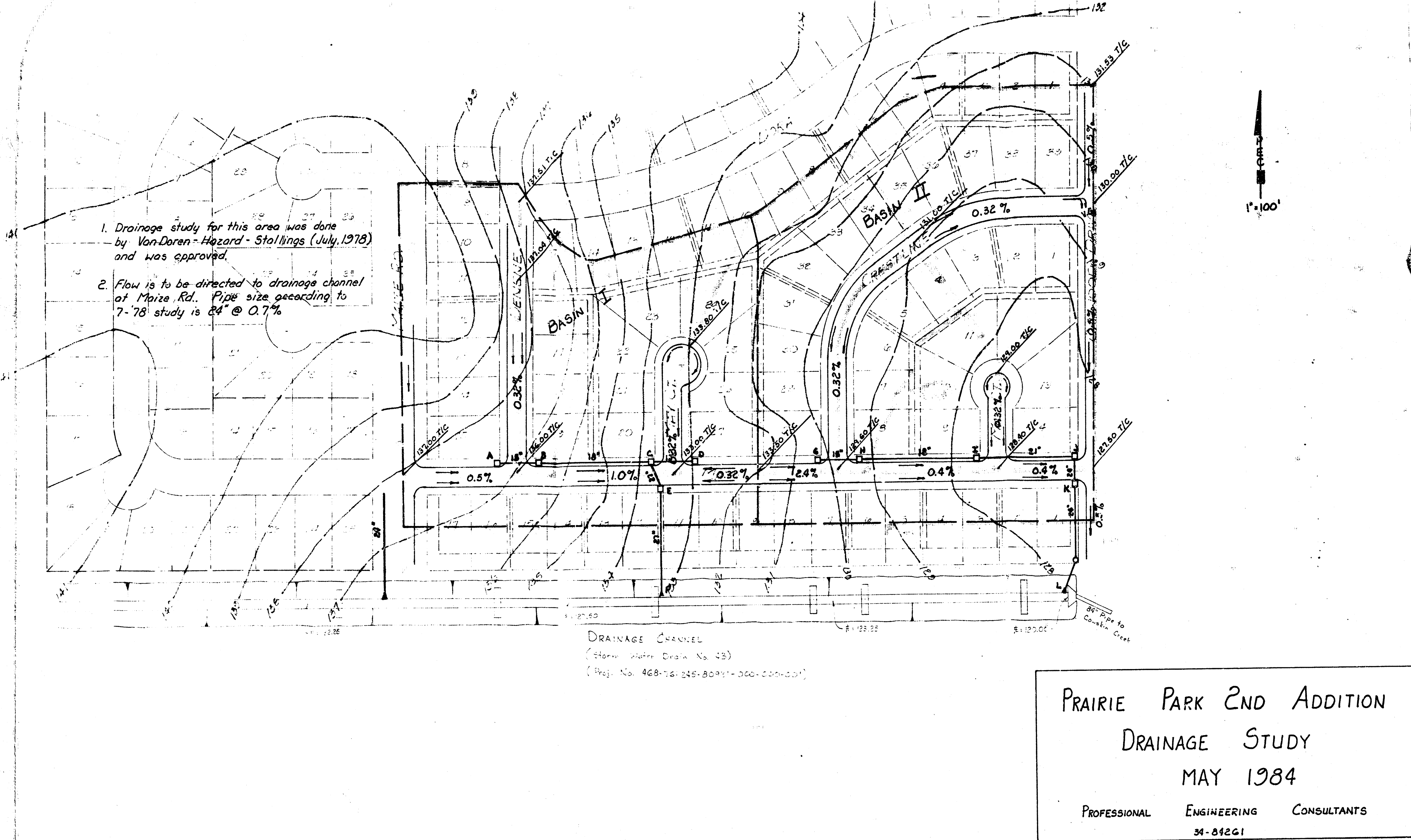




HYDROLOGY DATA SHEET

PAGE 1. OF 2

PROFESSIONAL
ENGINEERING
CONSULTANTS
INCORPORATED

1000 N. 10TH AVE.
MINNEAPOLIS, MINN. 55403

PROJECT: PRAIRIE PARK 2ND ADDITION PROJECT NO. 34-84261-1787
ITEM: DRAINAGE STUDY DATE: MAY 1984
RETURN PERIOD: 2 YR COMPUTATIONS BY: KLR REVISIONS BY: _____

SCHEMATIC DIAGRAM:

ANALYSIS OF BASIN I

SUB-BASIN	C	AREA (ac)	TRIBUTARY AREA			HYDROLOGY SUMMATION										CONDUIT DATA			
			SLOPE (%)	LENGTH (ft)	Q_p (cfs)	Q_u (cfs)	Q_s (cfs)	Q_t (cfs)	Q_b (cfs)	Q_c (cfs)	Q_m (cfs)	Q_n (cfs)	Q_o (cfs)	Q_p (cfs)	Q_q (cfs)	Q_r (cfs)	Q_s (cfs)		
A	0.5	2.6	1.0	16	3.76	5.1	16	3.76	5.1	15	0.9	4.1	2.7	1	17				
B	0.5	1.2	1.0	15	4.06	2.4	17	3.86	2.3	7.4	18	0.7	4.2	2.30	1	18			
C	0.5	1.3	0.5	20	3.63	2.3	20	3.63	2.3	2.3	15	0.2	1.8	4.0	0	20			
D	0.5	2.0	0.5	20	3.63	3.6	20	3.63	3.6	12.9	21	0.9	5.3	4.0	0	20			
E	0.5	1.1	1.2	15	4.06	2.2	20	3.63	2.0	14.9	21	1.3	6.0	2.00	1	21			

PROFESSIONAL
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1000 UNIVERSITY AVENUE
SUITE 100
DALLAS, TEXAS 75201
(214) 342-2001

HYDROLOGY DATA SHEET

PAGE 5 OF 6

PROJECT: PRAIRIE PARK 2ND ADDITION PROJECT NO. 34-84261-1787

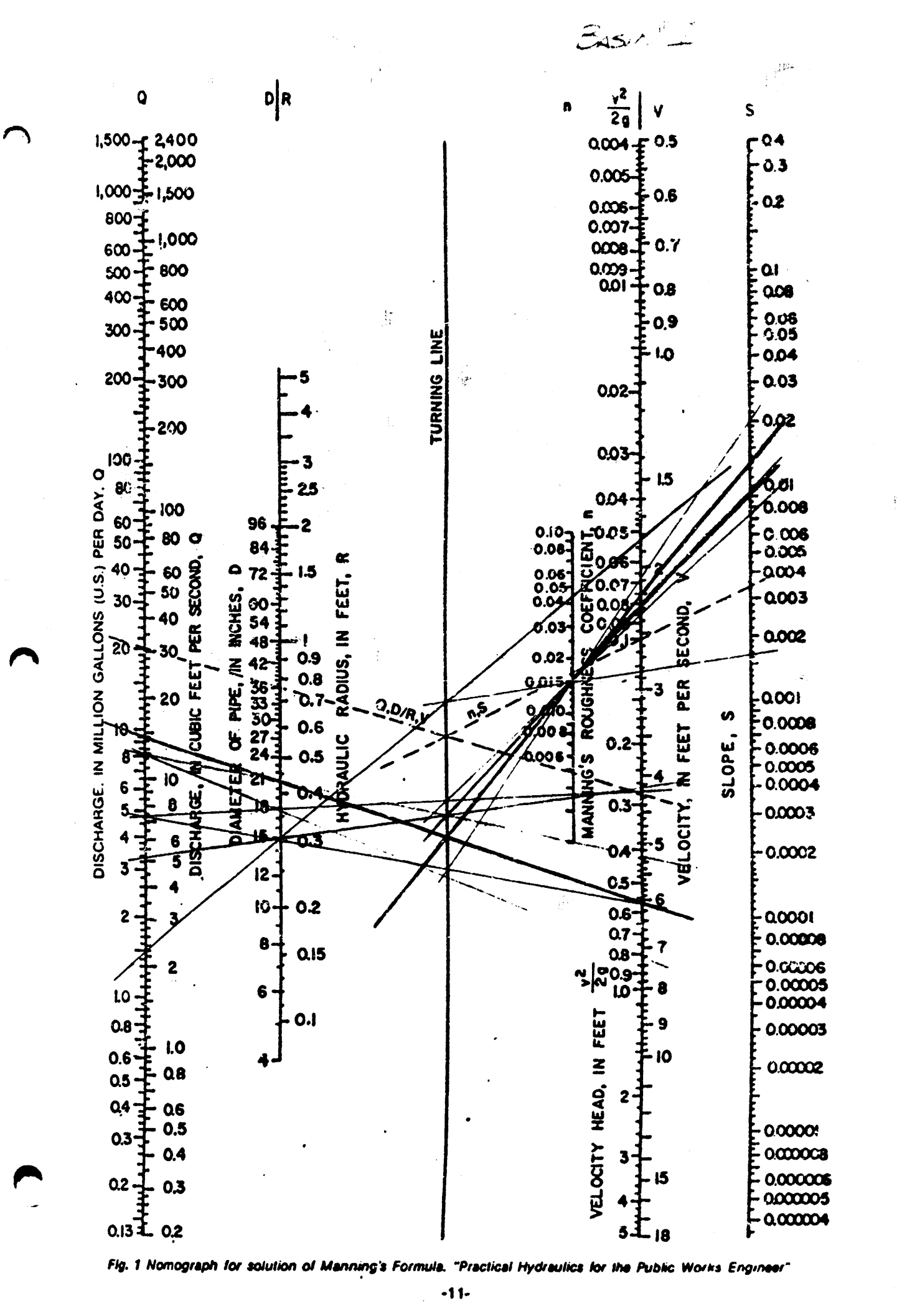
ITEM: DRAINAGE STUDY DATE: MAY 1984

RETURN PERIOD: 100 YR COMPUTATIONS BY: KLR REVISIONS BY: _____

SCHEMATIC DIAGRAM:

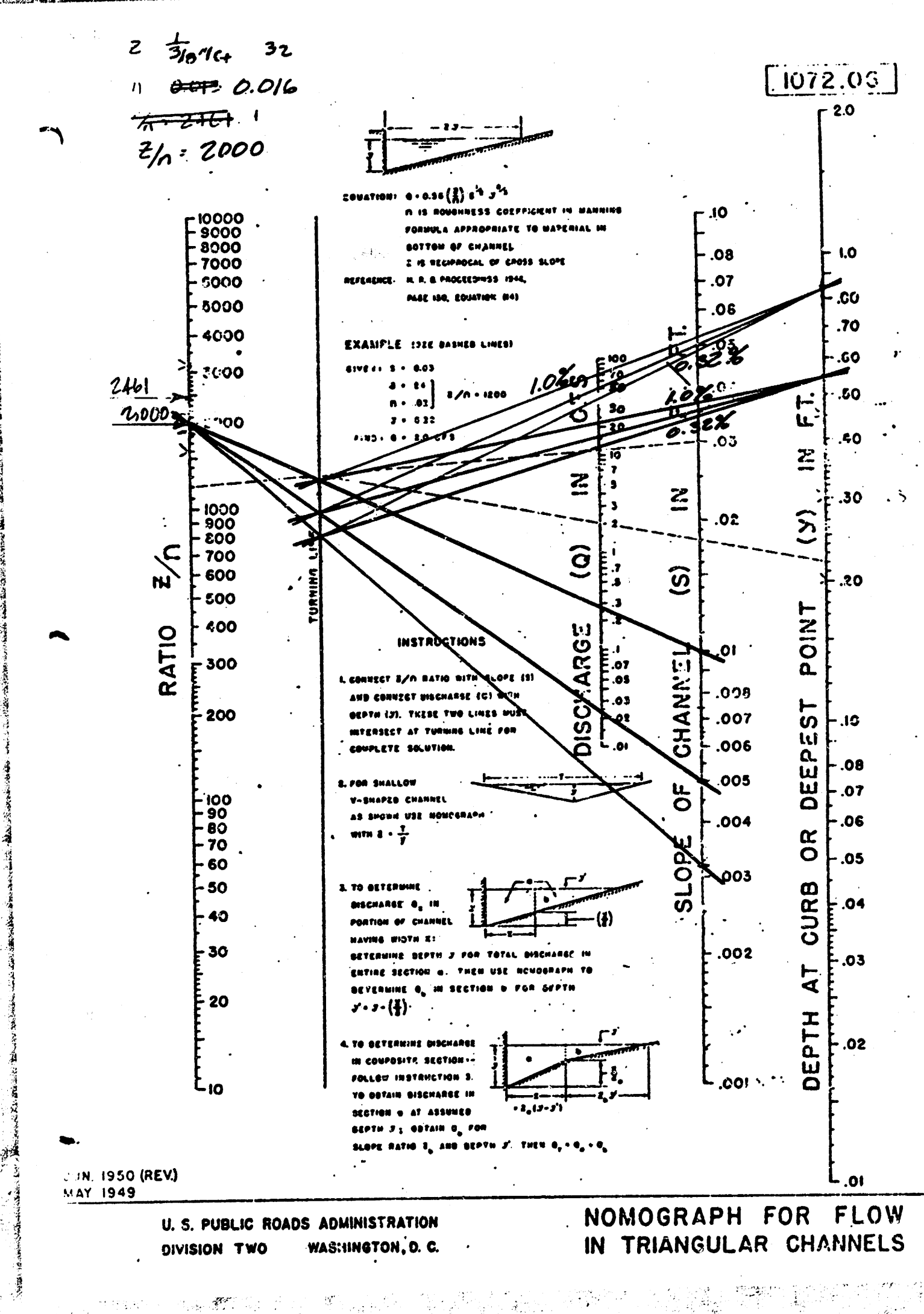
ANALYSIS OF BASIN I

TRIBUTARY AREA				HYDROLOGY SUMMATION										CONDUIT DATA							
SUB-BASIN	C	AREA (AC)	SLOPE (%)	LENGTH (FT)	Q_p (CFS)	Q_u (CFS)	Q_s (CFS)	Q_t (CFS)	Q_b (CFS)	Q_c (CFS)	Q_m (CFS)	Q_n (CFS)	Q_o (CFS)	PPE (INCHES)	SLOPE (%)	VELOCITY (FT/SEC)	LENGTH (FT)	Q_p (CFS)	Q_u (CFS)	Q_s (CFS)	Q_t (CFS)
A	0.5	2.6	1.0	16	8.76	11.4															
B	0.5	1.2	1.0	15	8.76	5.3															
DRAINAGE																					
D	0.5	1.3	0.5	20	8.03	5.2															
C	0.5	2.0	0.5	20	8.03	3.0															
E	0.5	1.1	1.2	15	8.76	4.9															
		0.5	8.2					20	8.03				32.9								



Capacity of Curb Inlet
Two Yr Storm
Inlet Capacity in Sump 2.0 cfs/ft. or 12 cfs
100 Yr Storm
Inlet Capacity in Sump 2.6 cfs/ft. or 13 cfs

Street Flow per Curb
Two Yr Storm
0.32% slope 12 cfs
0.5% slope 15 cfs
1.0% slope 22 cfs
100 Yr Storm
0.32% slope 40 cfs
0.5% slope 50 cfs
1.0% slope 70 cfs



Date MAY 29 1984 Page 1 of
Project PRAIRIE PARK 2ND DRAINAGE STUDY
Item BACK WATER ANALYSIS

1) MANNING'S EQUATION $Q = \frac{1.49}{n} (A) (V)^{4/3} (S)^{1/4}$

2) $K = Q / (A V) = PIF \text{ FULL}$

3) $(Q - 0.00340 K^3 (R^3)^{1/4})^2 = S$

4) $Q = 0.0032 K^3 (R^3)^{1/4} \times$

15" PIPE $R = 0.485 \quad K = 0.01729$

18" PIPE $R = 0.750 \quad K = 0.01094$

21" PIPE $R = 0.875 \quad K = 0.00725$

24" PIPE $R = 1.0 \quad K = 0.00548$

27" PIPE $R = 1.125 \quad K = 0.00371$

30" PIPE $R = 1.250 \quad K = 0.0028$

36" PIPE $R = 1.50 \quad K = 0.0017$

5) $(Q \cdot X) = S$

PROFESSIONAL
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1000 EAST 10TH ST
DES MOINES, IOWA 50319
281-382-3833

HYDROLOGY DATA SHEET ¹⁰⁰

PAGE 2 OF 2

PROJECT: PRairie Park 2nd Addition PROJECT NO. 34-84261-1787

ITEM: DRAINAGE STUDY DATE: MAY 1984

RETURN PERIOD: 2 YR COMPUTATIONS BY: KLR REVISIONS BY:

SCHEMATIC DIAGRAM:

ANALYSIS OF BASIN II

TRIBUTARY AREA		HYDROLOGY SUMMATION		CONDUIT DATA															
SUB-BASIN	C	AREA (ac)	SLOPE (%)	LENGTH (ft)	Q_p (cfs)	Q_u (cfs)	Q_s (cfs)	Q_t (cfs)	Q_b (cfs)	Q_c (cfs)	Q_m (cfs)	Q_n (cfs)	Q_o (cfs)	PIPE (inches)	ROPE (%)	VELOCITY (ft/sec)	LENGTH (ft)	V_s (ft/sec)	V_t (ft/sec)
G	0.5	2.5	1.4	17	8.76	11.4								15	0.8	3.2	90	1	18
H	0.5	1.2	1.0	15	8.76	5.3								18	0.7	4.0	200	1	19
I	0.5	1.1	1.0	15	8.76	4.9								21	0.5	3.6	200	1	20
J	0.5	1.7	1.2	19	8.76	5.3								24	0.9	5.5	50	0	20
K	0.5	1.5	1.5	15	8.76	5.3								27	0.6	5.0	200	1	21

PROFESSIONAL
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1985 EAST ENGLISH
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CHICAGO, ILL. 60611
(312) 382-0881

HYDROLOGY DATA SHEET

PAGE 1 OF 1

PROJECT: PRAIRIE PARK 2ND ADDITION PROJECT NO. 34-84261-1787

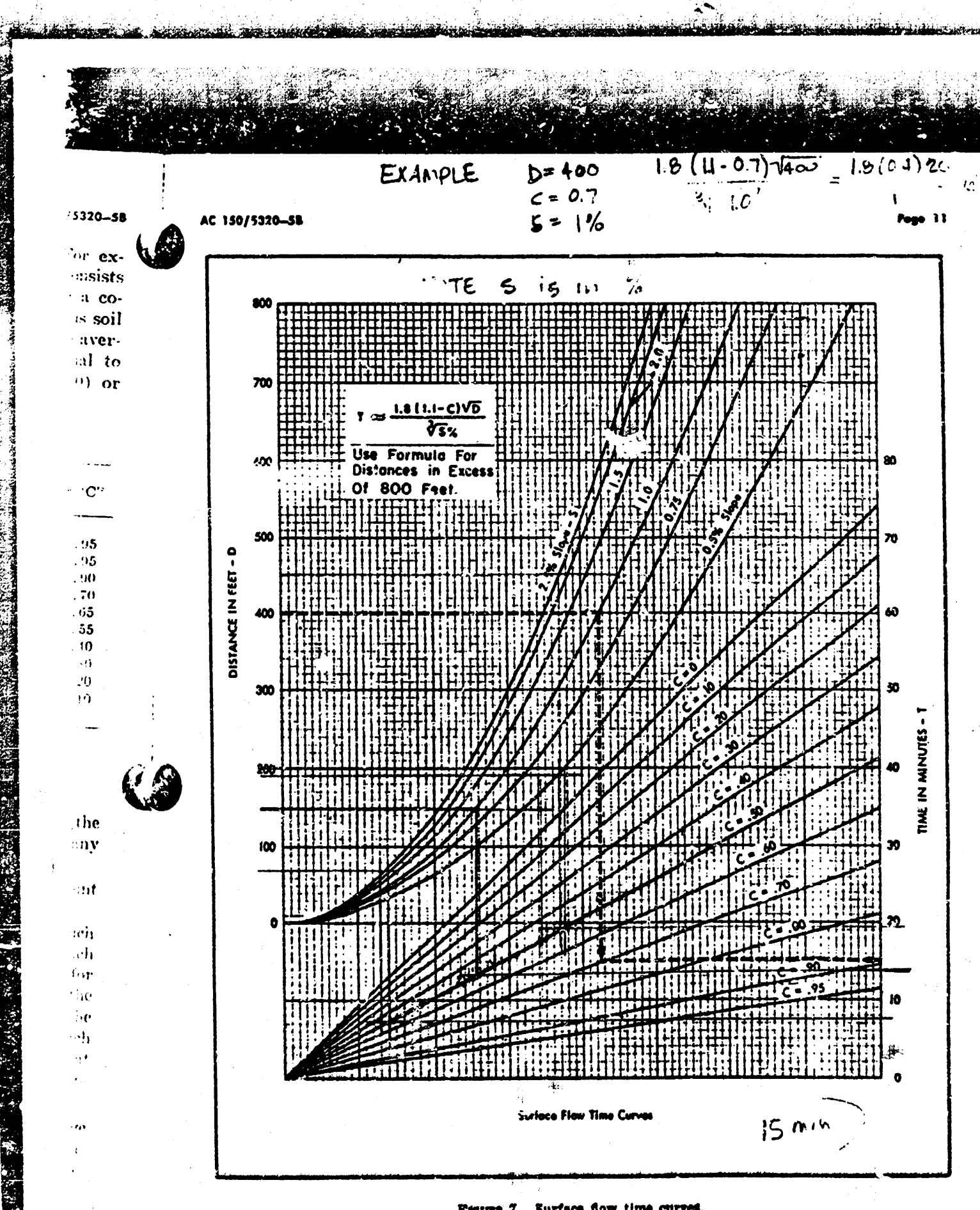
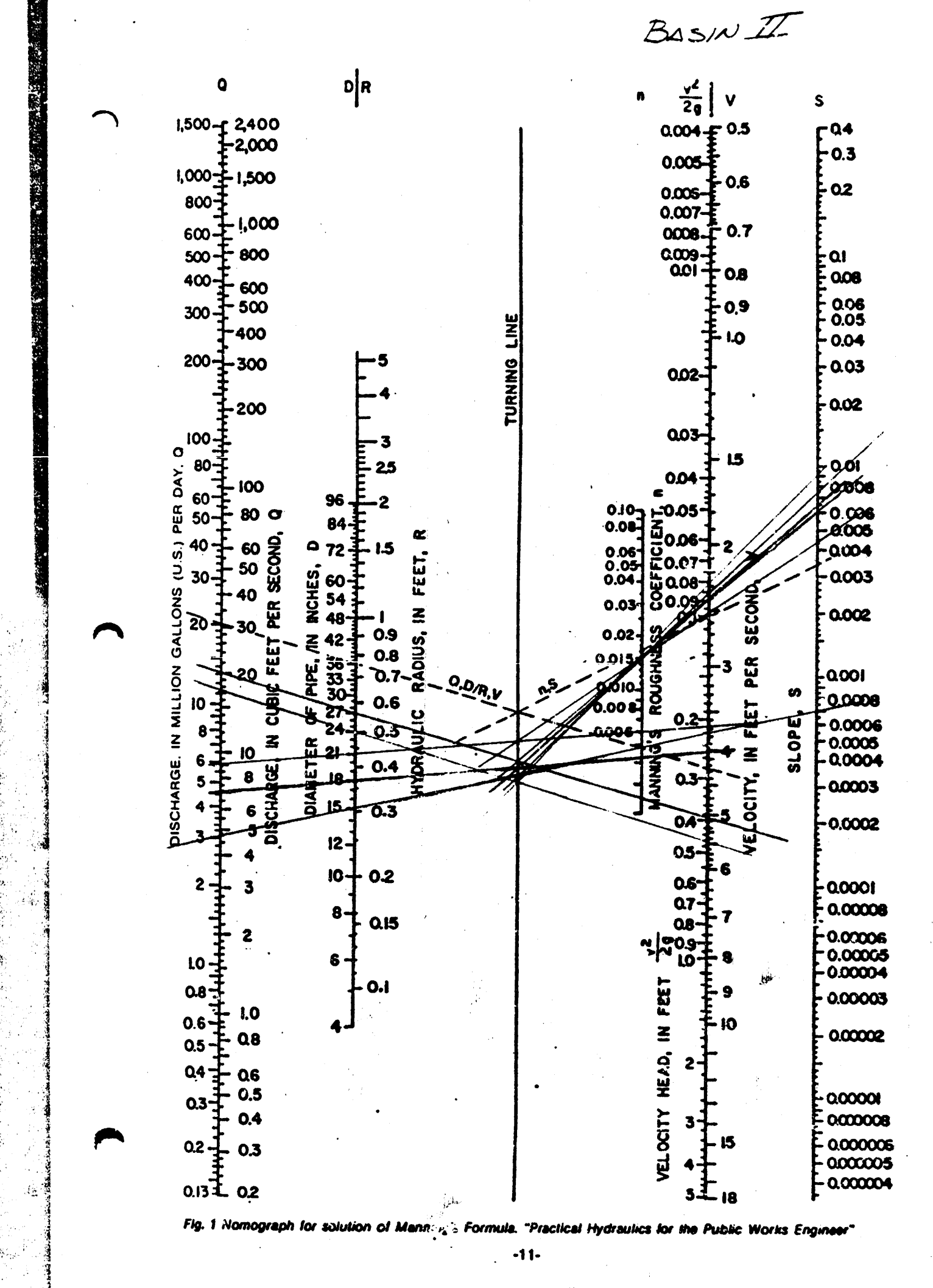
ITEM: DRAINAGE STUDY DATE: MAY 1984

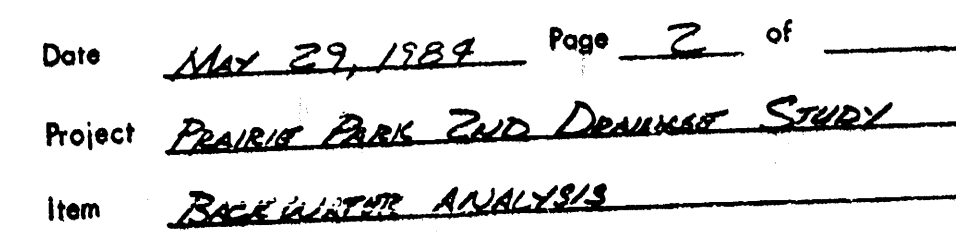
RETURN PERIOD: 100 YR COMPUTATIONS BY: KLR REVISIONS BY:

SCHEMATIC DIAGRAM:

ANALYSIS OF BASIN II

SUB-BASIN	C	AREA (ac)	TRIBUTARY AREA	LENGTH (ft)	HYDROLOGY SUMMATION	CONDUIT DATA														
NO.	C	AREA (ac)	SLOPE (%)	LENGTH (ft)	Q_p (cfs)	Q_u (cfs)	Q_s (cfs)	Q_t (cfs)	Q_b (cfs)	Q_c (cfs)	Q_m (cfs)	Q_n (cfs)	Q_o (cfs)	Q_p (cfs)	SLOPE (%)	VELOCITY (ft/sec)	LENGTH (ft)	Q_s (cfs)	Q_u (cfs)	Q_s (cfs)
G	0.5	2.5	1.4	17	8.76	11.4														
H	0.5	1.2	1.0	15	8.76	5.3														
I	0.5	1.1	1.0	15	8.76	4.9														
J	0.5	1.7	1.2	19	8.76	5.3														
K	0.5	1.5	1.5	15	8.76	5.3														





Basin No. 1 - Two Year SPRAIN

F-E $\rightarrow$ 19.5 cfs 21' dia. ELEV = 130 TOP OF

$(19.5 \cdot 0.00785)^{1/2} = S$

$S = 0.0110$ L = 200 ft $\frac{h}{L} = \frac{2.00}{200} = 0.01$
ELEV = 132.20

19' BELOW TOP CURB

E-C $\rightarrow$ 19.5 cfs 21' dia. ELEV 132.2

$(19.5 \cdot 0.00785)^{1/2} = S$

$S = 0.00921$ L = 45 ft $\frac{h}{L} = \frac{0.37}{45} = 0.0082$
ELEV = 132.6

0.4' BELOW TOP CURB

F-E $\rightarrow$ 19.5 cfs 21' dia. ELEV = 130 TOP OF

$(19.5 \cdot 0.00508)^{1/2} = S$

$S = 0.00543$ L = 200 ft $\frac{h}{L} = \frac{1.07}{200} = 0.00535$
ELEV = 131.1

1.9' BELOW TOP CURB

E-C $\rightarrow$ 21' dia. ELEV = 131.1

1.3' ABOVE $\frac{h}{L} = \frac{0.37}{13.1} = 0.0282$
ELEV 131.5

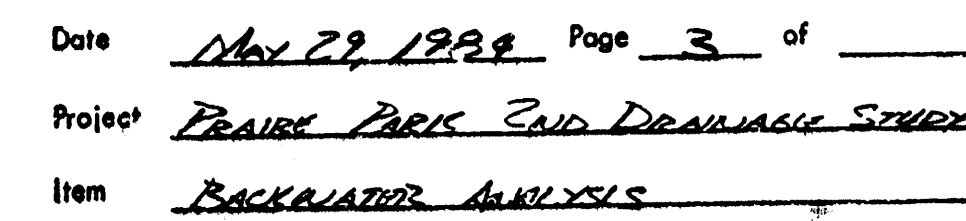
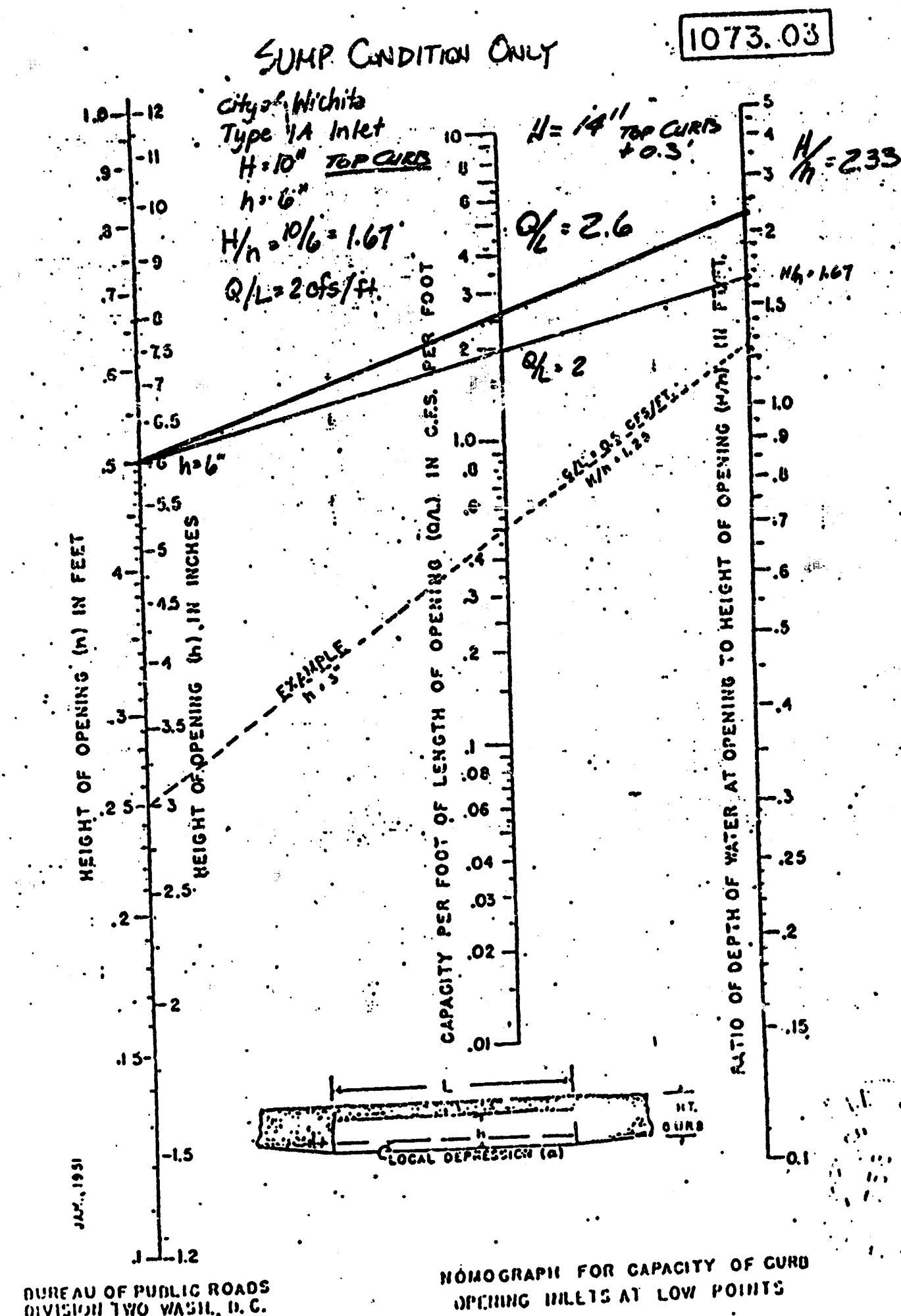
1.5' BELOW TOP CURB

C-B $\rightarrow$ 7.4 cfs 18' dia. ELEV = 131.5

$(7.4 \cdot 0.00873)^{1/2} = S$

$S = 0.00655$ L = 230 ft $\frac{h}{L} = \frac{1.5}{230} = 0.00652$
ELEV = 133.0

3.0' BELOW TOP CURB



B-A → 151.424 151.424 ELEV 133.0
 $(51.0.0.01779)^T = S$
 $S = 0.00823$ L = 30.81 A = 0.65
 ELEV = 133.7

C-D → 23.045 151.424 ELEV 131.5
 $(23.0.0.01779)^T = S$
 $S = 0.00167$ L = 45.85 A = 0.08
 ELEV = 131.6

1 ft Bk Below Top Curve

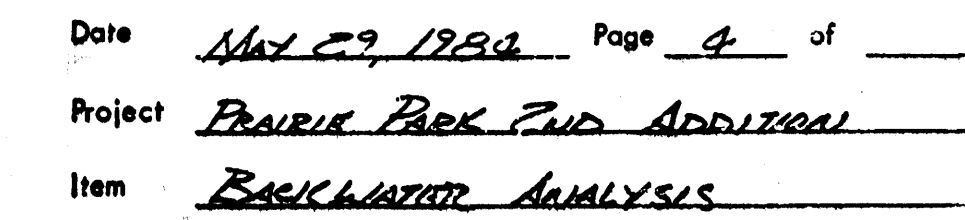
Basin T - 100 yr storm

E-F → 32.9085 27.1414 ELEV = 130.9 TOP OF CURVE
 $(32.9.0.00371)^T = S$
 $S = 0.01890$ L = 20.04 A = 3.0
 ELEV = 133.0

0 Below Top of Curve

INVERTING = STREET SLOPE OF 1%
 151.424 PAV.

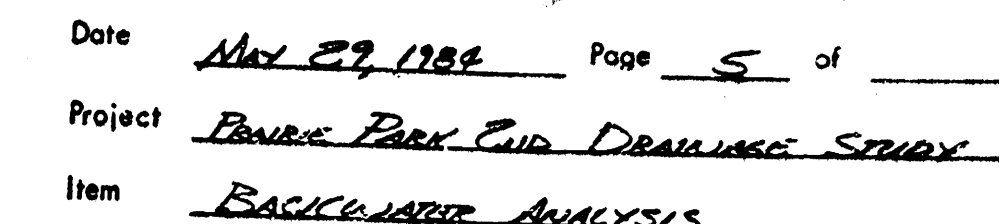
$Q = \frac{1.49}{0.013} (0.75)^{1.49} \left(\frac{675}{2} \right)^{0.58} (20)^{1.49}$
 $Q = 91.083$ in PAV



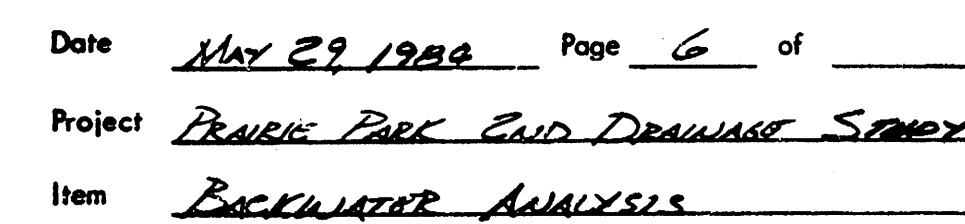
INTERSECTION MAY 22ND MAY 100% SPAIN

9.1 W. DIS.
 6.8
 11.3 W. DIS.
 21.4 W. DIS.
 16.1 W. DIS.
 27.4 W. DIS.
 23.0 W. DIS.
 27.4 W. DIS.
 32.9 W. DIS.
 9.4 CFS

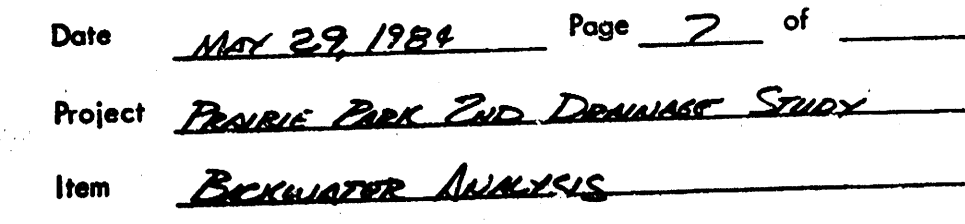
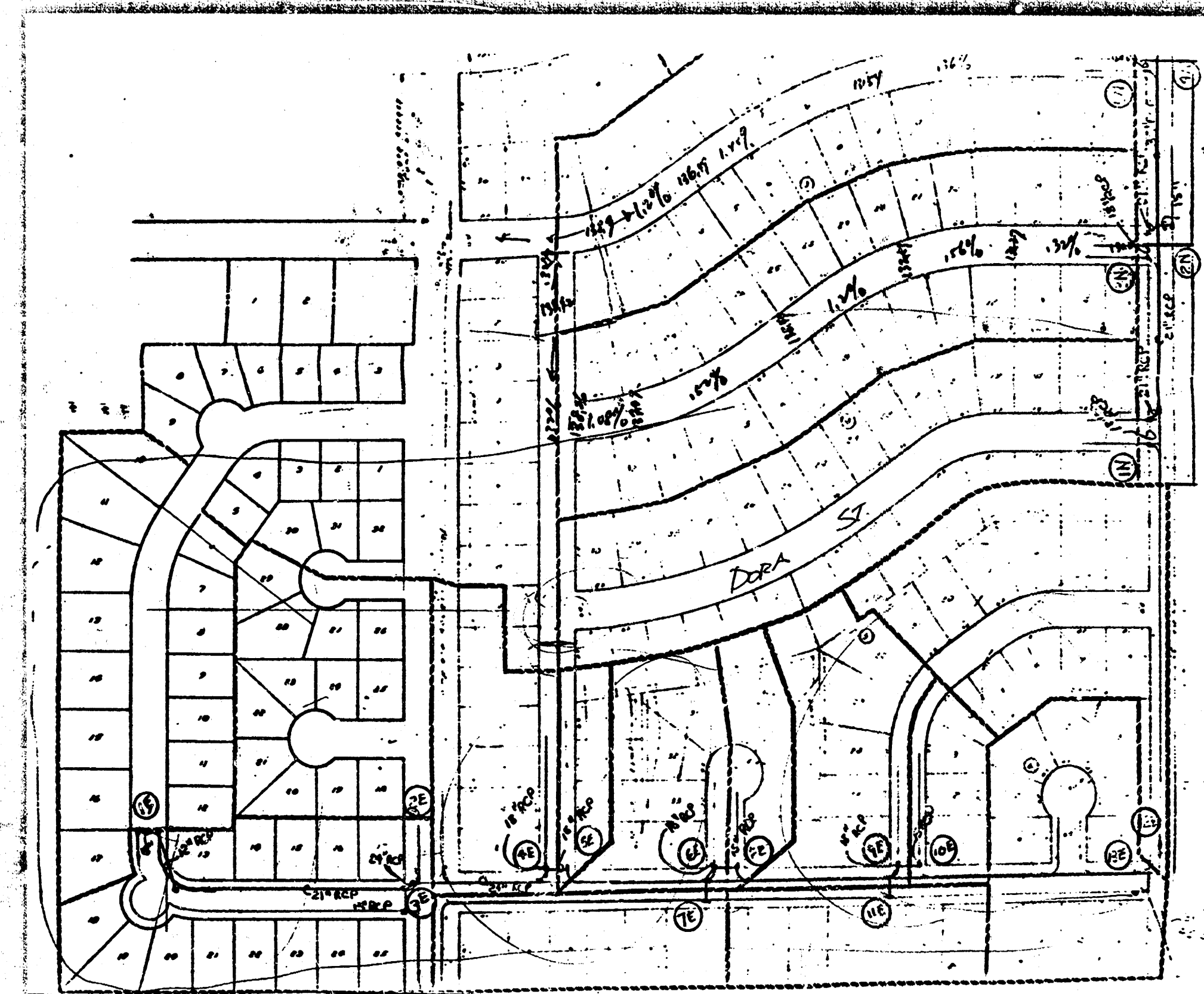
CATCH SPAIN WATERS @ 100
 23.0 CFS W. DIS.
 = 9.1 CFS FLOW UP STREAM
 12.9 CFS FOR WATERS OK
 TOTAL Q TO WATERS @ 100% = 19.9 CFS
 WATERS TO WATERS @ 6.5 CFS
 Q TO WATERS @ 9.4 CFS
 10.9 CFS FOR WATERS OK



BEGIN III - TWO YEAR STRAIN
 L-K → 20.3 OBS 21-HOUR ELEV. = 123.3 $\Delta = 0$
 $(20.5 - 0.00371)^2 = .5$
 S = 0.00567 L = 200 lb A = 11
 ELEV. = 123.9
 2.1 BELOW TOP OF CURB
 L-I → 17.6 OBS 21-HOUR ELEV. = 124.5
 $(17.6 - 0.00508)^2 = .5$
 S = 0.00779 L = 50 lb A = 0.60
 ELEV. = 124.1
 2.6 BELOW TOP OF CURB
 J-K → 9.1 OBS 21-HOUR ELEV. = 124.9
 $(9.1 - 0.00775)^2 = .5$
 S = 0.00935 L = 200 lb A = 0.57
 ELEV. = 125.8
 2.6 BELOW TOP OF CURB
 I-H → 7.1 OBS 18-HOUR ELEV. = 125.0
 $(7.1 - 0.01098)^2 = .5$
 S = 0.00663 L = 50 lb A = 1.05
 ELEV. = 127.3
 2.3 BELOW TOP OF CURB
 1.3 BELOW TOP OF CURB



$H = 5 \rightarrow 4.8 \text{ CRS}$ $15' \text{ HIGH}$ $ELEV = 127.3$
 $(48 \cdot 0.01779) \div 5$
 $S = 0.00729$ $C = 90$ $\frac{1}{6} \text{ BELOW TOP OF CURB}$ $\frac{1}{6} = 0.65$
 $1.6 \text{ BELOW TOP OF CURB}$ $\frac{1}{6} \text{ BELOW TOP OF CURB}$
 $L = 18 \rightarrow 20.2 \text{ SLOPE}$ $22' \text{ HIGH}$ $5 \text{ BELOW } 127.3 \text{ ELEVATION}$
 $(20.2 \cdot 0.00009) \div 5$
 $S = 0.00035$ $C = 200$ $\frac{1}{6} = 2.15$
 $ELEV = 125.9$
 $\frac{1}{6} \text{ BELOW TOP OF CURB}$
BROWN II - 100% SPREAD
 $I = II$ NEGATIVE SLOPE = STREET SLOPE = 0.4%
 $18' \text{ HIGH POINT}$
 $R = 3.8 \text{ CRS}$

[illegible]

Name Park and Addition															V45 / KH Dodge		/ 700		600 7000		6								
IN	OUT	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Comments	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
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871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900
901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930
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991	992	993	994	995	996	997	998	999	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020
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1141	1142	1143	1144	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154	1155	1156	1157	1158	1159	1160	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170
1171	1172	1173	1174	1175	1176	1177	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187	1188	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200
1201	1202	1203	1204	1205	1206	1207	1208	1209	1210	1211	1212	1213	1214	1215	1216	1217	1218	1219	1220	1221	1222	1223	1224	1225	1226	1227	1228	1229	1230
1231	1232	1233	1234	1235	1236	1237	1238	1239	1240	1241	1242	1243	1244	1245	1246	1247	1248	1249	1250	1251	1252	1253	1254	1255	1256	1257	1258	1259	1260
1261	1262	1263	1264	1265	1266	1267	1268	1269	1270	1271	1272	1273	1274	1275	1276	1277	1278	1279	1280	1281	1282	1283	1284	1285	1286	1287	1288	1289	1290
1291	1292	1293	1294	1295	1296	1297	1298	1299	1300	1301	1302	1303	1304	1305	1306	1307	1308	1309	1310	1311	1312	1313	1314	1315	1316	1317	1318	1319	1320
1321	1322	1323	1324	1325	1326	1327	1328	1329	1330	1331	1332	1333	1334	1335	1336	1337	1338	1339	1340	1341	1342	1343	1344	1345	1346	1347	1348	1349	1350
1351	1352	1353	1354	1355	1356	1357	1358	1359	1360	1361	1362	1363	1364	1365	1366	1367	1368	1369	1370	1371	1372	1373	1374	1375	1376	1377	1378	1379	1380
1381	1382	1383	1384	1385	1386	1387	1388	1389	1390	1391	1392	1393	1394	1395	1396	1397	1398	1399	1400	1401	1402	1403	1404	1405	1406	1407	1408	1409	1410
1411	1412	1413	1414	1415	1416	1417	1418	1419	1420	1421	1422	1423	1424	1425	1426	1427	1428	1429	1430	1431	1432	1433	1434	1435	1436	1437	1438	1439	1440
1441	1442	1443	1444	1445	1446	1447	1448	1449	1450	1451	1452																		



 Seal of the State of Kansas Department of Transportation Division of Highways	TO: <u>City of Wichita</u> <u>Department of Engineering</u> <u>455 N. Main - 7th Floor</u> <u>Wichita, KS 67202</u>	PROJECT NO. <u>34-84261-1767</u>
	PROJECT: <u>Prairie Park 2nd</u> <u>Drainage Study</u>	
COPIES TO: _____ _____ _____ _____ _____	ATTN: <u>Mr. Chris Breitenstein, P.E.</u>	DATE: <u>May 30, 1984</u>
	FROM: <u>Kevin Road, Design Engineer</u>	
	REFERENCE: _____ _____ _____	

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

Transmitted herewith, for your review and approval, are the Drainage Plan and Drainage Calculations for Phase II and Phase III developments of Prairie Park 2nd Addition. Basin I in the calculations corresponds to Phase II development and Basin II in the calculations corresponds to Phase III development.

If you have any questions, please call.

Cn

Елс. 2

Revised Drainage Plan disregard

Previous Plans

EQ.5
6/13/04