HYDROLOGY E19/D17 2 PLANS

E19/D17

2 Plans

INSTRUCTIONS FOR DRAINAGE STUDY REVISIONS

MEADOWOOD MANOR, UNIT 1

1. Page i, Drainage STudy Index: Change title of Exhibit "F" to "STREETS AND MAXIMUM RUNOFFS".

2. Page 4, V. CONCLUSIONS AND RECOMMENDATIONS: Delete sentence "Recommended street grades are contained in Exhibit 'F'" and replace it with "Design streets to carry maximum runoffs contained in Exhibit 'F' through use of tables in Exhibit 'E'".

3. Replace page 13 with revised page 13.

4. Add new page, 14A, after page 14 and replace page 15 with revised pages 15A-H.

5. Replace page 16 with revised page 16 entitled "STREETS AND MAXIMUM RUNOFFS".

REVISED MAY 1972

EXHIBIT E

STREET CARRYING CAPACITIES
AT VARIOUS GRADES
IN CFS

n(conc)=.015 n(soil)=.0225

STREET WIDTH	TYPE CROWN	CURB HT	.0050	.0100	.0150	.0200	.0250	.0300	.0350	.0400
32'	8"	8"	18	25	31	36	40	44	47	50
48'	8"	8"	27	38	47	54	60	66	71	76
	6"	8"	53	75	92	106	118	130	140	150
	4"	8"	85	121	148	171	191	209	226	242
	2"	8"	124	175	215	248	277	304	328	351

REVISED MAY 1972

RNH

FACE TO FACE = ? 48
CURB = ? 8
CROWN = ? 8

N	A	P	S	S1/2	R	R2/3	V	Q
.0150	10.6667	49.3580	.0050	.0707	.2161	.3601	2.5227	26.9084
.0150	10.6667	49.3580	.0100	.1000	.2161	.3601	3.5676	38.0543
.0150	10.6667	49.3580	.0150	.1225	.2161	.3601	4.3694	46.6068
.0150	10.6667	49.3580	.0200	.1414	.2161	.3601	5.0453	53.8169
.0150	10.6667	49.3580	.0250	.1581	.2161	.3601	5.6409	60.1691
.0150	10.6667	49.3580	.0300	.1732	.2161	.3601	6.1792	65.9120
.0150	10.6667	49.3580	.0350	.1871	.2161	.3601	6.6743	71.1931
.0150	10.6667	49.3580	.0400	.2000	.2161	.3601	7.1352	76.1086

FACE TO FACE = ? 48
CURB = ? 8
CROWN = ? 6

N	A	P	S	S1/2	R	R2/3	V	Q
.0150	16.0000	49.3472	.0050	.0707	.3242	.4720	3.3061	52.8978
.0150	16.0000	49.3472	.0100	.1000	.3242	.4720	4.6755	74.8088
.0150	16.0000	49.3472	.0150	.1225	.3242	.4720	5.7264	91.6216
.0150	16.0000	49.3472	.0200	.1414	.3242	.4720	6.6122	105.7955
.0150	16.0000	49.3472	.0250	.1581	.3242	.4720	7.3927	118.2830
.0150	16.0000	49.3472	.0300	.1732	.3242	.4720	8.0983	129.5726
.0150	16.0000	49.3472	.0350	.1871	.3242	.4720	8.7471	139.9544
.0150	16.0000	49.3472	.0400	.2000	.3242	.4720	9.3511	149.6175

FACE TO FACE = ? 48
CURB = ? 8
CROWN = ? 4

N	A	P	S	S1/2	R	R2/3	V	Q
.0150	21.3333	49.3395	.0050	.0707	.4324	.5718	4.0055	85.4504
.0150	21.3333	49.3395	.0100	.1000	.4324	.5718	5.6646	120.8451
.0150	21.3333	49.3395	.0150	.1225	.4324	.5718	6.9377	148.0044
.0150	21.3333	49.3395	.0200	.1414	.4324	.5718	8.0110	170.9007
.0150	21.3333	49.3395	.0250	.1581	.4324	.5718	8.9565	191.0728
.0150	21.3333	49.3395	.0300	.1732	.4324	.5718	9.8114	209.3098
.0150	21.3333	49.3395	.0350	.1871	.4324	.5718	10.5975	226.0804
.0150	21.3333	49.3395	.0400	.2000	.4324	.5718	11.3292	241.6901

FACE TO FACE = ? 48
CURB = ? 8
CROWN = ? 2

N	A	P	S	S1/2	R	R2/3	V	Q
.0150	26.6667	49.3349	.0050	.0707	.5405	.6636	4.6482	123.9532
.0150	26.6667	49.3349	.0100	.1000	.5405	.6636	6.5736	175.2963
.0150	26.6667	49.3349	.0150	.1225	.5405	.6636	8.0510	214.6932
.0150	26.6667	49.3349	.0200	.1414	.5405	.6636	9.2965	247.9064
.0150	26.6667	49.3349	.0250	.1581	.5405	.6636	10.3938	277.1678
.0150	26.6667	49.3349	.0300	.1732	.5405	.6636	11.3858	303.6221
.0150	26.6667	49.3349	.0350	.1871	.5405	.6636	12.2981	327.9493
.0150	26.6667	49.3349	.0400	.2000	.5405	.6636	13.1472	350.5926

0.663 / 1.229 / 3

14A

50' R.O.W. 32' FACE-FACE 8" CURB 8" CROWN .2' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	15.3611	51.3731	.0050	.0707	.2990	.4472	2.8545	43.0477
.0165	15.3611	51.3731	.0100	.1000	.2990	.4472	420368	62.0100
.0165	15.3611	51.3731	.0150	.1225	.2990	.4472	4.9441	75.9464
.0165	15.3611	51.3731	.0200	.1414	.2990	.4472	5.7089	87.6954
.0165	15.3611	51.3731	.0250	.1581	.2990	.4472	6.3828	98.0464
.0165	15.3611	51.3731	.0300	.1732	.2990	.4472	6.9920	107.4045
.0165	15.3611	51.3731	.0350	.1871	.2990	.4472	7.5522	116.0101
.0165	15.3611	51.3731	.0400	.2000	.2990	.4472	8.0736	124.0200

50' R.O.W. 32' FACE-FACE 8" CURB 6" CROWN .2' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	18.9167	51.3569	.0050	.0707	.3683	.5138	3.2801	62.0482
.0165	18.9167	51.3569	.0100	.1000	.3683	.5138	4.6387	87.7494
.0165	18.9167	51.3569	.0150	.1225	.3683	.5138	5.6813	107.4706
.0165	18.9167	51.3569	.0200	.1414	.3683	.5138	6.5602	124.0964
.0165	18.9167	51.3569	.0250	.1581	.3683	.5138	7.3345	138.7439
.0165	18.9167	51.3569	.0300	.1732	.3683	.5138	8.0345	151.9864
.0165	18.9167	51.3569	.0350	.1871	.3683	.5138	8.6783	164.1640
.0165	18.9167	51.3569	.0400	.2000	.3683	.5138	9.2775	175.4988

50' R.O.W. 32' FACE-FACE 8" CURB 4" CROWN .2' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	22.4722	51.3453	.0050	.0707	.4377	.5765	3.6797	82.6903
.0165	22.4722	51.3453	.0100	.1000	.4377	.5765	5.2038	116.9417
.0165	22.4722	51.3453	.0150	.1225	.4377	.5765	6.3734	143.2238
.0165	22.4722	5123453	.0200	.1414	.4377	.5765	7.3593	165.3806
.0165	22.4722	51.3453	.0250	.1581	.4377	.5765	8.2280	184.9011
.0165	22.4722	51.3453	.0300	.1732	.4377	.5765	9.0133	202.5490
.0165	22.4722	51.3453	.0350	.1871	.4377	.5765	9.7355	218.7780
.0165	22.4722	51.3453	.0400	.2000	.4377	.5765	10.4077	233.8835

50' R.O.W. 32' FACE-FACE 8" CURB 2" CROWN .2' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	26.0278	51.3384	.0050	.0707	.5070	.6358	4.0585	105.6348
.0165	26.0278	51.3384	.0100	.1000	.5070	.6358	5.7396	149.3901
.0165	26.0278	51.3384	.0150	.1225	.5070	.6358	7.0296	182.9648
.0165	26.0278	51.3384	.0200	.1414	.5070	.6358	8.1171	211.2696
.0165	26.0278	51.3384	.0250	.1581	.5070	.6358	9.0752	236.2066
.0165	26.0278	51.3384	.0300	.1732	.5070	.6358	9.9414	258.7513
.0165	26.0278	51.3384	.0350	.1871	.5070	.6358	10.7379	279.4834
.0165	26.0278	51.3384	.0400	.2000	.5070	.6358	11.4793	298.7803

50' R.O.W. 32' FACE-FACE 8" CURB 8" CROWN .4' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	24.3611	51.3904	.0050	.0707	.4740	.6080	3.8805	94.5336
.0165	24.3611	51.3904	.0100	.1000	.4740	.6080	5.4879	133.6907
.0165	24.3611	51.3904	.0150	.1225	.4740	.6080	6.7212	163.7370
.0165	24.3611	51.3904	.0200	.1414	.4740	.6080	7.7610	189.0672
.0165	24.3611	51.3904	.0250	.1581	.4740	.6080	8.6771	211.3836
.0165	24.3611	51.3904	.0300	.1732	.4740	.6080	9.5053	231.5591
.0165	24.3611	51.3904	.0350	.1871	.4740	.6080	10.2669	250.1124
.0165	24.3611	51.3904	.0400	.2000	.4740	.6080	10.9757	267.3814

50' R.O.W. 32' FACE-FACE 8" CURB 6" CROWN .4' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	27.9167	51.3742	.0050	.0707	.5434	.6659	4.2502	118.6523
.0165	27.9167	51.3742	.0100	.1000	.5434	.6659	6.0107	167.7996
.0165	27.9167	51.3742	.0150	.1225	.5434	.6659	7.3616	205.5117
.0165	27.9167	51.3742	.0200	.1414	.5434	.6659	8.5005	237.3045
.0165	27.9167	51.3742	.0250	.1581	.5434	.6659	9.5038	265.3145
.0165	27.9167	51.3742	.0300	.1732	.5434	.6659	10.4109	290.6375
.0165	27.9167	51.3742	.0350	.1871	.5434	.6659	11.2451	313.9244
.0165	27.9167	51.3742	.0400	.2000	.5434	.6659	12.0215	335.5993

50' R.O.W. 32' FACE-FACE 8" CURB 4" CROWN .4' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	31.4722	51.3626	.0050	.0707	.6127	.7214	4.6045	144.9124
.0165	31.4722	51.3626	.0100	.1000	.6127	.7214	6.5117	204.9371
.0165	31.4722	51.3626	.0150	.1225	.6127	.7214	7.9751	250.9957
.0165	31.4722	51.3626	.0200	.1414	.6127	.7214	9.2089	289.8248
.0165	31.4722	51.3626	.0250	.1581	.6127	.7214	10.2959	324.0340
.0165	31.4722	51.3626	.0300	.1732	.6127	.7214	11.2786	354.9615
.0165	31.4722	51.3626	.0350	.1871	.6127	.7214	12.1822	383.4022
.0165	31.4722	51.3626	.0400	.2000	.6127	.7214	13.0234	409.8742

50' R.O.W. 32' FACE-FACE 8" CURB 2" CROWN .4' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	35.0278	51.3557	.0050	.0707	.6821	.7748	4.9454	173.2267
.0165	35.0278	51.3557	.0100	.1000	.6821	.7748	6.9939	244.9795
.0165	35.0278	51.3557	.0150	.1225	.6821	.7748	8.5657	300.0374
.0165	35.0278	51.3557	.0200	.1414	.6821	.7748	9.8908	346.4534
.0165	35.0278	51.3557	.0250	.1581	.6821	.7748	11.0583	387.3466
.0165	35.0278	51.3557	.0300	.1732	.6821	.7748	12.1137	424.3170
.0165	35.0278	51.3557	.0350	.1871	.6821	.7748	13.0843	458.3147
.0165	35.0278	51.3557	.0400	.2000	.6821	.7748	13.9877	489.9590

50' R.O.W. 32' FACE-FACE 8" CURB 8" CROWN .6' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	33.3611	51.4236	.0050	.0707	.6488	.7494	4.7822	159.5397
.0165	33.3611	51.4236	.0100	.1000	.6488	.7494	6.7631	225.6231
.0165	33.3611	51.4236	.0150	.1225	.6488	.7494	8.2830	276.3308
.0165	33.3611	51.4236	.0200	.1414	.6488	.7494	9.5644	319.0793
.0165	33.3611	51.4236	.0250	.1581	.6488	.7494	10.6933	356.7415
.0165	33.3611	51.4236	.0300	.1732	.6488	.7494	11.7140	390.7908
.0165	33.3611	51.4236	.0350	.1871	.6488	.7494	12.6525	422.1023
.0165	33.3611	51.4236	.0400	.2000	.6488	.7494	13.5261	451.2463

50' R.O.W. 32' FACE-FACE 8" CURB 6" CROWN .6' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	36.9167	51.4074	.0050	.0707	.7181	.8019	5.1172	188.9082
.0165	36.9167	51.4074	.0100	.1000	.7181	.8019	7.2367	267.1566
.0165	36.9167	51.4074	.0150	.1225	.7181	.8019	8.8632	327.1987
.0165	36.9167	51.4074	.0200	.1414	.7181	.8019	10.2343	377.8165
.0165	36.9167	51.4074	.0250	.1581	.7181	.8019	11.4423	422.4116
.0165	36.9167	51.4074	.0300	.1732	.7181	.8019	12.5344	462.7288
.0165	36.9167	51.4074	.0350	.1871	.7181	.8019	13.5387	499.8042
.0165	36.9167	51.4074	.0400	.2000	.7181	.8019	14.4735	534.3132

50' R.O.W. 32' FACE-FACE 8" CURB 4" CROWN .6' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	40.4722	51.3958	.0050	.0707	.7875	.8527	5.4414	220.2241
.0165	40.4722	51.3958	.0100	.1000	.7875	.8527	7.6953	311.4440
.0165	40.4722	51.3958	.0150	.1225	.7875	.8527	9.4247	381.4394
.0165	40.4722	51.3958	.0200	.1414	.7875	.8527	10.8827	440.4483
.0165	40.4722	51.3958	.0250	.1581	.7875	.8527	12.1673	492.4362
.0165	40.4722	51.3958	.0300	.1732	.7875	.8527	13.3286	539.4368
.0165	40.4722	51.3958	.0350	.1871	.7875	.8527	14.3965	582.6583
.0165	40.4722	51.3958	.0400	.2000	.7875	.8527	15.3905	622.8879

50' R.O.W. 32' FACE-FACE 8" CURB 2" CROWN .6' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	44.0278	51.3889	.0050	.0707	.8568	.9021	5.7560	253.4243
.0165	44.0278	51.3889	.0100	.1000	.8568	.9021	8.1402	358.3961
.0165	44.0278	51.3889	.0150	.1225	.8568	.9021	9.9697	438.9438
.0165	44.0278	51.3889	.0200	.1414	.8568	.9021	11.5120	506.8487
.0165	44.0278	51.3889	.0250	.1581	.8568	.9021	12.8708	566.6741
.0165	44.0278	51.3889	.0300	.1732	.8568	.9021	14.0993	620.7603
.0165	44.0278	51.3889	.0350	.1871	.8568	.9021	15.2290	670.4978
.0165	44.0278	51.3889	.0400	.2000	.8568	.9021	16.2805	716.7923

50' R.O.W. 32' FACE-FACE 8" CURB 8" CROWN .7' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	37.8611	51.4461	.0050	.0707	.7359	.8151	5.2008	196.9066
.0165	37.8611	51.4461	.0100	.1000	.7359	.8151	7.3550	278.4680
.0165	37.8611	51.4461	.0150	.1225	.7359	.8151	9.0080	341.0523
.0165	37.8611	51.4461	.0200	.1414	.7359	.8151	10.4015	393.8132
.0165	37.8611	51.4461	.0250	.1581	.7359	.8151	11.6293	440.2966
.0165	37.8611	51.4461	.0300	.1732	.7359	.8151	12.7392	482.3207
.0165	37.8611	51.4461	.0350	.1871	.7359	.8151	13.7599	520.9659
.0165	37.8611	51.4461	.0400	.2000	.7359	.8151	14.7100	556.9360

50' R.O.W. 32' FACE-FACE 8" CURB 6" CROWN .7' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	41.4167	51.4299	.0050	.0707	.8053	.8656	5.5225	228.7225
.0165	41.4167	51.4299	.0100	.1000	.8053	.8656	7.8100	323.4624
.0165	41.4167	51.4299	.0150	.1225	.8053	.8656	9.5652	396.1589
.0165	41.4167	51.4299	.0200	.1414	.8053	.8656	11.0449	457.4449
.0165	41.4167	51.4299	.0250	.1581	.8053	.8656	12.3486	511.4390
.0165	41.4167	51.4299	.0300	.1732	.8053	.8656	13.5272	560.2533
.0165	41.4167	51.4299	.0350	.1871	.8053	.8656	14.6111	605.1428
.0165	41.4167	51.4299	.0400	.2000	.8053	.3656	15.6199	646.9248

50' R.O.W. 32' FACE-FACE 8" CURB 4" CROWN .7' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	44.9722	51.4184	.0050	.0707	.8746	.9146	5.8349	262.4101
.0165	44.9722	51.4184	.0100	.1000	.8746	.9146	8.2518	371.1039
.0165	44.9722	51.4184	.0150	.1225	.8746	.9146	10.1064	454.5076
.0165	44.9722	51.4184	.0200	.1414	.8746	.9146	11.6699	524.8202
.0165	44.9722	51.4184	.0250	.1581	.8746	.9146	13.0473	586.7668
.0165	44.9722	51.4184	.0300	.1732	.8746	.9146	14.2926	642.7709
.0165	44.9722	51.4184	.0350	.1871	.8746	.9146	15.4378	694.2719
.0165	44.9722	51.4184	.0400	.2000	.8746	.9146	16.5037	742.2079

50' R.O.W. 32' FACE-FACE 8" CURB 2" CROWN .7' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	48.5278	51.4114	.0050	.0707	.9439	.9622	6.1390	297.9142
.0165	48.5278	51.4114	.0100	.1000	.9439	.9622	8.6819	421.3143
.0165	48.5278	51.4114	.0150	.1225	.9439	.9622	10.6331	516.0025
.0165	48.5278	51.4114	.0200	.1414	.9439	.9622	12.2781	595.8284
.0165	48.5278	51.4114	.0250	.1581	.9439	.9622	13.7273	666.1564
.0165	48.5278	51.4114	.0300	.1732	.9439	.9622	15.0375	729.7377
.0165	48.5278	51.4114	.0350	.1871	.9439	.9622	16.2424	788.2068
.0165	48.5278	51.4114	.0400	.2000	.9439	.9622	17.3638	842.6286

86' R.O.W. 48' FACE-FACE 8" CURB 8" CROWN 1.0' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0176	80.0833	87.4140	.0050	.0707	.9161	.9433	5.6384	451.5424
.0176	80.0833	87.4140	.0100	.1000	.9161	.9433	7.9739	638.5774
.0176	80.0833	87.4140	.0150	.1225	.9161	.9433	9.7660	782.0944
.0176	80.0833	87.4140	.0200	.1414	.9161	.9433	11.2768	903.0848
.0176	80.0833	87.4140	.0250	.1581	.9161	.9433	12.6079	1009.6795
.0176	80.0833	87.4140	.0300	.1732	.9161	.9433	13.8112	1106.0485
.0176	80.0833	87.4140	.0350	.1871	.9161	.9433	14.9178	1194.6689
.0176	80.0833	87.4140	.0400	.2000	.9161	.9433	15.9478	1277.1547

86' R.O.W. 48' FACE-FACE 8" CURB 6" CROWN 1.0' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0176	85.4167	87.4032	.0050	.0707	.9773	.9848	5.8864	502.7984
.0176	85.4167	87.4032	.0100	.1000	.9773	.9848	8.3247	711.0643
.0176	85.4167	87.4032	.0150	.1225	.9773	.9848	10.1956	870.8724
.0176	85.4167	87.4032	.0200	.1414	.9773	.9848	11.7728	1005.5968
.0176	85.4167	87.4032	.0250	.1581	.9773	.9848	13.1624	1124.2914
.0176	85.4167	87.4032	.0300	.1732	.9773	.9848	14.4187	1231.5995
.0176	85.4167	87.4032	.0350	.1871	.9773	.9848	15.5740	1330.2795
.0176	85.4167	87.4032	.0400	.2000	.9773	.9848	16.6493	1422.1286

86' R.O.W. 48' FACE-FACE 8" CURB 4" CROWN 1.0' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0176	90.7500	87.3955	.0050	.0707	1.0384	1.0254	6.1292	556.2293
.0176	90.7500	87.3955	.0100	.1000	1.0384	1.0254	8.6681	786.6270
.0176	90.7500	87.3955	.0150	.1225	1.0384	1.0254	10.6162	963.4173
.0176	90.7500	87.3955	.0200	.1414	1.0384	1.0254	12.2585	1112.4585
.0176	90.7500	87.3955	.0250	.1581	1.0384	1.0254	13.7054	1243.7664
.0176	90.7500	87.3955	.0300	.1732	1.0384	1.0254	15.0135	1362.4779
.0176	90.7500	87.3955	.0350	.1871	1.0384	1.0254	16.2165	1471.6443
.0176	90.7500	87.3955	.0400	.2000	1.0384	1.0254	17.3361	1573.2539

86' R.O.W. 48' FACE-FACE 8" CURB 2" CROWN 1.0' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0176	96.0833	87.3908	.0050	.0707	1.0995	1.0653	6.3673	611.7888
.0176	96.0833	87.3908	.0100	.1000	1.0995	1.0653	9.0047	865.2000
.0176	96.0833	87.3908	.0150	.1225	1.0995	1.0653	11.0284	1059.6492
.0176	96.0833	87.3908	.0200	.1414	1.0995	1.0653	12.7345	1223.5775
.0176	96.0833	87.3908	.0250	.1581	1.0995	1.0653	14.2377	1368.0013
.0176	96.0833	87.3908	.0300	.1732	1.0995	1.0653	15.5966	1498.5703
.0176	96.0833	87.3908	.0350	.1871	1.0995	1.0653	16.8462	1618.6410
.0176	96.0833	87.3908	.0400	.2000	1.0995	1.0653	18.0094	1730.4000

86' R.O.W. 48' FACE-FACE 8" CURB 8" CROWN .5' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0176	44.5833	87.3696	.0050	.0707	.5103	.6386	3.8176	170.1994
.0176	44.5833	87.3696	.0100	.1000	.5103	.6386	5.3988	240.6983
.0176	44.5833	87.3696	.0150	.1225	.5103	.6386	6.6122	294.7940
.0176	44.5833	87.3696	.0200	.1414	.5103	.6386	7.6351	340.3988
.0176	44.5833	87.3696	.0250	.1581	.5103	.6386	8.5363	380.5774
.0176	44.5833	87.3696	.0300	.1732	.5103	.6386	9.3511	416.9017
.0176	44.5833	87.3696	.0350	.1871	.5103	.6386	10.1003	450.3053
.0176	44.5833	87.3696	.0400	.2000	.5103	.6386	10.7977	481.3966

86' R.O.W. 48' FACE-FACE 8" CURB 6" CROWN .5' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0176	49.9167	87.3588	.0050	.0707	.5714	.6886	4.1165	205.4823
.0176	49.9167	87.3588	.0100	.1000	.5714	.6886	5.8216	290.5958
.0176	49.9167	87.3588	.0150	.1225	.5714	.6886	7.1300	355.9057
.0176	49.9167	87.3588	.0200	.1414	.5714	.6886	8.2330	410.9645
.0176	49.9167	87.3588	.0250	.1581	.5714	.6886	9.2048	459.4723
.0176	49.9167	87.3588	.0300	.1732	.5714	.6886	10.0833	503.3267
.0176	49.9167	87.3588	.0350	.1871	.5714	.6886	10.8913	543.6550
.0176	49.9167	87.3588	.0400	.2000	.5714	.6886	11.6432	581.1916

86' R.O.W. 48' FACE-FACE 8" CURB 4" CROWN .5' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0176	55.2500	87.3511	.0050	.0707	.6325	.7368	4.4049	243.3729
.0176	55.2500	87.3511	.0100	.1000	.6325	.7368	6.2295	344.1812
.0176	55.2500	87.3511	.0150	.1225	.6325	.7368	7.6296	421.5342
.0176	55.2500	87.3511	.0200	.1414	.6325	.7368	8.8099	486.7457
.0176	55.2500	87.3511	.0250	.1581	.6325	.7368	9.8497	544.1983
.0176	55.2500	87.3511	.0300	.1732	.6325	.7368	10.7899	596.1393
.0176	55.2500	87.3511	.0350	.1871	.6325	.7368	11.6544	643.9041
.0176	55.2500	87.3511	.0400	.2000	.6325	.7368	12.4590	688.3624

86' R.O.W. 48' FACE-FACE 8" CURB 2" CROWN .5' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0176	60.5833	87.3464	.0050	.0707	.6936	.7836	4.6842	283.7825
.0176	60.5833	87.3464	.0100	.1000	.6936	.7836	6.6244	401.3290
.0176	60.5833	87.3464	.0150	.1225	.6936	.7836	8.1132	491.5257
.0176	60.5833	87.3464	.0200	.1414	.6936	.7836	9.3683	567.5650
.0176	60.5833	87.3464	.0250	.1581	.6936	.7836	10.4741	634.3569
.0176.	60.5833	87.3464	.0300	.1732	.6936	.7836	11.4738	695.1223
.0176	60.5833	87.3464	.0350	.1871	.6936	.7836	12.3931	750.8179
.0176	60.5833	87.3464	.0400	.2000	.6936	.7836	13.2488	802.6581

86' R.O.W. 48' FACE-FACE 8" CURB 8" CROWN 1.5' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0176	115.5833	87.4915	.0050	.0707	1.3211	1.2040	7.1949	831.6155
.0176	115.5833	87.4915	.0100	.1000	1.3211	1.2040	10.1752	1176.0819
.0176	115.5833	87.4915	.0150	.1225	1.3211	1.2040	12.4620	1440.4003
.0176	115.5833	87.4915	.0200	.1414	1.3211	1.2040	14.3899	1663.2310
.0176	115.5833	87.4915	.0250	.1581	1.3211	1.2040	16.0884	1859.5487
.0176	115.5833	87.4915	.0300	.1732	1.3211	1.2040	17.6239	2037.0336
.0176	115.5833	87.4915	.0350	.1871	1.3211	1.2040	19.0360	2200.2478
.0176	115.5833	87.4915	.0400	.2000	1.3211	1.2040	20.3504	2352.1638

86' R.O.W. 48' FACE-FACE 8" CURB 6" CROWN 1.5' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0176	120.9167	87.4807	.0050	.0707	1.3822	1.2408	7.4151	896.6067
.0176	120.9167	87.4807	.0100	.1000	1.3822	1.2408	10.4865	1267.9934
.0176	120.9167	87.4807	.0150	.1225	1.3822	1.2408	12.8433	1552.9684
.0176	120.9167	87.4807	.0200	.1414	1.3822	1.2408	14.8302	1793.2135
.0176	120.9167	87.4807	.0250	.1581	1.3822	1.2408	16.5806	2004.8736
.0176	120.9167	87.4807	.0300	.1732	1.3822	1.2408	18.1632	2196.2290
.0176	120.9167	87.4807	.0350	.1871	1.3822	1.2408	19.6185	2372.1985
.0176	120.9167	87.4807	.0400	.2000	1.3822	1.2408	20.9730	2535.9868

86' R.O.W. 48' FACE-FACE 8" CURB 4" CROWN 1.5' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0176	126.2500	87.4730	.0050	.0707	1.4433	1.2771	7.6319	963.5271
.0176	126.2500	87.4730	.0100	.1000	1.4433	1.2771	10.7931	1362.6331
.0176	126.2500	87.4730	.0150	.1225	1.4433	1.2771	13.2168	1668.8779
.0176	126.2500	87.4730	.0200	.1414	1.4433	1.2771	15.2638	1927.0542
.0176	126.2500	87.4730	.0250	.1581	1.4433	1.2771	17.0654	2154.5121
.0176	126.2500	87.4730	.0300	.1732	1.4433	1.2771	18.6943	2360.1498
.0176	126.2500	87.4730	.0350	.1871	1.4433	1.2771	20.1921	2549.2531
.0176	126.2500	87.4730	.0400	.2000	1.4433	1.2771	21.5863	2725.2662

86' R.O.W. 48' FACE-FACE 8" CURB 2" CROWN 1.5' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0176	131.5833	87.4684	.0050	.0707	1.5044	1.3129	7.8456	1032.3454
.0176	131.5833	87.4684	.0100	.1000	1.5044	1.3129	11.0953	1459.9569
.0176	131.5833	87.4684	.0150	.1225	1.5044	1.3129	13.5889	1788.0748
.0176	131.5833	87.4684	.0200	.1414	1.5044	1.3129	15.6911	2064.6909
.0176	131.5833	87.4684	.0250	.1581	1.5044	1.3129	17.5432	2308.3946
.0176	131.5833	87.4684	.0300	.1732	1.5044	1.3129	19.2176	2528.7196
.0176	131.5833	87.4684	.0350	.1871	1.5044	1.3129	20.7574	2731.3293
.0176	131.5833	87.4684	.0400	.2000	1.5044	1.3129	22.1906	2919.9139

86' R.O.W. 48' FACE-FACE 8" CURB 8" CROWN 2.0' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0176	151.0833	87.6019	.0050	.0707	1.7247	1.4381	8.5913	1297.9957
.0176	151.0833	87.6019	.0100	.1000	1.7247	1.4381	12.1499	1835.6432
.0176	151.0833	87.6019	.0150	.1225	1.7247	1.4381	14.8805	2248.1945
.0176	151.0833	87.6019	.0200	.1414	1.7247	1.4381	17.1825	2595.9914
.0176	151.0833	87.6019	.0250	.1581	1.7247	1.4381	19.2106	2902.4067
.0176	151.0833	87.6019	.0300	.1732	1.7247	1.4381	21.0442	3179.4272
.0176	151.0833	87.6019	.0350	.1871	1.7247	1.4381	22.7303	3434.1739
.0176	151.0833	87.6019	.0400	.2000	1.7247	1.4381	24.2997	3671.2863

86' R.O.W. 48' FACE-FACE 8" CURB 6" CROWN 2.0' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0176	156.4167	87.5911	.0050	.0707	1.7858	1.4719	8.7928	1375.3456
.0176	156.4167	87.5911	.0100	.1000	1.7858	1.4719	12.4349	1945.0324
.0176	156.4167	87.5911	.0150	.1225	1.7858	1.4719	15.2296	2382.1685
.0176	156.4167	87.5911	.0200	.1414	1.7858	1.4719	17.5857	2750.6912
.0176	156.4167	87.5911	.0250	.1581	1.7858	1.4719	19.6614	3075.3663
.0176	156.4167	87.5911	.0300	.1732	1.7858	1.4719	21.5380	3368.8949
.0176	156.4167	87.5911	.0350	.1871	1.7858	1.4719	23.2636	3638.8224
.0176	156.4167	87.5911	.0400	.2000	1.7858	1.4719	24.8699	3890.0648

86' R.O.W. 48' FACE-FACE 8" CURB 4" CROWN 2.0' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0176	161.7500	87.5834	.0050	.0707	1.8468	1.5053	8.9920	1454.4556
.0176	161.7500	87.5834	.0100	.1000	1.8468	1.5053	12.7166	2056.9109
.0176	161.7500	87.5834	.0150	.1225	1.8468	1.5053	15.5746	2519.1911
.0176	161.7500	87.5834	.0200	.1414	1.8468	1.5053	17.9840	2908.9113
.0176	161.7500	87.5834	.0250	.1581	1.8468	1.5053	20.1067	3252.2617
.0176	161.7500	87.5834	.0300	.1732	1.8468	1.5053	22.0258	3562.6742
.0176	161.7500	87.5834	.0350	.1871	1.8468	1.5053	23.7906	3848.1279
.0176	161.7500	87.5834	.0400	.2000	1.8468	1.5053	25.4332	4113.8218

86' R.O.W. 48' FACE-FACE 8" CURB 2" CROWN 2.0' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0176	167.0833	87.5788	.0050	.0707	1.9078	1.5382	9.1888	1535.3020
.0176	167.0833	87.5788	.0100	.1000	1.9078	1.5382	12.9950	2171.2449
.0176	167.0833	87.5788	.0150	.1225	1.9078	1.5382	15.9155	2659.2210
.0176	167.0833	87.5788	.0200	.1414	1.9078	1.5382	18.3777	3070.6039
.0176	167.0833	87.5788	.0250	.1581	1.9078	1.5382	20.5469	3433.0396
.0176	167.0833	87.5788	.0300	.1732	1.9078	1.5382	22.5080	3760.7064
.0176	167.0833	87.5788	.0350	.1871	1.9078	1.5382	24.3114	4062.0272
.0176	167.0833	87.5788	.0400	.2000	1.9078	1.5382	25.9900	4342.4897

EXHIBIT F

STREETS AND MAXIMUM RUNOFFS

STREET DESCRIPTION & LOCATION	MAXIMUM RUNOFF (in c.f.s.)
A. Unnamed east-west street approximately 1950' north of Academy Blvd., N.E. - 50' R/W, 32' F to F	124
B. Esther Avenue, N.E. - 50' R/W, 32' face to face	14
C. Hensch Avenue, N.E. - 50' R/W, 32' face to face	15
D. Hooten Avenue, N.E. - 50' R/W, 32' face to face	14
E. Burlison Drive, N.E. - 86' R/W, 48' face to face, from southwest corner of the property to the northwest corner of the property	124

REVISED MAY 1972
MM #1

CAMPBELL-HICKS and ASSOCIATES, Inc.
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Consulting Civil Engineers
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DRAINAGE STUDY RELATIVE TO THE DEVELOPMENT OF MEADOWOOD MANOR, UNIT 1 ALBUQUERQUE, NEW MEXICO

MARCH 1972

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DRAINAGE STUDY RELATIVE TO THE DEVELOPMENT OF
MEADOWOOD MANOR, UNIT 1

I. GENERAL

The purpose of this report is to present findings pertinent to estimating and handling of runoff for use in the master planned development of Meadowood Manor, Unit 1, and to describe a proposed method for providing adequate storm drainage in the area.

II. LOCATION

Meadowood Manor, Unit 1, is bounded on the west by Academy Acres, Unit 4, and Burlison Drive, N.E.; on the north by unplatted land; on the east by Bear Canyon Village; and on the south by unplatted land and Academy Acres, Unit 4. It is situated mainly in the Southwest one-quarter (SW 1/4) of Section 30, Township 11 North, Range 4 East, N.M.P.M.

III. EXISTING DRAINAGE CONDITIONS

A. General

This area is generally located between Burlison Drive, N.E., on the west and Truchas Drive, N.E., on the east. It is crossed by three small arroyos in a general east-west direction.

B. Topography

Meadowood Manor, Unit 1, lies between Burlison Drive, N.E., and Truchas Drive, N.E., north of Academy Blvd. It is crossed by three minor drainage areas with the drainage area limits on the east at Truchas Drive in Bear Canyon Village, Reference 6, and as shown in Exhibit "A", a portion of a scale photograph by Koogle and Pouls Engineering, Inc., and Exhibit "C", a plat by Ralph K. Hicks and Associates, Inc. Through field investigation, it is considered that the photograph is satisfactory for the purpose of determining the original division lines.

C. Drainage Areas and Channels

Upon completion of Truchas Drive, N.E., drainage areas contributing runoff from the east end of the development will be non-existent. The runoff within the development can be carried by planning the streets in such a manner (i.e. set property lines high enough and adjust grades

on streets) as to carry water across the development.

IV. PROPOSED DRAINAGE PLANS

A. General

In order to provide an adequate system of storm drainage for this proposed development it was necessary to:

(1) Determine the drainage areas which can and will contribute storm runoff which could be expected during a 100 year design storm.

(2) Determine the amount of runoff which could be expected after the entire area is developed.

(3) Prepare a table of street carrying capacities for use in sizing streets and overflow sections (section above high curb to property line).

(4) Determine the points where storm runoff will concentrate.

(5) Determine the ability of the drainage channels, streets plus overflow sections, and structures to handle the runoff that may concentrate on them.

(6) Determine and recommend the means by which the expected runoff can be carried by the master planned area.

(7) Design additional channels and structures to simulate and distribute the expected runoff in a manner similar the the existing terrain at the outlet end.

B. Drainage Areas

A study of the photography, Exhibit "A", to determine the areas which could conceivably contribute runoff to the proposed development was made, for which a copy of computations is contained in Exhibit "D" of this report. Finally, the Master Plan of Drainage, Exhibit "B", was prepared showing the entire area with directions of flow as well as runoff quantities.

C. Runoff Quantities

The quantities of storm runoff to be expected from each drainage area were determined using the Rational Formula, Q=CIA, where: Q=quantity of storm runoff in cubic feet per second; C=coefficient of runoff dependent upon the type of surface drained; I=intensity of rainfall in inches per hour for a duration equal to the total accumulation time in minutes; and A=area of

contributing watershed in acres.

The area (A) of each separate contributing area was determined by outlining the watershed on a scale photograph or the contour map and measuring the area (by planimeter) in acres.

The intensity of rainfall (I) was determined by assuming a 100 year frequency rainfall and then utilizing Intensity Duration Frequency Curves (Chart I) for the Albuquerque Area, "Master Plan of Drainage - City of Albuquerque, New Mexico and Environs," 1963, prepared by Gordon Herkenhoff and Associates, Consulting Engineers, together with expected accumulation of runoff from each of the areas. The total accumulation times are determined by a combination of Yarnell's Method and probable future streets and drainage channel alignments and grades, as shown, assuming overland flows to cross either poor grass, asphalt pavement or bare soil surfaces, depending upon the probable type of development in each area and estimating the probable type of grading to be done in each area; assuming future streets to be asphalt paved with concrete curbs and crowned with either full crown (8"), 3/4 crown (6"), 1/2 crown (4"). These times of flow were calculated by use of tables on pages 5.00, 5.04, and 5.05 of Design by E.E. Seelye.

The coefficient of runoff (C) was determined by assuming the maximum possible development in the areas under consideration. A coefficient of 0.65 is used for areas where dense residential development was most probable. A coefficient of 0.70 should be used for commercial areas or where a large amount of the exposed surface is impermeable.

The quantities of runoff are shown along with the areas after development on Exhibit "C", the Plan of Drainage for this subdivision.

D. Drainage Channels and Facilities

All existing structure capacities, as well as any proposed future structures, were verified from computer output sheets which form a part of Exhibit "E" and are based on Manning's Equation, $Q=AV$, where $V=\frac{1.486}{n}R^{2/3}S^{1/2}$ when A=cross-sectional area of the channel or structure; R=hydraulic radius of channel or area divided by wetted perimeter; S=slope of channel or facility in feet per foot; and "n" values of 0.015 for concrete and asphalt surfaces, 0.013 for concrete pipes, 0.0225 for dirt lined channels or a composite "n" value based on proportional wetted surfaces with different values.

V. CONCLUSIONS AND RECOMMENDATIONS

On the basis of this study and its computations, it is concluded that the development of this area can be satisfactorily accomplished provided adequate storm drainage is done.

Recommended street grades are contained in Exhibit "F".

Completion of Truchas Drive, N.E., prior to or at least concurrently with construction of Unit 1 of Meadowood Manor is necessary.

The total runoff quantities "Q" for Academy Acres, Unit 4, will be reduced 26 c.f.s. upon completion of this storm drainage plan.

If all the above recommendations and conclusions are followed, this plan of handling drainage should provide the necessary requirements to make this a very satisfactory development.

Respectfully submitted,

Donald L. Campbell

Donald L. Campbell
P.E. & L.S. No. 3633

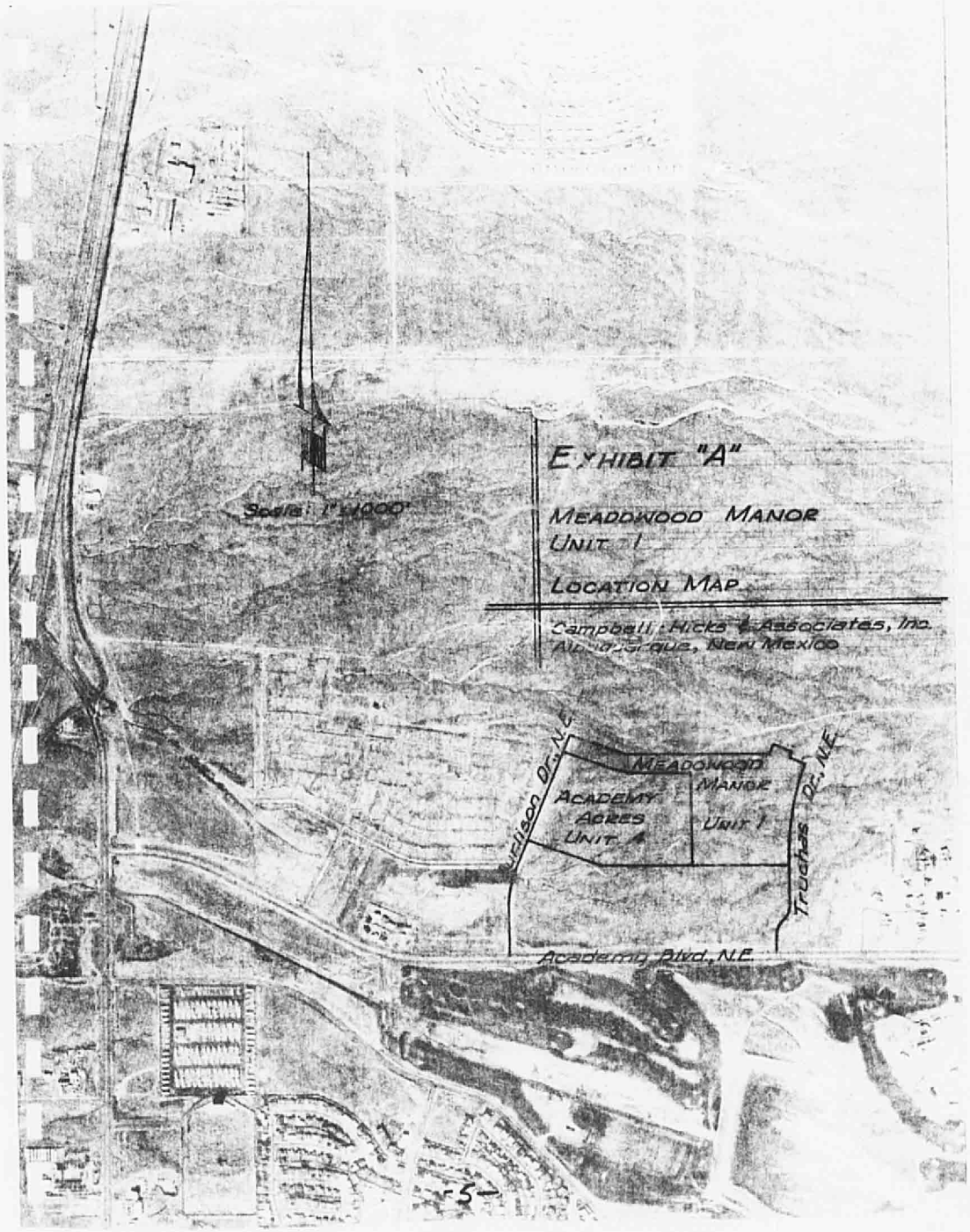
EXHIBIT "A"
MEADOWOOD MANOR
UNIT 1
LOCATION MAP
Campbell, Hicks & Associates, Inc.
Albuquerque, New Mexico
Scale: 1" = 1000'
MEADOWOOD
MANOR
UNIT 1
ACADEMY
ACRES
UNIT A
Wellson Dr. N.E.
Truchas Dr. N.E.
Academy Blvd. N.E.

EXHIBIT D

SUMMARY OF RUNOFF COMPUTATIONS

Sheet No.	Area Number	Area (in acres)	Expected Runoff (in c.f.s.) Individual	Total
1	1	5	14	
2	2	5	15	
3	3	5	14	
4	4	11	31	124

RUNOFF COMPUTATIONS

Sheet No. 1

Job No. HEADWOOD MANOR UNIT #1

Drainage Area No. 1

Area = 5.0 acres

Maximum Overland Flow: L = 121 S = 0.4

Maximum Channel Flow:

Channel No. 1 L = 756' S = 3.9

Channel No. 2 L = _____ S = _____

Channel No. 3 L = _____ S = _____

Accumulation Time

Overland Flow: 18.5 min.

Channel No. 1 Flow:

Velocity= 7.0 ft/sec; Time= $\frac{756}{7.0 \times 60}$ = 1.8 min.

Channel No. 2 Flow:

Velocity= _____ ft/sec; Time= $\frac{\quad}{\times 60}$ = _____ min.

Channel No. 3 Flow:

Velocity= _____ ft/sec; Time= $\frac{\quad}{\times 60}$ = _____ min.

Total Accumulation Time: T = 20.3 min.

$I = \frac{189}{T+25} = \frac{189}{45.3} = 4.17$

Q = CIA = (0.65)(4.17)(5) = 14 c.f.s.

Date: 3-15-72

Comp. by: [illegible]

Checked by: [illegible]

RUNOFF COMPUTATIONS

Sheet No. 2

Job No. Heatwood Manor Unit #1

Drainage Area No. 2

Area = 5 acres

Maximum Overland Flow: L = 132' S = 3.3

Maximum Channel Flow:

Channel No. 1 L = 762' S = 2.3

Channel No. 2 L = _____ S = _____

Channel No. 3 L = _____ S = _____

Accumulation Time

Overland Flow: 13.0 min.

Channel No. 1 Flow:

Velocity= 5.5 ft/sec; Time= $\frac{762}{5.5 \times 60}$ = 2.3 min.

Channel No. 2 Flow:

Velocity= _____ ft/sec; Time= $\frac{\quad}{\quad \times 60}$ = _____ min.

Channel No. 3 Flow:

Velocity= _____ ft/sec; Time= $\frac{\quad}{\quad \times 60}$ = _____ min.

Total Accumulation Time: T = 15.3 min.

$$I = \frac{189}{T+25} = \frac{189}{40.3} = 4.69$$

$$Q = CIA = (0.65)(4.69)(5) = 15 \text{ c.f.s.}$$

Date: 3-15-72

Comp. by: AEP

Checked by: A

RUNOFF COMPUTATIONS

Sheet No. 3

Job No. Headwood Manor Unit #1

Drainage Area No. 3

Area = 5 acres

Maximum Overland Flow: L = 130' S = 1.9

Maximum Channel Flow:

Channel No. 1 L = 806' S = 1.2

Channel No. 2 L = _____ S = _____

Channel No. 3 L = _____ S = _____

Accumulation Time

Overland Flow: 14.2 min.

Channel No. 1 Flow:

Velocity= 4.3 ft/sec; Time= $\frac{806}{4.3 \times 60}$ = 3.1 min.

Channel No. 2 Flow:

Velocity= _____ ft/sec; Time= $\frac{\quad}{\times 60}$ = _____ min.

Channel No. 3 Flow:

Velocity= _____ ft/sec; Time= $\frac{\quad}{\times 60}$ = _____ min.

Total Accumulation Time: T = 17.3 min.

$I = \frac{189}{T+25} = \frac{189}{42.3} = 4.46$

Q = CIA = (0.65)(4.46)(5) = 14 c.f.s.

Date: 3-15-72

Comp. by: MP

Checked by: TL.

RUNOFF COMPUTATIONS

Sheet No. 4

Job No. Headwood Manor Unit #1

Drainage Area No. 4

Area = 11 acres

Maximum Overland Flow: L = 155' S = 2.0

Maximum Channel Flow:

Channel No. 1 L = 1250' S = 3.0

Channel No. 2 L = _____ S = _____

Channel No. 3 L = _____ S = _____

Accumulation Time

Overland Flow: 14.2 min.

Channel No. 1 Flow:

Velocity= 6.12 ft/sec; Time= $\frac{1250}{6.12 \times 60}$ = 3.4 min.

Channel No. 2 Flow:

Velocity= _____ ft/sec; Time= $\frac{\quad}{\times 60}$ = _____ min.

Channel No. 3 Flow:

Velocity= _____ ft/sec; Time= $\frac{\quad}{\times 60}$ = _____ min.

Total Accumulation Time: T = 18.9 min.

$I = \frac{189}{25+T} = \frac{189}{43.9} = 4.31$

Q = CIA = (0.65)(4.31)(11) = 31 c.f.s.

Date: 3-15-72

Comp. by: [illegible]

Checked by: [illegible]

TOTAL Q = 31 + 6 + 50 + 31 + 6 = 124 c.f.s.

EXHIBIT E

STREET CARRYING CAPACITIES
AT VARIOUS GRADES
IN CFS

n(conc)=.015 n(soil)=.0225 n(composite)=.006

STREET WIDTH	TYPE CROWN	CURB HT	.0050	.0100	.0150	.0200	.0250	.0300	.0350	.0400
32'	8"	8"	18	25	31	36	40	44	47	50

R/W TO R/W
OVERFLOW SECTIONS CAPACITIES

R/W	W	HI CURB DEPTH	.0050	.0100	.0150	.0200	.0250	.0300	.0350	.0400
50'	32'	0.1	14	19	23	27	30	33	36	38
		0.2	43	61	75	86	96	105	114	122
		0.4	137	193	237	273	305	335	361	386

09/21/71 09.48.14.
PROGRAM AAPIBAN

FACE TO FACE = ? 32
CURB = ? 8
CROWN = ? 8

N	A	P	S	S1/2	R	R2/3	V	Q
.0150	7.1111	33.3703	.0050	.0707	.2131	.3568	2.4998	17.7719
.0150	7.1111	33.3703	.0100	.1000	.2131	.3568	3.5344	25.1333
.0150	7.1111	33.3703	.0150	.1225	.2131	.3568	4.3287	30.7819
.0150	7.1111	33.3703	.0200	.1414	.2131	.3568	4.9984	35.5439
.0150	7.1111	33.3703	.0250	.1581	.2131	.3568	5.5883	39.7392
.0150	7.1111	33.3703	.0300	.1732	.2131	.3568	6.1217	43.5322
.0150	7.1111	33.3703	.0350	.1871	.2131	.3568	6.6122	47.0201
.0150	7.1111	33.3703	.0400	.2000	.2131	.3568	7.0687	50.2666

FACE TO FACE = ? 32
CURB = ? 8
CROWN = ? 6

N	A	P	S	S1/2	R	R2/3	V	Q
.0150	10.6667	33.3542	.0050	.0707	.3198	.4676	3.2759	34.9430
.0150	10.6667	33.3542	.0100	.1000	.3198	.4676	4.6328	49.4169
.0150	10.6667	33.3542	.0150	.1225	.3198	.4676	5.6740	60.5231
.0150	10.6667	33.3542	.0200	.1414	.3198	.4676	6.5518	69.8860
.0150	10.6667	33.3542	.0250	.1581	.3198	.4676	7.3252	78.1350
.0150	10.6667	33.3542	.0300	.1732	.3198	.4676	8.0243	85.5926
.0150	10.6667	33.3542	.0350	.1871	.3198	.4676	8.6672	92.4505
.0150	10.6667	33.3542	.0400	.2000	.3198	.4676	9.2657	98.8338

FACE TO FACE = ? 32
CURB = ? 8
CROWN = ? 4

N	A	P	S	S1/2	R	R2/3	V	Q
.0150	14.2222	33.3426	.0050	.0707	.4265	.5666	3.9694	56.4537
.0150	14.2222	33.3426	.0100	.1000	.4265	.5666	5.6136	79.8375
.0150	14.2222	33.3426	.0150	.1225	.4265	.5666	6.8752	97.7806
.0150	14.2222	33.3426	.0200	.1414	.4265	.5666	7.9388	112.9073
.0150	14.2222	33.3426	.0250	.1581	.4265	.5666	8.8758	126.2342
.0150	14.2222	33.3426	.0300	.1732	.4265	.5666	9.7230	138.2827
.0150	14.2222	33.3426	.0350	.1871	.4265	.5666	10.5020	149.3623
.0150	14.2222	33.3426	.0400	.2000	.4265	.5666	11.2272	159.6751

FACE TO FACE = ? 32
CURB = ? 8
CROWN = ? 2

N	A	P	S	S1/2	R	R2/3	V	Q
.0150	17.7778	33.3356	.0050	.0707	.5333	.6576	4.6067	81.8972
.0150	17.7778	33.3356	.0100	.1000	.5333	.6576	6.5149	115.8201
.0150	17.7778	33.3356	.0150	.1225	.5333	.6576	7.9791	141.8501
.0150	17.7778	33.3356	.0200	.1414	.5333	.6576	9.2134	163.7984
.0150	17.7778	33.3356	.0250	.1581	.5333	.6576	10.3009	183.1277
.0150	17.7778	33.3356	.0300	.1732	.5333	.6576	11.2841	200.6064
.0150	17.7778	33.3356	.0350	.1871	.5333	.6576	12.1852	216.6796
.0150	17.7778	33.3356	.0400	.2000	.5333	.6576	13.0298	231.640[illegible]

FACE

0.640 / 1.192 /

50' R.O.W. 3.2' F to F

R above Hi Card

	n	A	P	S	R	R2/3	S1/2	V	Q=AV
	.0060	4.1000	50.0000	.0050	.0820	.1887	.0707	3.3054	13.5522
	.0060	4.1000	50.0000	.0100	.0820	.1887	.1000	4.6745	19.1658
	.0060	4.1000	50.0000	.0150	.0820	.1887	.1224	5.7251	23.4732
0.1	.0060	4.1000	50.0000	.0200	.0820	.1887	.1414	6.6108	27.1045
	.0060	4.1000	50.0000	.0250	.0820	.1887	.1581	7.3911	30.3038
	.0060	4.1000	50.0000	.0300	.0820	.1887	.1732	8.0966	33.1961
	.0060	4.1000	50.0000	.0350	.0820	.1887	.1870	8.7453	35.8559
	.0060	4.1000	50.0000	.0400	.0820	.1887	.2000	9.3491	38.3316
	.0060	8.2000	50.0040	.0050	.1639	.2995	.0707	5.2467	43.0235
	.0060	8.2000	50.0040	.0100	.1639	.2995	.1000	7.4200	60.8444
	.0060	8.2000	50.0040	.0150	.1639	.2995	.1224	9.0876	74.5189
	.0060	8.2000	50.0040	.0200	.1639	.2995	.1414	10.4935	86.0470
0.2	.0060	8.2000	50.0040	.0250	.1639	.2995	.1581	11.7321	96.2034
	.0060	8.2000	50.0040	.0300	.1639	.2995	.1732	12.8519	105.3856
	.0060	8.2000	50.0040	.0350	.1639	.2995	.1870	13.8816	113.8295
	.0060	8.2000	50.0040	.0400	.1639	.2995	.2000	14.8401	121.6888
	.0060	16.4000	50.0160	.0050	.3278	.4755	.0707	8.3273	136.5692
	.0060	16.4000	50.0160	.0100	.3278	.4755	.1000	11.7767	193.1381
	.0060	16.4000	50.0160	.0150	.3278	.4755	.1224	14.4234	236.5449
	.0060	16.4000	50.0160	.0200	.3278	.4755	.1414	16.6547	273.1385
0.4	.0060	16.4000	50.0160	.0250	.3278	.4755	.1581	18.6206	305.3781
	.0060	16.4000	50.0160	.0300	.3278	.4755	.1732	20.3978	334.5250
	.0060	16.4000	50.0160	.0350	.3278	.4755	.1870	22.0322	361.3283
	.0060	16.4000	50.0160	.0400	.3278	.4755	.2000	23.5534	386.2762

EXHIBIT F

RECOMMENDED STREET GRADES

STREET DESCRIPTION & LOCATION	MIN. % GRADE	CROWN HEIGTH	PROPERTY LINE ABOVE HIGH CURB
A. Unnamed east-west street approximately 1950' north of Academy Blvd., N.E., 50 R/W, 32' F to F.	1.0	8"	0.3'
B. Esther Avenue, N.E. - 50' R/W, 32' face to face	0.5	8"	0.0'
C. Hensch Avenue, N.E. - 50' R/W, 32' face to face	0.5	8"	0.0'
D. Hooten Avenue, N.E. - 50' R/W, 32' face to face	0.5	8"	0.0'
E. Unnamed north-south street in eastern portion of development, 50' R/W, 32' face to face	0.5	8"	0.0'
F. Burlison Drive, N.E. - 86' R/W, 48' face to face, from southwest corner of property to northwest corner of property	0.5	2"	0.0'

REFERENCES

1. Design by E.E. Seelye, 1945.

2. Handbook of Hydraulics, by Horace W. King and Ernest F. Brater, 1963

3. Miscellaneous Publication No. 204 by David L. Yarnell, U.S. Department of Agriculture, 1961.

4. "Storm Drainage Conditions Relative to the Development of Academy Acres Subdivision, Bernalillo County, New Mexico," by Basil Smith Engineering Co., 1971.

5. "Master Plan of Drainage - City of Albuquerque, New Mexico and Environs," by Gordon Herkenhoff and Associates, 1963.

6. "Plan of Drainage, Bear Canyon Village" by Mossman-Gladden, Inc., undated.

7. "Drainage Study Relative to the Development of Academy Acres, Unit 4, Albuquerque, New Mexico" by Campbell-Hicks and Associates, Inc., February 1972.