G20/D6

1 PLAN

ROYAL HEIGHTS
UNIT 2

R.H. 2

ROYAL HEIGHTS UNIT #2

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DRAINAGE STUDY RELATIVE TO THE DEVELOPMENT OF ROYAL HEIGHTS, UNIT 2

September 1971

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DRAINAGE STUDY RELATIVE TO THE DEVELOPMENT OF ROYAL HEIGHTS, UNIT 2

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 Royal Heights, Unit 2 and to describe a proposed method for providing adequate storm drainage in the area.

II. LOCATION

Royal Heights, Unit 2 is bounded on the West by Eubank Heights Addition; on the North by Regional Shopping Center (P-1) and Deseret Subdivision (O-1); on the East by Eubank Heights Addition; and on the South by Piermont Heights. It is situated mainly in the Northwest one-half (NW 1/2) of the Southeast one- quarter (SE 1/4) of the Northeast one-quarter (NE 1/4) of Section 5, Township 10 North, Range 4 East, N.M.P.M.

III. EXISTING DRAINAGE CONDITIONS

A. General

This area, being generally located between Parsifal Street, N.E. and Eubank Blvd., N.E. within the Eubank Heights Addition, lies in the mesas and alluvial fans located on the West side of the Sandia Mountains. It is crossed by a small arroyo in a general East-West direction.

B. Topography

Royal Heights, Unit 2 lies between Parsifal Street, N.E. and Eubank Blvd., N.E., North of Comanche Road, N.E. within the Eubank Heights Addition. It is crossed by one semi-major and several minor drainage areas which form well defined channels as shown in Exhibit "A", a portion of a scale photograph by Koogle and Pouls Engineering, and Exhibit "B", from a planning study by Ralph K. Hicks and Associates, Inc. Through field investigation, it is considered that the photograph (dated 6-5-71) is satisfactory for the purpose of determining the original division lines.

C. Drainage Areas and Channels

At the present time only one semi-major drainage area contributing 34 c.f.s. from the North end of the development exists. However, the runoff from this area can be carried by aligning master planned streets in such a manner (i.e. set property lines high enough and adjust grades on streets within the development) as to carry water across the development, redepositing it in its original channel.

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 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 the storm runoff will concentrate.

(5) Determine the ability of each 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 to the existing terrain at the outlet end.

B. Drainage Areas

A study of the photography 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 (I) of rainfall 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 be across 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 crowned (6"), 1/2 crowned (4"). These times of flow were calculated by the 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 areas after development on Exhibit "B", the Master 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 which forms a part of Exhibit "C" and is 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 calculations it is concluded that the development of this area can be satisfactorily accomplished provided adequate storm drainage is done as recommended below:

A. Construct the easement channels as shown on Exhibit "B" prior to or at least concurrently with construction of the adjacent lot and street grading.

B. Recommended street grades are contained in Exhibit "E".

If all the above recommendations are followed this Master Plan of Drainage should provide the necessary requirements to make this a very satisfactory development.

Respectfully submitted,

Donald L. Campbell

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

THIS MICROIMAGE IS THE BEST POSSIBLE
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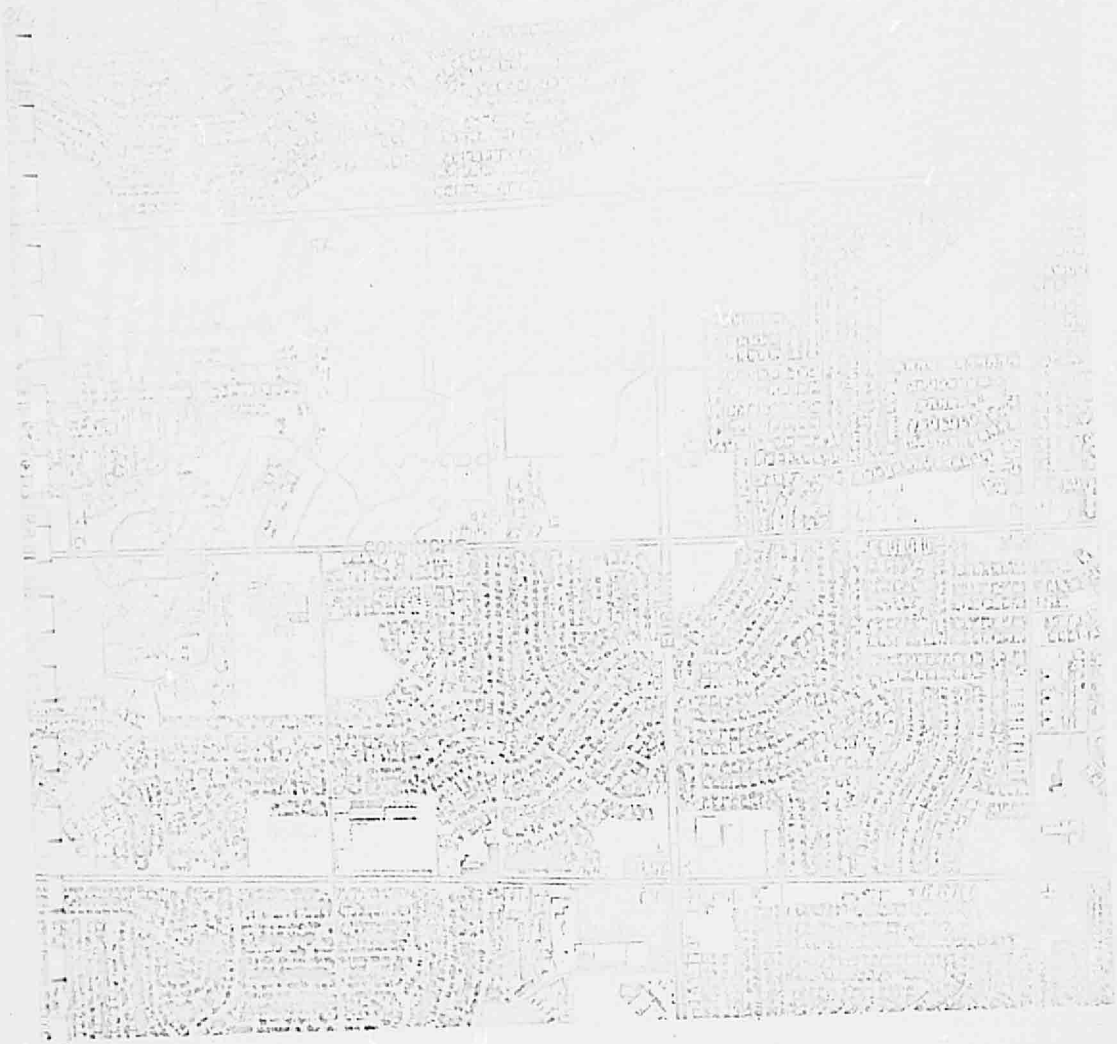

ROYAL HEIGHTS UNIT NO. 2

CAMPBELL - HICKS & ASSOCIATES, INC.

CIVIL ENGINEERS, LAND SURVEYORS, AND
LAND PLANNING CONSULTANTS
ALBUQUERQUE, NEW MEXICO

INSTRUCTIONS FOR DRAINAGE STUDY REVISIONS

ROYAL HEIGHTS, UNIT 2

1. Page i, Drainage Study Index: Change title of Exhibit "E" to "Streets and Maximum Runoffs".

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

3. Page 7, Exhibit "C": Delete table: R/W TO R/W, OVERFLOW SECTIONS CAPACITIES.

4. Replace pages 12, 13 and 14 with revised pages 12A, 12B, 12C, 12D; 13A,13B, 13C, 13D; and 14A, 14B, 14C and 14D.

5. Replace page 22 with revised page 22 entitled "Streets and Maximum Runoffs".

REVISED APRIL 1972

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	43.8477
.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	.8656	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	[illegible].46	5.8349	262.4101
.0165	44.9722	51.4184	.0100	.1000	.8746	[illegible]146	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

60' R.O.W. 40' FACE-FACE 8" CURB 8" CROWN .2' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	18.8556	61.3652	.0050	.0707	.3073	.4553	2.9056	54.7868
.0165	18.8556	61.3652	.0100	.1000	.3073	.4553	4.1091	77.4802
.0165	18.8556	61.3652	.0150	.1225	.3073	.4553	5.0327	94.8935
.0165	18.8556	61.3652	.0200	.1414	.3073	.4553	5.8112	109.5736
.0165	18.8556	61.3652	.0250	.1581	.3073	.4553	6.4971	122.5070
.0165	18.8556	61.3652	.0300	.1732	.3073	.4553	7.1172	134.1997
.0165	18.8556	61.3652	.0350	.1871	.3073	.4553	7.6875	144.9522
.0165	18.8556	61.3652	.0400	.2000	.3073	.4553	8.2183	154.9604

60' R.O.W. 40' FACE-FACE 8" CURB 6" CROWN .2' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	23.3000	61.3523	.0050	.0707	.3798	.5244	3.3463	77.9692
.0165	23.3000	61.3523	.0100	.1000	.3798	.5244	4.7324	110.2651
.0165	23.3000	61.3523	.0150	.1225	.3798	.5244	5.7960	135.0466
.0165	23.3000	61.3523	.0200	.1414	.3798	.5244	6.6926	155.9384
.0165	23.3000	61.3523	.0250	.1581	.3798	.5244	7.4826	174.3444
.0165	23.3000	61.3523	.0300	.1732	.3798	.5244	8.1968	190.9848
.0165	23.3000	61.3523	.0350	.1871	.3798	.5244	8.8535	206.2871
.0165	23.3000	61.3523	.0400	.2000	.3798	.5244	9.4648	220.5302

60' R.O.W. 40' FACE-FACE 8" CURB 4" CROWN .2' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	27.7444	61.3430	.0050	.0707	.4523	.5892	3.7597	104.3104
.0165	27.7444	61.3430	.0100	.1000	.4523	.5892	5.3170	147.5172
.0165	27.7444	61.3430	.0150	.1225	.4523	.5892	6.5120	180.6710
.0165	27.7444	61.3430	.0200	.1414	.4523	.5892	7.5194	208.6209
.0165	27.7444	61.3430	.0250	.1581	.4523	.5892	8.4069	233.2452
.0165	27.7444	61.3430	.0300	.1732	.4523	.5892	9.2093	255.5074
.0165	27.7444	61.3430	.0350	.1871	.4523	.5892	9.9472	275.9795
.0165	27.7444	61.3430	.0400	.2000	.4523	.5892	10.6340	295.0345

60' R.O.W. 40' FACE-FACE 8" CURB 2" CROWN .2' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	32.1889	61.3375	.0050	.0707	.5248	.6506	4.1514	133.6289
.0165	32.1889	61.3375	.0100	.1000	.5248	.6506	5.8710	188.9798
.0165	32.1889	61.3375	.0150	.1225	.5248	.6506	7.1904	231.4521
.0165	32.1889	61.3375	.0200	.1414	.5248	.6506	8.3028	267.2578
.0165	32.1889	61.3375	.0250	.1581	.5248	.6506	9.2828	298.8033
.0165	32.1889	61.3375	.0300	.1732	.5248	.6506	10.1688	327.3227
.0165	32.1889	61.3375	.0350	.1871	.5248	.6506	10.9836	353.5489
.0165	32.1889	61.3375	.0400	.2000	.5248	.6506	11.7419	377.9596

60' R.O.W. 40' FACE-FACE 8" CURB 8" CROWN .4' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	29.6556	61.3796	.0050	.0707	.4831	.6157	3.9286	116.5060
.0165	29.6556	61.3796	.0100	.1000	.4831	.6157	5.5559	164.7643
.0165	29.6556	61.3796	.0150	.1225	.4831	.6157	6.8046	201.7943
.0165	29.6556	61.3796	.0200	.1414	.4831	.6157	7.8573	233.0120
.0165	29.6556	61.3796	.0250	.1581	.4831	.6157	8.7847	260.5153
.0165	29.6556	61.3796	.0300	.1732	.4831	.6157	9.6232	285.3802
.0165	29.6556	61.3796	.0350	.1871	.4831	.6157	10.3942	308.2459
.0165	29.6556	61.3796	.0400	.2000	.4831	.6157	11.1119	329.5287

60' R.O.W. 40' FACE-FACE 8" CURB 6" CROWN .4' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	34.1000	61.3667	.0050	.0707	.5557	.6759	4.3125	147.0556
.0165	34.1000	61.3667	.0100	.1000	.5557	.6759	6.0988	207.9681
.0165	34.1000	61.3667	.0150	.1225	.5557	.6759	7.4694	254.7078
.0165	34.1000	61.3667	.0200	.1414	.5557	.6759	8.6250	294.1113
.0165	34.1000	61.3667	.0250	.1581	.5557	.6759	9.6430	328.8264
.0165	34.1000	61.3667	.0300	.1732	.5557	.6759	10.5634	360.2113
.0165	34.1000	61.3667	.0350	.1871	.5557	.6759	11.4098	389.0727
.0165	34.1000	61.3667	.0400	.2000	.5557	.6759	12.1975	415.9362

60' R.O.W. 40' FACE-FACE 8" CURB 4" CROWN .4' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	38.5444	61.3574	.0050	.0707	.6282	.7335	4.6799	180.3842
.0165	38.5444	61.3574	.0100	.1000	.6282	.7335	6.6184	255.1018
.0165	38.5444	61.3574	.0150	.1225	.6282	.7335	8.1058	312.4346
.0165	38.5444	61.3574	.0200	.1414	.6282	.7335	9.3598	360.7684
.0165	38.5444	61.3574	.0250	.1581	.6282	.7335	10.4646	403.3514
.0165	38.5444	61.3574	.0300	.1732	.6282	.7335	11.4634	441.8493
.0165	38.5444	61.3574	.0350	.1871	.6282	.7335	12.3819	477.2518
.0165	38.5444	61.3574	.0400	.2000	.6282	.7335	13.2368	510.2036

60' R.O.W. 40' FACE-FACE 8" CURB 2" CROWN .4' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	42.9889	61.3519	.0050	.0707	.7007	.7889	5.0333	216.3774
.0165	42.9889	61.3519	.0100	.1000	.7007	.7889	7.1182	306.0039
.0165	42.9889	61.3519	.0150	.1225	.7007	.7889	8.7180	374.7767
.0165	42.9889	61.3519	.0200	.1414	.7007	.7889	10.0667	432.7549
.0165	42.9889	61.3519	.0250	.1581	.7007	.7889	11.2549	483.8346
.0165	42.9889	61.3519	.0300	.1732	.7007	.7889	12.3291	530.0143
.0165	42.9889	61.3519	.0350	.1871	.7007	.7889	13.3169	572.4809
.0165	42.9889	61.3519	.0400	.2000	.7007	.7889	14.2364	612.0078

60' R.O.W. 40' FACE-FACE 8" CURB 8" CROWN .6' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	40.4556	61.4074	.0050	.0707	.6588	.7571	4.8301	195.4036
.0165	40.4556	61.4074	.0100	.1000	.6588	.7571	6.8308	276.3425
.0165	40.4556	61.4074	.0150	.1225	.6588	.7571	8.3659	338.4490
.0165	40.4556	61.4074	.0200	.1414	.6588	.7571	9.6602	390.8073
.0165	40.4556	61.4074	.0250	.1581	.6588	.7571	10.8004	436.9358
.0165	40.4556	61.4074	.0300	.1732	.6588	.7571	11.8312	478.6392
.0165	40.4556	61.4074	.0350	.1871	.6588	.7571	12.7792	516.9894
.0165	40.4556	61.4074	.0400	.2000	.6588	.7571	13.6615	552.6850

60' R.O.W. 40' FACE-FACE 8" CURB 6" CROWN .6' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	44.9000	61.3944	.0050	.0707	.7313	.8117	5.1783	232.5051
.0165	44.9000	61.3944	.0100	.1000	.7313	.8117	7.3232	328.8119
.0165	44.9000	61.3944	.0150	.1225	.7313	.8117	8.9691	402.7107
.0165	44.9000	61.3944	.0200	.1414	.7313	.8117	10.3566	465.0102
.0165	44.9000	61.3944	.0250	.1581	.7313	.8117	11.5790	519.8972
.0165	44.9000	61.3944	.0300	.1732	.7313	.8117	12.6842	569.5189
.0165	44.9000	61.3944	.0350	.1871	.7313	.8117	13.7005	615.1507
.0165	44.9000	61.3944	.0400	.2000	.7313	.8117	14.6464	657.6237

60' R.O.W. 40' FACE-FACE 8" CURB 4" CROWN .6' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	49.3444	61.3851	.0050	.0707	.8038	.8645	5.5151	272.1386
.0165	49.3444	61.3851	.0100	.1000	.8038	.8645	7.7995	384.8621
.0165	49.3444	61.3851	.0150	.1225	.8038	.8645	9.5524	471.3579
.0165	49.3444	61.3851	.0200	.1414	.8038	.8645	11.0302	544.2772
.0165	49.3444	61.3851	.0250	.1581	.8038	.8645	12.3321	608.5204
.0165	49.3444	61.3851	.0300	.1732	.8038	.8645	13.5091	666.6007
.0165	49.3444	61.3851	.0350	.1871	.8038	.8645	14.5915	720.0111
.0165	49.3444	61.3851	.0400	.2000	.8038	.8645	15.5990	769.7242

60' R.O.W. 40' FACE-FACE 8" CURB 2" CROWN .6' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	53.7889	61.3796	.0050	.0707	.8763	.9158	5.8418	314.2221
.0165	53.7889	61.3796	.0100	.1000	.8763	.9158	8.2615	444.3771
.0165	53.7889	61.3796	.0150	.1225	.8763	.9158	10.1182	544.2486
.0165	53.7889	61.3796	.0200	.1414	.8763	.9158	11.6835	628.4442
.0165	53.7889	61.3796	.0250	.1581	.8763	.9158	13.0626	702.6219
.0165	53.7889	61.3796	.0300	.1732	.8763	.9158	14.3093	769.6838
.0165	53.7889	61.3796	.0350	.1871	.8763	.9158	15.4559	831.3535
.0165	53.7889	61.3796	.0400	.2000	.8763	.9158	16.5230	888.7542

60' R.O.W. 40' FACE-FACE 8" CURB 8" CROWN .8' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	51.2556	61.4482	.0050	.0707	.8341	.8861	5.6515	289.6713
.0165	51.2556	61.4482	.0100	.1000	.8341	.8861	7.9924	409.6571
.0165	51.2556	61.4482	.0150	.1225	.8341	.8861	9.7887	501.7254
.0165	51.2556	61.4482	.0200	.1414	.8341	.8861	11.3030	579.3426
.0165	51.2556	61.4482	.0250	.1581	.8341	.8861	12.6372	647.7247
.0165	51.2556	61.4482	.0300	.1732	.8341	.8861	13.8433	709.5469
.0165	51.2556	61.4482	.0350	.1871	.8341	.8861	14.9525	766.3982
.0165	51.2556	61.4482	.0400	.2000	.8341	.8861	15.9849	819.3141

60' R.O.W. 40' FACE-FACE 8" CURB 6" CROWN .8' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	55.7000	61.4353	.0050	.0707	.9066	.9368	5.9744	332.7735
.0165	55.7000	61.4353	.0100	.1000	.9066	.9368	8.4491	470.6128
.0165	55.7000	61.4353	.0150	.1225	.9066	.9368	10.3479	576.3806
.0165	55.7000	61.4353	.0200	.1414	.9066	.9368	11.9488	665.5469
.0165	55.7000	61.4353	.0250	.1581	.9066	.9368	13.3591	744.1041
.0165	55.7000	61.4353	.0300	.1732	.9066	.9368	14.6342	815.1252
.0165	55.7000	61.4353	.0350	.1871	.9066	.9368	15.8067	880.4358
.0165	55.7000	61.4353	.0400	.2000	.9066	.9368	16.8981	941.2255

60' R.O.W. 40' FACE-FACE 8" CURB 4" CROWN .8' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	60.1444	61.4260	.0050	.0707	.9791	.9860	6.2887	378.2280
.0165	60.1444	61.4260	.0100	.1000	.9791	.9860	8.8935	534.8951
.0165	60.1444	61.4260	.0150	.1225	.9791	.9860	10.8923	655.1101
.0165	60.1444	61.4260	.0200	.1414	.9791	.9860	12.5773	756.4560
.0165	60.1444	61.4260	.0250	.1581	.9791	.9860	14.0619	845.7435
.0165	60.1444	61.4260	.0300	.1732	.9791	.9860	15.4040	926.4656
.0165	60.1444	61.4260	.0350	.1871	.9791	.9860	16.6382	1000.6972
.0165	60.1444	61.4260	.0400	.2000	.9791	.9860	17.7870	1069.7903

60' R.O.W. 40' FACE-FACE 8" CURB 2" CROWN .8' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	64.5889	61.4205	.0050	.0707	1.0516	1.0341	6.5951	425.9711
.0165	64.5889	61.4205	.0100	.1000	1.0516	1.0341	9.3269	602.4141
.0165	64.5889	61.4205	.0150	.1225	1.0516	1.0341	11.4231	737.8036
.0165	64.5889	61.4205	.0200	.1414	1.0516	1.0341	13.1902	851.9422
.0165	64.5889	61.4205	.0250	.1581	1.0516	1.0341	14.7471	952.5004
.0165	64.5889	61.4205	.0300	.1732	1.0516	1.0341	16.1547	1043.4119
.0165	64.5889	61.4205	.0350	.1871	1.0516	1.0341	17.4490	1127.0136
.0165	64.5889	61.4205	.0400	.2000	120516	1.0341	18.6538	1204.8282

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

N	A	P	S	S1/2	R	R2/3	V	Q
.0159	22.0000	65.3614	.0050	.0707	.3366	.4839	3.1940	70.2688
.0159	22.0000	65.3614	.0100	.1000	.3366	.4839	4.5170	99.3750
.0159	22.0000	65.3614	.0150	.1225	.3366	.4839	5.5322	121.7090
.0159	22.0000	65.3614	.0200	.1414	.3366	.4839	6.3881	140.5375
.0159	22.0000	65.3614	.0250	.1581	.3366	.4839	7.1421	157.1257
.0159	22.0000	65.3614	.0300	.1732	.3366	.4839	7.8238	172.1226
.0159	22.0000	65.3614	.0350	.1871	.3366	.4839	8.4506	185.9136
.0159	22.0000	65.3614	.0400	.2000	.3366	.4839	9.0341	198.7500

64' R.O.W. 48' FACE-FACE 8" CURB 6" CROWN .2' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0159	27.3333	65.3506	.0050	.0707	.4183	.5593	3.6917	100.9073
.0159	27.3333	65.3506	.0100	.1000	.4183	.5593	5.2209	142.7044
.0159	27.3333	65.3506	.0150	.1225	.4183	.5593	6.3943	174.7765
.0159	27.3333	65.3506	.0200	.1414	.4183	.5593	7.3835	201.8145
.0159	27.3333	65.3506	.0250	.1581	.4183	.5593	8.2550	225.6355
.0159	27.3333	65.3506	.0300	.1732	.4183	.5593	9.0429	247.1713
.0159	27.3333	65.3506	.0350	.1871	.4183	.5593	9.7674	266.9755
.0159	27.3333	65.3506	.0400	.2000	.4183	.5593	10.4418	285.4089

64' R.O.W. 48' FACE-FACE 8" CURB 4" CROWN .2' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0159	32.6667	65.3429	.0050	.0707	.4999	.6299	4.1579	135.8232
.0159	32.6667	65.3429	.0100	.1000	.4999	.6299	5.8801	192.0830
.0159	32.6667	65.3429	.0150	.1225	.4999	.6299	7.2016	235.2527
.0159	32.6667	65.3429	.0200	.1414	.4999	.6299	8.3157	271.6465
.0159	32.6667	65.3429	.0250	.1581	.4999	.6299	9.2972	303.7100
.0159	32.6667	65.3429	.0300	.1732	.4999	.6299	10.1846	332.6976
.0159	32.6667	65.3429	.0350	.1871	.4999	.6299	11.0006	359.3545
.0159	32.6667	65.3429	.0400	.2000	.4999	.6299	11.7602	384.1661

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

N	A	P	S	S1/2	R	R2/3	V	Q
.0159	38.0000	65.3383	.0050	.0707	.5816	.6968	4.5991	174.7662
.0159	38.0000	65.3383	.0100	.1000	.5816	.6968	6.5041	247.1567
.0159	38.0000	65.3383	.0150	.1225	.5816	.6968	7.9659	302.7039
.0159	38.0000	65.3383	.0200	.1414	.5816	.6968	9.1982	349.5324
.0159	38.0000	65.3383	.0250	.1581	.5816	.6968	10.2839	390.7891
.0159	38.0000	65.3383	.0300	.1732	.5816	.6968	11.2655	428.0880
.0159	38.0000	65.3383	.0350	.1871	.5816	.6968	12.1681	462.3879
.0159	38.0000	65.3383	.0400	.2000	.5816	.6968	13.0082	494.3134

64' R.O.W. 48' FACE-FACE 8" CURB 8" CROWN .3' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0159	28.0000	65.3697	.0050	.0707	.4283	.5682	3.7506	105.0174
.0159	28.0000	65.3697	.0100	.1000	.4283	.5682	5.3042	148.5171
.0159	28.0000	65.3697	.0150	.1225	.4283	.5682	6.4963	181.8955
.0159	28.0000	65.3697	.0200	.1414	.4283	.5682	7.5012	210.0349
.0159	28.0000	65.3697	.0250	.1581	.4283	.5682	8.3866	234.8261
.0159	28.0000	65.3697	.0300	.1732	.4283	.5682	9.1871	257.2391
.0159	28.0000	65.3697	.0350	.1871	.4283	.5682	9.9232	277.8500
.0159	28.0000	65.3697	.0400	.2000	.4283	.5682	10.6084	297.0342

64' R.O.W. 48' FACE-FACE 8" CURB 6" CROWN .3' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0159	33.3333	65.3589	.0050	.0707	.5100	.6383	4.2133	140.4450
.0159	33.3333	65.3589	.0100	.1000	.5100	.6383	5.9586	198.6192
.0159	33.3333	65.3589	.0150	.1225	.5100	.6383	7.2977	243.2579
.0159	33.3333	65.3589	.0200	.1414	.5100	.6383	8.4267	280.8900
.0159	33.3333	65.3589	.0250	.1581	.5100	.6383	9.4213	314.0446
.0159	33.3333	65.3589	.0300	.1732	.5100	.6383	10.3206	344.0186
.0159	33.3333	65.3589	.0350	.1871	.5100	.6383	11.1475	371.5825
.0159	33.3333	65.3589	.0400	.2000	.5100	.6383	11.9172	397.2384

64' R.O.W. 48' FACE-FACE 8" CURB 4" CROWN .3' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0159	38.6667	65.3512	.0050	.0707	.5917	.7048	4.6519	179.8736
.0159	38.6667	65.3512	.0100	.1000	.5917	.7048	6.5788	254.3797
.0159	38.6667	65.3512	.0150	.1225	.5917	.7048	8.0573	311.5502
.0159	38.6667	65.3512	.0200	.1414	.5917	.7048	9.3038	359.7472
.0159	38.6667	65.3512	.0250	.1581	.5917	.7048	10.4020	402.2096
.0159	38.6667	65.3512	.0300	.1732	.5917	.7048	11.3948	440.5986
.0159	38.6667	65.3512	.0350	.1871	.5917	.7048	12.3078	475.9009
.0159	38.6667	65.3512	.0400	.2000	.5917	.7048	13.1576	508.7594

64' R.O.W. 48' FACE-FACE 8" CURB 2" CROWN .3' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0159	44.0000	65.3466	.0050	.0707	.6733	.7682	5.0706	223.1068
.0159	44.0000	65.3466	.0100	.1000	.6733	.7682	7.1709	315.5206
.0159	44.0000	65.3466	.0150	.1225	.6733	.7682	8.7826	386.4323
.0159	44.0000	65.3466	.0200	.1414	.6733	.7682	10.1412	446.2136
.0159	44.0000	65.3466	.0250	.1581	.6733	.7682	11.3382	498.8819
.0159	44.0000	65.3466	.0300	.1732	.6733	.7682	12.4204	546.4978
.0159	44.0000	65.3466	.0350	.1871	.6733	.7682	13.4156	590.2851
.0159	44.0000	65.3466	.0400	.2000	.6733	.7682	14.3418	631.0413

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

N	A	P	S	S1/2	R	R2/3	V	Q
.0159	34.0000	65.3830	.0050	.0707	.5200	.6467	4.2680	145.1111
.0159	34.0000	65.3830	.0100	.1000	.5200	.6467	6.0358	205.2182
.0159	34.0000	65.3830	.0150	.1225	.5200	.6467	7.3923	251.3399
.0159	34.0000	65.3830	.0200	.1414	.5200	.6467	8.5359	290.2223
.0159	34.0000	65.3830	.0250	.1581	.5200	.6467	9.5435	324.4784
.0159	34.0000	65.3830	.0300	.1732	.5200	.6467	10.4544	355.4483
.0159	34.0000	65.3830	.0350	.1871	.5200	.6467	11.2920	383.9280
.0159	34.0000	65.3830	.0400	.2000	.5200	.6467	12.0717	410.4363

64' R.O.W. 48' FACE-FACE 8" CURB 6" CROWN .4' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0159	39.3333	65.3722	.0050	.0707	.6017	.7127	4.7038	185.0181
.0159	39.3333	65.3722	.0100	.1000	.6017	.7127	6.6522	261.6551
.0159	39.3333	65.3722	.0150	.1225	.6017	.7127	8.1473	320.4607
.0159	39.3333	65.3722	.0200	.1414	.6017	.7127	9.4077	370.0362
.0159	39.3333	65.3722	.0250	.1581	.6017	.7127	10.5181	413.7130
.0159	39.3333	65.3722	.0300	.1732	.6017	.7127	11.5220	453.1999
.0159	39.3333	65.3722	.0350	.1871	.6017	.7127	12.4452	489.5118
.0159	39.3333	65.3722	.0400	.2000	.6017	.7127	13.3045	523.3102

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

N	A	P	S	S1/2	R	R2/3	V	Q
.0159	44.6667	65.3645	.0050	.0707	.6833	.7758	5.1204	228.7091
.0159	44.6667	65.3645	.0100	.1000	.6833	.7758	7.2413	323.4434
.0159	44.6667	65.3645	.0150	.1225	.6833	.7758	8.8687	396.1357
.0159	44.6667	65.3645	.0200	.1414	.6833	.7758	10.2407	457.4181
.0159	44.6667	65.3645	.0250	.1581	.6833	.7758	11.4495	511.4090
.0159	44.6667	65.3645	.0300	.1732	.6833	.7758	12.5422	560.2205
.0159	44.6667	65.3645	.0350	.1871	.6833	.7758	13.5472	605.1073
.0159	44.6667	65.3645	.0400	.2000	.6833	.7758	14.4825	646.8869

64' R.O.W. 48' FACE-FACE 8" CURB 2" CROWN .4' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0159	50.0000	65.3599	.0050	.0707	.7650	.8364	5.5205	276.0236
.0159	50.0000	65.3599	.0100	.1000	.7650	.8364	7.8071	390.3563
.0159	50.0000	65.3599	.0150	.1225	.7650	.8364	9.5617	478.0869
.0159	50.0000	65.3599	.0200	.1414	.7650	.8364	11.0409	552.0472
.0159	50.0000	65.3599	.0250	.1581	.7650	.8364	12.3441	617.2075
.0159	50.0000	65.3599	.0300	.1732	.7650	.8364	13.5223	676.1169
.0159	50.0000	65.3599	.0350	.1871	.7650	.8364	14.6058	730.2897
.0159	50.0000	65.3599	.0400	.2000	.7650	.8364	15.6143	780.7126

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

N	A	P	S	S1/2	R	R2/3	V	Q
.0159	40.0000	65.4013	.0050	.0707	.6116	.7205	4.7549	190.1976
.0159	40.0000	65.4013	.0100	.1000	.6116	.7205	6.7245	268.9800
.0159	40.0000	65.4013	.0150	.1225	.6116	.7205	8.2358	329.4319
.0159	40.0000	65.4013	.0200	.1414	.6116	.7205	9.5099	380.3952
.0159	40.0000	65.4013	.0250	.1581	.6116	.7205	10.6324	425.2947
.0159	40.0000	65.4013	.0300	.1732	.6116	.7205	11.6472	465.8870
.0159	40.0000	65.4013	.0350	.1871	.6116	.7205	12.5804	503.2155
.0159	40.0000	65.4013	.0400	.2000	.6116	.7205	13.4490	537.9600

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

N	A	P	S	S1/2	R	R2/3	V	Q
.0159	45.3333	65.3905	.0050	.0707	.6933	.7833	5.1692	234.3391
.0159	45.3333	65.3905	.0100	.1000	.6933	.7833	7.3104	331.4055
.0159	45.3333	65.3905	.0150	.1225	.6933	.7833	8.9534	405.8872
.0159	45.3333	65.3905	.0200	.1414	.6933	.7833	10.3385	468.6782
.0159	45.3333	65.3905	.0250	.1581	.6933	.7833	11.5588	523.9981
.0159	45.3333	65.3905	.0300	.1732	.6933	.7833	12.6620	574.0112
.0159	45.3333	65.3905	.0350	.1871	.6933	.7833	13.6765	620.0029
.0159	45.3333	65.3905	.0400	.2000	.6933	.7833	14.6208	662.8110

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

N	A	P	S	S1/2	R	R2/3	V	Q
.0159	50.6667	65.3828	.0050	.0707	.7749	.8437	5.5675	282.0874
.0159	50.6667	65.3828	.0100	.1000	.7749	.8437	7.8737	398.9318
.0159	50.6667	65.3828	.0150	.1225	.7749	.8437	9.6432	488.5897
.0159	50.6667	65.3828	.0200	.1414	.7749	.8437	11.1350	564.1748
.0159	50.6667	65.3828	.0250	.1581	.7749	.8437	12.4493	630.7666
.0159	50.6667	65.3828	.0300	.1732	.7749	.8437	13.6376	690.9702
.0159	50.6667	65.3828	.0350	.1871	.7749	.8437	14.7303	746.3331
.0159	50.6667	65.3828	.0400	.2000	.7749	.8437	15.7473	797.8637

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

N	A	P	S	S1/2	R	R2/3	V	Q
.0159	56.0000	65.3782	.0050	.0707	.8566	.9019	5.9519	333.3076
.0159	56.0000	65.3782	.0100	.1000	.8566	.9019	8.4173	471.3682
.0159	56.0000	65.3782	.0150	.1225	.8566	.9019	10.3090	577.3057
.0159	56.0000	65.3782	.0200	.1414	.8566	.9019	11.9038	666.6153
.0159	56.0000	65.3782	.0250	.1581	.8566	.9019	13.3089	745.2985
.0159	56.0000	65.3782	.0300	.1732	.8566	.9019	14.5792	816.4336
.0159	56.0000	65.3782	.0350	.1871	.8566	.9019	15.7473	881.8491
.0159	56.0000	65.3782	.0400	.2000	.8566	.9019	16.8346	942.7363

EXHIBIT E

STREETS AND MAXIMUM RUNOFFS

STREET DESCRIPTION AND LOCATION	MAXIMUM RUNOFFS (in c.f.s.)
A. Piermont Drive, N.E. 135.81' East of Eubank Heights on Parsifal St., N.E. from a point at the edge of Piermont Heights 424.93' due North to an intersection with Prestly Place, N.E.	88
B. Prestly Place, N.E. beginning from a point 280' East of Parsifal St., N.E. and 424.93' North of the North edge of Piermont Heights to a point 603.98' due East to an intersection with Weimer Dr., N.E.	44
C. Weimer Dr., N.E. beginning from a point 900' East of Parsifal St., N.E. and 670' North of Piermont Heights running South 85' then Southwest 29' then South 56' and East 135'.	39
D. Orlando Place, N.E. leading Westerly from Piermont Dr., N.E. to Eubank Heights	88
E. Espejo Street, N.E. from a point 550' East of Parsifal St., N.E. and 534' North of Piermont Heights to a point 534' due South.	26

REVISED APRIL 1972
RH#2

STREET CARRYING CAPACITIES
AT VARIOUS GRADES
IN CFS
EXHIBIT C

N(CONC) = .015
N(SOIL) = .0225
N(COMPOSITE) = .006

STREET WIDTH	TYPE CROWN	.0050	.0100	.0150	.0200	.0250	.0300	.0350	.04
32'	8"	18	25	31	36	40	44	47	50
	6"	35	49	61	70	78	86	92	99
	4"	56	80	98	113	126	138	149	160
	2"	82	116	142	164	183	201	217	232
40'	8"	22	32	39	45	50	55	59	63
	6"	44	62	76	88	98	108	116	124
	4"	71	100	123	142	159	174	188	201
	2"	103	146	178	206	230	252	272	291
44'	8"	25	35	43	49	55	60	65	70
	6"	48	68	84	97	108	119	128	137
	4"	78	111	135	156	175	192	207	221
	2"	113	160	196	227	254	278	300	321
48'	8"	27	38	47	54	60	66	71	76
	6"	53	75	92	106	118	130	140	150
	4"	85	121	148	171	191	209	226	242
	2"	124	175	215	248	277	304	328	351

R/W	ST WD	HI CURB DEPTH	R/W TO R/W OVERFLOW SECTIONS CAPACITIES							
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
60'	40	0.1	17	24	29	33	37	41	44	47
		0.2	53	75	92	106	119	130	140	150
		0.4	168	238	292	337	376	412	445	476
		0.6	331	468	573	662	740	810	875	936
64'	48	0.1	19	27	33	39	43	47	51	55
		0.2	61	87	106	123	137	150	162	174
		0.4	195	275	337	390	436	477	515	551
		0.6	383	541	663	766	856	938	1013	1083

09/21/71. 09.48.14.
PROGRAM KAPLMAN

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	2.4992	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	163.7944
.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	12.1882	216.6796
.0150	17.7778	33.3356	.0400	.2000	.5333	.6576	13.0298	231.6403

FACE

0.640 / 1.192 / 3

FACE TO FACE = ? 40
CURB = ? 8
CROWN = ? 8

N	A	P	S	S1/2	R	R2/3	V	Q
.0150	8.8889	41.3629	.0050	.0707	.2149	.3588	2.5133	22.3400
.0150	8.8889	41.3629	.0100	.1000	.2149	.3588	3.5543	31.5936
.0150	8.8889	41.3629	.0150	.1225	.2149	.3588	4.3531	38.6941
.0150	8.8889	41.3629	.0200	.1414	.2149	.3588	5.0265	44.6801
.0150	8.8889	41.3629	.0250	.1581	.2149	.3588	5.6198	49.9539
.0150	8.8889	41.3629	.0300	.1732	.2149	.3588	6.1562	54.7217
.0150	8.8889	41.3629	.0350	.1871	.2149	.3588	6.6494	59.1062
.0150	8.8889	41.3629	.0400	.2000	.2149	.3588	7.1086	63.1872

FACE TO FACE = ? 40
CURB = ? 8
CROWN = ? 6

N	A	P	S	S1/2	R	R2/3	V	Q
.0150	13.3333	41.3500	.0050	.0707	.3225	.4702	3.2940	43.9198
.0150	13.3333	41.3500	.0100	.1000	.3225	.4702	4.6584	62.1119
.0150	13.3333	41.3500	.0150	.1225	.3225	.4702	5.7053	76.0713
.0150	13.3333	41.3500	.0200	.1414	.3225	.4702	6.5880	87.8396
.0150	13.3333	41.3500	.0250	.1581	.3225	.4702	7.3656	98.2076
.0150	13.3333	41.3500	.0300	.1732	.3225	.4702	8.0686	107.5810
.0150	13.3333	41.3500	.0350	.1871	.3225	.4702	8.7151	116.2008
.0150	13.3333	41.3500	.0400	.2000	.3225	.4702	9.3168	124.2239

FACE TO FACE = ? 40
CURB = ? 8
CROWN = ? 4

N	A	P	S	S1/2	R	R2/3	V	Q
.0150	17.7778	41.3407	.0050	.0707	.4300	.5697	3.9910	70.9506
.0150	17.7778	41.3407	.0100	.1000	.4300	.5697	5.6441	100.3393
.0150	17.7778	41.3407	.0150	.1225	.4300	.5697	6.9126	122.8901
.0150	17.7778	41.3407	.0200	.1414	.4300	.5697	7.9819	141.9012
.0150	17.7778	41.3407	.0250	.1581	.4300	.5697	8.9241	158.6504
.0150	17.7778	41.3407	.0300	.1732	.4300	.5697	9.7758	173.7928
.0150	17.7778	41.3407	.0350	.1871	.4300	.5697	10.5591	187.7177
.0150	17.7778	41.3407	.0400	.2000	.4300	.5697	11.2882	200.6787

FACE TO FACE = ? 40
CURB = ? 8
CROWN = ? 2

N	A	P	S	S1/2	R	R2/3	V	Q
.0150	22.2222	41.3352	.0050	.0707	.5376	.6612	4.6315	102.9228
.0150	22.2222	41.3352	.0100	.1000	.5376	.6612	6.5500	145.5549
.0150	22.2222	41.3352	.0150	.1225	.5376	.6612	8.0220	178.2676
.0150	22.2222	41.3352	.0200	.1414	.5376	.6612	9.2631	205.8457
.0150	22.2222	41.3352	.0250	.1581	.5376	.6612	10.3564	230.1485
.0150	22.2222	41.3352	.0300	.1732	.5376	.6612	11.3449	252.1084
.0150	22.2222	41.3352	.0350	.1871	.5376	.6612	12.2539	272.3082
.0150	22.2222	41.3352	.0400	.2000	.5376	.6612	13.0999	291.1098

0.655 / 1.215 / 3

FACE TO FACE = ? 44
CURB = ? 8
CROWN = ? 8

N	A	P	S	S1/2	R	R2/3	V	Q
.0150	9.7778	45.3603	.0050	.0707	.2156	.3595	2.5184	24.6242
.0150	9.7778	45.3603	.0100	.1000	.2156	.3595	3.5615	34.8239
.0150	9.7778	45.3603	.0150	.1225	.2156	.3595	4.3620	42.6504
.0150	9.7778	45.3603	.0200	.1414	.2156	.3595	5.0368	49.2484
.0150	9.7778	45.3603	.0250	.1581	.2156	.3595	5.6313	55.0614
.0150	9.7778	45.3603	.0300	.1732	.2156	.3595	6.1688	60.3168
.0150	9.7778	45.3603	.0350	.1871	.2156	.3595	6.6630	65.1496
.0150	9.7778	45.3603	.0400	.2000	.2156	.3595	7.1231	69.6478

FACE TO FACE = ? 44
CURB = ? 8
CROWN = ? 6

N	A	P	S	S1/2	R	R2/3	V	Q
.0150	14.6667	45.3485	.0050	.0707	.3234	.4712	3.3006	48.4087
.0150	14.6667	45.3485	.0100	.1000	.3234	.4712	4.6677	68.4602
.0150	14.6667	45.3485	.0150	.1225	.3234	.4712	5.7168	83.8463
.0150	14.6667	45.3485	.0200	.1414	.3234	.4712	6.6012	96.8173
.0150	14.6667	45.3485	.0250	.1581	.3234	.4712	7.3803	108.2451
.0150	14.6667	45.3485	.0300	.1732	.3234	.4712	8.0848	118.5765
.0150	14.6667	45.3485	.0350	.1871	.3234	.4712	8.7325	128.0773
.0150	14.6667	45.3485	.0400	.2000	.3234	.4712	9.3355	136.9204

FACE TO FACE = ? 44
CURB = ? 8
CROWN = ? 4

N	A	P	S	S1/2	R	R2/3	V	Q
.0150	19.5556	45.3401	.0050	.0707	.4313	.5709	3.9989	78.2002
.0150	19.5556	45.3401	.0100	.1000	.4313	.5709	5.6553	110.5918
.0150	19.5556	45.3401	.0150	.1225	.4313	.5709	6.9263	135.4408
.0150	19.5556	45.3401	.0200	.1414	.4313	.5709	7.9978	156.4005
.0150	19.5556	45.3401	.0250	.1581	.4313	.5709	8.9418	174.8610
.0150	19.5556	45.3401	.0300	.1732	.4313	.5709	9.7958	191.5507
.0150	19.5556	45.3401	.0350	.1871	.4313	.5709	10.5800	206.8984
.0150	19.5556	45.3401	.0400	.2000	.4313	.5709	11.3105	221.1837

FACE TO FACE = ? 44
CURB = ? 8
CROWN = ? 2

N	A	P	S	S1/2	R	R2/3	V	Q
.0150	24.4444	45.3350	.0050	.0707	.5392	.6625	4.6406	113.4376
.0150	24.4444	45.3350	.0100	.1000	.5392	.6625	6.5628	160.4250
.0150	24.4444	45.3350	.0150	.1225	.5392	.6625	8.0378	196.4797
.0150	24.4444	45.3350	.0200	.1414	.5392	.6625	9.2813	226.8752
.0150	24.4444	45.3350	.0250	.1581	.5392	.6625	10.3768	253.6542
.0150	24.4444	45.3350	.0300	.1732	.5392	.6625	11.3672	277.8642
.0150	24.4444	45.3350	.0350	.1871	.5392	.6625	12.2779	300.1276
.0150	24.4444	45.3350	.0400	.2000	.5392	.6625	13.1257	320.8500

0.669 / 1.227 / 3

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	.025	.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	175.2953
.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

R above Hi Card

50 R.O.W. 32' F to F

	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

60 R.O.W. 40 F to ℄

R above 1/i Curb

	n	A	P	S	R	R2/3	S1/2	V	Q=AV
	.0060	5.0000	60.0000	.0050	.0833	.1907	.0707	3.3411	16.7058
	.0060	5.0000	60.0000	.0100	.0833	.1907	.1000	4.7251	23.6256
	.0060	5.0000	60.0000	.0150	.0833	.1907	.1224	5.7870	28.9353
0.1	.0060	5.0000	60.0000	.0200	.0833	.1907	.1414	6.6823	33.4116
	.0060	5.0000	60.0000	.0250	.0833	.1907	.1581	7.4710	37.3554
	.0060	5.0000	60.0000	.0300	.0833	.1907	.1732	8.1841	40.9207
	.0060	5.0000	60.0000	.0350	.0833	.1907	.1870-	8.8399	44.1995
	.0060	5.0000	60.0000	.0400	.0833	.1907	.2000	9.4502	47.2512
	.0060	10.0000	60.0020	.0050	.1666	.3028	.0707	5.3036	53.0365
	.0060	10.0000	60.0020	.0100	.1666	.3028	.1000	7.5005	75.0050
	.0060	10.0000	60.0020	.0150	.1666	.3028	.1224	9.1862	91.8620
	.0060	10.0000	60.0020	.0200	.1666	.3028	.1414	10.6073	106.0731
0.2	.0060	10.0000	60.0020	.0250	.1666	.3028	.1581	11.8593	118.5933
	.0060	10.0000	60.0020	.0300	.1666	.3028	.1732	12.9912	129.9125
	.0060	10.0000	60.0020	.0350	.1666	.3028	.1870	14.0321	140.3215
	.0060	10.0000	60.0020	.0400	.1666	.3028	.2000	15.0010	150.0100
	.0060	20.0000	60.0140	.0050	.3332	.4806	.0707	8.4179	168.3581
	.0060	20.0000	60.0140	.0100	.3332	.4806	.1000	11.9047	238.0943
	.0060	20.0000	60.0140	.0150	.3332	.4806	.1224	14.5802	291.6048
	.0060	20.0000	60.0140	.0200	.3332	.4806	.1414	16.8358	336.7163
0.4	.0060	20.0000	60.0140	.0250	.3332	.4806	.1581	18.8230	376.4602
	.0060	20.0000	60.0140	.0300	.3332	.4806	.1732	20.6195	412.3915
	.0060	20.0000	60.0140	.0350	.3332	.4806	.1870	22.2716	445.4338
	.0060	20.0000	60.0140	.0400	.3332	.4806	.2000	23.8094	476.1887
	.0060	30.0000	60.0340	.0050	.4997	.6297	.0707	11.0281	330.8439
	.0060	30.0000	60.0340	.0100	.4997	.6297	.1000	15.5961	467.8839
	.0060	30.0000	60.0340	.0150	.4997	.6297	.1224	19.1012	573.0384
0.6	.0060	30.0000	60.0340	.0200	.4997	.6297	.1414	22.0562	661.6878
	.0060	30.0000	60.0340	.0250	.4997	.6297	.1581	24.6596	739.7894
	.0060	30.0000	60.0340	.0300	.4997	.6297	.1732	27.0132	810.3987
	.0060	30.0000	60.0340	.0350	.4997	.6297	.1870	29.1776	875.3306
	.0060	30.0000	60.0340	.0400	.4997	.6297	.2000	31.1922	935.7678

R above Hi Curb

64' R.O.W. 48' F to F

	n	A	P	S	R	R2/3	S1/2	V	Q=AV
	.0060	5.6000	64.0000	.0050	.0875	.1970	.0707	3.4516	19.3291
	.0060	5.6000	64.0000	.0100	.0875	.1970	.1000	4.8813	27.3355
	.0060	5.6000	64.0000	.0150	.0875	.1970	.1224	5.9784	33.4790
	.0060	5.6000	64.0000	.0200	.0875	.1970	.1414	6.9032	38.6582
0.1	.0060	5.6000	64.0000	.0250	.0875	.1970	.1581	7.7180	43.2212
	.0060	5.6000	64.0000	.0300	.0875	.1970	.1732	8.4547	47.3465
	.0060	5.6000	64.0000	.0350	.0875	.1970	.1870	9.1321	51.1401
	.0060	5.6000	64.0000	.0400	.0875	.1970	.2000	9.7626	54.6710
	.0060	11.2000	64.0040	.0050	.1749	.3128	.0707	5.4788	61.3636
	.0060	11.2000	64.0040	.0100	.1749	.3128	.1000	7.7483	86.7813
	.0060	11.2000	64.0040	.0150	.1749	.3128	.1224	9.4897	106.2849
	.0060	11.2000	64.0040	.0200	.1749	.3128	.1414	10.9577	122.7273
0.2	.0060	11.2000	64.0040	.0250	.1749	.3128	.1581	12.2511	137.2132
	.0060	11.2000	64.0040	.0300	.1749	.3128	.1732	13.4205	150.3096
	.0060	11.2000	64.0040	.0350	.1749	.3128	.1870	14.4957	162.3529
	.0060	11.2000	64.0040	.0400	.1749	.3128	.2000	15.4966	173.5626
	.0060	22.4000	64.0180	.0050	.3499	.4965	.0707	8.6959	194.7890
	.0060	22.4000	64.0180	.0100	.3499	.4965	.1000	12.2979	275.4733
	.0060	22.4000	64.0180	.0150	.3499	.4965	.1224	15.0618	337.3845
	.0060	22.4000	64.0180	.0200	.3499	.4965	.1414	17.3918	389.5780
0.4	.0060	22.4000	64.0180	.0250	.3499	.4965	.1581	19.4447	435.5615
	.0060	22.4000	64.0180	.0300	.3499	.4965	.1732	21.3006	477.1337
	.0060	22.4000	64.0180	.0350	.3499	.4965	.1870	23.0072	515.3633
	.0060	22.4000	64.0180	.0400	.3499	.4965	.2000	24.5958	550.9466
	.0060	33.6000	64.0440	.0050	.5246	.6504	.0707	11.3918	382.7651
	.0060	33.6000	64.0440	.0100	.5246	.6504	.1000	16.1104	541.3116
	.0060	33.6000	64.0440	.0150	.5246	.6504	.1224	19.7312	662.9686
	.00[illegible]	33.6000	64.0440	.0200	.5246	.6504	.1414	22.7836	765.5303
0.6	.0[illegible]	33.6000	64.0440	.0250	.5246	.6504	.1581	25.4728	855.8888
	.0060	33.6000	64.0440	.0300	.5246	.6504	.1732	27.9041	937.5793
	.0060	33.6000	64.0440	.0350	.5246	.6504	.1870	30.1399	1012.7014
	.0060	33.6000	64.0440	.0400	.5246	.6504	.2000	32.2209	1082.6233

EXHIBIT D

SUMMARY OF RUNOFF COMPUTATIONS

Sheet No.	Area Number	Area (in Acres)	Expected Runoff (in c.f.s.) Individual	Total
1	A-1	12	39	
2	A-2	17	54	88
3	A-3	8	26	
4	A-4	3	10	
5	TS-1	8	22	Recommend burm to tie TS-1 & TS-2 together-34
6	TS-2	4	12	

RUNOFF COMPUTATIONS

Sheet No. 1

Job No. Royal Heights Unit 2

Drainage Area No. A-1

Area = 12 acres

Maximum Overland Flow: L = 150' S = 2.5%

Maximum Channel Flow:

Channel No. 1 L = 663' S = 2.0%

Channel No. 2 L = _____ S = _____

Channel No. 3 L = _____ S = _____

Accumulation Time:

Overland Flow: 10.9 min.

Channel No. 1 Flow:

Velocity = 5 ft/sec; Time = $\frac{663}{5 \times 60}$ = 2.2 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 = 13.1 min.

$I = \frac{189}{T+25} = \frac{189}{38.1} = 4.96$

Q = CIA = (.65)(4.96)(12) = 39 c.f.s.

Date: 9-23-71

Comp. by: LWP

Checked by: TE

RUNOFF COMPUTATIONS

Sheet No. 2

Job No. Royal Heights Unit 2

Drainage Area No. A-2

Area = 17 acres

Maximum Overland Flow: L = 150' S = 2.5%

Maximum Channel Flow:

Channel No. 1 L = 925' S = 3.1%

Channel No. 2 L = _____ S = _____

Channel No. 3 L = _____ S = _____

Accumulation Time:

Overland Flow: 10.9 min.

Channel No. 1 Flow:

Velocity= 6 ft/sec; Time = $\frac{925}{6 \times 60}$ = 2.6 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 = 13.5 min.

$I = \frac{189}{T+25} = \frac{189}{38.5} = 4.91$

Q = CIA = (.65)(4.91)(17) = 54 c.f.s.

Date: 9-23-71

Comp. by: LWP

Checked by: TA

RUNOFF COMPUTATIONS

Sheet No. 3

Job No. Royal Heights Unit 2

Drainage Area No. A-3

Area = 8 acres

Maximum Overland Flow: L = 150' S = 3.5%

Maximum Channel Flow:

Channel No. 1 L = 488 S = 1.5%

Channel No. 2 L = _____ S = _____

Channel No. 3 L = _____ S = _____

Accumulation Time:

Overland Flow: 10.2 min.

Channel No. 1 Flow:

Velocity = 4 ft/sec; Time = $\frac{488}{4 \times 60}$ = 2.0 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 = 12.2 min.

$I = \frac{189}{T+25} = \frac{189}{37.2} = 5.08$

Q = CIA = (.65)(5.08)(8) = 26 c.f.s.

Date: 9-23-71

Comp. by: LWP

Checked by: [illegible]

RUNOFF COMPUTATIONS

Sheet No. 4

Job No. Royal Heights Unit 2

Drainage Area No. A-4

Area = 3 acres

Maximum Overland Flow: L = 150' S = 3.3%

Maximum Channel Flow:

Channel No. 1 L = 125' S = 2.0%

Channel No. 2 L = _____ S = _____

Channel No. 3 L = _____ S = _____

Accumulation Time:

Overland Flow: 10.4 min.

Channel No. 1 Flow:

Velocity= 5 ft/sec; Time = $\frac{125}{5 \times 60}$ = .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 = 10.8 min.

$I = \frac{189}{T+25} = \frac{189}{35.8} = 5.28$

Q = CIA = (.65)(5.28)(3) = 10 c.f.s.

Date: 9-23-71

Comp. by: LWP

Checked by: TL

RUNOFF COMPUTATIONS

Sheet No. 5

Job No. Royal Heights Unit 2

Drainage Area No. TS-1

Area = 8 acres

Maximum Overland Flow: L = 500' S = 3.0%

Maximum Channel Flow:

Channel No. 1 L = 500' S = 3.0%

Channel No. 2 L = _____ S = _____

Channel No. 3 L = _____ S = _____

Accumulation Time:

Overland Flow: 17.0 min.

Channel No. 1 Flow:

Velocity = 4 ft/sec; Time = $\frac{500}{4 \times 60}$ = 2.1 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 = 19.1 min.

$I = \frac{189}{T+25} = \frac{189}{44.1} = 4.29$

Q = CIA = (.65)(4.29)(8) = 22 c.f.s.

total Q: 12 + 22 = 34

Date: 9-23-71

Comp. by: LWP

Checked by: TA

RUNOFF COMPUTATIONS

Sheet No. 6

Job No. Royal Heights Unit 2

Drainage Area No. TS-2

Area = 4 acres

Maximum Overland Flow: L = 310' S = 3.2%

Maximum Channel Flow:

Channel No. 1 L = 250' S = 2.5%

Channel No. 2 L = _____ S = _____

Channel No. 3 L = _____ S = _____

Accumulation Time:

Overland Flow: 14.0 min.

Channel No. 1 Flow:

Velocity = 3.8 ft/sec; Time = $\frac{250}{3.8 \times 60}$ = 1.1 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 = 15.1 min.

$I = \frac{189}{T+25} = \frac{189}{40.1} = 4.72$

Q = CIA = (.65)(4.72)(4) = 12 c.f.s.

Date: 9-23-71

Comp. by: LWP

Checked by: [illegible]

EXHIBIT E

RECOMMENDED STREET GRADES

STREET DESCRIPTION & LOCATION	MIN. % GRADE	CROWN HEIGTH	PROPERTY LINE ABOVE HIGH CURB
A. Piermont Drive, N.E. 135.81' East of Eubank Heights on Parsifal St., N.E. from a point at the edge of Piermont Heights 424.93' due North to an intersection with Prestly Place, N.E.	1.5%	8"	0.2'
B. Prestly Place, N.E. beginning from a point 280' East of Parsifal St., N.E. and 424.93' North of the North edge of Piermont Heights to a point 603.98' due East to an intersection with Weimer Dr., N.E.	1.5%	8"	0.2'
C. Weimer Dr., N.E. beginning from a point 900' East of Parsifal St., N.E. and 670' North of Piermont Heights running South 85' then Southwest 29' then South 56' and East 135'.	1.0%	8"	0.1'
D. Orlando Place, N.E. leading Westerly from Piermont Dr., N.E. to Eubank Heights	1.5%	8"	0.2'
E. Espejo Street, N.E. from a point 550' East of Parsifal St., N.E. and 534' North of Piermont Heights to a point 534' due South.	1.5%	8"	0.1'

REFERENCES

A. Design by E. E. Seelye

B. Handbook of Hydraulics by Horace W. King and Ernest F. Brater

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

D. Flood Plain Information-Albuquerque Arroyos, Part 1, Albuquerque, New Mexico, by U.S. Corp of Engineers, U.S. Army for Albuquerque Metropolitan Arroyo Flood Control Authority

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