DRAINAGE REPORT

for

Paradise Skies

Prepared by

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TABLE OF CONTENTS

Location

Paradise Skies is a proposed single family subdivision. It is located south of McMahon Boulevard and west of Bandelier Drive. It is located on Vicinity Map Page A-11 and contains approximately 105 acres. It is identified as Tract AAA Paradise Skies. Units 1 and 2 of the Paradise Skies Subdivision are already built. Units 3, 4, and 5 are currently in the development process. The balance of the site is for future construction. The purpose of this report is to provide the drainage analysis and management plan for the entire undeveloped site and the specific grading approval for the Units 3, 4, and 5. Interim solutions have been provided for Units 3, 4 and 5 until the rest of the site is developed. Site specific grading and drainage plans will be submitted for future units as they are developed. The site was previously approved under DRB 94-107.

Existing Drainage Conditions

The previously identified basins (A11/D3) have been modified to reflect the improvements in Units 1 and 2. The area west of Unit 2 is undeveloped. There are four existing basins west of Units 1 and 2. Basins A and B sheet flow south and west to the Arroyo de Las Calabacillas with an undeveloped runoff flow of 117.28 cfs. Basin C, with an undeveloped runoff flow of 98.02 cfs, drains to an existing desilting pond and then into the existing storm drain located in Unit 1 of Paradise Skies Subdivision. Basin D is the very north edge of the project and represents flows that would drain from the extension of McMahon Boulevard. Flows from the project do no flow north. Basin D, with a undeveloped runoff flow of 52.61 cfs, drains northeast to the Black Channel. See the enclosed existing basin map for the basin locations.

FEMA Map and Soil Conditions

The site is located on FIRM Map section 35001C0104 D as shown on the attached excerpt. The map shows that the site does not lie within any 100 year flood plains.

The site contains two different soils from the Soil Conservation Service Soil Survey of Bernalillo County. The soils are a Bluepoint loamy fine sand and a Madurez loamy fine sand. Both soils have slow runoff, a severe hazard of soil blowing and moderate to rapid permeability.

On Site Drainage Management Plan

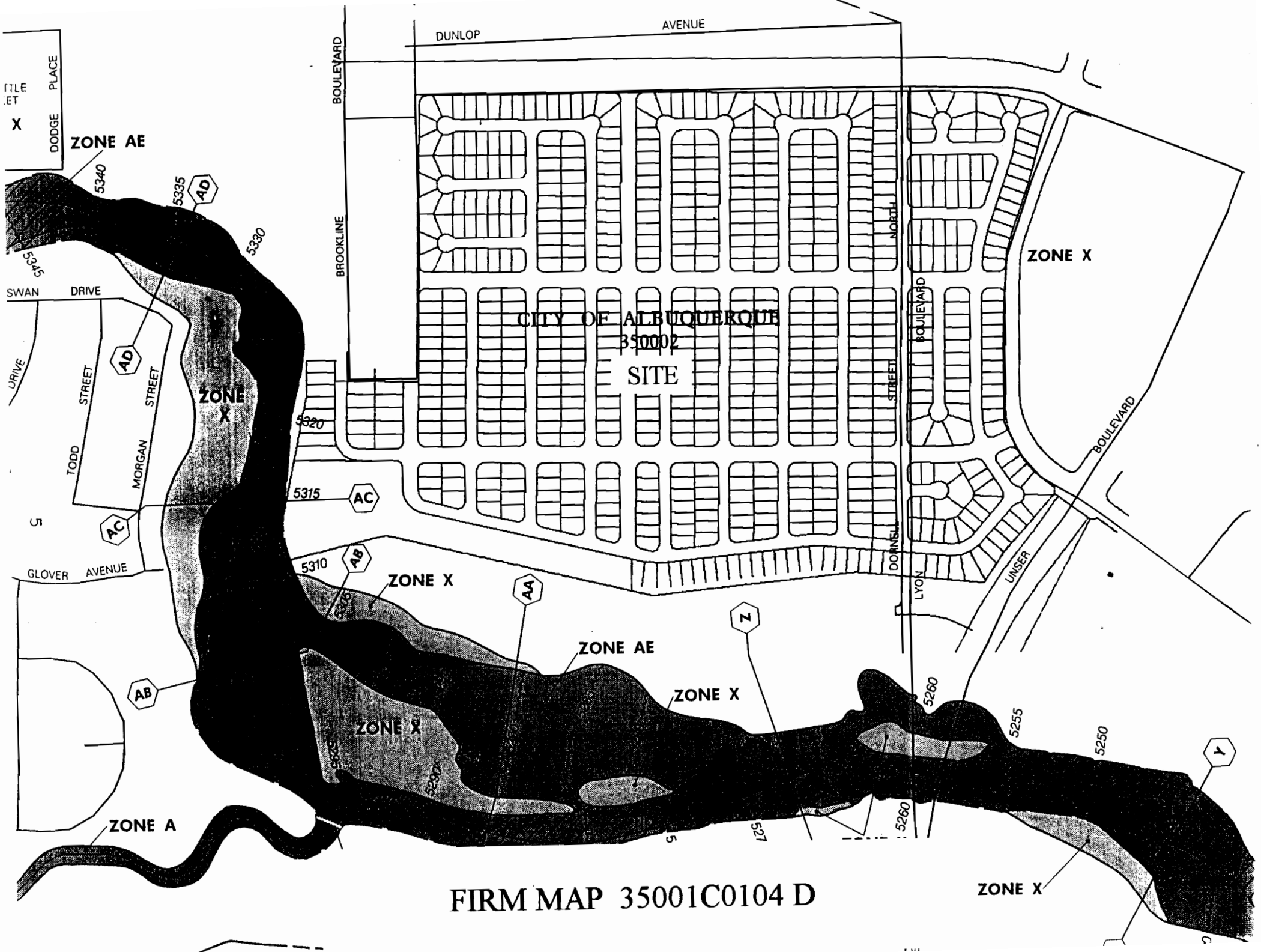
The proposed drainage management plan is to collect the developed flows in three different storm drain systems. Attached is a reduced copy of the basin layout showing the direction of the flows and the collection system.

Storm Drain 'A'

Unit 5 will drain 45.77 cfs of flow to Aquarius Avenue and Unit 3 will drain 47.59 cfs of flow to Aquarius Avenue. Double 'A' drop inlets will collect the flow in a 24" RCP storm drain in Aquarius Avenue. The 24" RCP will connect to the existing 48" RCP storm drain installed in Unit 1 of Paradise Skies. The existing 48" storm drain has capacity for the developed flows generated in Units 3 and 5 of 106.54 cfs. However, only 93.36 cfs of developed flow will be entering the storm drain from Units 3 and 5. The existing 48" storm line drains through Units 1 and 2 and discharges to the Swinburn Dam.

Storm Drain 'B'

Unit 4 has a total developed flow rate of 38.01 cfs and will drain to the existing storm line located on Virgo Street. Two single 'A' drop inlets in Sagittarius will collect 17.65 cfs of developed



FIRM MAP 35001C0104 D

flow. This flow will be conveyed via a new 24" RCP pipe in Taurus Avenue to the existing storm line located in Virgo Street. The balance of the developed flow (20.36 cfs) will be carried by surface flow to Taurus Avenue. Taurus Avenue then carries the water towards Virgo Street in Units 1 and 2 to the existing storm sewer line. The existing portion of Taurus Avenue has the capacity to carry the developed flow from Unit 4. The 60" RCP existing storm line has capacity for this flow from Unit 4 and discharges to the Swinburn Dam via an energy dissipater.

Storm Drain 'C'

This is the most extensive of the three storm drains being designed. The storm drain will discharge a total of 253.39 cfs to the Swinburn Dam through a 60" RCP pipe. The northern cul-de-sacs will drain 17.40 cfs to a 24" RCP pipe in Aquarius Avenue that will connect to a central 30" RCP line located in Milky Way Drive. Milky Way Drive will add 43.16 cfs for a total of 60.56 cfs in the main line. The western flows will be captured by several double 'A' and single 'C' drop inlets. This flow of 52.20 cfs will be conveyed by a new 36" in Sagittarius Avenue to connect with the main line in Milky Way Drive. The east portion of the site, not included in Unit 4, will drain to two single 'A' drop inlets located in Sagittarius Avenue. A 30" RCP pipe will transport 19.87 cfs to the main line in Milky Way Drive. The main line will increase from 36" RCP to 48" RCP with the additional flows, and the flow will increase to 163.21 cfs. The southern portion of the site will drain 90.18 cfs to two double 'A' drop inlets located in Taurus Avenue. At this point, the central line will increase from 48" to 60" and convey the total 253.39 cfs to the Swinburn Dam.

The park area in the southwest corner of the site will sheet flow south to the Swinburn Dam.

STORM SEWER LAYOUT

Interim Solutions

This report sets up several interim solutions in the event only one unit is built at a time. If all three unis are bult then the interim solution for Unit 3 is not needed.

Unit 3

Unit 3 will be the first of three new units to be developed. The existing Basin C flows east and impacts Unit 3 with 71.48 cfs of undeveloped flow. Until Unit 5 is developed a temporary detention pond will catch the undeveloped runoff from Basin C. The drop inlets in Unit 3 have a capacity for 50.0 cfs. The detention pond will release 42.97 cfs through a 15.5 foot wide spillway into Aquarius Avenue. The detention pond provided will have a capacity of 0.9273 ac-ft and a 100-year water surface elevation of ----. This flow will be captured by the new storm sewer system and drain to the existing storm sewer system in Virgo Street.

Unit 4

The undeveloped sections to the west of Unit 4 drain south and do not impact the development of Unit 4. Unit 3 will be developed prior to Unit 4, consequently there will be no flow from the north effecting Unit 4.

Unit 5

The 49.55 cfs from the undeveloped portion of the site located west of Unit 5 will be captured in a temporary retention pond. The undeveloped runoff generates a 1.3647 ac-ft pond requirement. The retention pond provided will have a capacity of 1.4222 ac-ft which is greater than the 1.3647 ac-ft required. The pond will have an emergency spillway 17.0 feet wide and will

discharge south into the undeveloped Basin B. After the balance of the site is developed the temporary pond will be removed.

Summary

There are two proposed storm drain systems for the site to develop Units 3, 4, and 5. Units 3 and 5 will drain to storm drain 'A' which will discharge 93.36 cfs to the existing storm drain in Aquarius Avenue and then to Virgo Street. Unit 4 will drain to storm drain 'B' which will discharge 38.01 cfs to the existing storm drain located in Virgo Street. The existing storm drain system will discharge to the Swinburn Dam via an existing 60" RCP line in Units 1 and 2. Storm Drain 'C' represents the system that will need to be installed to complete the development on the balance of the lots. Storm Drain 'C' which will discharge a total of 253.39 cfs to the Swinburn Dam.

RUNOFF CALCULATIONS

The site is @ Zone 1

LAND TREATMENT

Proposed
B = 20%
C = 20%
D = 60 %

Existing
B = 100%

DEPTH (INCHES) @ 100-YEAR STORM

P_{60} = 1.87 inches

P_{360} = 2.20 inches

P_{1440} = 2.66 inches

DEPTH (INCHES) @ 10-YEAR STORM

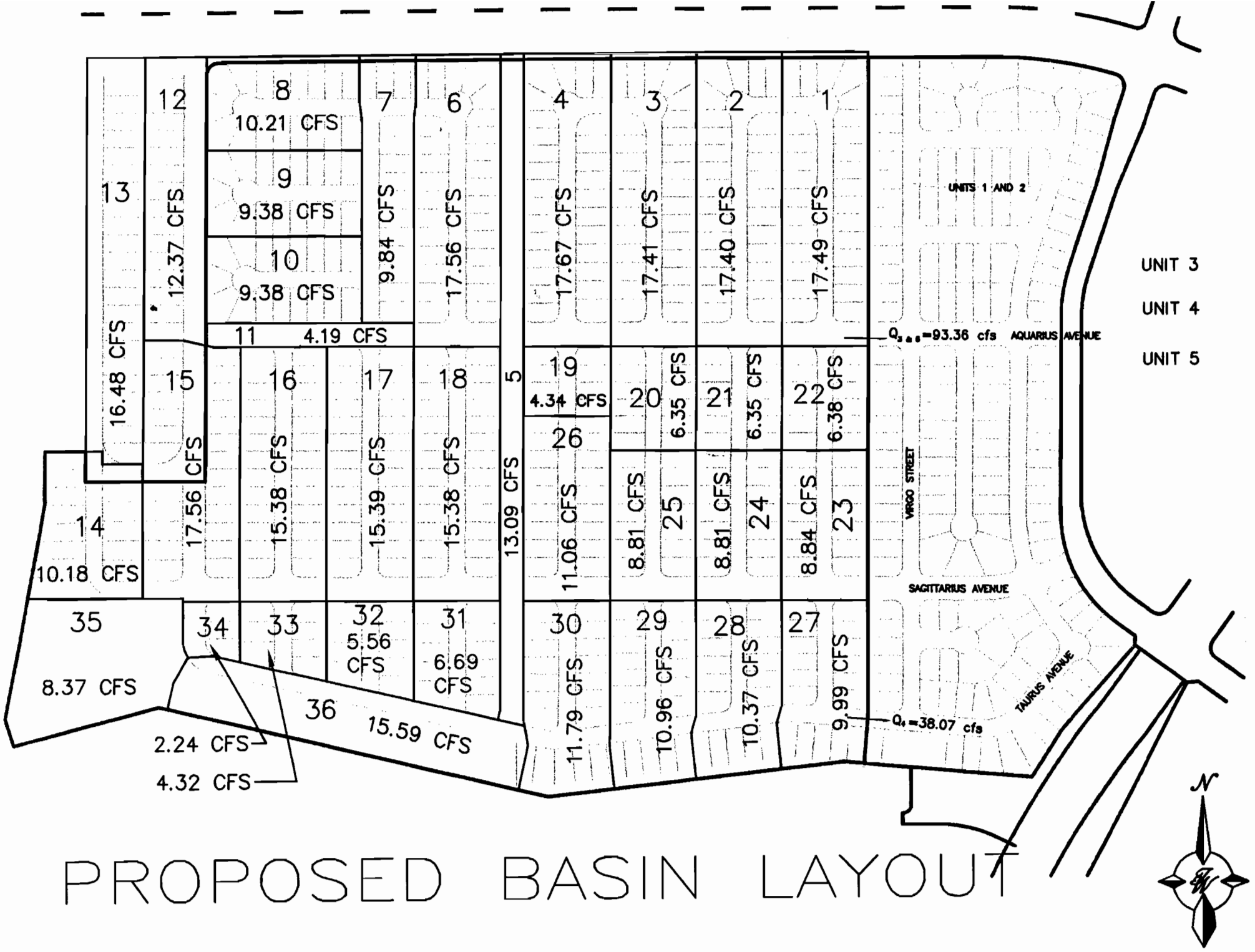
P_{60} = 1.87 x 0.667
= 1.25 inches

P_{360} = 1.47

P_{1440} = 1.77

See the summary output from AHYMO calculations.

Also see the following summary tables.



PROPOSED BASIN LAYOUT

DRAINAGE BASINS

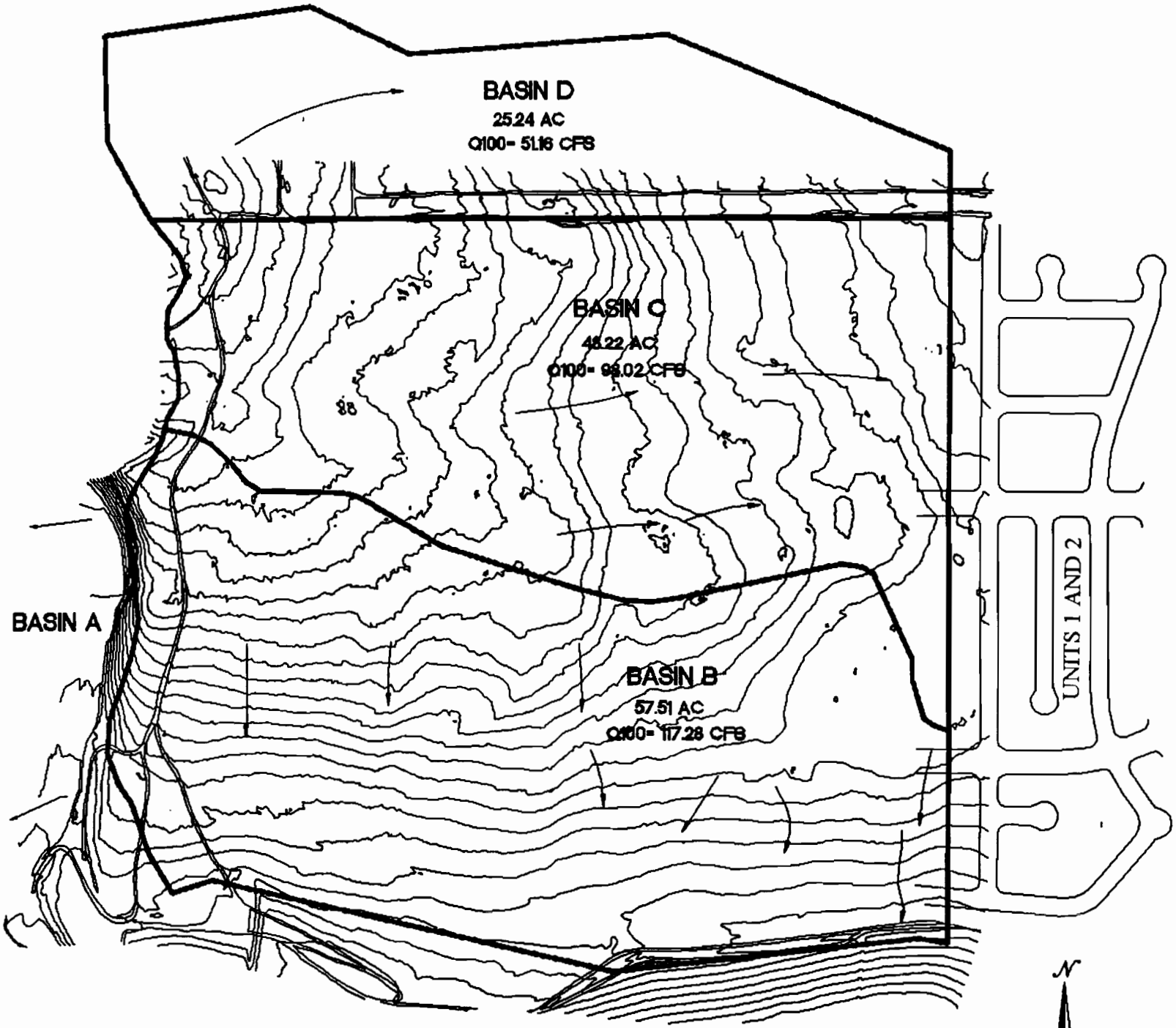
Proposed

BASIN	AREA (SF)	AREA (AC)	AREA (MI^2)
1	210287.78	4.8275	0.007543
2	209155.46	4.8015	0.007502
3	209233.91	4.8033	0.007505
4	212395.16	4.8759	0.007619
5	129582.61	2.9748	0.004648
6	211121.45	4.8467	0.007573
7	118216.07	2.7139	0.004240
8	122610.45	2.8147	0.004398
9	112668.00	2.5865	0.004041
10	112668.00	2.5865	0.004041
11	41445.33	0.9515	0.001487
12	148675.85	3.4131	0.005333
13	198106.02	4.5479	0.007106
14	122302.42	2.8077	0.004387
15	21114.99	0.4847	0.000757
16	184897.83	4.2447	0.006632
17	184949.68	4.2459	0.006634
18	184881.03	4.2443	0.006632
19	52058.61	1.1951	0.001867
20	76249.05	1.7504	0.002735
21	76249.08	1.7504	0.002735
22	76546.12	1.7573	0.002746
23	106164.63	2.4372	0.003808
24	105751.02	2.4277	0.003793
25	105760.68	2.4279	0.003794
26	132891.70	3.0508	0.004767
27	120030.01	2.7555	0.004305
28	124524.39	2.8587	0.004467
29	131640.47	3.0220	0.004722
30	141679.21	3.2525	0.005082
31	80275.21	1.8429	0.002879
32	66650.56	1.5301	0.002391
33	51754.11	1.1881	0.001856
34	26797.32	0.6152	0.000961
35	177743.15	4.0804	0.006376
36	187342.57	4.3008	0.006720

RUNOFF CALCULATION RESULTS

Proposed

SUB-BASIN	Q-100 CFS	Q-10 CFS	V-100 AC-FT	V-10 AC-FT
1	17.49	10.57	0.606	0.350
2	17.40	10.51	0.606	0.348
3	17.41	10.51	0.603	0.348
4	17.67	10.67	0.612	0.353
5	13.09	8.67	0.487	0.307
6	17.56	10.61	0.608	0.351
7	9.84	5.94	0.340	0.197
8	10.21	6.17	0.353	0.204
9	9.38	5.67	0.324	0.187
10	9.38	5.67	0.324	0.187
11	4.19	2.78	0.156	0.098
12	12.37	7.47	0.428	0.247
13	16.48	9.96	0.571	0.330
14	10.18	6.15	0.352	0.204
15	17.56	10.61	0.608	0.351
16	15.38	9.29	0.533	0.308
17	15.39	9.3	0.533	0.308
18	15.38	9.29	0.533	0.308
19	4.34	2.62	0.150	0.087
20	6.35	3.84	0.220	0.127
21	6.35	3.84	0.220	0.127
22	6.38	3.85	0.220	0.127
23	8.84	5.34	0.306	0.177
24	8.81	5.32	0.305	0.176
25	8.81	5.32	0.305	0.176
26	11.06	6.68	0.383	0.221
27	9.99	6.04	0.346	0.200
28	10.37	6.26	0.359	0.207
29	10.96	6.62	0.379	0.219
30	11.79	7.12	0.408	0.236
31	6.69	4.04	0.231	0.134
32	5.56	3.36	0.192	0.111
33	4.32	2.61	0.141	0.086
34	2.24	1.35	0.077	0.045
35	8.37	3.13	0.227	0.076
36	15.59	9.42	0.540	0.312



EXISTING BASIN LAYOUT

DRAINAGE BASINS

Existing

BASIN	AREA (SF)	AREA (AC)	AREA (MI^2)
B	2505215.34	57.5118	0.089862
C	2100545.87	48.2219	0.075347
D	1099488.20	25.2408	0.039439

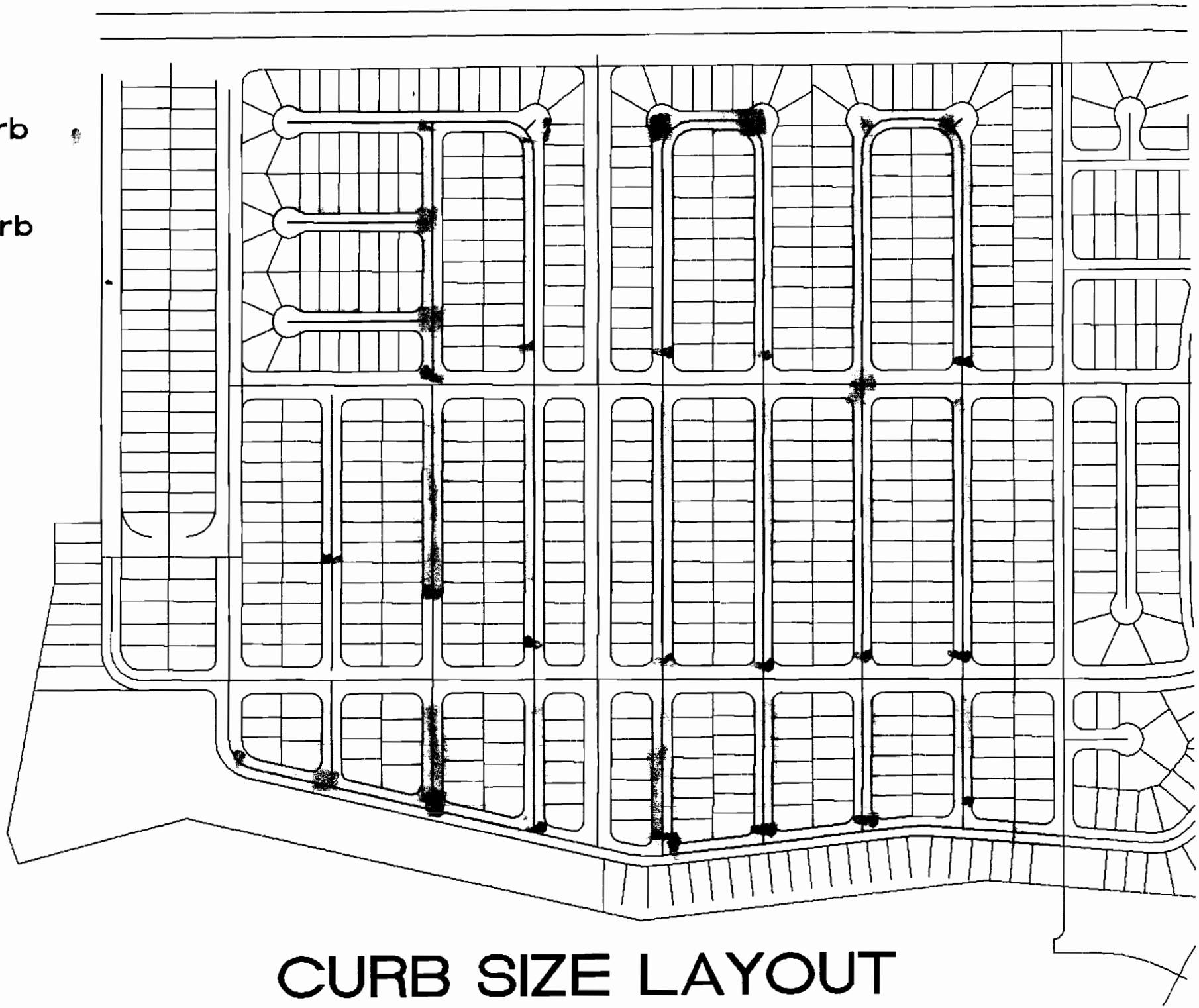
RUNOFF CALCULATION RESULTS

Existing

BASIN	Q-100 CFS	Q-10 CFS	V-100 AC-FT	V-10 AC-FT
B	117.28	43.96	3.199	1.075
C	98.02	36.91	2.682	0.902
D	51.16	19.34	1.404	0.472

4" curb

8" curb



CURB SIZE LAYOUT

Street Capacity Calculations

Street: Milky Way Drive

48' F-F Street Section with 8" curb

Slope= 0.0559

Flow = 28.64

For water depths less than 0.125 feet

Y= Water depth

Area = 8*Y^2

P= SQRT(257*Y^2) + Y

n= 0.017

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.01	0.0008	0.170312	0.004697	0.000464	0.000927	0.579658	0.005797	1.021513	0.010287
0.02	0.0032	0.340624	0.009395	0.002944	0.005889	0.92015	0.018403	1.14661	0.023938
0.04	0.0128	0.681249	0.018789	0.018696	0.037393	1.460647	0.058426	1.287026	0.055502
0.06	0.0288	1.021873	0.028184	0.055123	0.110246	1.913989	0.114839	1.377006	0.090633
0.08	0.0512	1.362498	0.037578	0.118714	0.237428	2.318633	0.185491	1.444638	0.128266
0.1	0.08	1.703122	0.046973	0.215243	0.430486	2.690535	0.269053	1.499376	0.167859
0.12	0.1152	2.043746	0.056367	0.350009	0.700017	3.038268	0.364592	1.545637	0.209078
0.125	0.125	2.128902	0.058716	0.390261	0.780522	3.122089	0.390261	1.556189	0.219608

For water depths greater than 0.125 ft but less than 0.565 ft

Y1= Y-0.125

A2= A1 + 2*Y1 + 25*Y1^2

P2= P1 + SQRT(2501*Y1^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.13	0.135625	2.383952	0.056891	0.414614	0.829227	3.05706	0.397418	1.494185	0.217288
0.18	0.310625	4.934452	0.06295	1.015883	2.031767	3.270449	0.588681	1.358449	0.267325
0.24	0.685625	7.995052	0.085756	2.755535	5.511071	4.019012	0.964563	1.445725	0.385155
0.3	1.240625	11.05565	0.112216	5.965137	11.93027	4.808171	1.442451	1.547004	0.52326
0.39	**2.410625**	**15.64655**	**0.154067**	**14.3179**	**28.63581**	**5.939499**	**2.316405**	**1.67606**	**0.749763**
0.4	2.565625	16.15665	0.158797	15.5488	31.0976	6.060433	2.424173	1.688674	0.77597
0.45	3.415625	18.70715	0.182584	22.71892	45.43784	6.651467	2.99316	1.747364	0.90955
0.5	4.390625	21.25765	0.206543	31.7061	63.4122	7.221318	3.610659	1.799714	1.046914
0.565	5.845	24.5733	0.23786	46.37397	92.74795	7.933956	4.482685	1.860106	1.230391

For water depths greater than 0.565 ft but less than 0.667 ft

Y2= Y - 0.565

A3= A2 + Y2*22

P3= P2 + Y2

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.57	5.955	24.5783	0.242287	47.83115	95.6623	8.032099	4.578296	1.874838	1.252948
0.58	6.175	24.5883	0.251136	50.7986	101.5972	8.226493	4.771366	1.903587	1.298108
0.59	6.395	24.5983	0.259977	53.83606	107.6721	8.418462	4.966892	1.931429	1.343335
0.6	6.615	24.6083	0.268812	56.94266	113.8853	8.608112	5.164867	1.958413	1.388631
0.61	6.835	24.6183	0.277639	60.11755	120.2351	8.795545	5.365282	1.984586	1.433999
0.62	7.055	24.6283	0.286459	63.3599	126.7198	8.980851	5.568128	2.009989	1.47944
0.64	7.495	24.6483	0.304078	70.04393	140.0879	9.345421	5.98107	2.058643	1.570549
0.667	8.089	24.6753	0.327818	79.48018	158.9604	9.825712	6.55375	2.120182	1.694042

For water depths greater than 0.667 ft but less than 0.847 ft

Y3= Y - 0.667

A4= A3 + 22 * Y3 +25 * Y3^2

P4= P3 + SQRT(2501 * Y3^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.7	8.842225	26.32563	0.335879	88.29969	176.5994	9.98614	6.990298	2.103394	1.761464
0.73	9.574225	27.82593	0.344076	97.15877	194.3175	10.14795	7.408005	2.093095	1.826471
0.75	10.08723	28.82613	0.349933	103.5232	207.0464	10.2628	7.697103	2.08837	1.87157
0.77	10.62023	29.82633	0.356069	110.2636	220.5272	10.38241	7.994459	2.085091	1.917958
0.8	11.45723	31.32663	0.365734	121.0967	242.1934	10.56946	8.455571	2.082476	1.989767
0.82	12.04023	32.32683	0.372453	128.8125	257.625	10.69851	8.772781	2.082038	2.039009
0.85	12.95223	33.82713	0.382895	141.1474	282.2949	10.89754	9.262912	2.083009	2.114759

Street Capacity Calculations

STREET Sagittarius

32' F-F Street Section with 8" curb

Slope= **0.0737**

Flow= **26.66**

For water depths less than 0.125 feet

Y= Water depth

Area = 8*Y^2

P= SQRT(257*Y^2) + Y

n= 0.017

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.01	0.0008	0.170312	0.004697	0.000532	0.001065	0.665579	0.006656	1.172929	0.012325
0.02	0.0032	0.340624	0.009395	0.003381	0.006762	1.056541	0.021131	1.316569	0.028558
0.04	0.0128	0.681249	0.018789	0.021468	0.042935	1.677155	0.067086	1.477798	0.065956
0.06	0.0288	1.021873	0.028184	0.063294	0.126587	2.197694	0.131862	1.581116	0.107475
0.08	0.0512	1.362498	0.037578	0.136311	0.272621	2.662317	0.212985	1.658773	0.151884
0.1	0.08	1.703122	0.046973	0.247148	0.494295	3.089345	0.308935	1.721625	0.198556
0.12	0.1152	2.043746	0.056367	0.401889	0.803779	3.488622	0.418635	1.774743	0.247102
0.125	0.125	2.128902	0.058716	0.448108	0.896217	3.584868	0.448108	1.786859	0.259499

For water depths greater than 0.125 ft but less than 0.405 ft

Y1= Y-0.125

A2= A1 + 2*Y1 + 25*Y1^2

P2= P1 + SQRT(2501*Y1^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.13	0.135625	2.383952	0.056891	0.476071	0.952141	3.510199	0.456326	1.715664	0.257049
0.16	0.225625	3.914252	0.057642	0.798944	1.597888	3.541027	0.566564	1.56006	0.281953
0.2	0.415625	5.954652	0.069798	1.671997	3.343994	4.02285	0.80457	1.585225	0.359385
0.24	0.685625	7.995052	0.085756	3.163981	6.327962	4.614739	1.107537	1.660021	0.456067
0.28	1.035625	10.03545	0.103197	5.406919	10.81384	5.220924	1.461859	1.738763	0.562604
0.32	1.465625	12.07585	0.121368	8.525697	17.05139	5.817106	1.861474	1.812192	0.675566
0.3659	**2.05762**	**14.41721**	**0.14272**	**13.33495**	**26.66991**	**6.480765**	**2.371312**	**1.888066**	**0.811032**
0.39	2.410625	15.64655	0.154067	16.44021	32.88041	6.819894	2.659759	1.924498	0.884207
0.405	2.645	16.4117	0.161165	18.58849	37.17697	7.027783	2.846252	1.94609	0.930381

For water depths greater than 0.405 ft but less than 0.667 ft

Y2= Y - 0.405

A3= A2 + Y2*16

P3= P2 + Y2

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.4136	2.7826	16.4203	0.169461	20.22092	40.44183	7.266915	3.005596	1.991278	0.976152
0.42	2.885	16.4267	0.175629	21.47071	42.94142	7.442187	3.125719	2.023709	1.010228
0.47	3.685	16.4767	0.223649	32.21953	64.43907	8.743429	4.109411	2.247527	1.277258
0.5	4.165	16.5067	0.252322	39.46588	78.93176	9.475601	4.7378	2.361532	1.438466
0.55	4.965	16.5567	0.299879	52.78613	105.5723	10.63165	5.847406	2.526337	1.709178
0.6	5.765	16.6067	0.347149	67.57409	135.1482	11.72144	7.032863	2.66672	1.982587
0.63	6.245	16.6367	0.375375	77.1163	154.2326	12.34849	7.779547	2.741672	2.147932
0.667	6.837	16.6737	0.410047	89.54848	179.097	13.09763	8.736118	2.826193	2.353172

For water depths greater than 0.667 ft but less than 0.847 ft

Y3= Y - 0.667

A4= A3 + 16 * Y3 + 25 * Y3^2

P4= P3 + SQRT(2501 * Y3^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.7	7.392225	18.32403	0.403417	95.77413	191.5483	12.95606	9.069244	2.728953	2.374104
0.73	7.944225	19.82433	0.400731	102.4685	204.937	12.89849	9.415899	2.660416	2.405697
0.75	8.337225	20.82453	0.400356	107.4705	214.941	12.89044	9.667832	2.623066	2.43234
0.77	8.750225	21.82473	0.400932	112.9024	225.8047	12.9028	9.935153	2.591257	2.462879
0.8	9.407225	23.32503	0.40331	121.8591	243.7182	12.95378	10.36302	2.552252	2.515117
0.82	9.870225	24.32523	0.405761	128.3741	256.7482	13.0062	10.66508	2.531136	2.553741
0.85	10.60223	25.82553	0.410533	138.9737	277.9473	13.10797	11.14178	2.505521	2.616679

Street Capacity Calculations

STREET Sirius St.

32' F-F Street Section with 8" curb

Slope= 0.0786

Flow= 15.38

For water depths less than 0.125 feet

Y= Water depth

Area = 8*Y^2

P= SQRT(257*Y^2) + Y

n= 0.017

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.01	0.0008	0.170312	0.004697	0.00055	0.0011	0.687349	0.006873	1.211293	0.012845
0.02	0.0032	0.340624	0.009395	0.003492	0.006983	1.091099	0.021822	1.359631	0.029735
0.04	0.0128	0.681249	0.018789	0.02217	0.044339	1.732011	0.06928	1.526134	0.068618
0.06	0.0288	1.021873	0.028184	0.065364	0.130728	2.269576	0.136175	1.632831	0.111761
0.08	0.0512	1.362498	0.037578	0.140769	0.281538	2.749396	0.219952	1.713028	0.157892
0.1	0.08	1.703122	0.046973	0.255231	0.510463	3.190392	0.319039	1.777936	0.206361
0.12	0.1152	2.043746	0.056367	0.415034	0.830069	3.602728	0.432327	1.832791	0.256769
0.125	0.125	2.128902	0.058716	0.462765	0.92553	3.702121	0.462765	1.845303	0.26964

For water depths greater than 0.125 ft but less than 0.405 ft

Y1= Y-0.125

A2= A1 + 2*Y1 + 25*Y1^2

P2= P1 + SQRT(2501*Y1^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.13	0.135625	2.383952	0.056891	0.491642	0.983284	3.625011	0.471251	1.771779	0.26716
0.16	0.225625	3.914252	0.057642	0.825076	1.650152	3.656847	0.585095	1.611086	0.293222
0.2	0.415625	5.954652	0.069798	1.726685	3.453369	4.154429	0.830886	1.637074	0.37371
0.24	0.685625	7.995052	0.085756	3.267468	6.534936	4.765678	1.143763	1.714317	0.474104
0.28	1.035625	10.03545	0.103197	5.583768	11.16754	5.39169	1.509673	1.795634	0.584687
0.3075	**1.322656**	**11.43823**	**0.115635**	**7.693436**	**15.38687**	**5.816655**	**1.788622**	**1.848514**	**0.664686**
0.36	1.975625	14.11625	0.139954	13.05096	26.10192	6.60599	2.378156	1.940255	0.824082
0.39	2.410625	15.64655	0.154067	16.97793	33.95587	7.042959	2.746754	1.987444	0.918371
0.405	2.645	16.4117	0.161165	19.19648	38.39295	7.257647	2.939347	2.009742	0.966269

For water depths greater than 0.405 ft but less than 0.667 ft

Y2= Y - 0.405

A3= A2 + Y2*16

P3= P2 + Y2

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.4136	2.7826	16.4203	0.169461	20.8823	41.7646	7.504601	3.103903	2.056408	1.01368
0.42	2.885	16.4267	0.175629	22.17297	44.34595	7.685606	3.227955	2.0899	1.048975
0.47	3.685	16.4767	0.223649	33.27337	66.54674	9.029408	4.243822	2.321039	1.325545
0.5	4.165	16.5067	0.252322	40.75673	81.51345	9.785529	4.892764	2.438773	1.4925
0.55	4.965	16.5567	0.299879	54.51266	109.0253	10.97939	6.038663	2.608968	1.77285
0.6	5.765	16.6067	0.347149	69.7843	139.5686	12.10482	7.262894	2.753943	2.055976
0.63	6.245	16.6367	0.375375	79.63862	159.2772	12.75238	8.034	2.831347	2.227193
0.667	6.837	16.6737	0.410047	92.47743	184.9549	13.52603	9.021859	2.918632	2.439714

For water depths greater than 0.667 ft but less than 0.847 ft

Y3= Y - 0.667

A4= A3 + 16 * Y3 + 25 * Y3^2

P4= P3 + SQRT(2501 * Y3^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.7	7.392225	18.32403	0.403417	98.90671	197.8134	13.37983	9.365881	2.818212	2.461756
0.73	7.944225	19.82433	0.400731	105.8201	211.6401	13.32038	9.723874	2.747433	2.494772
0.75	8.337225	20.82453	0.400356	110.9857	221.9713	13.31206	9.984047	2.708861	2.52255
0.77	8.750225	21.82473	0.400932	116.5952	233.1904	13.32482	10.26011	2.676012	2.554351
0.8	9.407225	23.32503	0.40331	125.8449	251.6898	13.37747	10.70198	2.635731	2.608697
0.82	9.870225	24.32523	0.405761	132.573	265.1459	13.4316	11.01392	2.613924	2.648853
0.85	10.60223	25.82553	0.410533	143.5192	287.0384	13.53671	11.5062	2.587472	2.714254

Street Capacity Calculations

STREET ORION Rd.

32' F-F Street Section with 4" curb

Slope= 0.0642

Flow= 10.21

For water depths less than 0.0625 feet

Y= Water depth

Area = 16*Y^2

P= SQRT(1025*Y^2) + Y

n= 0.017

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.0100	0.0016	0.3302	0.0048	0.0010	0.0020	0.6343	0.0063	1.1177	0.0116
0.0175	0.0049	0.5778	0.0085	0.0045	0.0090	0.9211	0.0161	1.2270	0.0229
0.0250	0.0100	0.8254	0.0121	0.0117	0.0234	1.1683	0.0292	1.3022	0.0352
0.0325	0.0169	1.0730	0.0158	0.0235	0.0470	1.3916	0.0452	1.3604	0.0484
0.0400	0.0256	1.3206	0.0194	0.0409	0.0818	1.5982	0.0639	1.4083	0.0621
0.0475	0.0361	1.5682	0.0230	0.0647	0.1294	1.7923	0.0851	1.4492	0.0765
0.0550	0.0484	1.8159	0.0267	0.0957	0.1913	1.9763	0.1087	1.4850	0.0912
0.0625	0.0625	2.0635	0.0303	0.1345	0.2690	2.1521	0.1345	1.5170	0.1064

For water depths greater than 0.0625 ft but less than 0.333 ft

Y1= Y-0.0625

A2= A1 + 2*Y1 + 25*Y1^2

P2= P1 + SQRT(2501*Y1^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.0630	0.0635	2.0890	0.0304	0.1370	0.2740	2.1574	0.1359	1.5147	0.1071
0.0900	0.1364	3.4663	0.0394	0.3495	0.6991	2.5624	0.2306	1.5052	0.1518
0.1200	0.2602	4.9966	0.0521	0.8034	1.6069	3.0883	0.3706	1.5711	0.2133
0.1500	0.4289	6.5269	0.0657	1.5469	3.0939	3.6067	0.5410	1.6411	0.2811
0.1800	0.6427	8.0572	0.0798	2.6374	5.2749	4.1040	0.7387	1.7047	0.3532
0.2100	0.9014	9.5875	0.0940	4.1280	8.2559	4.5795	0.9617	1.7611	0.4284
0.2260	**1.0578**	**10.4036**	**0.1017**	**5.1038**	**10.2076**	**4.8249**	**1.0904**	**1.7886**	**0.4697**
0.2700	1.5539	12.6481	0.1229	8.5054	17.0109	5.4736	1.4779	1.8564	0.5866
0.3330	2.4328	15.8617	0.1534	15.4384	30.8768	6.3461	2.1132	1.9380	0.7612

For water depths greater than 0.333 ft but less than 0.513 ft

Y2= Y - 0.333

A3= A2 + Y2*16 + 25 Y2^2

P3= P2 + SQRT (2501 Y2^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.3400	2.5460	16.2118	0.1570	16.4138	32.8276	6.4469	2.1920	1.9484	0.7822
0.3414	2.5689	16.2818	0.1578	16.6132	33.2265	6.4670	2.2078	1.9505	0.7864
0.4000	3.6170	19.2124	0.1883	26.3144	52.6289	7.2752	2.9101	2.0272	0.9641
0.4181	3.9754	20.1175	0.1976	29.8715	59.7430	7.5141	3.1416	2.0479	1.0197
0.4400	4.4310	21.2128	0.2089	34.5493	69.0986	7.7972	3.4308	2.0715	1.0876
0.4600	4.8680	22.2130	0.2192	39.1906	78.3811	8.0507	3.7033	2.0918	1.1501
0.4950	5.6809	23.9633	0.2371	48.1943	96.3887	8.4836	4.1994	2.1250	1.2605
0.5130	6.1228	24.8635	0.2463	53.2772	106.5543	8.7015	4.4639	2.1410	1.3178

Street Capacity Calculations

STREET: Ursa Rd

28' F-F Street Section with 4" curb

Slope= 0.0627

Flow= 9.38

For water depths less than 0.0625 feet

Y= Water depth

Area = 16*Y^2

P= SQRT(1025*Y^2) + Y

n= 0.017

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.01	0.0016	0.330156	0.004846	0.001003	0.002006	0.626812	0.006268	1.104611	0.011402
0.02	0.0064	0.660312	0.009692	0.006368	0.012736	0.995002	0.0199	1.239884	0.026467
0.025	0.01	0.825391	0.012115	0.011546	0.023092	1.154598	0.028865	1.286864	0.034683
0.035	0.0196	1.155547	0.016962	0.028321	0.056642	1.444938	0.050573	1.361092	0.052106
0.045	0.0324	1.485703	0.021808	0.055355	0.11071	1.70849	0.076882	1.419313	0.070585
0.055	0.0484	1.815859	0.026654	0.094527	0.189055	1.953046	0.107418	1.467585	0.089917
0.06	0.0576	1.980937	0.029077	0.119214	0.238428	2.069688	0.124181	1.489023	0.099861
0.0625	0.0625	2.063476	0.030289	0.132924	0.265848	2.126787	0.132924	1.499188	0.104896

For water depths greater than 0.0625 ft but less than 0.3025 ft

Y1= Y-0.0625

A2= A1 + 2*Y1 + 25*Y1^2

P2= P1 + SQRT(2501*Y1^2)+Y1

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.063	0.063506	2.088981	0.030401	0.135397	0.270793	2.132022	0.134317	1.496902	0.105537
0.1	0.172656	3.976351	0.043421	0.466857	0.933715	2.703971	0.270397	1.506864	0.16889
0.13	0.311406	5.506651	0.056551	1.004209	2.008418	3.224756	0.419218	1.576149	0.231972
0.16	0.495156	7.036951	0.070365	1.847216	3.694432	3.730572	0.596892	1.643568	0.300404
0.2	0.810156	9.077351	0.08925	3.541432	7.082864	4.371295	0.874259	1.722531	0.397362
0.2204	**1.00161**	**10.11796**	**0.098993**	**4.691443**	**9.382886**	**4.683901**	**1.032332**	**1.758223**	**0.448795**
0.28	1.680156	13.15815	0.127689	9.325165	18.65033	5.550177	1.55405	1.848417	0.605205
0.3025	1.9825	14.30588	0.138579	11.62026	23.24053	5.86142	1.773079	1.878072	0.666301

For water depths greater than 0.3025 ft but less than 0.333 ft

Y2= Y - 0.3025

A3= A2 + Y2*14

P3= P2 + Y2

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.303	1.9895	14.30638	0.139064	11.68846	23.37691	5.875072	1.780147	1.880892	0.66859
0.308	2.0595	14.31138	0.143906	12.379	24.75801	6.010684	1.851291	1.908625	0.691498
0.3102	2.0903	14.31358	0.146036	12.68779	25.37558	6.069841	1.882865	1.920563	0.701587
0.316	2.1715	14.31938	0.151648	13.51618	27.03236	6.224352	1.966895	1.951294	0.728215
0.32	2.2275	14.32338	0.155515	14.09947	28.19895	6.32973	2.025514	1.971888	0.746605
0.324	2.2835	14.32738	0.15938	14.69245	29.3849	6.43418	2.084674	1.992016	0.765017
0.3241	2.2849	14.32748	0.159477	14.7074	29.4148	6.43678	2.08616	1.992513	0.765477
0.333	2.4095	14.33638	0.168069	16.06161	32.12321	6.66595	2.219761	2.035692	0.806526

For water depths greater than 0.333 ft but less than 0.513 ft

Y3= Y - 0.333

A4= A3 + 14 * Y3 + 25 * Y3^2

P4= P3 + SQRT(2501 * Y3^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.335	2.4376	14.4364	0.168851	16.29928	32.59857	6.686612	2.240015	2.035897	0.811466
0.36	2.805725	15.68665	0.178861	19.4951	38.9902	6.948328	2.501398	2.040803	0.874484
0.39	3.288725	17.18695	0.19135	23.90289	47.80578	7.268133	2.834572	2.050986	0.952892
0.416	3.743725	18.48721	0.202504	28.25722	56.51443	7.547888	3.139921	2.062295	1.022975
0.45	4.389725	20.18755	0.217447	34.74376	69.48752	7.914792	3.561656	2.079243	1.117215
0.48	5.007725	21.68785	0.2309	41.25344	82.50688	8.23796	3.954221	2.09542	1.202524
0.513	5.7395	23.33818	0.245928	49.31161	98.62321	8.591621	4.407501	2.11392	1.298433

Street Capacity Calculations

STREET: Aries

28' F-F Street Section with 4" curb

Slope= 0.006

Flow= 17.49

For water depths less than 0.0625 feet

Y= Water depth

Area = 16*Y^2

P= SQRT(1025*Y^2) + Y

n= 0.017

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.01	0.0016	0.330156	0.004846	0.00031	0.00062	0.193901	0.001939	0.341705	0.001954
0.02	0.0064	0.660312	0.009692	0.00197	0.00394	0.307798	0.006156	0.383551	0.004754
0.025	0.01	0.825391	0.012115	0.003572	0.007143	0.357168	0.008929	0.398084	0.006324
0.035	0.0196	1.155547	0.016962	0.008761	0.017522	0.446983	0.015644	0.421046	0.009714
0.045	0.0324	1.485703	0.021808	0.017124	0.034248	0.528511	0.023783	0.439056	0.013374
0.055	0.0484	1.815859	0.026654	0.029242	0.058483	0.604163	0.033229	0.453989	0.017257
0.06	0.0576	1.980937	0.029077	0.036878	0.073756	0.640246	0.038415	0.46062	0.019271
0.0625	0.0625	2.063476	0.030289	0.041119	0.082239	0.657909	0.041119	0.463765	0.020295

For water depths greater than 0.0625 ft but less than 0.3025 ft

Y1= Y-0.0625

A2= A1 + 2*Y1 + 25*Y1^2

P2= P1 + SQRT(2501*Y1^2)+Y1

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.063	0.063506	2.088981	0.030401	0.041884	0.083768	0.659528	0.04155	0.463058	0.020407
0.1	0.172656	3.976351	0.043421	0.14442	0.288839	0.836458	0.083646	0.46614	0.032739
0.13	0.311406	5.506651	0.056551	0.310646	0.621292	0.997559	0.129683	0.487572	0.045726
0.16	0.495156	7.036951	0.070365	0.571425	1.142851	1.154031	0.184645	0.508428	0.060125
0.2	0.810156	9.077351	0.08925	1.095521	2.191042	1.352234	0.270447	0.532855	0.080872
0.23	1.098906	10.60765	0.103596	1.641221	3.282442	1.493504	0.343506	0.548801	0.097344
0.28	1.680156	13.15815	0.127689	2.884685	5.76937	1.716915	0.480736	0.571797	0.126207
0.3025	1.9825	14.30588	0.138579	3.59466	7.189321	1.813196	0.548492	0.58097	0.139694

For water depths greater than 0.3025 ft but less than 0.333 ft

Y2= Y - 0.3025

A3= A2 + Y2*14

P3= P2 + Y2

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.303	1.9895	14.30638	0.139064	3.615755	7.23151	1.817419	0.550678	0.581843	0.140244
0.308	2.0595	14.31138	0.143906	3.829372	7.658744	1.85937	0.572686	0.590422	0.145758
0.3102	2.0903	14.31358	0.146036	3.924893	7.849785	1.87767	0.582453	0.594115	0.14819
0.316	2.1715	14.31938	0.151648	4.181151	8.362302	1.925467	0.608447	0.603621	0.154619
0.32	2.2275	14.32338	0.155515	4.361589	8.723179	1.958065	0.626581	0.609992	0.159068
0.324	2.2835	14.32738	0.15938	4.545023	9.090046	1.990376	0.644882	0.616218	0.163527
0.3241	2.2849	14.32748	0.159477	4.549647	9.099294	1.99118	0.645341	0.616372	0.163639
0.333	2.4095	14.33638	0.168069	4.968563	9.937126	2.062072	0.68667	0.629729	0.173603

For water depths greater than 0.333 ft but less than 0.513 ft

Y3= Y - 0.333

A4= A3 + 14 * Y3 + 25 * Y3^2

P4= P3 + SQRT(2501 * Y3^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.335	2.4376	14.4364	0.168851	5.042088	10.08418	2.068464	0.692935	0.629793	0.174672
0.36	2.805725	15.68665	0.178861	6.030694	12.06139	2.149424	0.773793	0.63131	0.188381
0.39	3.288725	17.18695	0.19135	7.394219	14.78844	2.248354	0.876858	0.63446	0.205597
0.416	**3.743725**	**18.48721**	**0.202504**	**8.741203**	**17.48241**	**2.334895**	**0.971316**	**0.637959**	**0.221102**
0.45	4.389725	20.18755	0.217447	10.74778	21.49556	2.448394	1.101777	0.643202	0.242094
0.48	5.007725	21.68785	0.2309	12.76151	25.52302	2.548365	1.223215	0.648206	0.261213
0.513	5.7395	23.33818	0.245928	15.25426	30.50851	2.657767	1.363435	0.653929	0.28282

Street Capacity Calculations

STREET: Taurus

32' F-F Street Section with 4" curb

Slope= **0.0191**

Flow= **35.445**

For water depths less than 0.0625 feet

Y= Water depth

Area = 16*Y^2

P= SQRT(1025*Y^2) + Y

n= 0.017

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.0100	0.0016	0.3302	0.0048	0.0006	0.0011	0.3460	0.0035	0.6097	0.0050
0.0175	0.0049	0.5778	0.0085	0.0025	0.0049	0.5024	0.0088	0.6693	0.0100
0.0250	0.0100	0.8254	0.0121	0.0064	0.0127	0.6373	0.0159	0.7103	0.0156
0.0325	0.0169	1.0730	0.0158	0.0128	0.0257	0.7591	0.0247	0.7420	0.0215
0.0400	0.0256	1.3206	0.0194	0.0223	0.0446	0.8718	0.0349	0.7681	0.0278
0.0475	0.0361	1.5682	0.0230	0.0353	0.0706	0.9776	0.0464	0.7905	0.0344
0.0550	0.0484	1.8159	0.0267	0.0522	0.1043	1.0779	0.0593	0.8100	0.0412
0.0625	0.0625	2.0635	0.0303	0.0734	0.1467	1.1738	0.0734	0.8274	0.0483

For water depths greater than 0.0625 ft but less than 0.333 ft

Y1= Y-0.0625

A2= A1 + 2*Y1 + 25*Y1^2

P2= P1 + SQRT(2501*Y1^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.0630	0.0635	2.0890	0.0304	0.0747	0.1495	1.1767	0.0741	0.8262	0.0486
0.0900	0.1364	3.4663	0.0394	0.1907	0.3813	1.3977	0.1258	0.8210	0.0688
0.1200	0.2602	4.9966	0.0521	0.4382	0.8764	1.6845	0.2021	0.8569	0.0973
0.1500	0.4289	6.5269	0.0657	0.8438	1.6875	1.9672	0.2951	0.8951	0.1292
0.1800	0.6427	8.0572	0.0798	1.4386	2.8771	2.2385	0.4029	0.9298	0.1632
0.2100	0.9014	9.5875	0.0940	2.2516	4.5031	2.4978	0.5245	0.9606	0.1990
0.2400	1.2052	11.1178	0.1084	3.3099	6.6198	2.7464	0.6591	0.9880	0.2361
0.2700	1.5539	12.6481	0.1229	4.6392	9.2785	2.9855	0.8061	1.0125	0.2745
0.3330	2.4328	15.8617	0.1534	8.4208	16.8415	3.4614	1.1526	1.0571	0.3584

For water depths greater than 0.333 ft but less than 0.513 ft

Y2= Y - 0.333

A3= A2 + Y2*16 + 25 Y2^2

P3= P2 + SQRT (2501 Y2^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.3400	2.5460	16.2118	0.1570	8.9528	17.9056	3.5164	1.1956	1.0628	0.3685
0.3700	3.0590	17.7121	0.1727	11.4605	22.9209	3.7465	1.3862	1.0854	0.4123
0.4000	3.6170	19.2124	0.1883	14.3530	28.7060	3.9682	1.5873	1.1057	0.4567
0.4200	4.0140	20.2126	0.1986	16.5056	33.0112	4.1120	1.7271	1.1182	0.4866
0.4306	**4.2325**	**20.7427**	**0.2040**	**17.7217**	**35.4434**	**4.1871**	**1.8029**	**1.1245**	**0.5025**
0.4600	4.8680	22.2130	0.2192	21.3762	42.7524	4.3912	2.0199	1.1410	0.5471
0.4779	5.2761	23.1081	0.2283	23.8100	47.6200	4.5128	2.1567	1.1504	0.5744
0.5130	6.1228	24.8635	0.2463	29.0596	58.1193	4.7462	2.4348	1.1678	0.6287

Flow = 4.39+ 2.24 + 4.32 + 5.56 + 6.69/2 + 15.59 = 35.445 cfs

Street Capacity Calculations

STREET: Taurus Ave.

32' F-F Street Section with 4" curb

Slope= 0.006

Flow= 22.75

For water depths less than 0.0625 feet

Y= Water depth

Area = 16*Y^2

P= SQRT(1025*Y^2) + Y

n= 0.017

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.0100	0.0016	0.3302	0.0048	0.0003	0.0006	0.1939	0.0019	0.3417	0.0020
0.0175	0.0049	0.5778	0.0085	0.0014	0.0028	0.2816	0.0049	0.3751	0.0040
0.0250	0.0100	0.8254	0.0121	0.0036	0.0071	0.3572	0.0089	0.3981	0.0063
0.0325	0.0169	1.0730	0.0158	0.0072	0.0144	0.4254	0.0138	0.4159	0.0088
0.0400	0.0256	1.3206	0.0194	0.0125	0.0250	0.4886	0.0195	0.4305	0.0115
0.0475	0.0361	1.5682	0.0230	0.0198	0.0396	0.5479	0.0260	0.4430	0.0143
0.0550	0.0484	1.8159	0.0267	0.0292	0.0585	0.6042	0.0332	0.4540	0.0173
0.0625	0.0625	2.0635	0.0303	0.0411	0.0822	0.6579	0.0411	0.4638	0.0203

For water depths greater than 0.0625 ft but less than 0.333 ft

Y1= Y-0.0625

A2= A1 + 2*Y1 + 25*Y1^2

P2= P1 + SQRT(2501*Y1^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.0630	0.0635	2.0890	0.0304	0.0419	0.0838	0.6595	0.0416	0.4631	0.0204
0.0900	0.1364	3.4663	0.0394	0.1069	0.2137	0.7834	0.0705	0.4602	0.0289
0.1200	0.2602	4.9966	0.0521	0.2456	0.4912	0.9441	0.1133	0.4803	0.0412
0.1500	0.4289	6.5269	0.0657	0.4729	0.9458	1.1026	0.1654	0.5017	0.0552
0.1800	0.6427	8.0572	0.0798	0.8063	1.6126	1.2546	0.2258	0.5211	0.0703
0.2100	0.9014	9.5875	0.0940	1.2620	2.5239	1.4000	0.2940	0.5384	0.0863
0.2400	1.2052	11.1178	0.1084	1.8551	3.7102	1.5393	0.3694	0.5537	0.1030
0.2700	1.5539	12.6481	0.1229	2.6002	5.2004	1.6733	0.4518	0.5675	0.1203
0.3330	2.4328	15.8617	0.1534	4.7197	9.4393	1.9400	0.6460	0.5925	0.1584

For water depths greater than 0.333 ft but less than 0.513 ft

Y2= Y - 0.333

A3= A2 + Y2*16 + 25 Y2^2

P3= P2 + SQRT (2501 Y2^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.3400	2.5460	16.2118	0.1570	5.0178	10.0357	1.9709	0.6701	0.5957	0.1631
0.3700	3.0590	17.7121	0.1727	6.4233	12.8467	2.0998	0.7769	0.6084	0.1832
0.4000	3.6170	19.2124	0.1883	8.0446	16.0891	2.2241	0.8896	0.6197	0.2036
0.4200	4.0140	20.2126	0.1986	9.2510	18.5021	2.3047	0.9680	0.6267	0.2174
0.4306	4.2325	20.7427	0.2040	9.9326	19.8653	2.3468	1.0105	0.6302	0.2248
0.4517	**4.6842**	**21.7979**	**0.2149**	**11.3788**	**22.7575**	**2.4292**	**1.0973**	**0.6370**	**0.2395**
0.4779	5.2761	23.1081	0.2283	13.3450	26.6900	2.5293	1.2088	0.6448	0.2580
0.5130	6.1228	24.8635	0.2463	16.2873	32.5746	2.6601	1.3646	0.6545	0.2832

Street Capacity Calculations

STREET: Taurus Ave.

32' F-F Street Section with 4" curb

Slope= 0.0191

Flow= 36.56

For water depths less than 0.0625 feet

Y= Water depth

Area = 16*Y^2

P= SQRT(1025*Y^2) + Y

n= 0.017

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.0100	0.0016	0.3302	0.0048	0.0006	0.0011	0.3460	0.0035	0.6097	0.0050
0.0175	0.0049	0.5778	0.0085	0.0025	0.0049	0.5024	0.0088	0.6693	0.0100
0.0250	0.0100	0.8254	0.0121	0.0064	0.0127	0.6373	0.0159	0.7103	0.0156
0.0325	0.0169	1.0730	0.0158	0.0128	0.0257	0.7591	0.0247	0.7420	0.0215
0.0400	0.0256	1.3206	0.0194	0.0223	0.0446	0.8718	0.0349	0.7681	0.0278
0.0475	0.0361	1.5682	0.0230	0.0353	0.0706	0.9776	0.0464	0.7905	0.0344
0.0550	0.0484	1.8159	0.0267	0.0522	0.1043	1.0779	0.0593	0.8100	0.0412
0.0625	0.0625	2.0635	0.0303	0.0734	0.1467	1.1738	0.0734	0.8274	0.0483

For water depths greater than 0.0625 ft but less than 0.333 ft

Y1= Y-0.0625

A2= A1 + 2*Y1 + 25*Y1^2

P2= P1 + SQRT(2501*Y1^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.0630	0.0635	2.0890	0.0304	0.0747	0.1495	1.1767	0.0741	0.8262	0.0486
0.0900	0.1364	3.4663	0.0394	0.1907	0.3813	1.3977	0.1258	0.8210	0.0688
0.1200	0.2602	4.9966	0.0521	0.4382	0.8764	1.6845	0.2021	0.8569	0.0973
0.1500	0.4289	6.5269	0.0657	0.8438	1.6875	1.9672	0.2951	0.8951	0.1292
0.1800	0.6427	8.0572	0.0798	1.4386	2.8771	2.2385	0.4029	0.9298	0.1632
0.2100	0.9014	9.5875	0.0940	2.2516	4.5031	2.4978	0.5245	0.9606	0.1990
0.2400	1.2052	11.1178	0.1084	3.3099	6.6198	2.7464	0.6591	0.9880	0.2361
0.3281	2.3573	15.6117	0.1510	8.0749	16.1499	3.4255	1.1239	1.0539	0.3517
0.3330	2.4328	15.8617	0.1534	8.4208	16.8415	3.4614	1.1526	1.0571	0.3584

For water depths greater than 0.333 ft but less than 0.513 ft

Y2= Y - 0.333

A3= A2 + Y2*16 + 25 Y2^2

P3= P2 + SQRT (2501 Y2^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.3400	2.5460	16.2118	0.1570	8.9528	17.9056	3.5164	1.1956	1.0628	0.3685
0.3873	3.3753	18.5772	0.1817	13.0802	26.1603	3.8753	1.5009	1.0974	0.4378
0.4000	3.6170	19.2124	0.1883	14.3530	28.7060	3.9682	1.5873	1.1057	0.4567
0.4200	4.0140	20.2126	0.1986	16.5056	33.0112	4.1120	1.7271	1.1182	0.4866
0.4353	**4.3312**	**20.9777**	**0.2065**	**18.2779**	**36.5558**	**4.2201**	**1.8370**	**1.1272**	**0.5096**
0.4517	4.6842	21.7979	0.2149	20.3019	40.6037	4.3341	1.9577	1.1364	0.5344
0.4779	5.2761	23.1081	0.2283	23.8100	47.6200	4.5128	2.1567	1.1504	0.5744
0.5130	6.1228	24.8635	0.2463	29.0596	58.1193	4.7462	2.4348	1.1678	0.6287

FLOW = 4.39 + 2.24 + 4.32 + 5.20 = 16.15

Street Capacity Calculations

STREET: Taurus Ave.

32' F-F Street Section with 4" curb

Slope= 0.0191

Flow= 26.15

For water depths less than 0.0625 feet

Y= Water depth

Area = 16*Y^2

P= SQRT(1025*Y^2) + Y

n= 0.017

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.0100	0.0016	0.3302	0.0048	0.0006	0.0011	0.3460	0.0035	0.6097	0.0050
0.0175	0.0049	0.5778	0.0085	0.0025	0.0049	0.5024	0.0088	0.6693	0.0100
0.0250	0.0100	0.8254	0.0121	0.0064	0.0127	0.6373	0.0159	0.7103	0.0156
0.0325	0.0169	1.0730	0.0158	0.0128	0.0257	0.7591	0.0247	0.7420	0.0215
0.0400	0.0256	1.3206	0.0194	0.0223	0.0446	0.8718	0.0349	0.7681	0.0278
0.0475	0.0361	1.5682	0.0230	0.0353	0.0706	0.9776	0.0464	0.7905	0.0344
0.0550	0.0484	1.8159	0.0267	0.0522	0.1043	1.0779	0.0593	0.8100	0.0412
0.0625	0.0625	2.0635	0.0303	0.0734	0.1467	1.1738	0.0734	0.8274	0.0483

For water depths greater than 0.0625 ft but less than 0.333 ft

Y1= Y-0.0625

A2= A1 + 2*Y1 + 25*Y1^2

P2= P1 + SQRT(2501*Y1^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.0630	0.0635	2.0890	0.0304	0.0747	0.1495	1.1767	0.0741	0.8262	0.0486
0.0900	0.1364	3.4663	0.0394	0.1907	0.3813	1.3977	0.1258	0.8210	0.0688
0.1200	0.2602	4.9966	0.0521	0.4382	0.8764	1.6845	0.2021	0.8569	0.0973
0.1500	0.4289	6.5269	0.0657	0.8438	1.6875	1.9672	0.2951	0.8951	0.1292
0.1800	0.6427	8.0572	0.0798	1.4386	2.8771	2.2385	0.4029	0.9298	0.1632
0.2100	0.9014	9.5875	0.0940	2.2516	4.5031	2.4978	0.5245	0.9606	0.1990
0.2400	1.2052	11.1178	0.1084	3.3099	6.6198	2.7464	0.6591	0.9880	0.2361
0.3281	2.3573	15.6117	0.1510	8.0749	16.1499	3.4255	1.1239	1.0539	0.3517
0.3330	2.4328	15.8617	0.1534	8.4208	16.8415	3.4614	1.1526	1.0571	0.3584

For water depths greater than 0.333 ft but less than 0.513 ft

Y2= Y - 0.333

A3= A2 + Y2*16 + 25 Y2^2

P3= P2 + SQRT (2501 Y2^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.3400	2.5460	16.2118	0.1570	8.9528	17.9056	3.5164	1.1956	1.0628	0.3685
0.3873	**3.3753**	**18.5772**	**0.1817**	**13.0802**	**26.1603**	**3.8753**	**1.5009**	**1.0974**	**0.4378**
0.4000	3.6170	19.2124	0.1883	14.3530	28.7060	3.9682	1.5873	1.1057	0.4567
0.4200	4.0140	20.2126	0.1986	16.5056	33.0112	4.1120	1.7271	1.1182	0.4866
0.4306	4.2325	20.7427	0.2040	17.7217	35.4434	4.1871	1.8029	1.1245	0.5025
0.4517	4.6842	21.7979	0.2149	20.3019	40.6037	4.3341	1.9577	1.1364	0.5344
0.4779	5.2761	23.1081	0.2283	23.8100	47.6200	4.5128	2.1567	1.1504	0.5744
0.5130	6.1228	24.8635	0.2463	29.0596	58.1193	4.7462	2.4348	1.1678	0.6287

FLOW = 4.39 + 2.24 + 4.32 + 5.20 = 16.15

Street Capacity Calculations

STREET: Taurus Ave.

32' F-F Street Section with 4" curb

Slope= 0.0191

Flow= 16.15

For water depths less than 0.0625 feet

Y= Water depth

Area = 16*Y^2

P= SQRT(1025*Y^2) + Y

n= 0.017

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.0100	0.0016	0.3302	0.0048	0.0006	0.0011	0.3460	0.0035	0.6097	0.0050
0.0175	0.0049	0.5778	0.0085	0.0025	0.0049	0.5024	0.0088	0.6693	0.0100
0.0250	0.0100	0.8254	0.0121	0.0064	0.0127	0.6373	0.0159	0.7103	0.0156
0.0325	0.0169	1.0730	0.0158	0.0128	0.0257	0.7591	0.0247	0.7420	0.0215
0.0400	0.0256	1.3206	0.0194	0.0223	0.0446	0.8718	0.0349	0.7681	0.0278
0.0475	0.0361	1.5682	0.0230	0.0353	0.0706	0.9776	0.0464	0.7905	0.0344
0.0550	0.0484	1.8159	0.0267	0.0522	0.1043	1.0779	0.0593	0.8100	0.0412
0.0625	0.0625	2.0635	0.0303	0.0734	0.1467	1.1738	0.0734	0.8274	0.0483

For water depths greater than 0.0625 ft but less than 0.333 ft

Y1= Y-0.0625

A2= A1 + 2*Y1 + 25*Y1^2

P2= P1 + SQRT(2501*Y1^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.0630	0.0635	2.0890	0.0304	0.0747	0.1495	1.1767	0.0741	0.8262	0.0486
0.0900	0.1364	3.4663	0.0394	0.1907	0.3813	1.3977	0.1258	0.8210	0.0688
0.1200	0.2602	4.9966	0.0521	0.4382	0.8764	1.6845	0.2021	0.8569	0.0973
0.1500	0.4289	6.5269	0.0657	0.8438	1.6875	1.9672	0.2951	0.8951	0.1292
0.1800	0.6427	8.0572	0.0798	1.4386	2.8771	2.2385	0.4029	0.9298	0.1632
0.2100	0.9014	9.5875	0.0940	2.2516	4.5031	2.4978	0.5245	0.9606	0.1990
0.2400	1.2052	11.1178	0.1084	3.3099	6.6198	2.7464	0.6591	0.9880	0.2361
0.3281	**2.3573**	**15.6117**	**0.1510**	**8.0749**	**16.1499**	**3.4255**	**1.1239**	**1.0539**	**0.3517**
0.3330	2.4328	15.8617	0.1534	8.4208	16.8415	3.4614	1.1526	1.0571	0.3584

For water depths greater than 0.333 ft but less than 0.513 ft

Y2= Y - 0.333

A3= A2 + Y2*16 + 25 Y2^2

P3= P2 + SQRT (2501 Y2^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.3400	2.5460	16.2118	0.1570	8.9528	17.9056	3.5164	1.1956	1.0628	0.3685
0.3700	3.0590	17.7121	0.1727	11.4605	22.9209	3.7465	1.3862	1.0854	0.4123
0.4000	3.6170	19.2124	0.1883	14.3530	28.7060	3.9682	1.5873	1.1057	0.4567
0.4200	4.0140	20.2126	0.1986	16.5056	33.0112	4.1120	1.7271	1.1182	0.4866
0.4306	4.2325	20.7427	0.2040	17.7217	35.4434	4.1871	1.8029	1.1245	0.5025
0.4517	4.6842	21.7979	0.2149	20.3019	40.6037	4.3341	1.9577	1.1364	0.5344
0.4779	5.2761	23.1081	0.2283	23.8100	47.6200	4.5128	2.1567	1.1504	0.5744
0.5130	6.1228	24.8635	0.2463	29.0596	58.1193	4.7462	2.4348	1.1678	0.6287

FLOW = 4.39 + 2.24 + 4.32 + 5.20 = 16.15

Street Capacity Calculations

STREET: Aries St.
28' F-F Street Section with 4" curb
Slope= 0.0371
Flow= 9.99

For water depths less than 0.0625 feet

Y= Water depth
Area = 16*Y^2
P= SQRT(1025*Y^2) + Y
n= 0.017

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.01	0.0016	0.330156	0.004846	0.000771	0.001543	0.482159	0.004822	0.849694	0.008015
0.02	0.0064	0.660312	0.009692	0.004898	0.009797	0.76538	0.015308	0.953749	0.01877
0.025	0.01	0.825391	0.012115	0.008881	0.017763	0.888145	0.022204	0.989888	0.024663
0.035	0.0196	1.155547	0.016962	0.021785	0.04357	1.111482	0.038902	1.046985	0.037198
0.045	0.0324	1.485703	0.021808	0.04258	0.085161	1.314212	0.05914	1.09177	0.050532
0.055	0.0484	1.815859	0.026654	0.072713	0.145426	1.502331	0.082628	1.128902	0.064514
0.06	0.0576	1.980937	0.029077	0.091702	0.183405	1.592055	0.095523	1.145393	0.071715
0.0625	0.0625	2.063476	0.030289	0.102249	0.204497	1.635977	0.102249	1.153212	0.075363

For water depths greater than 0.0625 ft but less than 0.3025 ft

Y1= Y-0.0625
A2= A1 + 2*Y1 + 25*Y1^2
P2= P1 + SQRT(2501*Y1^2)+Y1

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.063	0.063506	2.088981	0.030401	0.10415	0.208301	1.640004	0.10332	1.151454	0.075816
0.1	0.172656	3.976351	0.043421	0.359118	0.718237	2.079961	0.207996	1.159117	0.12138
0.13	0.311406	5.506651	0.056551	0.772462	1.544925	2.480562	0.322473	1.212412	0.167183
0.16	0.495156	7.036951	0.070365	1.420924	2.841848	2.869648	0.459144	1.264273	0.217048
0.2	0.810156	9.077351	0.08925	2.724157	5.448313	3.362508	0.672502	1.325014	0.287883
0.2467	**1.279141**	**11.45952**	**0.111623**	**4.99279**	**9.98558**	**3.903237**	**0.962928**	**1.384881**	**0.375313**
0.28	1.680156	13.15815	0.127689	7.173147	14.34629	4.269333	1.195413	1.421848	0.440168
0.3025	1.9825	14.30588	0.138579	8.938594	17.87719	4.508748	1.363896	1.444659	0.485013

For water depths greater than 0.3025 ft but less than 0.333 ft

Y2= Y - 0.3025
A3= A2 + Y2*14
P3= P2 + Y2

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.303	1.9895	14.30638	0.139064	8.991048	17.9821	4.51925	1.369333	1.446829	0.486718
0.308	2.0595	14.31138	0.143906	9.522235	19.04447	4.623567	1.424058	1.468161	0.50378
0.3102	2.0903	14.31358	0.146036	9.759759	19.51952	4.669071	1.448346	1.477344	0.511295
0.316	2.1715	14.31938	0.151648	10.39698	20.79396	4.787925	1.512984	1.500983	0.531134
0.32	2.2275	14.32338	0.155515	10.84566	21.69133	4.868984	1.558075	1.516825	0.544837
0.324	2.2835	14.32738	0.15938	11.3018	22.60359	4.94933	1.603583	1.532308	0.558558
0.3241	2.2849	14.32748	0.159477	11.31329	22.62659	4.95133	1.604726	1.53269	0.558902
0.333	2.4095	14.33638	0.168069	12.35498	24.70997	5.127613	1.707495	1.565904	0.589499

For water depths greater than 0.333 ft but less than 0.513 ft

Y3= Y - 0.333
A4= A3 + 14 * Y3 + 25 * Y3^2
P4= P3 + SQRT(2501 * Y3^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.335	2.4376	14.4364	0.168851	12.53781	25.07562	5.143506	1.723075	1.566062	0.593112
0.36	2.805725	15.68665	0.178861	14.99611	29.99222	5.344825	1.924137	1.569836	0.639249
0.39	3.288725	17.18695	0.19135	18.38669	36.77339	5.590827	2.180423	1.577669	0.696735
0.416	3.743725	18.48721	0.202504	21.73615	43.47229	5.806021	2.415305	1.586368	0.748178
0.45	4.389725	20.18755	0.217447	26.72576	53.45151	6.088253	2.739714	1.599405	0.817427
0.48	5.007725	21.68785	0.2309	31.73316	63.46632	6.336842	3.041684	1.611849	0.880172
0.513	5.7395	23.33818	0.245928	37.9317	75.86341	6.608886	3.390359	1.626079	0.95077

Street Capacity Calculations

STREET: Canis St.
28' F-F Street Section with 4" curb
Slope= 0.0462
Flow= 10.37

For water depths less than 0.0625 feet

Y= Water depth
Area = 16*Y^2
P= SQRT(1025*Y^2) + Y
n= 0.017

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.01	0.0016	0.330156	0.004846	0.000861	0.001722	0.538052	0.005381	0.948193	0.009311
0.02	0.0064	0.660312	0.009692	0.005466	0.010933	0.854105	0.017082	1.06431	0.021721
0.025	0.01	0.825391	0.012115	0.009911	0.019822	0.991101	0.024778	1.104638	0.028506
0.035	0.0196	1.155547	0.016962	0.02431	0.048621	1.240328	0.043411	1.168354	0.04292
0.045	0.0324	1.485703	0.021808	0.047517	0.095033	1.466559	0.065995	1.218331	0.058233
0.055	0.0484	1.815859	0.026654	0.081142	0.162284	1.676485	0.092207	1.259767	0.074273
0.06	0.0576	1.980937	0.029077	0.102333	0.204665	1.77661	0.106597	1.27817	0.082529
0.0625	0.0625	2.063476	0.030289	0.114101	0.228203	1.825624	0.114101	1.286896	0.086711

For water depths greater than 0.0625 ft but less than 0.3025 ft

Y1= Y-0.0625
A2= A1 + 2*Y1 + 25*Y1^2
P2= P1 + SQRT(2501*Y1^2)+Y1

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.063	0.063506	2.088981	0.030401	0.116224	0.232448	1.830117	0.115297	1.284933	0.087236
0.1	0.172656	3.976351	0.043421	0.400748	0.801496	2.321075	0.232108	1.293485	0.139637
0.13	0.311406	5.506651	0.056551	0.862008	1.724016	2.768114	0.359855	1.352958	0.192091
0.16	0.495156	7.036951	0.070365	1.585641	3.171283	3.202305	0.512369	1.41083	0.249106
0.2	0.810156	9.077351	0.08925	3.039948	6.079895	3.752298	0.75046	1.478613	0.330004
0.2406	**1.21169**	**11.14836**	**0.108688**	**5.184851**	**10.3697**	**4.279024**	**1.029533**	**1.537337**	**0.416449**
0.28	1.680156	13.15815	0.127689	8.004676	16.00935	4.764245	1.333989	1.586672	0.503699
0.3025	1.9825	14.30588	0.138579	9.974778	19.94956	5.031414	1.522003	1.612128	0.554808

For water depths greater than 0.3025 ft but less than 0.333 ft

Y2= Y - 0.3025
A3= A2 + Y2*14
P3= P2 + Y2

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.303	1.9895	14.30638	0.139064	10.03331	20.06663	5.043133	1.528069	1.614549	0.556738
0.308	2.0595	14.31138	0.143906	10.62608	21.25215	5.159542	1.589139	1.638354	0.576058
0.3102	2.0903	14.31358	0.146036	10.89114	21.78227	5.210322	1.616242	1.648601	0.584568
0.316	2.1715	14.31938	0.151648	11.60222	23.20445	5.342953	1.688373	1.674981	0.607028
0.32	2.2275	14.32338	0.155515	12.10292	24.20584	5.433409	1.738691	1.692659	0.622542
0.324	2.2835	14.32738	0.15938	12.61193	25.22385	5.523069	1.789474	1.709937	0.638074
0.3241	2.2849	14.32748	0.159477	12.62476	25.24952	5.5253	1.79075	1.710364	0.638463
0.333	2.4095	14.33638	0.168069	13.7872	27.57441	5.722018	1.905432	1.747428	0.673096

For water depths greater than 0.333 ft but less than 0.513 ft

Y3= Y - 0.333
A4= A3 + 14 * Y3 + 25 * Y3^2
P4= P3 + SQRT(2501 * Y3^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.335	2.4376	14.4364	0.168851	13.99123	27.98245	5.739754	1.922818	1.747604	0.677221
0.36	2.805725	15.68665	0.178861	16.7345	33.46899	5.964411	2.147188	1.751815	0.729861
0.39	3.288725	17.18695	0.19135	20.51812	41.03625	6.23893	2.433183	1.760556	0.795409
0.416	3.743725	18.48721	0.202504	24.25586	48.51171	6.47907	2.695293	1.770264	0.854037
0.45	4.389725	20.18755	0.217447	29.82387	59.64775	6.794019	3.057308	1.784812	0.932918
0.48	5.007725	21.68785	0.2309	35.41175	70.8235	7.071425	3.394284	1.798698	1.004361
0.513	5.7395	23.33818	0.245928	42.32884	84.65768	7.375005	3.783377	1.814578	1.084717

Street Capacity Calculations

STREET: Haleys

28' F-F Street Section with 4" curb

Slope= 0.0324

Flow= 10.96

For water depths less than 0.0625 feet

Y= Water depth

Area = 16*Y^2

P= SQRT(1025*Y^2) + Y

n= 0.017

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.01	0.0016	0.330156	0.004846	0.000721	0.001442	0.450584	0.004506	0.794051	0.007292
0.02	0.0064	0.660312	0.009692	0.004578	0.009155	0.715258	0.014305	0.891292	0.01712
0.025	0.01	0.825391	0.012115	0.0083	0.0166	0.829983	0.02075	0.925063	0.022513
0.035	0.0196	1.155547	0.016962	0.020358	0.040717	1.038695	0.036354	0.978422	0.033994
0.045	0.0324	1.485703	0.021808	0.039792	0.079584	1.228149	0.055267	1.020274	0.046218
0.055	0.0484	1.815859	0.026654	0.067951	0.135902	1.403949	0.077217	1.054974	0.059043
0.06	0.0576	1.980937	0.029077	0.085697	0.171394	1.487797	0.089268	1.070385	0.065652
0.0625	0.0625	2.063476	0.030289	0.095553	0.191105	1.528842	0.095553	1.077692	0.069

For water depths greater than 0.0625 ft but less than 0.3025 ft

Y1= Y-0.0625

A2= A1 + 2*Y1 + 25*Y1^2

P2= P1 + SQRT(2501*Y1^2)+Y1

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.063	0.063506	2.088981	0.030401	0.09733	0.19466	1.532605	0.096554	1.076049	0.069413
0.1	0.172656	3.976351	0.043421	0.335601	0.671202	1.943752	0.194375	1.08321	0.111142
0.13	0.311406	5.506651	0.056551	0.721876	1.443753	2.318118	0.301355	1.133016	0.153208
0.16	0.495156	7.036951	0.070365	1.327873	2.655746	2.681725	0.429076	1.18148	0.199052
0.2	0.810156	9.077351	0.08925	2.545761	5.091522	3.142309	0.628462	1.238243	0.264225
0.261	**1.444556**	**12.18896**	**0.118513**	**5.483889**	**10.96778**	**3.796245**	**0.99082**	**1.309502**	**0.370157**
0.28	1.680156	13.15815	0.127689	6.703402	13.4068	3.989749	1.11713	1.328736	0.40446
0.3025	1.9825	14.30588	0.138579	8.353236	16.70647	4.213486	1.27458	1.350053	0.445779

For water depths greater than 0.3025 ft but less than 0.333 ft

Y2= Y - 0.3025

A3= A2 + Y2*14

P3= P2 + Y2

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.303	1.9895	14.30638	0.139064	8.402255	16.80451	4.2233	1.27966	1.352081	0.447356
0.308	2.0595	14.31138	0.143906	8.898657	17.79731	4.320785	1.330802	1.372017	0.463143
0.3102	2.0903	14.31358	0.146036	9.120626	18.24125	4.36331	1.353499	1.380598	0.470097
0.316	2.1715	14.31938	0.151648	9.716117	19.43223	4.47438	1.413904	1.402689	0.488455
0.32	2.2275	14.32338	0.155515	10.13542	20.27084	4.550131	1.456042	1.417493	0.501137
0.324	2.2835	14.32738	0.15938	10.56168	21.12336	4.625215	1.49857	1.431962	0.513836
0.3241	2.2849	14.32748	0.159477	10.57242	21.14485	4.627084	1.499638	1.43232	0.514153
0.333	2.4095	14.33638	0.168069	11.5459	23.09179	4.791823	1.595677	1.463358	0.542472

For water depths greater than 0.333 ft but less than 0.513 ft

Y3= Y - 0.333

A4= A3 + 14 * Y3 + 25 * Y3^2

P4= P3 + SQRT(2501 * Y3^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.335	2.4376	14.4364	0.168851	11.71675	23.43351	4.806676	1.610236	1.463506	0.545798
0.36	2.805725	15.68665	0.178861	14.01407	28.02813	4.994811	1.798132	1.467033	0.588275
0.39	3.288725	17.18695	0.19135	17.18261	34.36522	5.224703	2.037634	1.474353	0.641223
0.416	3.743725	18.48721	0.202504	20.31272	40.62544	5.425805	2.257135	1.482482	0.688623
0.45	4.389725	20.18755	0.217447	24.97558	49.95116	5.689554	2.560299	1.494666	0.752448
0.48	5.007725	21.68785	0.2309	29.65507	59.31013	5.921864	2.842495	1.506294	0.810295
0.513	5.7395	23.33818	0.245928	35.44769	70.89537	6.176093	3.168336	1.519593	0.875398

Street Capacity Calculations

STREET: Perseus St.

32' F-F Street Section with 4" curb

Slope= 0.0362

Flow= 11.79

For water depths less than 0.0625 feet

Y= Water depth

Area = 16*Y^2

P= SQRT(1025*Y^2) + Y

n= 0.017

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.0100	0.0016	0.3302	0.0048	0.0008	0.0015	0.4763	0.0048	0.8393	0.0079
0.0175	0.0049	0.5778	0.0085	0.0034	0.0068	0.6916	0.0121	0.9214	0.0157
0.0250	0.0100	0.8254	0.0121	0.0088	0.0175	0.8773	0.0219	0.9778	0.0243
0.0325	0.0169	1.0730	0.0158	0.0177	0.0353	1.0450	0.0340	1.0215	0.0334
0.0400	0.0256	1.3206	0.0194	0.0307	0.0614	1.2001	0.0480	1.0575	0.0431
0.0475	0.0361	1.5682	0.0230	0.0486	0.0972	1.3458	0.0639	1.0882	0.0531
0.0550	0.0484	1.8159	0.0267	0.0718	0.1437	1.4840	0.0816	1.1151	0.0635
0.0625	0.0625	2.0635	0.0303	0.1010	0.2020	1.6160	0.1010	1.1391	0.0742

For water depths greater than 0.0625 ft but less than 0.333 ft

Y1= Y-0.0625

A2= A1 + 2*Y1 + 25*Y1^2

P2= P1 + SQRT(2501*Y1^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.0630	0.0635	2.0890	0.0304	0.1029	0.2058	1.6200	0.1021	1.1374	0.0746
0.0900	0.1364	3.4663	0.0394	0.2625	0.5249	1.9242	0.1732	1.1303	0.1057
0.1200	0.2602	4.9966	0.0521	0.6033	1.2066	2.3190	0.2783	1.1797	0.1490
0.1500	0.4289	6.5269	0.0657	1.1616	2.3232	2.7083	0.4062	1.2323	0.1970
0.1800	0.6427	8.0572	0.0798	1.9805	3.9609	3.0817	0.5547	1.2800	0.2480
0.2100	0.9014	9.5875	0.0940	3.0997	6.1994	3.4388	0.7221	1.3224	0.3015
0.2400	1.2052	11.1178	0.1084	4.5567	9.1134	3.7810	0.9074	1.3601	0.3570
0.2626	**1.4637**	**12.2706**	**0.1193**	**5.8989**	**11.7977**	**4.0301**	**1.0583**	**1.3859**	**0.3999**
0.3330	2.4328	15.8617	0.1534	11.5928	23.1856	4.7653	1.5868	1.4553	0.5388

For water depths greater than 0.333 ft but less than 0.513 ft

Y2= Y - 0.333

A3= A2 + Y2*16 + 25 Y2^2

P3= P2 + SQRT (2501 Y2^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.3400	2.5460	16.2118	0.1570	12.3253	24.6505	4.8411	1.6460	1.4631	0.5538
0.3700	3.0590	17.7121	0.1727	15.7776	31.5551	5.1578	1.9084	1.4943	0.6185
0.4000	3.6170	19.2124	0.1883	19.7597	39.5195	5.4630	2.1852	1.5222	0.6840
0.4200	4.0140	20.2126	0.1986	22.7232	45.4463	5.6610	2.3776	1.5394	0.7281
0.4306	4.2325	20.7427	0.2040	24.3974	48.7947	5.7643	2.4821	1.5480	0.7517
0.4517	4.6842	21.7979	0.2149	27.9495	55.8989	5.9668	2.6952	1.5645	0.7988
0.4779	5.2761	23.1081	0.2283	32.7791	65.5582	6.2128	2.9691	1.5838	0.8578
0.5130	6.1228	24.8635	0.2463	40.0062	80.0125	6.5340	3.3520	1.6077	0.9377

Street Capacity Calculations

STREET: Cassiopeia St.

32' F-F Street Section with 4" curb

Slope= 0.0598

Flow= 6.69

For water depths less than 0.0625 feet

Y= Water depth

Area = 16*Y^2

P= SQRT(1025*Y^2) + Y

n= 0.017

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.0100	0.0016	0.3302	0.0048	0.0010	0.0020	0.6121	0.0061	1.0788	0.0111
0.0175	0.0049	0.5778	0.0085	0.0044	0.0087	0.8890	0.0156	1.1842	0.0218
0.0250	0.0100	0.8254	0.0121	0.0113	0.0226	1.1276	0.0282	1.2568	0.0337
0.0325	0.0169	1.0730	0.0158	0.0227	0.0454	1.3431	0.0437	1.3129	0.0462
0.0400	0.0256	1.3206	0.0194	0.0395	0.0790	1.5425	0.0617	1.3592	0.0594
0.0475	0.0361	1.5682	0.0230	0.0624	0.1249	1.7297	0.0822	1.3986	0.0732
0.0550	0.0484	1.8159	0.0267	0.0923	0.1846	1.9073	0.1049	1.4332	0.0873
0.0625	0.0625	2.0635	0.0303	0.1298	0.2596	2.0770	0.1298	1.4641	0.1019

For water depths greater than 0.0625 ft but less than 0.333 ft

Y1= Y-0.0625

A2= A1 + 2*Y1 + 25*Y1^2

P2= P1 + SQRT(2501*Y1^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.0630	0.0635	2.0890	0.0304	0.1322	0.2645	2.0821	0.1312	1.4619	0.1025
0.0900	0.1364	3.4663	0.0394	0.3373	0.6747	2.4731	0.2226	1.4527	0.1453
0.1200	0.2602	4.9966	0.0521	0.7754	1.5508	2.9806	0.3577	1.5163	0.2042
0.1620	0.5090	7.1390	0.0713	1.8708	3.7417	3.6755	0.5954	1.6093	0.2965
0.1978	**0.7908**	**8.9651**	**0.0882**	**3.3493**	**6.6985**	**4.2355**	**0.8378**	**1.6783**	**0.3809**
0.2100	0.9014	9.5875	0.0940	3.9840	7.9680	4.4198	0.9281	1.6997	0.4106
0.2400	1.2052	11.1178	0.1084	5.8566	11.7133	4.8596	1.1663	1.7481	0.4853
0.2700	1.5539	12.6481	0.1229	8.2088	16.4176	5.2827	1.4263	1.7916	0.5623
0.3330	2.4328	15.8617	0.1534	14.9000	29.7999	6.1247	2.0395	1.8704	0.7299

For water depths greater than 0.333 ft but less than 0.513 ft

Y2= Y - 0.333

A3= A2 + Y2*16 + 25 Y2^2

P3= P2 + SQRT (2501 Y2^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.3400	2.5460	16.2118	0.1570	15.8414	31.6827	6.2221	2.1155	1.8805	0.7500
0.3700	3.0590	17.7121	0.1727	20.2785	40.5570	6.6292	2.4528	1.9206	0.8368
0.4000	3.6170	19.2124	0.1883	25.3967	50.7934	7.0215	2.8086	1.9565	0.9247
0.4200	4.0140	20.2126	0.1986	29.2055	58.4111	7.2760	3.0559	1.9785	0.9838
0.4306	4.2325	20.7427	0.2040	31.3573	62.7147	7.4087	3.1902	1.9897	1.0153
0.4600	4.8680	22.2130	0.2192	37.8237	75.6475	7.7699	3.5742	2.0189	1.1033
0.4779	5.2761	23.1081	0.2283	42.1302	84.2603	7.9852	3.8161	2.0356	1.1574
0.5130	6.1228	24.8635	0.2463	51.4191	102.8381	8.3980	4.3082	2.0663	1.2644

Street Capacity Calculations

STREET: Andromeda St.

32' F-F Street Section with 4" curb

Slope= 0.0679

Flow= 5.56

For water depths less than 0.0625 feet

Y= Water depth

Area = 16*Y^2

P= SQRT(1025*Y^2) + Y

n= 0.017

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.0100	0.0016	0.3302	0.0048	0.0010	0.0021	0.6523	0.0065	1.1495	0.0120
0.0175	0.0049	0.5778	0.0085	0.0046	0.0093	0.9472	0.0166	1.2619	0.0237
0.0250	0.0100	0.8254	0.0121	0.0120	0.0240	1.2015	0.0300	1.3392	0.0365
0.0325	0.0169	1.0730	0.0158	0.0242	0.0484	1.4312	0.0465	1.3990	0.0501
0.0400	0.0256	1.3206	0.0194	0.0421	0.0842	1.6437	0.0657	1.4483	0.0643
0.0475	0.0361	1.5682	0.0230	0.0665	0.1331	1.8432	0.0876	1.4904	0.0791
0.0550	0.0484	1.8159	0.0267	0.0984	0.1967	2.0324	0.1118	1.5272	0.0944
0.0625	0.0625	2.0635	0.0303	0.1383	0.2767	2.2132	0.1383	1.5601	0.1101

For water depths greater than 0.0625 ft but less than 0.333 ft

Y1= Y-0.0625

A2= A1 + 2*Y1 + 25*Y1^2

P2= P1 + SQRT(2501*Y1^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.0630	0.0635	2.0890	0.0304	0.1409	0.2818	2.2187	0.1398	1.5577	0.1108
0.0900	0.1364	3.4663	0.0394	0.3595	0.7189	2.6352	0.2372	1.5480	0.1571
0.1200	0.2602	4.9966	0.0521	0.8263	1.6525	3.1760	0.3811	1.6157	0.2207
0.1620	0.5090	7.1390	0.0713	1.9935	3.9870	3.9165	0.6345	1.7148	0.3201
0.1816	**0.6553**	**8.1388**	**0.0805**	**2.7833**	**5.5665**	**4.2472**	**0.7713**	**1.7564**	**0.3693**
0.2100	0.9014	9.5875	0.0940	4.2453	8.4905	4.7096	0.9890	1.8111	0.4430
0.2400	1.2052	11.1178	0.1084	6.2407	12.4814	5.1783	1.2428	1.8628	0.5235
0.2700	1.5539	12.6481	0.1229	8.7471	17.4942	5.6291	1.5199	1.9091	0.6064
0.3330	2.4328	15.8617	0.1534	15.8770	31.7541	6.5264	2.1733	1.9931	0.7868

For water depths greater than 0.333 ft but less than 0.513 ft

Y2= Y - 0.333

A3= A2 + Y2*16 + 25 Y2^2

P3= P2 + SQRT (2501 Y2^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.3400	2.5460	16.2118	0.1570	16.8802	33.7603	6.6301	2.2542	2.0038	0.6084
0.3700	3.0590	17.7121	0.1727	21.6083	43.2166	7.0639	2.6136	2.0465	0.9017
0.4000	3.6170	19.2124	0.1883	27.0621	54.1242	7.4820	2.9928	2.0848	0.9962
0.4200	4.0140	20.2126	0.1986	31.1207	62.2414	7.7531	3.2563	2.1082	1.0597
0.4306	4.2325	20.7427	0.2040	33.4136	66.8272	7.8945	3.3994	2.1201	1.0936
0.4600	4.8680	22.2130	0.2192	40.3041	80.6081	8.2794	3.8085	2.1513	1.1883
0.4779	5.2761	23.1081	0.2283	44.8929	89.7857	8.5088	4.0664	2.1691	1.2464
0.5130	6.1228	24.8635	0.2463	54.7909	109.5818	8.9487	4.5907	2.2018	1.3613

Street Capacity Calculations

STREET: Sirius St.

32' F-F Street Section with 4" curb

Slope= 0.08

Flow= 4.32

For water depths less than 0.0625 feet

Y= Water depth

Area = 16*Y^2

P= SQRT(1025*Y^2) + Y

n= 0.017

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.0100	0.0016	0.3302	0.0048	0.0011	0.0023	0.7080	0.0071	1.2477	0.0133
0.0175	0.0049	0.5778	0.0085	0.0050	0.0101	1.0282	0.0180	1.3697	0.0263
0.0250	0.0100	0.8254	0.0121	0.0130	0.0261	1.3042	0.0326	1.4536	0.0404
0.0325	0.0169	1.0730	0.0158	0.0263	0.0525	1.5535	0.0505	1.5186	0.0554
0.0400	0.0256	1.3206	0.0194	0.0457	0.0913	1.7841	0.0714	1.5720	0.0711
0.0475	0.0361	1.5682	0.0230	0.0722	0.1444	2.0007	0.0950	1.6177	0.0875
0.0550	0.0484	1.8159	0.0267	0.1068	0.2135	2.2061	0.1213	1.6577	0.1043
0.0625	0.0625	2.0635	0.0303	0.1501	0.3003	2.4023	0.1501	1.6934	0.1217

For water depths greater than 0.0625 ft but less than 0.333 ft

Y1= Y-0.0625

A2= A1 + 2*Y1 + 25*Y1^2

P2= P1 + SQRT(2501*Y1^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.0630	0.0635	2.0890	0.0304	0.1529	0.3059	2.4083	0.1517	1.6908	0.1224
0.0900	0.1364	3.4663	0.0394	0.3902	0.7804	2.8604	0.2574	1.6803	0.1735
0.1200	0.2602	4.9966	0.0521	0.8969	1.7937	3.4474	0.4137	1.7538	0.2436
0.1620	**0.5090**	**7.1390**	**0.0713**	**2.1639**	**4.3277**	**4.2512**	**0.6887**	**1.8613**	**0.3531**
0.1800	0.6427	8.0572	0.0798	2.9441	5.8883	4.5812	0.8246	1.9029	0.4027
0.2100	0.9014	9.5875	0.0940	4.6080	9.2160	5.1120	1.0735	1.9659	0.4882
0.2400	1.2052	11.1178	0.1084	6.7740	13.5479	5.6208	1.3490	2.0219	0.5767
0.2700	1.5539	12.6481	0.1229	9.4945	18.9891	6.1101	1.6497	2.0722	0.6677
0.3330	2.4328	15.8617	0.1534	17.2337	34.4675	7.0840	2.3590	2.1634	0.8658

For water depths greater than 0.333 ft but less than 0.513 ft

Y2= Y - 0.333

A3= A2 + Y2*16 + 25 Y2^2

P3= P2 + SQRT (2501 Y2^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.3400	2.5460	16.2118	0.1570	18.3226	36.6452	7.1967	2.4469	2.1750	0.8895
0.3700	3.0590	17.7121	0.1727	23.4547	46.9094	7.6675	2.8370	2.2214	0.9920
0.4000	3.6170	19.2124	0.1883	29.3746	58.7492	8.1213	3.2485	2.2629	1.0956
0.4200	4.0140	20.2126	0.1986	33.7800	67.5600	8.4156	3.5345	2.2884	1.1654
0.4306	4.2325	20.7427	0.2040	36.2688	72.5377	8.5691	3.6899	2.3013	1.2025
0.4600	4.8680	22.2130	0.2192	43.7481	87.4961	8.9869	4.1340	2.3351	1.3064
0.4779	5.2761	23.1081	0.2283	48.7290	97.4580	9.2359	4.4138	2.3544	1.3701
0.5130	6.1228	24.8635	0.2463	59.4728	118.9456	9.7134	4.9830	2.3899	1.4962

FINDING STREET CAPACITY - 28 F-F CROSS-SECTION FOR 4" CURB

Q = 1.49/n A R^(2/3) S^½
n = 0.017
SLOPE = STREET SLOPE
R^2/3 = (A/P)^2/3
D2 = HYDRAULIC DEPTH AFTER HYDRAULIC JUMP = D1/2 [SQRT (1 + 8Fr²) - 1]
E = V² / 2g

HALF STREET CALCULATIONS

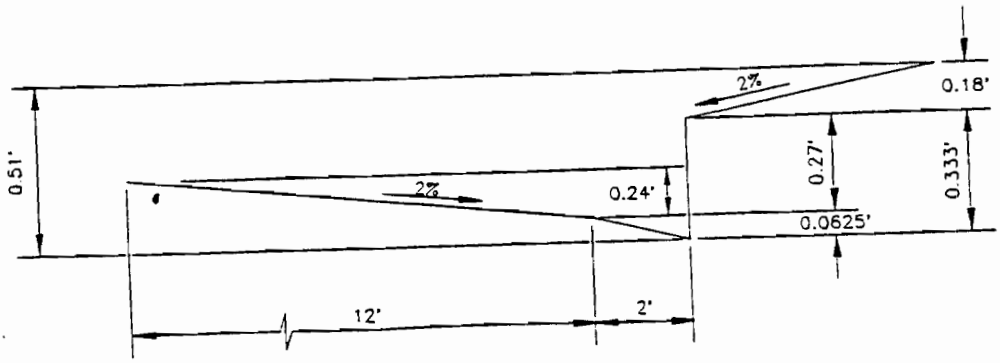
@Y < = 0.0625
A1 = ½ Y (Y/0.03125) = 16Y²
P1 = SQRT[Y² + (Y/0.03125)²] + Y = SQRT(1025 Y²) + Y

@ 0.0625 < Y < = 0.3025 & Y1 = Y - 0.0625
A2 = A1 + ½Y1 (Y1/0.02) + 2Y1 = A1 + 25Y1² + 2Y1
P2 = P1 + SQRT[Y1² + (Y1/0.02)²] + Y1 = P1 + SQRT(2501 Y²) + Y1

@ 0.3025 < Y < = 0.333 & Y2 = Y - 0.3025
A3 = A2 + 14Y2
P3 = P2 + Y2

@ 0.333 < Y < = 0.513 & Y3 = Y - 0.333
A4 = A3 + 14Y3 + ½Y3[Y3/(0.02)] = A3 + 14 Y3 + 25 Y3²
P4 = P3 + SQRT(Y3² + [Y3/(0.02)]²) = P3 + SQRT(2501 Y3²)

SEE THE FOLLOWING SHEET FOR INPUT AND OUTPUT FILE FOR CALCULATION RESULTS FROM COMPUTER PROGRAM USING THE EQUATION SHOWN ABOVE



28' F—F
4" CURB
NOT TO SCALE

FINDING STREET CAPACITY – 32 F–F CROSS–SECTION FOR 8" CURB

$Q = 1.49/n\ A\ R^{\wedge}(2/3)\ S^{\wedge}\frac{1}{2}$
$n =$ 0.017
SLOPE = STREET SLOPE
$R^{\wedge}2/3 = (A/P)^{\wedge}2/3$
D2 = WATER DEPTH AFTER HYDRAULIC JUMP = $D1/2\ [SQRT\ (1 + 8Fr^2) - 1]$
$E = V^2 / 2g$

HALF STREET CALCULATIONS

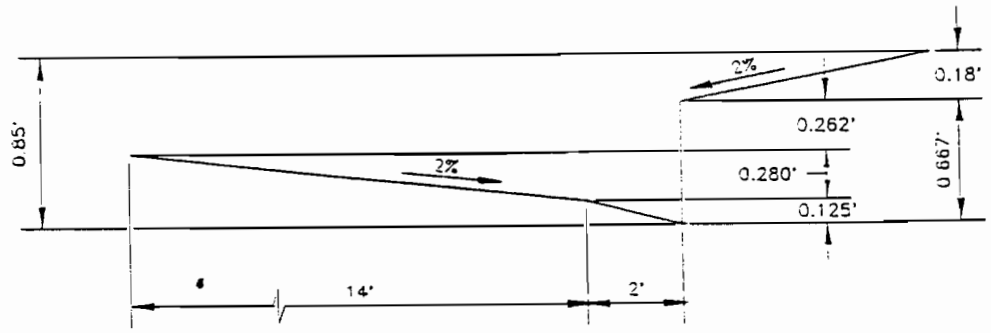
@ $Y \leq 0.125$
$A1 = \frac{1}{2}\ Y\ (Y/0.0625) = 8Y^2$
$P1 = SQRT[Y^2 + (Y/0.0625)^2] + Y = SQRT(257\ Y^2) + Y$

@ $0.125 < Y \leq 0.405$ & $Y1 = Y - 0.125$
$A2 = A1 + \frac{1}{2}Y1\ (Y1/0.02) + 2Y1 = A1 + 25Y1^2 + 2Y1$
$P2 = P1 + SQRT[Y1^2 + (Y1/0.02)^2] + Y1 = P1 + SQRT(2501\ Y1^2) + Y1$

@ $0.405 < Y \leq 0.667$ & $Y2 = Y - 0.405$
$A3 = A2 + 16Y2 + \frac{1}{2}Y2[Y2/(0.02)] = A2 + 16\ Y2$
$P3 = P2 + SQRT(Y2^2 + [Y2/(0.02)]^2) = P2 + Y2$

@ $0.667 < Y \leq 0.847$ & $Y3 = Y - 0.667$
$A4 = A3 + 16Y3 + \frac{1}{2}Y3[Y3/(0.02)] = A3 + 16\ Y3 + 25\ Y3^2$
$P4 = P3 + SQRT(Y3^2 + [Y3/(0.02)]^2) = P3 + SQRT(2501\ Y3^2)$

SEE THE FOLLOWING SHEET FOR INPUT AND OUTPUT FILE FOR CALCULAITON RESULTS FROM COMPUTER PROGRAM USING THE EQUATION SHWON ABOVE



32' F–F
8" CURB
NOT TO SCALE

FINDING STREET CAPACITY – 32 F–F CROSS–SECTION FOR 4" CURB

$Q = 1.49/n\ A\ R\ ^\wedge\ (2/3)\ S\ ^\wedge\ ½$
n = 0.017
SLOPE = STREET SLOPE
$R\ ^\wedge\ 2/3 = (A/P)\ ^\wedge\ 2/3$
D2 = HYDRAULIC DEPTH AFTER HYDRAULIC JUMP = $D1/2\ [SQRT\ (1 + 8Fr^2) - 1]$
$E = V^2 / 2g$

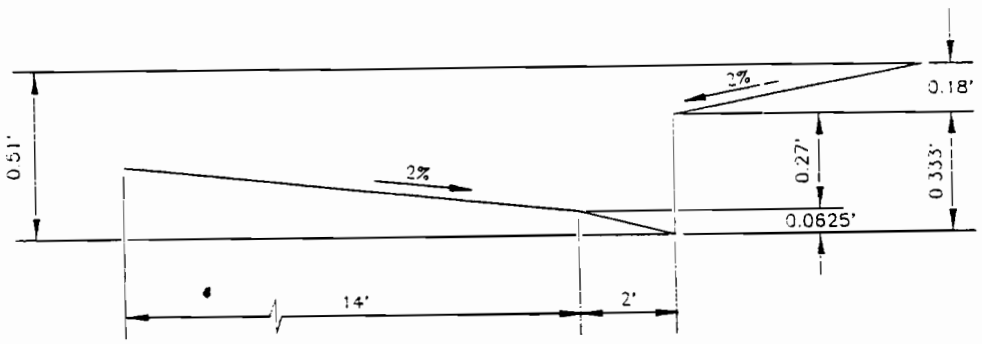
HALF STREET CALCULATIONS

@ $Y \leq 0.0625$
$A1 = ½\ Y\ (Y/0.03125) = 16Y^2$
$P1 = SQRT[Y^2 + (Y/0.03125)^2] + Y = SQRT(1025\ Y^2) + Y$

@ $0.0625 < Y \leq 0.333$ & $Y1 = Y - 0.0625$
$A2 = A1 + ½Y1\ (Y1/0.02) + 2Y1 = A1 + 25Y1^2 + 2Y1$
$P2 = P1 + SQRT[Y1^2 + (Y1/0.02)^2] + Y1 = P1 + SQRT(2501\ Y^2) + Y1$

@ $0.333 < Y \leq 0.513$ & $Y2 = Y - 0.333$
$A3 = A2 + 16Y2 + ½Y2[Y2/(0.02)] = A2 + 16\ Y2 + 25\ Y2^2$
$P3 = P2 + SQRT(Y2^2 + [Y2/(0.02)]^2) = P2 + SQRT(2501\ Y2^2)$

SEE THE FOLLOWING SHEET FOR INPUT AND OUTPUT FILE FOR CALCULAITON RESULTS FROM COMPUTER PROGRAM USING THE EQUATION SHWON ABOVE



32' F–F
4" CURB
NOT TO SCALE

Street Capacity

48' F-F Cross-Section for 8" Curb

Manning's Equation:

$$Q=\frac{1.49}{n}AR^{2/3}S^{1/2}$$

Q (cfs) = Flow
n = 0.017
S = Street Slope
R = $A_{Area}/P_{Wetted\ Perimeter}$

Half Street Calculations

@ Y ≤ 0.125:

$$A=\frac{1}{2}Y\left(\frac{Y}{0.0625}\right)$$

$$=8Y^2$$

$$P=\sqrt{Y^2+\left(\frac{Y}{0.0625}\right)^2}+Y$$

$$=\sqrt{257Y^2}+Y$$

@ 0.125 < Y ≤ 0.565:
$Y_1 = Y - 0.125$

$$A_1=A+\frac{1}{2}Y_1\left(\frac{Y_1}{0.02}\right)+2Y_1$$

$$=A+25Y_1^2+2Y_1$$

$$P_1=P+\sqrt{Y_1^2+\left(\frac{Y_1}{0.02}\right)^2}+Y_1$$

$$=P+\sqrt{2501Y_1^2}+Y_1$$

@ 0.565 < Y ≤0.667:
$Y_2 = Y - 0.565$

$$A_2=A_1+24Y_2$$

$$P_2=P_1+Y_2$$

@ $0.667 < Y \leq 0.85$:

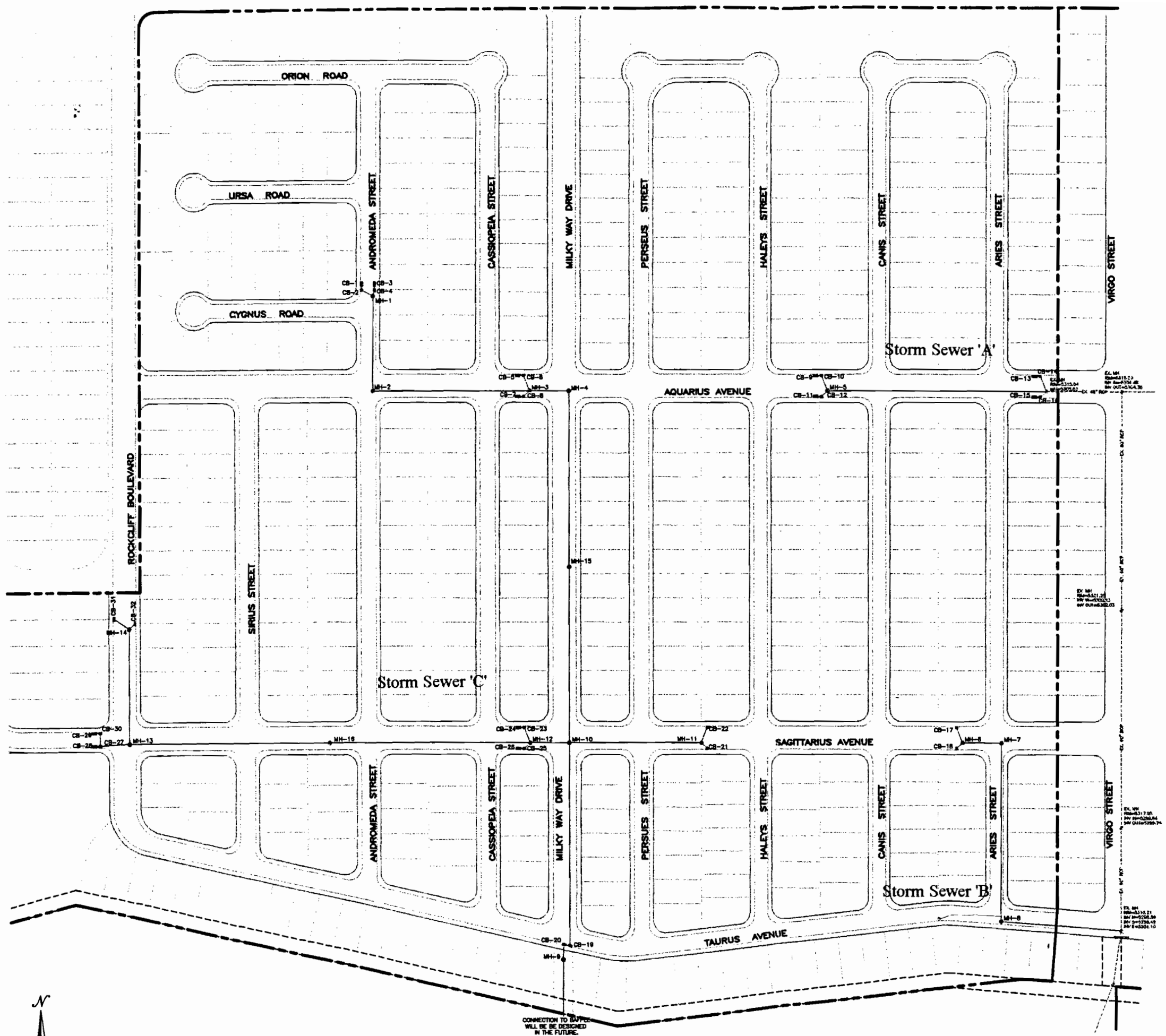
$Y_3 = Y - 0.667$

$$A_3 = A_2 + 24Y_3 + \frac{1}{2}Y_3\left(\frac{Y_3}{0.02}\right)$$

$$= A_3 + 24Y_3 + 25Y_3^2$$

$$P_3 = P_2 + \sqrt{Y_3^2 + \left(\frac{Y_3}{0.02}\right)^2}$$

$$= P_3 + \sqrt{2501Y_3^2}$$



STORM SEWER LAYOUT

Pipe Capacity

STORM SEWER 'A' (Units 3 and 5)

Pipe	D	Slope	Area	R	Q Provided	Q Required	Velocity
	(in)	(%)	(ft^2)		(cfs)	(cfs)	(ft/s)
CB9 to CB10	18	3.8	1.77	0.375	20.53	18.00	10.19
CB11 to CB12	18	3.8	1.77	0.375	20.53	18.00	10.19
CB10 to MH5	24	4.06	3.14	0.5	45.71	22.89	7.29
CB12 to MH5	18	8.12	1.77	0.375	30.01	22.89	12.95
CB13 to CB14	18	4.4	1.77	0.375	22.09	19.50	11.03
CB15 to CB16	18	4.4	1.77	0.375	22.09	19.50	11.03
CB14 to EXISTING	18	19.96	1.77	0.375	47.06	23.80	13.47
CB16 to EXISTING	18	39.88	1.77	0.375	66.51	23.80	13.47
MH5 to EXISTING	30	5.47	4.91	0.625	96.19	45.77	9.32

STORM SEWER 'B' (Unit 4)

Pipe	D	Slope	Area	R	Q Provided	Q Required	Velocity
	(in)	(%)	(ft^2)		(cfs)	(cfs)	(ft/s)
CB17 to MH6	18	1.56	1.77	0.375	13.16	8.83	5.00
CB18 to MH6	15	3.12	1.23	0.3125	11.44	8.83	7.20
MH6 to MH7	24	1.67	3.14	0.5	29.31	17.65	5.62
MH7 to MH8	24	1.84	3.14	0.5	30.77	17.65	5.62
MH8 to EXISTING	30	1.29	4.91	0.625	46.71	38.01	7.74
CB34 to CB33	18	1	1.77	0.375	10.53	10.18	5.76
CB33 to MH17	30	0.6	4.91	0.625	31.86	20.36	4.15
MH17 to MH8	30	0.6	4.91	0.625	31.86	20.36	4.15

STORM SEWER 'C'

Pipe	D	Slope	Area	R	Q Provided	Q Required	Velocity
	(in)	(%)	(ft^2)		(cfs)	(cfs)	(ft/s)
CB1 to CB2	18	0.9	1.77	0.375	9.99	5.60	3.17
CB2 to MH1	18	3.98	1.77	0.375	21.01	8.70	4.92
CB4 to MH1	18	3.98	1.77	0.375	21.01	8.70	4.92
MH1 to MH2	24	1.04	3.14	0.5	23.13	17.40	5.54
MH2 to MH3	18	3.42	1.77	0.375	19.48	17.40	9.85
CB5 to CB6	24	2.6	3.14	0.5	36.58	18.00	5.73
CB6 to MH3	24	3.53	3.14	0.5	42.62	21.58	6.87
CB8 to MH3	24	6.71	3.14	0.5	58.76	21.58	6.87
MH3 to MH4	36	1.68	7.07	0.75	86.68	60.56	8.57
MH4 to MH15	36	2.17	7.07	0.75	98.52	60.56	8.57
MH15 to MH10	36	7.46	7.07	0.75	182.66	60.56	8.57
CB31 to MH14	15	7.29	1.23	0.3125	17.49	12.77	10.41
CB32 to MH14	12	30.49	0.79	0.25	19.73	12.77	16.26
MH14 to MH13	18	7.62	1.77	0.375	29.07	25.54	14.45
CB28 to CB27	15	3.2	1.23	0.3125	11.59	11.50	9.37
CB29 to CB30	24	1	3.14	0.5	22.68	11.50	3.66
CB30 to CB27	24	4.7	3.14	0.5	49.18	13.33	4.24
CB27 to MH13	24	2.16	3.14	0.5	33.34	26.66	8.49
MH13 to MH16	36	1.44	7.07	0.75	80.25	52.20	7.38
MH16 to MH12	36	1.48	7.07	0.75	81.36	52.20	7.38
CB24 to CB23	18	2.3	1.77	0.375	15.97	10.00	5.66
CB23 to MH12	18	7.24	1.77	0.375	28.34	15.30	8.66
CB25 to MH12	18	14.47	1.77	0.375	40.07	15.30	8.66
MH12 to MH10	36	10.05	7.07	0.75	212.01	82.80	11.71
CB21 to MH11	18	3.35	1.77	0.375	19.28	9.94	5.62
CB22 to MH11	18	1.68	1.77	0.375	13.65	9.94	5.62
MH11 to MH10	30	0.55	4.91	0.625	30.50	19.87	4.05
MH10 to CB19	48	3.08	12.57	1	252.77	163.21	12.99
CB19 to CB20	48	18.46	12.57	1	618.83	208.30	16.58
CB20 to MH9	54	2.89	15.90	1.125	335.20	253.39	15.93
MH9 to DAM	60	1	19.63	1.25	261.14	253.39	12.91

Manning's Equation:

$Q = 1.49/n * A * R^{(2/3)} * S^{(1/2)}$

A = Area

R = D/4

S = Slope

n = 0.013

HYDRAULIC GRADE LINE

MANNING'S EQUATION
$Q = 1.49/n * A * R^{(3/2)} * S^{(1/2)}$

LOCATION	DEPTH (IN)	DEPTH (FT)	DIAMETER (IN)	SLOPE (FT/FT)	THETA	AREA (FT^2)	WP	R	Q (CFS)	V (FPS)
CB-1 to CB-2	9.64	0.80	18	0.009	3.28	0.96	2.46	0.39	5.60	5.82
CB-2 to MH-1	8.08	0.67	18	0.0398	2.94	0.77	2.20	0.35	8.71	11.34
CB-3 to CB-4	9.64	0.80	18	0.009	3.28	0.96	2.46	0.39	5.60	5.82
CB-4 to MH-1	8.08	0.67	18	0.0398	2.94	0.77	2.20	0.35	8.71	11.34
MH-1 to MH-2	15.54	1.30	24	0.0104	3.74	2.15	3.74	0.58	17.40	8.09
MH-2 to MH-3	10.77	0.90	24	0.0342	2.94	1.37	2.94	0.47	17.39	12.73
CB-5 to CB-6	11.89	0.99	24	0.026	3.12	1.55	3.12	0.50	18.00	11.60
CB-6 to MH-3	12.09	1.01	24	0.0353	3.16	1.59	3.16	0.50	21.58	13.61
CB-7 to CB-8	11.30	0.94	24	0.031	3.02	1.45	3.02	0.48	18.01	12.38
CB-8 to MH-3	10.07	0.84	24	0.0671	2.82	1.25	2.82	0.44	21.60	17.27
MH-3 to MH-4	22.16	1.85	36	0.0168	3.61	4.56	5.41	0.84	60.54	13.26
MH-4 to MH-15	20.40	1.70	36	0.0217	3.41	4.13	5.11	0.81	60.54	14.65
MH-15 to MH-10	14.27	1.19	36	0.0746	2.72	2.61	4.09	0.64	60.54	23.21
MH-10 to MH-11	17.65	1.47	30	0.0055	3.50	3.00	4.37	0.69	19.88	6.62
MH-11 to CB-22	11.40	0.95	18	0.0168	3.68	1.18	2.76	0.43	9.95	8.43
MH-11 to CB-21	9.16	0.76	18	0.0335	3.18	0.90	2.38	0.38	9.93	10.99
MH-10 to CB-19	28.07	2.34	48	0.0308	3.48	7.63	6.96	1.10	163.22	21.38
CB-19 to CB-20	19.19	1.60	48	0.1846	2.74	4.69	5.48	0.86	208.34	44.42
CB-19 to MH-9	35.08	2.92	54	0.0289	3.75	10.94	8.44	1.30	253.34	23.17
MH-10 to MH-12	15.62	1.30	36	0.1005	2.88	2.94	4.31	0.68	82.77	28.14
MH-12 to CB-25	9.42	0.79	18	0.0724	3.23	0.94	2.43	0.39	15.30	16.34
CB-25 to CB-26	10.32	0.86	18	0.023	3.44	1.05	2.58	0.41	10.00	9.54
MH-12 to CB-23	7.72	0.64	18	0.1447	2.86	0.72	2.14	0.34	15.32	21.16
CB-23 to CB-24	10.32	0.86	18	0.023	3.44	1.05	2.58	0.41	10.00	9.54
MH-12 to MH-16	20.97	1.75	36	0.0148	3.47	4.27	5.21	0.82	52.21	12.22
MH-16 to MH-13	21.15	1.76	36	0.0144	3.49	4.32	5.24	0.82	52.19	12.09
MH-13 to CB-27	16.24	1.35	24	0.0216	3.86	2.26	3.86	0.59	26.67	11.79
CB-27 to CB-28	12.19	1.02	15	0.032	4.49	1.07	2.81	0.38	11.50	10.76
CB-27 to CB-30	8.54	0.71	24	0.047	2.56	1.00	2.56	0.39	13.34	13.31
CB-30 to CB-29	12.10	1.01	24	0.01	3.16	1.59	3.16	0.50	11.50	7.25
MH-13 to MH-14	10.79	0.90	18	0.0762	3.54	1.11	2.66	0.42	19.51	17.64
MH-14 to MH-31	9.51	0.79	15	0.0729	3.68	0.82	2.30	0.36	12.76	15.55
MH-14 to CB-32	7.03	0.59	12	0.3049	3.49	0.48	1.74	0.27	12.77	26.72
CB-9 to CB-10	13.07	1.09	18	0.038	4.08	1.37	3.06	0.45	18.01	13.10
CB-10 to MH-5	12.01	1.00	24	0.0406	3.14	1.57	3.14	0.50	22.89	14.55
CB-11 to CB-12	13.07	1.09	18	0.038	4.08	1.37	3.06	0.45	18.01	13.10
CB-12 to MH-5	11.77	0.98	18	0.0812	3.77	1.22	2.83	0.43	22.90	18.70
MH-5 to EX. MH	14.80	1.23	30	0.0519	3.11	2.41	3.89	0.62	45.79	18.98
CB-13 to CB-14	13.13	1.09	18	0.044	4.10	1.38	3.07	0.45	19.49	14.11
CB-14 to EX. MH	9.06	0.76	18	0.1996	3.15	0.89	2.37	0.38	23.79	26.70
CB-15 to CB-16	13.14	1.10	18	0.044	4.10	1.38	3.07	0.45	19.51	14.11
CB-16 to EX. MH	7.44	0.62	18	0.3988	2.79	0.69	2.09	0.33	23.79	34.51
CB-17 to MH-6	10.79	0.90	18	0.0156	3.54	1.11	2.66	0.42	8.83	7.98
CB-18 to MH-6	9.89	0.82	15	0.0312	3.79	0.86	2.37	0.36	8.83	10.29
MH-6 to MH-7	13.43	1.12	24	0.0167	3.38	1.81	3.38	0.54	17.65	9.76
MH-7 to MH-8	10.98	0.92	24	0.0329	2.97	1.40	2.97	0.47	17.64	12.59
MH-8 to EX. MH	20.55	1.71	30	0.0129	3.90	3.58	4.87	0.74	38.00	10.60
CB-34 to CB-33	14.24	1.19	18	0.01	4.38	1.50	3.29	0.46	10.18	6.79
CB-33 to CB-17	17.43	1.45	30	0.006	3.47	2.96	4.33	0.68	20.36	6.88
CB-17 to MH-8	17.43	1.45	30	0.006	3.47	2.96	4.33	0.68	20.36	6.88

MANHOLE HEAD CAPACITY

MANHOLE	PIPE DIAMETER (IN)	AREA (SF)	Q (CFS)	H REQ (FT)	H ALLOW (FT)
1	24	3.14	17.4	2.32	6
2	24	3.14	17.4	2.32	7
3	36	7.07	60.56	4.67	6
4	36	7.07	60.56	4.67	6
5	30	4.91	45.77	5.00	5.43
6	24	3.14	17.65	2.36	5.58
7	24	3.14	17.65	2.36	8
8	30	4.91	38.01	3.84	7.95
9	60	19.63	253.39	9.68	10
10	48	12.57	163.21	9.28	15.31
11	30	4.91	19.87	1.96	6
12	36	7.07	82.8	7.42	7.5
13	36	7.07	52.2	3.85	6
14	18	1.77	19.5	6.00	6.5
15	36	7.07	60.56	4.67	6
16	60	19.63	52.2	2.80	6
17	30	4.91	20.36	1.99	5.1
CB-19	60	19.63	208.3	7.35	7.5
CB-20	60	19.63	253.39	9.68	10

ORIFICE EQUATION

$Q = CA \sqrt{2gH}$

C = 0.6

A= Area of pipe leaving manhole

g = 32.2

H = Height of water within manhole

Street Capacity Calculations

STREET Andromeda St.

32' F-F Street Section with 4" curb

Slope= **0.0073**

Flow= **29.43**

For water depths less than 0.0625 feet

Y= Water depth

Area = 16*Y^2

P= SQRT(1025*Y^2) + Y

n= 0.017

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.0100	0.0016	0.3302	0.0048	0.0003	0.0007	0.2139	0.0021	0.3769	0.0023
0.0175	0.0049	0.5778	0.0085	0.0015	0.0030	0.3106	0.0054	0.4138	0.0047
0.0250	0.0100	0.8254	0.0121	0.0039	0.0079	0.3940	0.0098	0.4391	0.0074
0.0325	0.0169	1.0730	0.0158	0.0079	0.0159	0.4693	0.0153	0.4587	0.0104
0.0400	0.0256	1.3206	0.0194	0.0138	0.0276	0.5389	0.0216	0.4749	0.0135
0.0475	0.0361	1.5682	0.0230	0.0218	0.0436	0.6044	0.0287	0.4887	0.0168
0.0550	0.0484	1.8159	0.0267	0.0323	0.0645	0.6664	0.0367	0.5008	0.0202
0.0625	0.0625	2.0635	0.0303	0.0454	0.0907	0.7257	0.0454	0.5115	0.0237

For water depths greater than 0.0625 ft but less than 0.333 ft

Y1= Y-0.0625

A2= A1 + 2*Y1 + 25*Y1^2

P2= P1 + SQRT(2501*Y1^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.0630	0.0635	2.0890	0.0304	0.0462	0.0924	0.7275	0.0458	0.5108	0.0238
0.0900	0.1364	3.4663	0.0394	0.1179	0.2357	0.8641	0.0778	0.5076	0.0337
0.1200	0.2602	4.9966	0.0521	0.2709	0.5418	1.0414	0.1250	0.5298	0.0481
0.1500	0.4289	6.5269	0.0657	0.5216	1.0433	1.2162	0.1824	0.5534	0.0643
0.1800	0.6427	8.0572	0.0798	0.8894	1.7787	1.3839	0.2491	0.5748	0.0818
0.2100	0.9014	9.5875	0.0940	1.3920	2.7839	1.5442	0.3243	0.5938	0.1003
0.2400	1.2052	11.1178	0.1084	2.0463	4.0925	1.6979	0.4075	0.6108	0.1195
0.2700	1.5539	12.6481	0.1229	2.8681	5.7361	1.8457	0.4983	0.6260	0.1395
0.3330	2.4328	15.8617	0.1534	5.2059	10.4118	2.1399	0.7126	0.6535	0.1834

For water depths greater than 0.333 ft but less than 0.513 ft

Y2= Y - 0.333

A3= A2 + Y2*16 + 25 Y2^2

P3= P2 + SQRT (2501 Y2^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.3400	2.5460	16.2118	0.1570	5.5348	11.0696	2.1739	0.7391	0.6570	0.1888
0.3700	3.0590	17.7121	0.1727	7.0851	14.1702	2.3162	0.8570	0.6710	0.2119
0.4038	**3.6909**	**19.4024**	**0.1902**	**9.1175**	**18.2350**	**2.4703**	**0.9975**	**0.6851**	**0.2383**
0.4181	3.9754	20.1175	0.1976	10.0728	20.1456	2.5338	1.0594	0.6906	0.2497
0.4400	4.4310	21.2128	0.2089	11.6502	23.3004	2.6293	1.1569	0.6985	0.2672
0.4600	4.8680	22.2130	0.2192	13.2152	26.4305	2.7147	1.2488	0.7054	0.2833
0.4779	**5.2761**	**23.1081**	**0.2283**	**14.7199**	**29.4397**	**2.7899**	**1.3333**	**0.7112**	**0.2978**
0.5130	6.1228	24.8635	0.2463	17.9653	35.9306	2.9342	1.5052	0.7219	0.3267

Street Capacity Calculations

Street: Aquarius
48' F-F Street Section with 8" curb
Slope= 0.038
Flow = 43.16

For water depths less than 0.125 feet

Y= Water depth
Area = 8*Y^2
P= SQRT(257*Y^2) + Y
n= 0.017

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.01	0.0008	0.170312	0.004697	0.000382	0.000765	0.477923	0.004779	0.842228	0.007918
0.02	0.0032	0.340624	0.009395	0.002428	0.004855	0.758655	0.015173	0.945369	0.018548
0.04	0.0128	0.681249	0.018789	0.015415	0.03083	1.20429	0.048172	1.061141	0.043271
0.06	0.0288	1.021873	0.028184	0.045448	0.090897	1.578067	0.094684	1.135329	0.070899
0.08	0.0512	1.362498	0.037578	0.097879	0.195757	1.911692	0.152935	1.191091	0.100568
0.1	0.08	1.703122	0.046973	0.177466	0.354931	2.218322	0.221832	1.236222	0.131838
0.12	0.1152	2.043746	0.056367	0.288579	0.577158	2.505025	0.300603	1.274364	0.164436
0.125	0.125	2.128902	0.058716	0.321767	0.643534	2.574134	0.321767	1.283064	0.172769

For water depths greater than 0.125 ft but less than 0.565 ft

Y1= Y-0.125
A2= A1 + 2*Y1 + 25*Y1^2
P2= P1 + SQRT(2501*Y1^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.13	0.135625	2.383952	0.056891	0.341845	0.68369	2.520518	0.327667	1.231942	0.170632
0.18	0.310625	4.934452	0.06295	0.837587	1.675173	2.696456	0.485362	1.120029	0.20898
0.2735	**0.973306**	**9.703887**	**0.100301**	**3.580253**	**7.160506**	**3.678444**	**1.006055**	**1.239532**	**0.361807**
0.38	2.260625	15.13645	0.14935	10.84326	21.68652	4.796576	1.822699	1.371234	0.571003
0.35	1.840625	13.60615	0.135279	8.265079	16.53016	4.490365	1.571628	1.33758	0.509806
0.4	2.565625	16.15665	0.158797	12.81984	25.63969	4.996772	1.998709	1.392296	0.612599
0.4705	**3.800256**	**19.75286**	**0.19239**	**21.58058**	**43.16117**	**5.678718**	**2.671837**	**1.458957**	**0.76362**
0.5	4.390625	21.25765	0.206543	26.14139	52.28279	5.953912	2.976956	1.483848	0.828611
0.565	5.845	24.5733	0.23786	38.23492	76.46984	6.541475	3.695933	1.53364	0.975067

For water depths greater than 0.565 ft but less than 0.667 ft

Y2= Y - 0.565
A3= A2 + Y2*22
P3= P2 + Y2

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.57	5.955	24.5783	0.242287	39.43635	78.8727	6.622393	3.774764	1.545787	0.993239
0.58	6.175	24.5883	0.251136	41.88298	83.76596	6.782669	3.933948	1.569491	1.029624
0.59	6.395	24.5983	0.259977	44.38735	88.77469	6.940945	4.095158	1.592446	1.066068
0.6	6.615	24.6083	0.268812	46.94871	93.89742	7.097311	4.258386	1.614694	1.102573
0.61	6.835	24.6183	0.277639	49.56637	99.13275	7.251847	4.423627	1.636273	1.139139
0.62	7.055	24.6283	0.286459	52.23967	104.4793	7.40463	4.590871	1.657218	1.175769
0.64	7.495	24.6483	0.304078	57.75059	115.5012	7.705215	4.931338	1.697332	1.249224
0.667	8.089	24.6753	0.327818	65.53069	131.0614	8.101211	5.403508	1.748071	1.348809

For water depths greater than 0.667 ft but less than 0.847 ft

Y3= Y - 0.667
A4= A3 + 22 * Y3 + 25 * Y3^2
P4= P3 + SQRT(2501 * Y3^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.7	8.842225	26.32563	0.335879	72.8023	145.6046	8.233482	5.763437	1.734229	1.402113
0.73	9.574225	27.82593	0.344076	80.10653	160.2131	8.366895	6.107833	1.725738	1.453615
0.75	10.08723	28.82613	0.349933	85.35395	170.7079	8.461589	6.346192	1.721842	1.489392
0.77	10.62023	29.82633	0.356069	90.91132	181.8226	8.560207	6.591359	1.719139	1.526226
0.8	11.45723	31.32663	0.365734	99.84315	199.6863	8.714427	6.971542	1.716983	1.5833
0.82	12.04023	32.32683	0.372453	106.2047	212.4095	8.820827	7.233078	1.716621	1.622472
0.85	12.95223	33.82713	0.382895	116.3748	232.7496	8.984926	7.637187	1.717422	1.682774

Street Capacity Calculations

Street: Sagittarius
48' F-F Street Section with 8" curb
Slope= 0.0151
Flow = 46.15

For water depths less than 0.125 feet

Y= Water depth
Area = 8*Y^2
P= SQRT(257*Y^2) + Y
n= 0.017

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.01	0.0008	0.170312	0.004697	0.000241	0.000482	0.301269	0.003013	0.530917	0.004021
0.02	0.0032	0.340624	0.009395	0.00153	0.003061	0.478235	0.009565	0.595934	0.009599
0.04	0.0128	0.681249	0.018789	0.009717	0.019434	0.75915	0.030366	0.668913	0.0228
0.06	0.0288	1.021873	0.028184	0.028649	0.057299	0.994768	0.059686	0.715679	0.037733
0.08	0.0512	1.362498	0.037578	0.0617	0.1234	1.205076	0.096406	0.75083	0.053893
0.1	0.08	1.703122	0.046973	0.111869	0.223739	1.398367	0.139837	0.77928	0.071019
0.12	0.1152	2.043746	0.056367	0.181912	0.363824	1.579097	0.189492	0.803323	0.088948
0.125	0.125	2.128902	0.058716	0.202833	0.405665	1.622661	0.202833	0.808807	0.093542

For water depths greater than 0.125 ft but less than 0.565 ft

Y1= Y-0.125
A2= A1 + 2*Y1 + 25*Y1^2
P2= P1 + SQRT(2501*Y1^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.13	0.135625	2.383952	0.056891	0.21549	0.430979	1.588863	0.206552	0.776581	0.091873
0.18	0.310625	4.934452	0.06295	0.527991	1.055982	1.699769	0.305958	0.706034	0.111002
0.24	0.685625	7.995052	0.085756	1.43215	2.8643	2.088824	0.501318	0.751395	0.161853
0.3	1.240625	11.05565	0.112216	3.100295	6.20059	2.498978	0.749693	0.804033	0.222645
0.35	1.840625	13.60615	0.135279	5.210071	10.42014	2.830599	0.99071	0.843172	0.277554
0.4647	**3.689302**	**19.457**	**0.189613**	**13.07921**	**26.15842**	**3.545172**	**1.647441**	**0.91648**	**0.41321**
0.5	4.390625	21.25765	0.206543	16.47879	32.95759	3.753177	1.876589	0.935376	0.457081
0.5571	**5.65696**	**24.17032**	**0.234046**	**23.07678**	**46.15357**	**4.079361**	**2.272612**	**0.963158**	**0.529792**
0.565	5.845	24.5733	0.23786	24.10221	48.20442	4.12356	2.329812	0.966763	0.540009

For water depths greater than 0.565 ft but less than 0.667 ft

Y2= Y - 0.565
A3= A2 + Y2*22
P3= P2 + Y2

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.57	5.955	24.5783	0.242287	24.85956	49.71911	4.174569	2.379504	0.97442	0.550588
0.58	6.175	24.5883	0.251136	26.40184	52.80369	4.275602	2.479849	0.989362	0.571778
0.59	6.395	24.5983	0.259977	27.98052	55.96105	4.375375	2.581471	1.003833	0.593016
0.6	6.615	24.6083	0.268812	29.59514	59.19027	4.473944	2.684366	1.017857	0.6143
0.61	6.835	24.6183	0.277639	31.24524	62.49047	4.571359	2.788529	1.03146	0.635631
0.62	7.055	24.6283	0.286459	32.93041	65.86081	4.667669	2.893955	1.044663	0.65701
0.64	7.495	24.6483	0.304078	36.40433	72.80867	4.857149	3.108576	1.06995	0.699909
0.667	8.089	24.6753	0.327818	41.30869	82.61738	5.106774	3.406218	1.101934	0.758124

For water depths greater than 0.667 ft but less than 0.847 ft

Y3= Y - 0.667
A4= A3 + 22 * Y3 + 25 * Y3^2
P4= P3 + SQRT(2501 * Y3^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.7	8.842225	26.32563	0.335879	45.8925	91.78501	5.190153	3.633107	1.093209	0.787411
0.73	9.574225	27.82593	0.344076	50.49689	100.9938	5.274253	3.850205	1.087856	0.815901
0.75	10.08723	28.82613	0.349933	53.80471	107.6094	5.333946	4.000459	1.085401	0.835777
0.77	10.62023	29.82633	0.356069	57.30792	114.6158	5.396112	4.155006	1.083696	0.8563
0.8	11.45723	31.32663	0.365734	62.93829	125.8766	5.493328	4.394662	1.082337	0.888201
0.82	12.04023	32.32683	0.372453	66.94846	133.8969	5.5604	4.559528	1.082109	0.910154
0.85	12.95223	33.82713	0.382895	73.35936	146.7187	5.663842	4.814266	1.082614	0.94403

Street Capacity Calculations

STREET Sagittarius

32' F-F Street Section with 8" curb

Slope= 0.0266

Flow= 26.66

For water depths less than 0.125 feet

Y= Water depth

Area = 8*Y^2

P= SQRT(257*Y^2) + Y

n= 0.017

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.01	0.0008	0.170312	0.004697	0.00032	0.00064	0.399859	0.003999	0.704659	0.006149
0.02	0.0032	0.340624	0.009395	0.002031	0.004062	0.634737	0.012695	0.790953	0.014505
0.04	0.0128	0.681249	0.018789	0.012897	0.025794	1.007582	0.040303	0.887815	0.034058
0.06	0.0288	1.021873	0.028184	0.038025	0.07605	1.320305	0.079218	0.949885	0.056002
0.08	0.0512	1.362498	0.037578	0.081891	0.163782	1.599436	0.127955	0.996538	0.079631
0.1	0.08	1.703122	0.046973	0.148478	0.296957	1.855981	0.185598	1.034298	0.104581
0.12	0.1152	2.043746	0.056367	0.241442	0.482885	2.095854	0.251502	1.066209	0.13063
0.125	0.125	2.128902	0.058716	0.269209	0.538419	2.153675	0.269209	1.073488	0.137295

For water depths greater than 0.125 ft but less than 0.405 ft

Y1= Y-0.125

A2= A1 + 2*Y1 + 25*Y1^2

P2= P1 + SQRT(2501*Y1^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.13	0.135625	2.383952	0.056891	0.286008	0.572017	2.108817	0.274146	1.030716	0.135333
0.16	0.225625	3.914252	0.057642	0.47998	0.959961	2.127337	0.340374	0.937235	0.14666
0.2	0.415625	5.954652	0.069798	1.004483	2.008966	2.416801	0.48336	0.952353	0.187329
0.2375	**0.666406**	**7.867527**	**0.084703**	**1.832386**	**3.664772**	**2.749653**	**0.653043**	**0.994302**	**0.235696**
0.28	1.035625	10.03545	0.103197	3.248306	6.496612	3.136566	0.878238	1.044594	0.296688
0.32	1.465625	12.07585	0.121368	5.121969	10.24394	3.494734	1.118315	1.088707	0.358021
0.36	1.975625	14.11625	0.139954	7.592275	15.18455	3.842974	1.383471	1.128725	0.422185
0.39	2.410625	15.64655	0.154067	9.876757	19.75351	4.097177	1.597899	1.156177	0.471831
0.405	2.645	16.4117	0.161165	11.16737	22.33475	4.22207	1.709938	1.169149	0.497086

For water depths greater than 0.405 ft but less than 0.667 ft

Y2= Y - 0.405

A3= A2 + Y2*16

P3= P2 + Y2

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.4136	2.7826	16.4203	0.169461	12.14809	24.29617	4.365733	1.805667	1.196297	0.522856
0.4236	**2.9426**	**16.4303**	**0.179096**	**13.32905**	**26.65809**	**4.529683**	**1.918774**	**1.226484**	**0.552857**
0.47	3.685	16.4767	0.223649	19.35648	38.71296	5.252776	2.468804	1.350243	0.692737
0.5	4.165	16.5067	0.252322	23.70985	47.4197	5.692641	2.846321	1.418734	0.783878
0.55	4.965	16.5567	0.299879	31.71224	63.42448	6.387158	3.512937	1.517743	0.937134
0.6	5.765	16.6067	0.347149	40.59638	81.19276	7.04187	4.225122	1.602081	1.09212
0.63	6.245	16.6367	0.375375	46.32904	92.65808	7.418581	4.673706	1.64711	1.185927
0.667	6.837	16.6737	0.410047	53.7979	107.5958	7.868641	5.248384	1.697887	1.302438

For water depths greater than 0.667 ft but less than 0.847 ft

Y3= Y - 0.667

A4= A3 + 16 * Y3 + 25 * Y3^2

P4= P3 + SQRT(2501 * Y3^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.7	7.392225	18.32403	0.403417	57.53807	115.0761	7.783593	5.448515	1.639469	1.310301
0.73	7.944225	19.82433	0.400731	61.55985	123.1197	7.749006	5.656775	1.598294	1.324928
0.75	8.337225	20.82453	0.400356	64.56489	129.1298	7.74417	5.808128	1.575855	1.337997
0.77	8.750225	21.82473	0.400932	67.82817	135.6563	7.751592	5.968726	1.556745	1.353378
0.8	9.407225	23.32503	0.40331	73.2091	146.4182	7.782221	6.225777	1.533312	1.380264
0.82	9.870225	24.32523	0.405761	77.1231	154.2462	7.813712	6.407244	1.520626	1.400439
0.85	10.60223	25.82553	0.410533	83.49098	166.982	7.874854	6.693626	1.505238	1.433661

Street Capacity Calculations

Street: Rockcliff Blvd.

48' F-F Street Section with 8" curb

Slope= 0.079

Flow = 25.54

For water depths less than 0.125 feet

Y= Water depth

Area = 8*Y^2

P= SQRT(257*Y^2) + Y

n= 0.017

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.01	0.0008	0.170312	0.004697	0.000551	0.001103	0.689096	0.006891	1.214372	0.012887
0.02	0.0032	0.340624	0.009395	0.0035	0.007001	1.093871	0.021877	1.363086	0.02983
0.04	0.0128	0.681249	0.018789	0.022226	0.044452	1.736413	0.069457	1.530013	0.068831
0.06	0.0288	1.021873	0.028184	0.06553	0.13106	2.275344	0.136521	1.636981	0.112105
0.08	0.0512	1.362498	0.037578	0.141127	0.282254	2.756383	0.220511	1.717381	0.158374
0.1	0.08	1.703122	0.046973	0.25588	0.51176	3.198499	0.31985	1.782454	0.206988
0.12	0.1152	2.043746	0.056367	0.416089	0.832178	3.611884	0.433426	1.837449	0.257545
0.125	0.125	2.128902	0.058716	0.463941	0.927882	3.71153	0.463941	1.849993	0.270454

For water depths greater than 0.125 ft but less than 0.565 ft

Y1= Y-0.125

A2= A1 + 2*Y1 + 25*Y1^2

P2= P1 + SQRT(2501*Y1^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.13	0.135625	2.383952	0.056891	0.492891	0.985783	3.634223	0.472449	1.776282	0.267971
0.18	0.310625	4.934452	0.06295	1.207679	2.415358	3.8879	0.699822	1.614919	0.330828
0.32	1.465625	12.07585	0.121368	8.82693	17.65386	6.022639	1.927244	1.876221	0.704024
0.38	2.260625	15.13645	0.14935	15.63441	31.26883	6.915969	2.628068	1.977121	0.889362
0.3574	**1.940044**	**13.98363**	**0.138737**	**12.77388**	**25.54776**	**6.584325**	**2.353238**	**1.940913**	**0.818458**
0.4	2.565625	16.15665	0.158797	18.48436	36.96873	7.204624	2.881849	2.00749	0.953085
0.45	3.415625	18.70715	0.182584	27.00818	54.01636	7.907243	3.55826	2.07726	1.115971
0.5571	5.65696	24.17032	0.234046	52.78376	105.5675	9.330764	5.198169	2.203042	1.479344
0.565	5.845	24.5733	0.23786	55.12923	110.2585	9.431862	5.329002	2.211288	1.506828

For water depths greater than 0.565 ft but less than 0.667 ft

Y2= Y - 0.565

A3= A2 + Y2*22

P3= P2 + Y2

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.57	5.955	24.5783	0.242287	56.86152	113.723	9.548534	5.442664	2.228801	1.534105
0.58	6.175	24.5883	0.251136	60.38921	120.7784	9.779629	5.672185	2.262979	1.588712
0.59	6.395	24.5983	0.259977	64.00014	128.0003	10.00784	5.904626	2.296077	1.643394
0.6	6.615	24.6083	0.268812	67.69326	135.3865	10.2333	6.139978	2.328156	1.698155
0.61	6.835	24.6183	0.277639	71.46755	142.9351	10.45612	6.378231	2.359269	1.752998
0.62	7.055	24.6283	0.286459	75.32205	150.6441	10.67641	6.619373	2.389469	1.807926
0.64	7.495	24.6483	0.304078	83.268	166.536	11.10981	7.110277	2.447308	1.918045
0.667	8.089	24.6753	0.327818	94.48579	188.9716	11.68078	7.791077	2.520466	2.067283

For water depths greater than 0.667 ft but less than 0.847 ft

Y3= Y - 0.667

A4= A3 + 22 * Y3 + 25 * Y3^2

P4= P3 + SQRT(2501 * Y3^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.7	8.842225	26.32563	0.335879	104.9704	209.9408	11.87149	8.310044	2.500508	2.149998
0.73	9.574225	27.82593	0.344076	115.502	231.0041	12.06385	8.806613	2.488265	2.229627
0.75	10.08723	28.82613	0.349933	123.0681	246.1361	12.20039	9.150291	2.482648	2.284813
0.77	10.62023	29.82633	0.356069	131.081	262.162	12.34258	9.503788	2.47875	2.34154
0.8	11.45723	31.32663	0.365734	143.9594	287.9188	12.56495	10.05196	2.475641	2.429286
0.82	12.04023	32.32683	0.372453	153.1319	306.2638	12.71836	10.42905	2.47512	2.48942
0.85	12.95223	33.82713	0.382695	167.7956	335.5912	12.95496	11.01172	2.476275	2.581871

DOUBLE 'A' DROP INLET
HEAD CAPACITY

Orifice Equation:

$$Q = CA\sqrt{2gH}$$

Q = Flow (cfs)
C = 0.60
A = Area of drop inlet (ft^2)
g = 32.2
H = Height of water above drop inlet (ft)

$$H = \frac{\left(\frac{Q}{C*A}\right)^2}{2g}$$

$$H = \frac{\left(\frac{90.18}{0.6*(2*11.24)}\right)^2}{2*32.2}$$

H = 0.69 feet

Allowable depth = 0.847 feet
Required depth = 0.69 feet

0.69 feet < 0.847 feet

STORM DROP INLET-EFFECTIVE AREA

Double 'A'

Area at the grate:

L = 88 ¾" - 2(6"$_{ends}$) - 6"$_{center\ piece}$ - 14(½ $_{middle\ bars}$)
= 63 ¾"
= 5.3125'

W = 25 ½" - 13(½"$_{middle\ bars}$)
= 19"
= 1.5833'

Area = 5.3125' x 1.5833'
= 8.41 ft^2

Effective Area = 8.41- 8.41 (0.5 $_{clogging\ factor}$)
= 4.21 ft^2 at the grate

Area at the throat:

L = 13.50"

H = 10 ¾" - 4 ½"
= 6 ¼"
= 0.5208'

Area = 13.50' x 0.5208'
= 7.03 ft^2 at the throat

Total Area:

Area = 4.21$_{grate}$ + 7.03$_{throat}$
= 11.24 ft^2

SINGLE 'A' DROP INLET
HEAD CAPACITY

Orifice Equation:

$$Q = CA\sqrt{2gH}$$

Q = Flow (cfs)
C = 0.60
A = Area of drop inlet (ft^2)
g = 32.2
H = Height of water above drop inlet (ft)

$$H = \frac{\left(\frac{Q}{C*A}\right)^2}{2g}$$

$$H = \frac{\left(\frac{19.87}{0.6*2*5.82}\right)^2}{2*32.2}$$

H = 0.13 feet

Allowable depth = 0.847 feet
Required depth = 0.13 feet

0.13 feet < 0.847 feet

STORM DROP INLET-EFFECTIVE AREA

Single 'A'

Area at the grate:

L = 38.375" - 7(½" $_{\text{middle bars}}$)
= 34.875"
= 2.906'

W = 25.5" - 13(½" $_{\text{middle bars}}$)
= 19"
= 1.583'

Area = 1.583' x 2.906'
= 4.601 ft^2

Effective Area = 4.601- 4.601 (0.5 $_{\text{clogging factor}}$)
= 2.30 ft^2 at the grate

Area at the throat:

L = 81.00"
= 6.75'

H = 10¾" - 4½"
= 6¼"
= 0.5208'

Area = 6.75' x 0.5208'
= 3.52 ft^2 at the throat

Total Area:

Area = 2.30_{grate} + 3.52_{throat}
= 5.82 ft^2

Desilting Pond Spillway

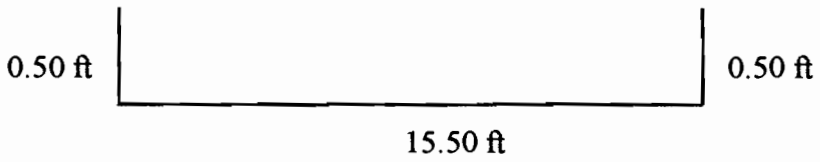
Weir Equation:

$$Q=CLH^{3/2}$$

Q= 71.48 cfs
C = 2.95
H = 0.50 ft
L = Length of weir

$$L=\frac{16.14}{2.95(0.50)^{3/2}}$$

L = 15.47 ft
Use 15.50 feet for length of weir



STORM DROP INLET-EFFECTIVE AREA

Single 'A'

Area at the grate:

L = 38.375" - 7(½" $_{\text{middle bars}}$)
= 34.875"
= 2.906'

W = 25.5" - 13(½" $_{\text{middle bars}}$)
= 19"
= 1.583'

Area = 1.583' x 2.906'
= 4.601 ft^2

Effective Area = 4.601- 4.601 (0.5 $_{\text{clogging factor}}$)
= 2.30 ft^2 at the grate

Area at the throat:

L = 81.00"
= 6.75'

H = 10¾" - 4½"
= 6¼"
= 0.5208'

Area = 6.75' x 0.5208'
= 3.52 ft^2 at the throat

Total Area:

Area = 2.30_{grate} + 3.52_{throat}
= 5.82 ft^2

SINGLE 'A' DROP INLET
HEAD CAPACITY

Orifice Equation:

$$Q = CA\sqrt{2gH}$$

Q = Flow (cfs)
C = 0.60
A = Area of drop inlet (ft^2)
g = 32.2
H = Height of water above drop inlet (ft)

$$H = \frac{\left(\frac{Q}{C*A}\right)^2}{2g}$$

$$H = \frac{\left(\frac{17.65}{0.6*2*5.82}\right)^2}{2*32.2}$$

H = 0.10 feet

Allowable depth = 0.847 feet
Required depth = 0.10 feet

0.10 feet < 0.847 feet

SINGLE 'A' DROP INLET
HEAD CAPACITY

Orifice Equation:

$$Q = CA\sqrt{2gH}$$

Q = Flow (cfs)
C = 0.60
A = Area of drop inlet (ft^2)
g = 32.2
H = Height of water above drop inlet (ft)

$$H = \frac{\left(\frac{Q}{C*A}\right)^2}{2g}$$

$$H = \frac{\left(\frac{20.87}{0.6*2*5.82}\right)^2}{2*32.2}$$

H = 0.13 feet

Allowable depth = 0.847 feet
Required depth = 0.13 feet

0.13 feet < 0.847 feet

ACS MONUMENT "SANDBERN"
Y=1534209.29
X=1361854.29
DELTA=-00°15'36"
CENTRAL ZONE
(NAD/1927)

TEMPORARY BENCHMARK
5/8" REBAR W/CAP
"LS 7719"
ELEV=5407.39

MATCHLINE
SEE SHEET 5

MATCHLINE
SEE SHEET 4

MATCHLINE
SEE SHEET 2

ROCKCLIFF AVENUE

SIRIUS STREET

AQUARIUS AVENUE

CYGNUS ROAD

URSA ROAD

ORION ROAD

McMAHON BOULEVARD

ANDROMEDA STREET

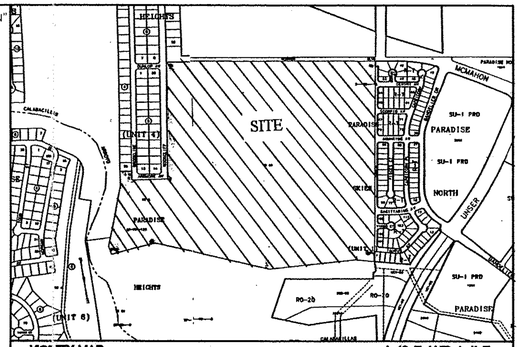
CASSIOPEIA STREET

MILKY WAY DRIVE

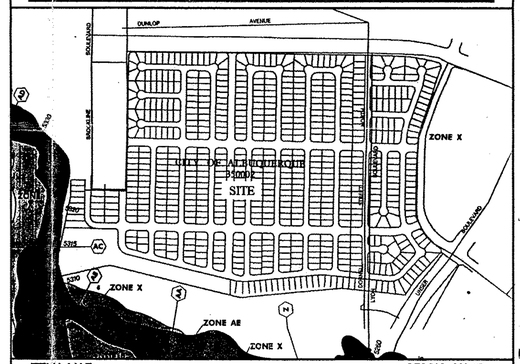
UNIT 5

MH-1
MH-2
MH-3
MH-4

CB-1
CB-2
CB-3
CB-4
CB-5
CB-6
CB-7
CB-8



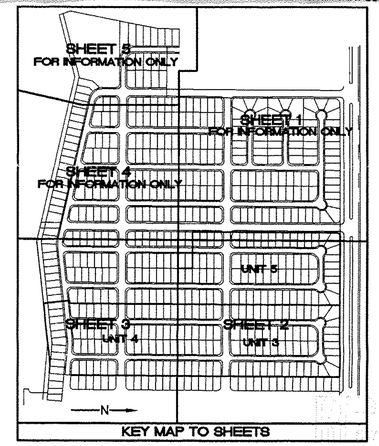
VICINITY MAP: A-10-Z AND A-11-Z



FEMA MAP: 35001C 0104D

LEGAL DESCRIPTION:
TRACT AAA OF PARADISE SKIES

NOTES:
1. SEE SHEET 3 FOR RETAINING WALL DETAILS. AND FOR EROSION CONTROL PLAN.
2. SEE MASTER STORM SEWER PLAN FOR STORM SEWER DATA.
3. SEE SHEET 4 FOR CROSS SECTION DETAILS.
4. FINISH FLOOR ELEVATIONS IS THE PAD ELEVATION + 0.50 FEET.
5. SEE SHEET 2 FOR LEGEND.
6. REAR YARD PONDS ONLY HAVE CAPACITY FOR WHAT FALLS WITHIN THAT LOT



KEY MAP TO SHEETS

THIS PLAN IS FOR INFORMATION ONLY

ROUGH GRADING APPROVAL DATE

GRAPHIC SCALE
50 25 0 25 50
SCALE: 1"=50'

50/960045/9645GRA.DWG/BDG/5-05-97/

ENGINEER'S SEAL
5-13-97

SHAHAB BIAZAR
P.E. #13479

PARADISE SKIES SUBDIVISION

GRADING AND DRAINAGE PLAN - A

TIERRA WEST DEVELOPMENT MANAGEMENT SERVICES
4421 McLEOD ROAD N.E., SUITE D
ALBUQUERQUE, NEW MEXICO 87109
(505)883-7592

DRAWN BY BDG
DATE 3-21-97
9645GRA.DWG
SHEET # 1
JOB # 960045

MATCHLINE SEE SHEET 1

PERSEUS STREET

HALEYS STREET

CANIS STREET

ARIES STREET

VIRGO STREET

MATCHLINE SEE SHEET 3

AQUARIUS AVENUE

MCMAHON BOULEVARD

UNIT 5

UNIT 3

STANDARD C&G PER C.O.A. STD DWG #2415

MOUTABLE C&G PER C.O.A. STD DWG #2415

MH-5

CB-12

CB-13

CB-14

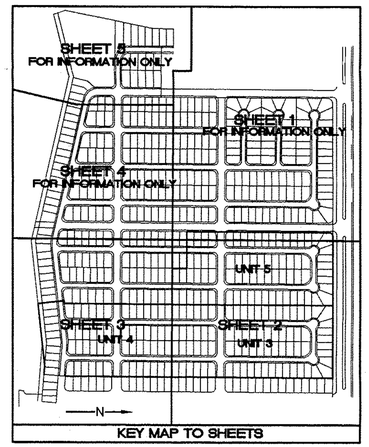
CB-15

CB-16

EX. MH RIM=5315.23 INV IN=5304.48 INV OUT=5304.38

EX. 60" RCP

EX. 48" RCP



KEY MAP TO SHEETS

NOTES:

1. SEE SHEET 3 FOR RETAINING WALL DETAILS AND EROSION CONTROL PLAN.
2. SEE MASTER STORM SEWER PLAN FOR STORM SEWER DATA.
3. SEE SHEET 4 FOR TYPICAL LOT DETAILS.
4. FINISH FLOOR ELEVATIONS IS THE PAD ELEVATION + 0.50 FEET.

LEGEND

- BOUNDARY LINE
- EASEMENT
- LIMITS OF TOP OF EXISTING SLOPE
- PROPOSED 4' HIGH SCREEN WALL
- PROPOSED 4' RETAINING WALL
- 4:1 MAX. SLOPE TIE
- 5365.46 SPOT ELEVATION @ FL

GRAPHIC SCALE

50 25 0 25 50

SCALE: 1"=50'

ENGINEER'S SEAL

SHAHAB BIAZAR
P.E. #13479

PARADISE SKIES SUBDIVISION

GRADING AND DRAINAGE PLAN - B

TIERRA WEST DEVELOPMENT MANAGEMENT SERVICES

4421 McLEOD ROAD N.E., SUITE D
ALBUQUERQUE, NEW MEXICO 87109
(505)883-7592

DRAWN BY BDG

DATE 3-21-97

9645GRB.DWG

SHEET # 2

JOB # 960045

50/960045/9645GRB.DWG/BDG/5-07-97/

MATCHLINE
SEE SHEET 4

PERSEUS STREET

HALEYS STREET

SAGITTARIUS AVENUE

CANIS STREET

ARIES STREET

TAURUS AVENUE

VIRGO STREET

UNIT 4

MATCH LINE
SEE SHEET 2

EX. MH
RIM=5317.95
INV IN=5299.84
INV OUT=5299.74

EX. MH
RIM=5321.25
INV IN=5302.13
INV OUT=5302.03

EX. MH
RIM=5310.21
INV N=5298.59
INV S=5298.49
INV E=5304.10

-EX. 60" RCP-

CEMENT MORTAR CAP OR OTHER AS DESIRED

8" CMU BLOCK WALL

NEW 4' SCREEN WALL

DURO WALL EVERY OTHER COURSE

TIE #4 BARS ON 24" O.C. MIN. 12"

BOND BEAM 2-#5 BARS

JOINT REINFORCEMENT SEE NOTE 6

8' MAXIMUM HEIGHT

4" WEEP HOLE 10' O.C.

1 CU.FT GRAVEL PACKED DRAIN

X-BARS

DOWELS SEE NOTE 7

#3 BARS 12" O.C. SEE NOTE 8

RETAINING WALL DETAIL

NOT TO SCALE

8 INCH REINFORCED CONCRETE MASONRY WALL

H	A	B	T	Y-BARS	X-BARS
ft.-in.	in.	ft.-in.	in.		
3'-4"	8"	2'-4"	9"	#3 @32" O.C.	#3 @27" O.C.
4'-0"	10"	2'-9"	9"	#4 @32" O.C.	#3 @27" O.C.
4'-8"	12"	3'-4"	10"	#5 @32" O.C.	#3 @27" O.C.
5'-4"	14"	3'-8"	10"	#4 @16" O.C.	#4 @30" O.C.
6'-0"	16"	4'-2"	12"	#6 @24" O.C.	#4 @25" O.C.

12 INCH REINFORCED CONCRETE MASONRY WALL

H	A	B	T	Y-BARS	X-BARS
ft.-in.	in.	ft.-in.	in.		
5'-4"	14"	3'-8"	10"	#4 @24" O.C.	#3 @25" O.C.
6'-0"	15"	4'-2"	12"	#6 @16" O.C.	#4 @30" O.C.
6'-8"	16"	4'-6"	12"	#6 @24" O.C.	#4 @22" O.C.
7'-4"	18"	4'-10"	12"	#5 @16" O.C.	#5 @26" O.C.
8'-0"	20"	5'-4"	12"	#7 @24" O.C.	#5 @21" O.C.

GENERAL NOTES:

1. ALL CONCRETE IS TO BE 4000 PSI @ 28 DAYS.
2. MINIMUM COMPACTION UNDER FOOTINGS IS TO BE 95% PER ASTM. D 1557 FOR A DEPTH OF 12" MOISTURE CONTENT IS TO BE ± 2.0%.
3. BACK FILL AGAINST WALLS IS TO BE HAND-PLACED AND COMPACTED.
4. ALL BARS ARE TO BE GRADE 60, ASTM 615.
5. TRUSS TYPE DUR-O-WALL EVERY OTHER COURSE.
6. DOWELS SHALL BE AT LEAST EQUAL IN SIZE AND SPACING TO V-BARS, SHALL PROJECT A MINIMUM OF 30 BAR DIA. INTO THE FILLED BLOCK CORES, AND SHALL EXTEND TO THE TOE OF THE FOOTING.
7. JOINT REINFORCEMENT CONSISTING OF 9GA. LONGITUDINAL WIRE AND 3/16" CROSS RODS SHALL BE PROVIDED AT 8" CENTERS VERTICALLY.
8. PROVIDE KEY FOR 8" AND 12" WALLS WHERE H EXCEEDS 6'-0"
9. USE EITHER EXPANSION JOINTS ON 20' CENTERS OR PILASTERS EVERY 16'.

EROSION CONTROL PLAN NOTES

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING A TOPSOIL DISTURBANCE PERMIT PRIOR TO BEGINING WORK.
2. CONTRACTOR IS RESPONSIBLE FOR CLEANING ALL SEDIMENT OUT OF EXISTING RIGHT-OF-WAY.
3. CONTRACTOR IS RESPONSIBLE FOR CLEANING UP ANY SEDIMENT THAT GETS INTO EXISTING RIGHT-OF-WAY.
4. REPAIR OF DAMAGED FACILITIES AND CEAN-UP OF SEDIMENT ACCUMULATION ON ADJACENT PROPERTIES AND IN PUBLIC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR.
5. ALL EXPOSED EARTH SURFACES MUST BE PROTECTED FROM WIND AND WATER EROSION PRIOR TO FINAL ACCEPTANCE OF ANY PROJECT.

SHEET 5
FOR INFORMATION ONLY

SHEET 1
FOR INFORMATION ONLY

SHEET 4
FOR INFORMATION ONLY

UNIT 5

SHEET 3
UNIT 4

SHEET 2
UNIT 3

N

KEY MAP TO SHEETS

NOTES

1. SEE SHEET 4 FOR TYPICAL LOT DETAILS.
2. SEE MASTER STORM SEWER PLAN FOR STORM SEWER DATA.
3. FINISH FLOOR ELEVATIONS IS THE PAD ELEVATION + 0.50 FEET.

LEGEND

- BOUNDARY LINE
- EASEMENT
- LIMITS OF TOP OF EXISTING SLOPE
- PROPOSED 4' HIGH SCREEN WALL
- PROPOSED 4' RETAINING WALL
- 4:1 MAX. SLOPE TIE
- 5363.46 SPOT ELEVATION @ FL

N

GRAPHIC SCALE

50 25 0 25 50

SCALE: 1"=50'

50/960045/9645GRC.DWG/BDG/5-07-97/

ENGINEER'S SEAL

SHAHAB BIAZAR
NEW MEXICO
13479
REGISTERED PROFESSIONAL ENGINEER
12/31/97

SHAHAB BIAZAR
P.E. #13479

PARADISE SKIES SUBDIVISION

GRADING AND DRAINAGE PLAN - C

TIERRA WEST DEVELOPMENT MANAGEMENT SERVICES

4421 McLEOD ROAD N.E., SUITE D
ALBUQUERQUE, NEW MEXICO 87109
(505)883-7592

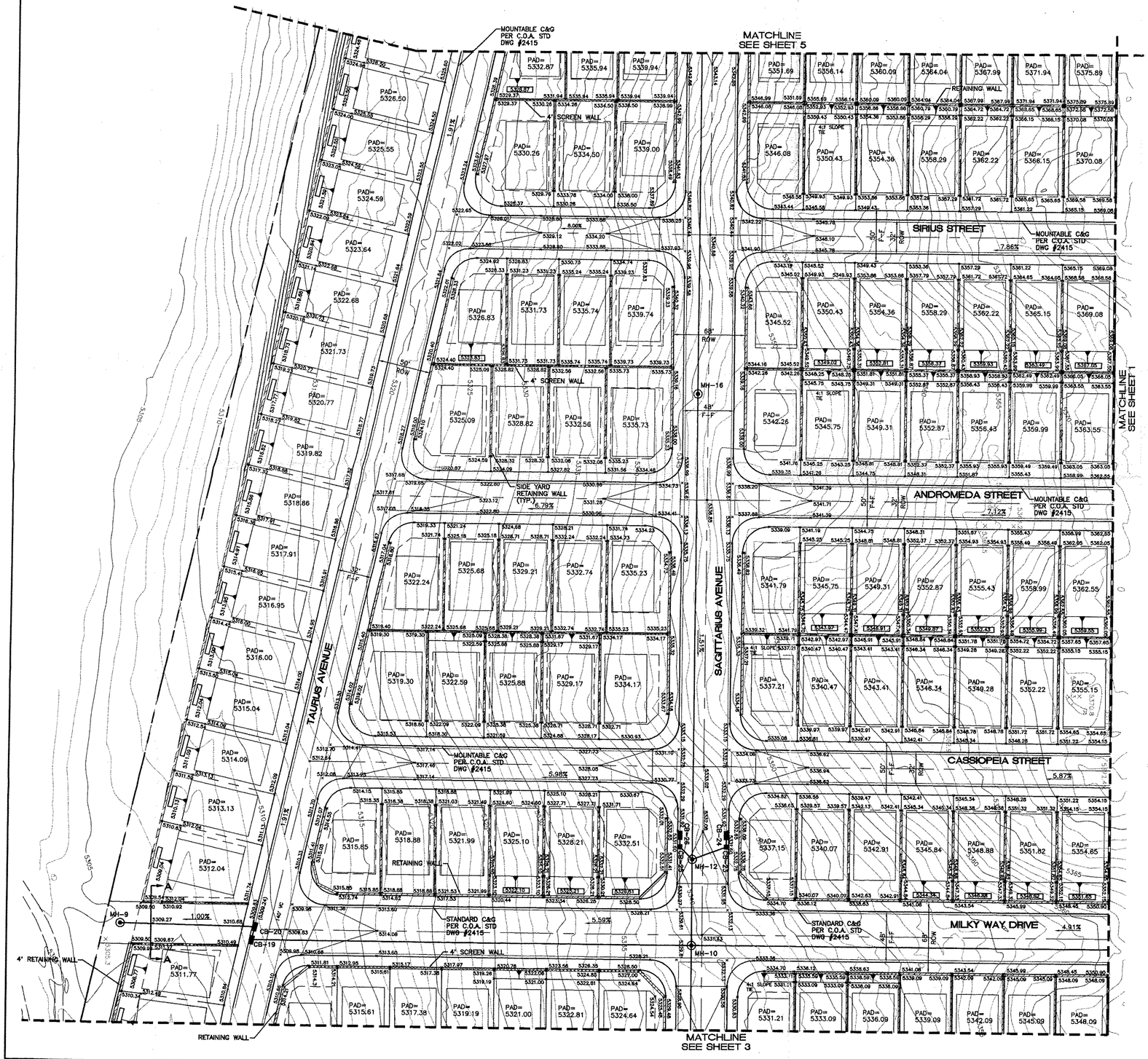
DRAWN BY BDG

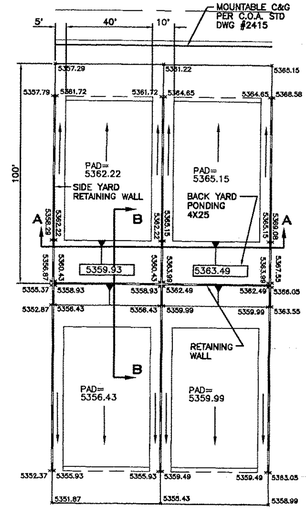
DATE 3-21-97

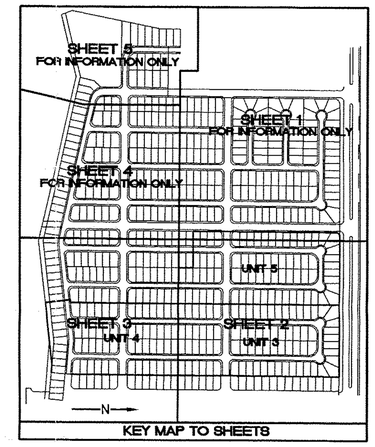
9645GRC.DWG

SHEET # 3

JOB # 960045

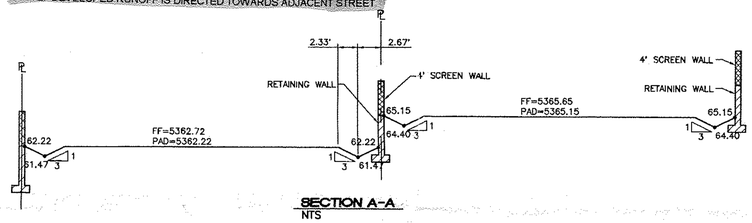




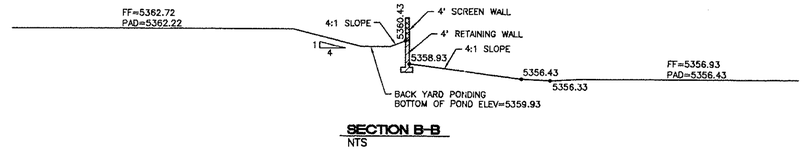


THIS PLAN IS FOR INFORMATION ONLY

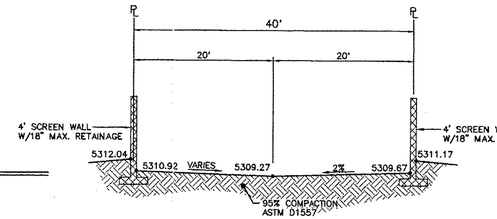
NOTE: DEVELOPED RUNOFF IS DIRECTED TOWARDS ADJACENT STREET.



SECTION A-A
NTS



SECTION B-B
NTS



SECTION A-A
NTS

LEGEND

- BOUNDARY LINE
- EASEMENT
- LIMITS OF TOP OF EXISTING SLOPE
- PROPOSED 4' HIGH SCREEN WALL
- PROPOSED 4' RETAINING WALL
- 4:1 MAX. SLOPE TIE
- 5365.46 SPOT ELEVATION @ FL

GRAPHIC SCALE

50 25 0 25 50

SCALE: 1"=50'

NOTES:

1. SEE SHEET 3 FOR RETAINING WALL DETAILS AND EROSION CONTROL PLAN.
2. SEE MASTER STORM SEWER PLAN FOR STORM SEWER DATA.
3. FINISH FLOOR ELEVATIONS IS THE PAD ELEVATION + 0.50 FEET.

50/960045/9645GRD.DWG/BDG/5-07-97/

ENGINEER'S SEAL

SHAHAB BIAZAR
NEW MEXICO
13479
REGISTERED PROFESSIONAL ENGINEER

SHAHAB BIAZAR
P.E. #13479

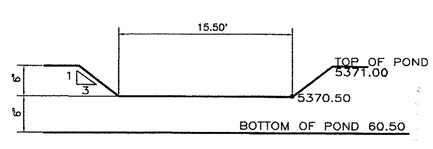
PARADISE SKIES SUBDIVISION

GRADING AND DRAINAGE PLAN - D

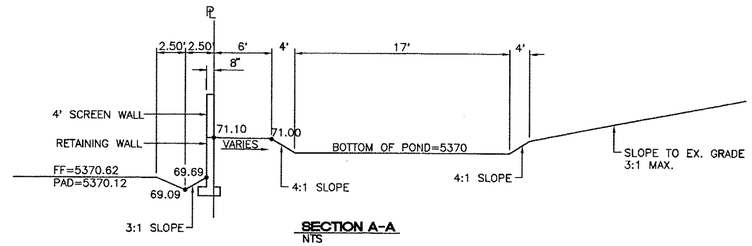
TIERRA WEST DEVELOPMENT MANAGEMENT SERVICES

4421 McLEOD ROAD N.E., SUITE D
ALBUQUERQUE, NEW MEXICO 87109
(505)883-7592

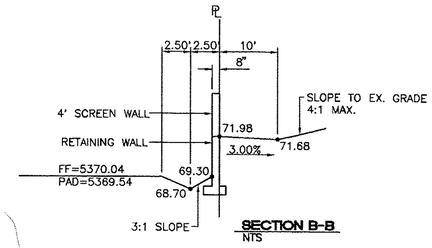
DRAWN BY	BDG
DATE	3-21-97
	9645GRD.DWG
SHEET #	4
JOB #	960045



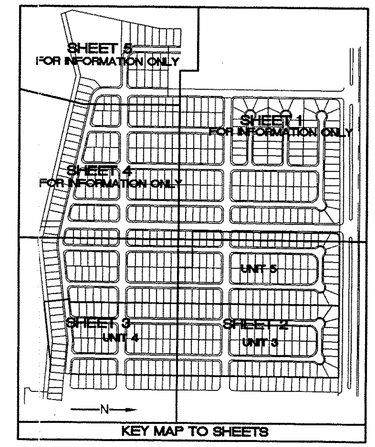
EMERGENCY SPILLWAY DETAIL
NTS



SECTION A-A
NTS



SECTION B-B
NTS



KEY MAP TO SHEETS

THIS PLAN IS FOR INFORMATION ONLY

NOTES

1. SEE SHEET 3 FOR RETAINING WALL DETAILS AND EROSION CONTROL PLAN.
2. SEE MASTER STORM SEWER PLAN FOR STORM SEWER DATA.
3. SEE SHEET 4 FOR CROSS SECTION DETAILS.
4. FINISH FLOOR ELEVATIONS IS THE PAD ELEVATION + 0.50 FEET.

LEGEND

- BOUNDARY LINE
- EASEMENT
- LIMITS OF TOP OF EXISTING SLOPE
- PROPOSED 4' HIGH SCREEN WALL
- PROPOSED 4' RETAINING WALL
- 4:1 MAX. SLOPE TIE
- 5365.46 SPOT ELEVATION @ FL

GRAPHIC SCALE

50 25 0 25 50

SCALE: 1"=50'

50/960045/9645GRE.DWG/BDG/5-08-97/

ENGINEER'S SEAL SHAHAB BIAZAR NEW MEXICO 13479 REGISTERED PROFESSIONAL ENGINEER 5-8-97 SHAHAB BIAZAR P.E. #13479	**PARADISE SKIES SUBDIVISION** **GRADING AND GRAINAGE PLAN - E** TIERRA WEST DEVELOPMENT MANAGEMENT SERVICES 4421 McLEOD ROAD N.E., SUITE D ALBUQUERQUE, NEW MEXICO 87109 (505)883-7592	DRAWN BY BDG DATE 3-21-97 9645GRE.DWG SHEET # 5 JOB # 960045