CITY OF ALBUQUERQUE

September 22, 2005

Mr. Ronald R. Bohannan, PE
TIERRA WEST, LLC
8509 Jefferson St. NE
Albuquerque, NM 87113

RE: WESTERN TRAILS ESTATES (F-11/D12)
Engineers Certification for Release of Financial Guaranty
Engineers Stamp dated 07/07/2004
Engineers Certification dated 09/20/2005

Dear Ron:

Based upon the information provided in your Engineer's Certification Submittal dated 09/21/2005, the above referenced plan is adequate to satisfy the Grading and Drainage Certification for Release of Financial Guaranty.

If you have any questions, you can contact me at 924-3982

Sincerely,

Arlene V. Portillo

Arlene V. Portillo
Plan Checker, Planning Dept.- Hydrology
Development and Building Services

C: Marilyn Maldonado, COA# 700581
File

P.O. Box 1293
Albuquerque
New Mexico 87103
www.cabq.gov

Albuquerque
Metropolitan
Arroyo
Flood
Control
Authority
2600 Prospect N.E., Albuquerque, NM 87107
Phone: (505) 884-2215 Fax: (505) 884 0214

Post-It® Fax Note 7671	Date 9-29	# of pages ▶ 1
To BRAD BINGHAM	From LYNN MAZUR	
Co./Dept. HYDROLOGY	Co. AMAFCA	
Phone #	Phone #	
Fax #	Fax #	

September 29, 2005

Mr. Brad Frosch
Tierra West, LLC
8509 Jefferson St. NE
Albuquerque, NM 87113

Re: Western Trails Estates Subdivision, ZAP F-11
Acceptance of Work for AMAFCA Maintenance, City Project No. 700581

Dear Mr. Frosch:

AMAFCA staff visited the referenced project on Wednesday, September 28, and found that the work has not been completed. We met at the site in August, and you provided a detail of the header wall along the north bank of the San Antonio Arroyo next to the City access road. This wall must be included to prevent erosion on the arroyo bank and potential headcutting of the City access road. In general, the City easement area on the north side of the arroyo does not appear complete. AMAFCA recommends that the City inspector visit the site, also.

Please address this item and call Jerry Lovato, AMAFCA Field Engineer, or me when it is ready for final inspection. If you have any questions, please call me at 884-2215.

Sincerely,
AMAFCA

Lynn M. Mazur

Lynn M. Mazur, P.E., C.F.M.
Development Review Engineer

Cc: Brad Bingham, City Hydrology
Jerry Lovato, AMAFCA
Dan Clemmer, Argus Development

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

March 24, 2003

Ron Bohannan, PE
Tierra West, LLC
8509 Jefferson NE
Albuquerque, NM 87113

Re: Western Trails Estates Subdivision Drainage Report
Engineer's Stamp dated 2-18-03 (F11/D12)

Dear Mr. Bohannan,

Based upon the information provided in your submittal dated 2-18-03, the above referenced plan is approved for Final Plat and Grading Permit and supercedes the one dated 10-28-02. This is now the plan that must be certified for release of Financial Guarantees.

If you have any questions, you can contact me at 924-3986.

Sincerely,

Bradley L. Bingham, PE
Sr. Engineer, Planning Dept
Development and Building Services

C: Lynn Mazur, AMAFCA
file

Albuquerque Metropolitan Arroyo Flood Control Authority
2600 PROSPECT N.E. - ALBUQUERQUE, NM 87107
TELEPHONE (505) 884-2215 FAX (505) 884-0214

Post-it* Fax Note 7671	Date 10-22	# of pages ▶ 1
To BRAD BINGHAM	From LYNN MAZUR	
Co./Dept. HYDROLOGY	Co. AMAFCA	
Phone #	Phone #	
Fax #	Fax #	

October 22, 2003

Ms. Sara Lavy, P.E.
Tierra West, LLC
8509 Jefferson St. NE
Albuquerque, New Mexico 87113

File

Re: Western Trails Estates Change Order, ZAP F-11

Dear Ms. Lavy:

AMAFCA staff has reviewed the proposed relocation of the sanitary sewer crossing and has no objection to the location. It would be prudent to locate the manhole within the AMAFCA maintenance road so that the City can have access for cleaning.

We would prefer to have the 10-inch water line and sanitary sewer cross the San Antonio Arroyo at one location. Please add a note that the gabions must be removed and replaced in whole sections, not cut and spliced together. Also, any damaged wire baskets must be replaced with new baskets.

The License Agreement will have to be amended with a new exhibit. Contact Kevin Broderick, City Design/Construction Section.

If you have any questions, please call me at 884-2215.

Sincerely,
AMAFCA

Lynn M. Mazur

Lynn M. Mazur, P.E.
Development Review Engineer

Cc: Brad Bingham, City Hydrology
Nancy Musinski, City Utility Development

F-11/012

DRAINAGE REPORT

for

Western Trails Estates

Prepared by

Tierra West, LLC
8509 Jefferson NE
Albuquerque, New Mexico 87113

Prepared for

Argus Development
6300 Riverside Plaza Lane NW, Suite 200
Albuquerque, New Mexico 87120

September 2002

RONALD RAY BOHANNAN NEW MEXICO REGISTERED PROFESSIONAL ENGINEER 9/18/02

Ronald R. Bohannan P.E. No. 7868

Location

Western Trails Estates is a proposed 131 unit single family subdivision. It is located at the northwest corner of Coors and Western Trails. The site is shown on the attached Zone Atlas Map F-11 and contains approximately 21.6 acres. The purpose of this report is to provide the drainage analysis and management plan for the subdivision.

Existing Drainage Conditions

The site is currently undeveloped and naturally drains from the southwest to the northeast. The undeveloped flow of 43.82 cfs drains to the San Antonio Arroyo located at the northern property line of the project.

No offsite flows enter the subdivision. The existing Quaker Heights Subdivision is located to the west and cuts off any flows from that direction. Coors Boulevard and Western Trails are located east and south of the property and capture any flows from those directions before they impact the site. The San Antonio Arroyo is located north of the property and collects the flows from this property.

FIRM Map

The site is located on FIRM Map 35001C0114 D as shown on the attached excerpt. The maps shows that the site does not lie within any 100 year flood plains. The San Antonio Arroyo is shown on the flood map on the north side of the property. However, this is an AMAFCA facility and no lots are proposed with the floodplain.

Proposed Drainage Management Plan

The site has been divided into 13 basins. The lots will drain to the adjacent streets, which will convey the flows north to the San Antonio Arroyo. There will be three separate discharge points located in the three cul-de-sacs adjacent to the San Antonio Arroyo. All of the

basins except 9 and 10 drain to the eastern cul-de-sac. Basins 9 and 10 drain to the two western cul-de-sacs to the San Antonio Arroyo. The site will discharge a total of 68.29 cfs to the arroyo.

Basin 9 has a developed flow of 7.79 cfs and will drain to Hayden Drive. A single 'C' drop inlet at the north end of Hayden Drive will collect the flows and convey them to the San Antonio Arroyo. Basin 10 has a developed flow of 5.77 cfs and will drain to the north end of McNary Drive. The remaining on-site basins (except Basin 13) will drain to Pinetop Street and be conveyed north. A double 'A' and single 'A' inlet will collect the 54.73 cfs from the subdivision. Pinetop Street has capacity for the developed flows with 8" standard curb. Basin 13 consists of the San Antonio Arroyo and the flow will stay within the arroyo.

AMAFCA is requiring water quality elements on the three discharge points. These will remove the debris and oil from the "first flush" storm runoff. Riprap is shown on the two western discharge points and a ring chamber is required by AMAFCA at the eastern discharge point to prevent erosion in the channel.

The three discharge points have an emergency overflow in the event of a storm greater than 100-year or poor maintenance of the storm drain facilities. The pedestrian openings in the perimeter wall will allow the overflow to enter the San Antonio Arroyo.

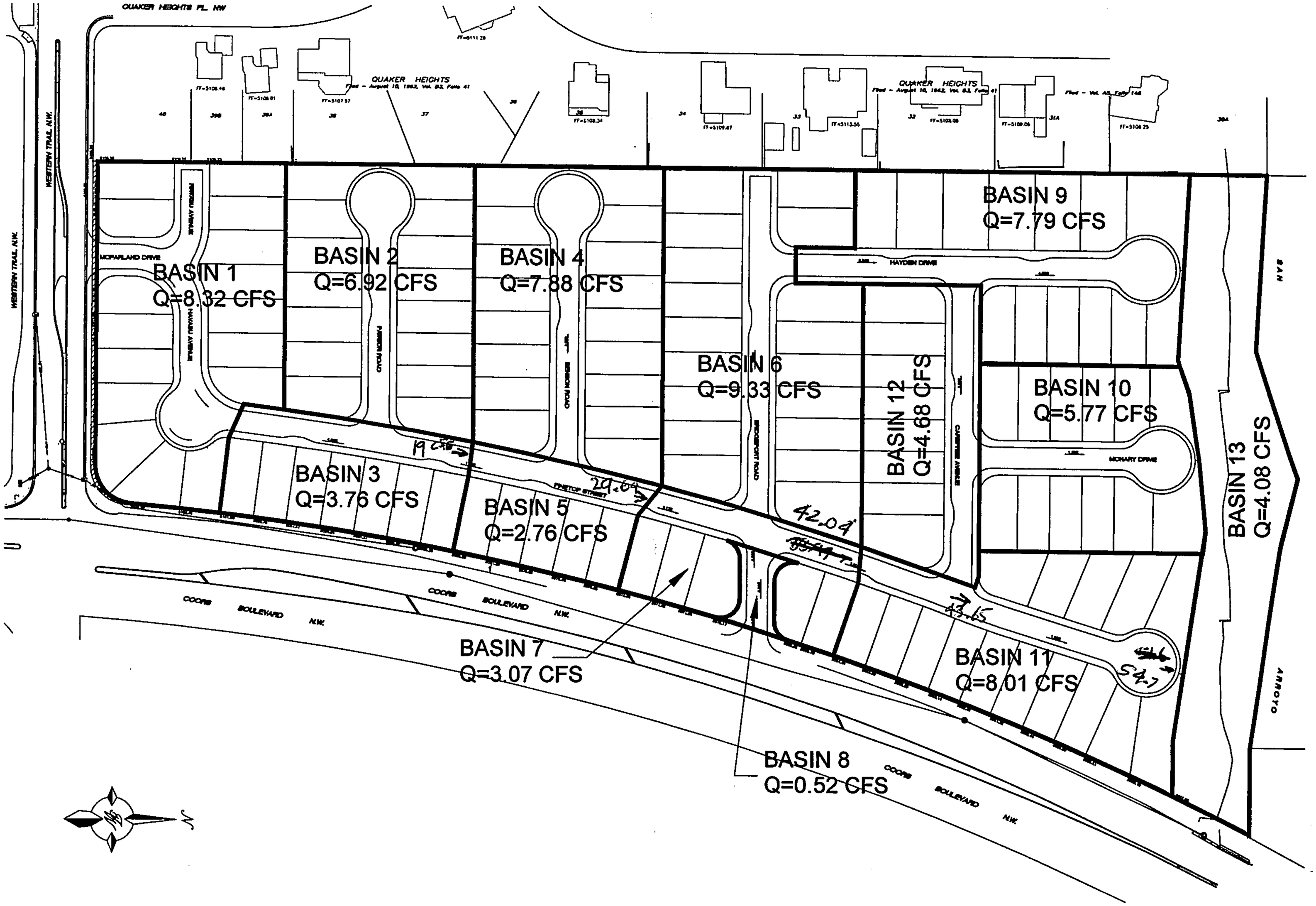
Calculations

The Weighted E method from the "City of Albuquerque Development Process Manual Volume 11 – Design Criteria, 1997 Revision" was used to calculate the runoff and volume for the site.

Summary

The site will free discharge 68.29 cfs into the San Antonio Arroyo. The on-site streets will convey the runoff to the north and the San Antonio Arroyo. The streets have capacity for

the developed flows. Water quality elements and baffled outlets are required by AMAFCA before the flow enters the arroyo. Basin 13 consists of the arroyo itself.



BASIN LAYOUT

Weighted E Method

Existing On-Site Basins

Basin	Area (sf)	Area (acres)	Treatment A		Treatment B		Treatment C		Treatment D		100-Year			10-Year		
			%	(acres)	%	(acres)	%	(acres)	%	(acres)	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs
1	918,768	21.09	0%	0	100%	21.09	0%	0.00	0%	0.00	0.670	1.178	42.82	0.220	0.387	16.03

Developed On-Site Basins

Basin	Area (sf)	Area (acres)	Treatment A		Treatment B		Treatment C		Treatment D		100-Year			10-Year		
			%	(acres)	%	(acres)	%	(acres)	%	(acres)	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs
1	100,636	2.31	0%	0	20%	0.46	20%	0.46	60%	1.39	1.514	0.291	8.32	0.876	0.169	5.05
2	83,698	1.92	0%	0	20%	0.38	20%	0.38	60%	1.15	1.514	0.242	6.92	0.876	0.140	4.20
3	45,516	1.04	0%	0	20%	0.21	20%	0.21	60%	0.63	1.514	0.132	3.76	0.876	0.076	2.28
4	95,304	2.19	0%	0	20%	0.44	20%	0.44	60%	1.31	1.514	0.276	7.88	0.876	0.160	4.78
5	33,327	0.77	0%	0	20%	0.15	20%	0.15	60%	0.46	1.514	0.097	2.76	0.876	0.056	1.67
6	112,771	2.59	0%	0	20%	0.52	20%	0.52	60%	1.55	1.514	0.327	9.33	0.876	0.189	5.65
7	37,182	0.85	0%	0	20%	0.17	20%	0.17	60%	0.51	1.514	0.108	3.07	0.876	0.062	1.86
8	5,452	0.13	0%	0	10%	0.01	0%	0.00	90%	0.11	1.840	0.019	0.52	1.138	0.012	0.34
9	94,226	2.16	0%	0	20%	0.43	20%	0.43	60%	1.30	1.514	0.273	7.79	0.876	0.158	4.72
10	69,795	1.60	0%	0	20%	0.32	20%	0.32	60%	0.96	1.514	0.202	5.77	0.876	0.117	3.50
11	96,825	2.22	0%	0	20%	0.44	20%	0.44	60%	1.33	1.514	0.280	8.01	0.876	0.162	4.85
12	56,575	1.30	0%	0	20%	0.26	20%	0.26	60%	0.78	1.514	0.164	4.68	0.876	0.095	2.84
13	87,460	2.01	0%	0	100%	2.01	0%	0.00	0%	0.00	0.670	0.112	4.08	0.220	0.037	1.53
Total	918,768	21.09		0		5.81		3.79		11.49		2.523	72.88		1.433	43.27

Equations:

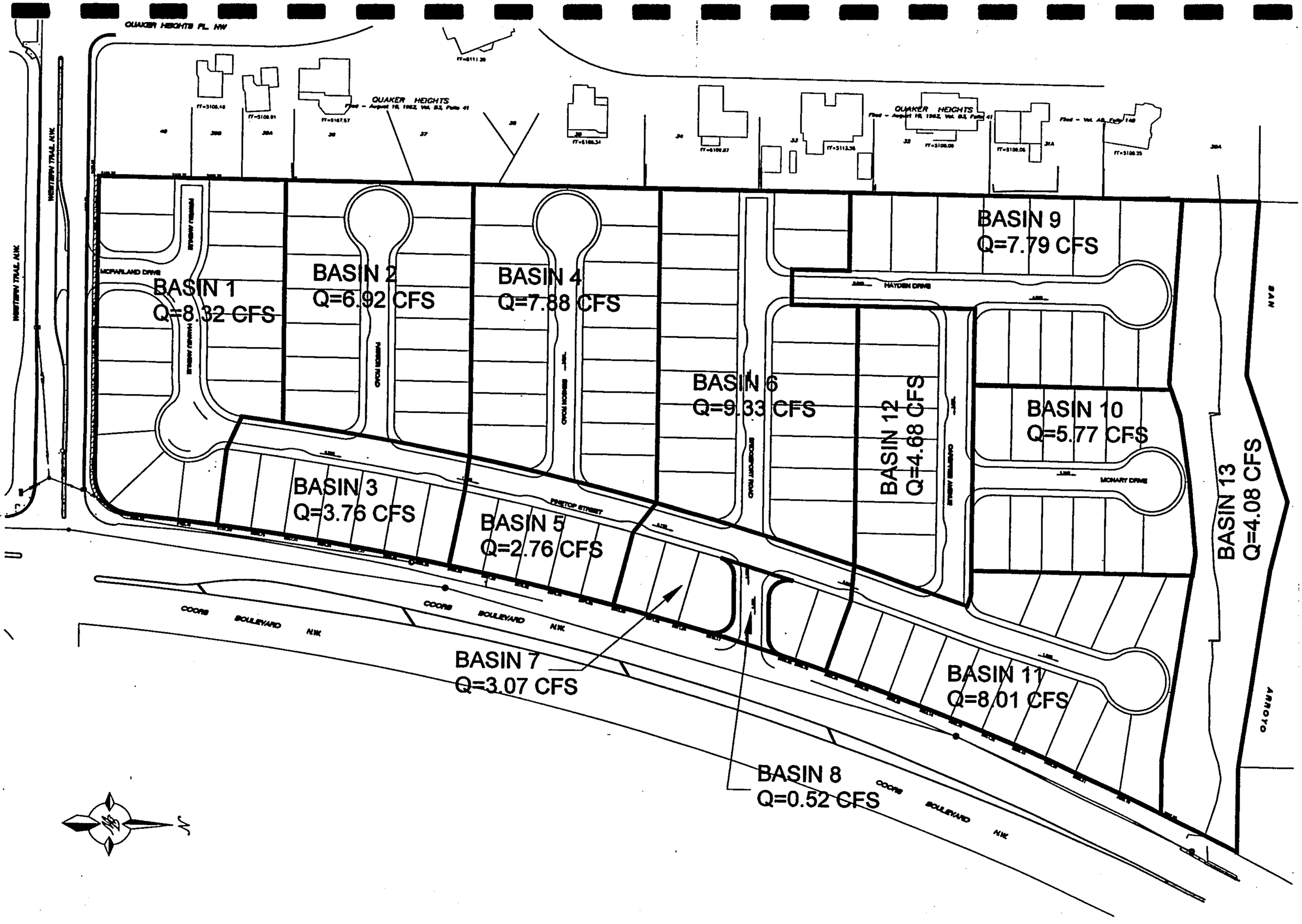
Weighted E = Ea*Aa + Eb*Ab + Ec*Ac + Ed*Ad / (Total Area)

Volume = Weighted D * Total Area

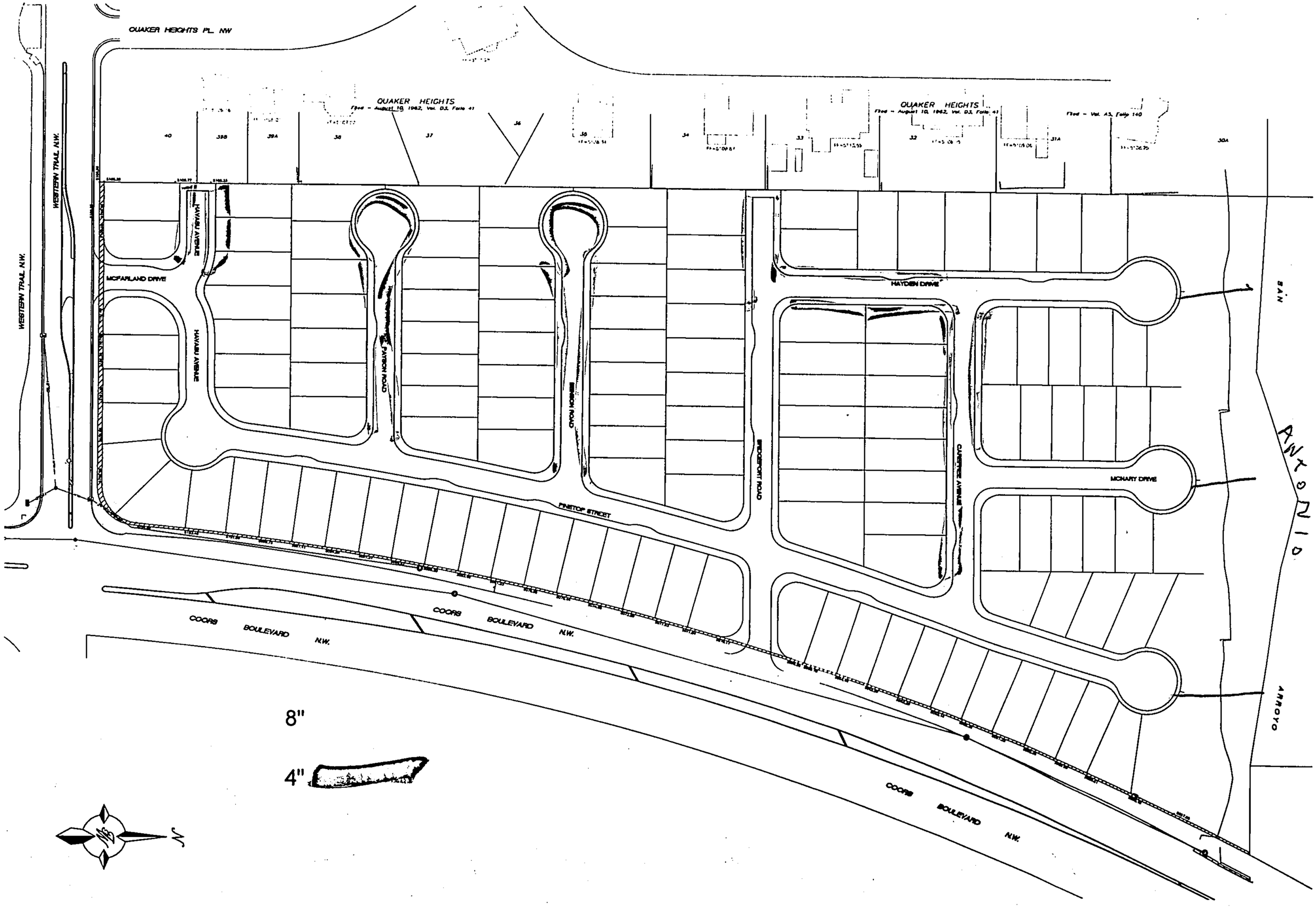
Flow = Qa * Aa + Qb * Ab + Qc * Ac + Qd * Ad

Excess Precipitation, E (inches)		
Zone 1	100-Year	10 - Year
E_a	0.44	0.08
E_b	0.67	0.22
E_c	0.99	0.44
E_d	1.97	1.24

Peak Discharge (cfs/acre)		
Zone 1	100-Year	10 - Year
Q_a	1.29	0.24
Q_b	2.03	0.76
Q_c	2.87	1.49
Q_d	4.37	2.89



BASIN LAYOUT



CURB SIZE LOCATION EXHIBIT

Street Capacity Calculations

OK

Payson Road
24' F-F Street Section with 4" curb
Slope= 0.0196

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	0.002	0.33	0.00	0.00	0.00	0.35	0.00	0.62	0.005
0.02	0.006	0.66	0.01	0.00	0.01	0.56	0.01	0.69	0.012
0.025	0.010	0.83	0.01	0.01	0.01	0.65	0.02	0.72	0.016
0.035	0.020	1.16	0.02	0.02	0.03	0.81	0.03	0.76	0.024
0.045	0.032	1.49	0.02	0.03	0.06	0.96	0.04	0.79	0.033
0.052	0.043	1.72	0.03	0.05	0.09	1.05	0.05	0.81	0.039
0.06	0.058	1.98	0.03	0.07	0.13	1.16	0.07	0.83	0.047
0.0625	0.063	2.06	0.03	0.07	0.15	1.19	0.07	0.84	0.049

For water depths greater than 0.0625 ft but less than 0.2625 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	0.064	2.09	0.03	0.08	0.15	1.19	0.08	0.84	0.049
0.1	0.173	3.98	0.04	0.26	0.52	1.51	0.15	0.84	0.079
0.13	0.311	5.51	0.06	0.56	1.12	1.80	0.23	0.88	0.110
0.16	0.495	7.04	0.07	1.03	2.07	2.09	0.33	0.92	0.143
0.2	0.810	9.08	0.09	1.98	3.96	2.44	0.49	0.96	0.190
0.216	0.959	9.89	0.10	2.47	4.95	2.58	0.56	0.98	0.210
0.24	1.205	11.12	0.11	3.35	6.71	2.78	0.67	1.00	0.240
0.2625	1.463	12.27	0.12	4.34	8.67	2.96	0.78	1.02	0.269

For water depths greater than 0.2625 ft but less than 0.333 ft

Y2= Y - 0.2625
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)
0.2625	1.463	12.27	0.12	4.34	8.67	2.96	0.78	1.02	0.269
0.27	1.553	12.27	0.13	4.79	9.58	3.08	0.83	1.05	0.287
0.28	1.673	12.28	0.14	5.42	10.83	3.24	0.91	1.08	0.310
0.29	**1.793**	**12.29**	**0.15**	**6.08**	**12.15**	**3.39**	**0.98**	**1.11**	**0.333**
0.3	1.913	12.30	0.16	6.77	13.53	3.54	1.06	1.14	0.356
0.31	2.033	12.31	0.17	7.48	14.97	3.68	1.14	1.17	0.379
0.32	2.153	12.32	0.17	8.23	16.46	3.82	1.22	1.19	0.402
0.333	2.309	12.34	0.19	9.24	18.49	4.00	1.33	1.22	0.433

Street Capacity Calculations

Benson Road
24' F-F Street Section with 4" curb
Slope= 0.03

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	0.002	0.33	0.00	0.00	0.00	0.43	0.00	0.76	0.007
0.02	0.006	0.66	0.01	0.00	0.01	0.69	0.01	0.86	0.016
0.025	0.010	0.83	0.01	0.01	0.02	0.80	0.02	0.89	0.021
0.035	0.020	1.16	0.02	0.02	0.04	1.00	0.03	0.94	0.032
0.045	0.032	1.49	0.02	0.04	0.08	1.18	0.05	0.98	0.044
0.052	0.043	1.72	0.03	0.06	0.11	1.30	0.07	1.01	0.052
0.06	0.058	1.98	0.03	0.08	0.16	1.43	0.09	1.03	0.062
0.0625	0.063	2.06	0.03	0.09	0.18	1.47	0.09	1.04	0.066

For water depths greater than 0.0625 ft but less than 0.2625 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	0.064	2.09	0.03	0.09	0.19	1.47	0.09	1.04	0.066
0.1	0.173	3.98	0.04	0.32	0.65	1.87	0.19	1.04	0.106
0.13	0.311	5.51	0.06	0.69	1.39	2.23	0.29	1.09	0.146
0.16	0.495	7.04	0.07	1.28	2.56	2.58	0.41	1.14	0.189
0.2	0.810	9.08	0.09	2.45	4.90	3.02	0.60	1.19	0.252
0.22	0.998	10.10	0.10	3.23	6.46	3.24	0.71	1.22	0.284
0.250	**1.311**	**11.60**	**0.11**	**4.64**	**9.28**	**3.54**	**0.88**	**1.25**	**0.333**
0.2625	1.463	12.27	0.12	5.36	10.73	3.67	0.96	1.26	0.355

For water depths greater than 0.2625 ft but less than 0.333 ft

Y2=	Y - 0.2625
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)
0.2625	1.463	12.27	0.12	5.36	10.73	3.67	0.96	1.26	0.355
0.27	1.553	12.27	0.13	5.92	11.85	3.82	1.03	1.29	0.377
0.28	1.673	12.28	0.14	6.70	13.40	4.01	1.12	1.33	0.407
0.29	1.793	12.29	0.15	7.52	15.04	4.19	1.22	1.37	0.436
0.3	1.913	12.30	0.16	8.37	16.74	4.38	1.31	1.41	0.466
0.31	2.033	12.31	0.17	9.26	18.52	4.56	1.41	1.44	0.496
0.32	2.153	12.32	0.17	10.18	20.37	4.73	1.51	1.47	0.526
0.333	2.309	12.34	0.19	11.43	22.87	4.95	1.65	1.51	0.565

Street Capacity Calculations

McNary Drive
24' F-F Street Section with 4" curb
Slope= 0.01

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	0.002	0.33	0.00	0.00	0.00	0.25	0.00	0.44	0.003
0.02	0.006	0.66	0.01	0.00	0.01	0.40	0.01	0.50	0.007
0.025	0.010	0.83	0.01	0.00	0.01	0.46	0.01	0.51	0.010
0.035	0.020	1.16	0.02	0.01	0.02	0.58	0.02	0.54	0.015
0.045	0.032	1.49	0.02	0.02	0.04	0.68	0.03	0.57	0.020
0.052	0.043	1.72	0.03	0.03	0.07	0.75	0.04	0.58	0.024
0.06	0.058	1.98	0.03	0.05	0.10	0.83	0.05	0.59	0.029
0.0625	0.063	2.06	0.03	0.05	0.11	0.85	0.05	0.60	0.030

For water depths greater than 0.0625 ft but less than 0.2625 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	0.064	2.09	0.03	0.05	0.11	0.85	0.05	0.60	0.030
0.1	0.173	3.98	0.04	0.19	0.37	1.08	0.11	0.60	0.049
0.13	0.311	5.51	0.06	0.40	0.80	1.29	0.17	0.63	0.068
0.16	0.495	7.04	0.07	0.74	1.48	1.49	0.24	0.66	0.089
0.2	0.810	9.08	0.09	1.41	2.83	1.75	0.35	0.69	0.119
0.216	0.959	9.89	0.10	1.77	3.54	1.84	0.40	0.70	0.131
0.24	1.205	11.12	0.11	2.39	4.79	1.99	0.48	0.71	0.151
0.2625	1.463	12.27	0.12	3.10	6.19	2.12	0.56	0.73	0.169

For water depths greater than 0.2625 ft but less than 0.333 ft

Y2=	Y - 0.2625
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)
0.2625	1.463	12.27	0.12	3.10	6.19	2.12	0.56	0.73	0.169
0.27	1.553	12.27	0.13	3.42	6.84	2.20	0.59	0.75	0.181
0.28	1.673	12.28	0.14	3.87	7.74	2.31	0.65	0.77	0.196
0.29	1.793	12.29	0.15	4.34	8.68	2.42	0.70	0.79	0.211
0.3	1.913	12.30	0.16	4.83	9.67	2.53	0.76	0.81	0.226
0.31	2.033	12.31	0.17	5.35	10.69	2.63	0.82	0.83	0.242
0.32	2.153	12.32	0.17	5.88 ←	11.76	2.73	0.87	0.85	0.257
0.333	**2.309**	**12.34**	**0.19**	**6.60**	**13.20**	**2.86**	**0.95**	**0.87**	**0.277**

ok

Street Capacity Calculations

Carefree Ave.
24' F-F Street Section with 4" curb
Slope= 0.0373

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	0.002	0.33	0.00	0.00	0.00	0.48	0.00	0.85	0.008
0.02	0.006	0.66	0.01	0.00	0.01	0.77	0.02	0.96	0.019
0.025	0.010	0.83	0.01	0.01	0.02	0.89	0.02	0.99	0.025
0.035	0.020	1.16	0.02	0.02	0.04	1.11	0.04	1.05	0.037
0.045	0.032	1.49	0.02	0.04	0.09	1.32	0.06	1.09	0.051
0.052	0.043	1.72	0.03	0.06	0.13	1.45	0.08	1.12	0.060
0.06	0.058	1.98	0.03	0.09	0.18	1.60	0.10	1.15	0.072
0.0625	0.063	2.06	0.03	0.10	0.21	1.64	0.10	1.16	0.076

For water depths greater than 0.0625 ft but less than 0.2625 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	0.064	2.09	0.03	0.10	0.21	1.64	0.10	1.15	0.076
0.1	0.173	3.98	0.04	0.36	0.72	2.09	0.21	1.16	0.122
0.13	0.311	5.51	0.06	0.77	1.55	2.49	0.32	1.22	0.168
0.16	0.495	7.04	0.07	1.42	2.85	2.88	0.46	1.27	0.218
0.2	0.810	9.08	0.09	2.73	5.46	3.37	0.67	1.33	0.289
0.224	**1.038**	**10.30**	**0.10**	**3.79**	**7.58**	**3.65**	**0.82**	**1.36**	**0.333**
0.24	1.205	11.12	0.11	4.63	9.25	3.84	0.92	1.38	0.364
0.2625	1.463	12.27	0.12	5.98	11.96	4.09	1.07	1.41	0.407

ok

For water depths greater than 0.2625 ft but less than 0.333 ft

Y2= Y - 0.2625
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)
0.2625	1.463	12.27	0.12	5.98	11.96	4.09	1.07	1.41	0.407
0.27	1.553	12.27	0.13	6.60	13.21	4.25	1.15	1.44	0.432
0.28	1.673	12.28	0.14	7.47	14.95	4.47	1.25	1.49	0.466
0.29	1.793	12.29	0.15	8.38	16.77	4.68	1.36	1.53	0.499
0.3	1.913	12.30	0.16	9.33	18.67	4.88	1.46	1.57	0.533
0.31	2.033	12.31	0.17	10.33	20.65	5.08	1.57	1.61	0.567
0.32	2.153	12.32	0.17	11.35	22.71	5.28	1.69	1.64	0.601
0.333	2.309	12.34	0.19	12.75	25.50	5.52	1.84	1.69	0.645

Street Capacity Calculations

Bridgeport Road
24' F-F Street Section with 4" curb
Slope= 0.044

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	0.002	0.33	0.00	0.00	0.00	0.53	0.01	0.93	0.009
0.02	0.006	0.66	0.01	0.01	0.01	0.83	0.02	1.04	0.021
0.025	0.010	0.83	0.01	0.01	0.02	0.97	0.02	1.08	0.028
0.035	0.020	1.16	0.02	0.02	0.05	1.21	0.04	1.14	0.042
0.045	0.032	1.49	0.02	0.05	0.09	1.43	0.06	1.19	0.056
0.052	0.043	1.72	0.03	0.07	0.14	1.58	0.08	1.22	0.067
0.06	0.058	1.98	0.03	0.10	0.20	1.73	0.10	1.25	0.080
0.0625	0.063	2.06	0.03	0.11	0.22	1.78	0.11	1.26	0.084

For water depths greater than 0.0625 ft but less than 0.2625 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	0.064	2.09	0.03	0.11	0.23	1.79	0.11	1.25	0.085
0.1	0.173	3.98	0.04	0.39	0.78	2.27	0.23	1.26	0.135
0.13	0.311	5.51	0.06	0.84	1.68	2.70	0.35	1.32	0.186
0.16	0.495	7.04	0.07	1.55	3.09	3.13	0.50	1.38	0.242
0.2	0.810	9.08	0.09	2.97	5.93	3.66	0.73	1.44	0.320
0.207	**0.869**	**9.41**	**0.09**	**3.26**	**6.51**	**3.75**	**0.77**	**1.45**	**0.333**
0.24	1.205	11.12	0.11	5.02	10.05	4.17	1.00	1.50	0.403
0.2625	1.463	12.27	0.12	6.50	12.99	4.44	1.17	1.53	0.451

For water depths greater than 0.2625 ft but less than 0.333 ft

Y2= Y - 0.2625
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)
0.2625	1.463	12.27	0.12	6.50	12.99	4.44	1.17	1.53	0.451
0.27	1.553	12.27	0.13	7.17	14.35	4.62	1.25	1.57	0.478
0.28	1.673	12.28	0.14	8.12	16.23	4.85	1.36	1.62	0.515
0.29	1.793	12.29	0.15	9.11	18.21	5.08	1.47	1.66	0.552
0.3	1.913	12.30	0.16	10.14	20.28	5.30	1.59	1.71	0.589
0.31	2.033	12.31	0.17	11.21	22.43	5.52	1.71	1.75	0.626
0.32	2.153	12.32	0.17	12.33	24.67	5.73	1.83	1.78	0.663
0.333	2.309	12.34	0.19	13.85	27.70	6.00	2.00	1.83	0.712

Street Capacity Calculations

Hayden Drive
24' F-F Street Section with 4" curb
Slope= 0.04

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	0.002	0.33	0.00	0.00	0.00	0.50	0.01	0.88	0.008
0.02	0.006	0.66	0.01	0.01	0.01	0.79	0.02	0.99	0.020
0.025	0.010	0.83	0.01	0.01	0.02	0.92	0.02	1.03	0.026
0.035	0.020	1.16	0.02	0.02	0.05	1.15	0.04	1.09	0.039
0.045	0.032	1.49	0.02	0.04	0.09	1.36	0.06	1.13	0.053
0.052	0.043	1.72	0.03	0.07	0.13	1.50	0.08	1.16	0.063
0.06	0.058	1.98	0.03	0.10	0.19	1.65	0.10	1.19	0.075
0.0625	0.063	2.06	0.03	0.11	0.21	1.70	0.11	1.20	0.079

For water depths greater than 0.0625 ft but less than 0.2625 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	0.064	2.09	0.03	0.11	0.22	1.70	0.11	1.20	0.080
0.1	0.173	3.98	0.04	0.37	0.75	2.16	0.22	1.20	0.127
0.13	0.311	5.51	0.06	0.80	1.60	2.58	0.33	1.26	0.175
0.16	0.495	7.04	0.07	1.48	2.95	2.98	0.48	1.31	0.228
0.2	0.810	9.08	0.09	2.83	5.66	3.49	0.70	1.38	0.302
0.216	**0.959**	**9.89**	**0.10**	**3.54**	**7.07**	**3.69**	**0.80**	**1.40**	**0.333**
0.24	1.205	11.12	0.11	4.79	9.58	3.97	0.95	1.43	0.380
0.2625	1.463	12.27	0.12	6.19	12.39	4.24	1.11	1.46	0.425

For water depths greater than 0.2625 ft but less than 0.333 ft

Y2= Y - 0.2625
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)
0.2625	1.463	12.27	0.12	6.19	12.39	4.24	1.11	1.46	0.425
0.27	1.553	12.27	0.13	6.84	13.68	4.41	1.19	1.49	0.451
0.28	1.673	12.28	0.14	7.74	15.48	4.63	1.30	1.54	0.486
0.29	1.793	12.29	0.15	8.68	17.36	4.84	1.40	1.58	0.521
0.3	1.913	12.30	0.16	9.67	19.33	5.05	1.52	1.63	0.556
0.31	2.033	12.31	0.17	10.69	21.38	5.26	1.63	1.67	0.591
0.32	2.153	12.32	0.17	11.76	23.52	5.46	1.75	1.70	0.627
0.333	2.309	12.34	0.19	13.20	26.41	5.72	1.90	1.75	0.673

←

ok

DROP INLET CALCULATIONS

Basin	TYPE OF INLET	AREA (SF)	Q (CFS)	H (FT)	H ALLOW (FT)
9	Single 'C'	4.36	7.79	0.1377	0.67
10	Single 'C'	4.36	5.77	0.0755	0.67
11	Double 'A'	11.24			
	Single 'A'	5.82			
	Total	17.06	54.73	0.4439	0.67

ORIFICE EQUATION

Q = CA sqrt(2gH)

C = 0.6

g = 32.2

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 'C" Drop Inlet
EFFECTIVE AREA

Area at the grate:

L = 38.375" - 7(2@ middle bars)
= 34.875"
= 2.906'

W = 25.5" - 13(2@ middle bars)
= 19"
= 1.583'

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

Effective Area: = 4.601- 4.601 (0.5 clogging factor)
= 2.30 ft^2 at the grate

Area at the throat:

L = 47.375@
= 3.95'

H = 10:@ - 42@
= 63@
= 0.5208'

Area = 3.95' x 0.5208'
= 2.06 ft^2 at the throat

Total Area:

Area = 2.30_{grate} + 2.06_{throat}
= 4.36 ft^2

Riprap Requirements

Equation taken from Table 5-5 from the Urban Storm Drainage Criteria Manual Volume 2 by Wright-McLaughlin Engineers.

Hayden Drive Cul-de-sac

$$\frac{VS^{0.17}}{(Ss-1)^{0.66}} = \frac{4.41 * 0.04^{0.17}}{(2.5-1)^{0.66}} = 1.95$$

Where:
V = Velocity (ft/sec)
S = Slope (ft/ft)
S_s = Specific gravity of rock

from Table 5-5 use Rock Type VL with a d_{50} of 6".

McNary Drive Cul-de-sac

$$\frac{VS^{0.17}}{(S_S-1)^{0.66}} = \frac{3.27 * 0.27^{0.17}}{(2.5-1)^{0.66}} = 2.01$$

Where:
V = Velocity (ft/sec)
S = Slope (ft/ft)
S_s = Specific gravity of rock

from Table 5-5 use Rock Type VL with a d_{50} of 6".

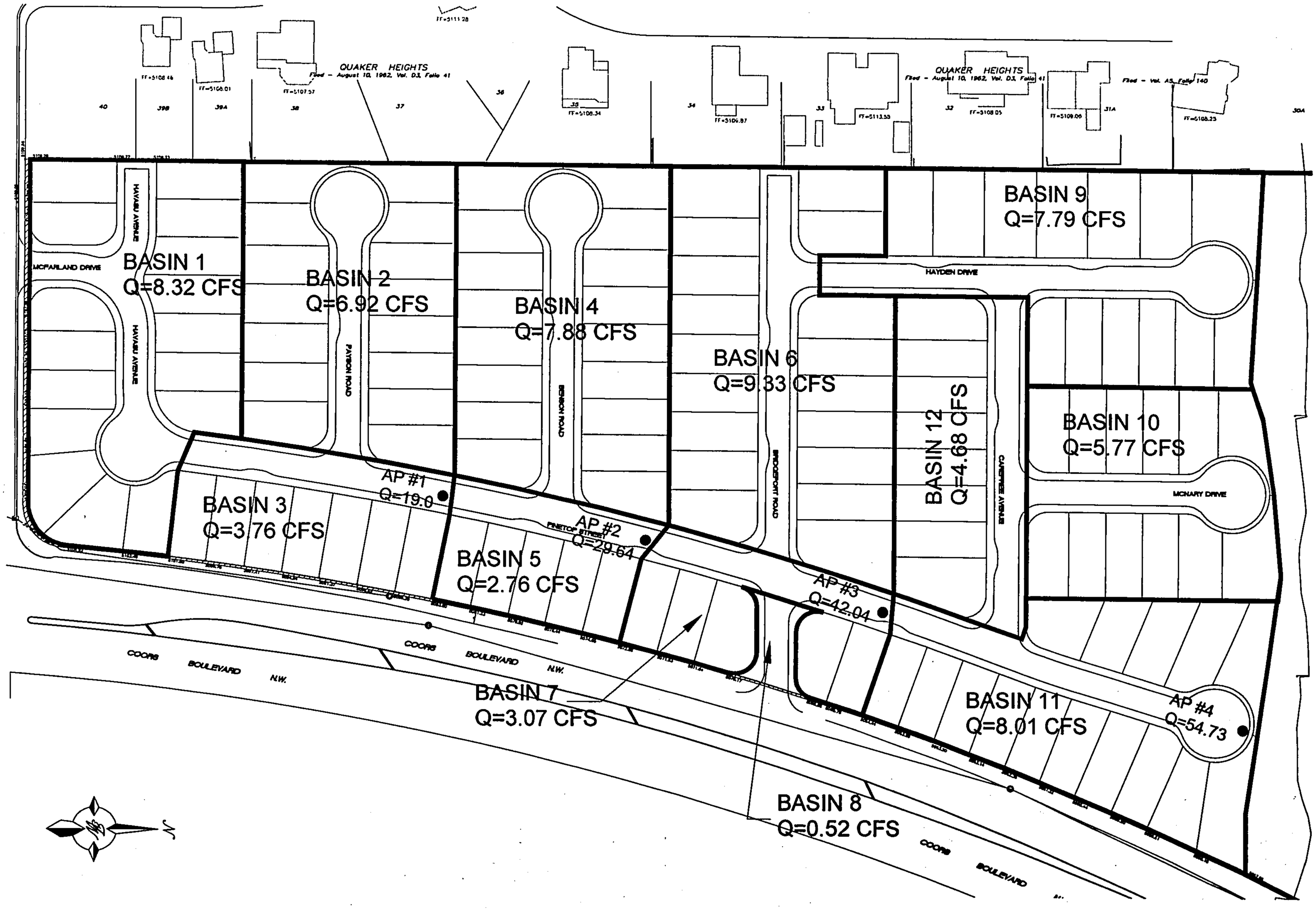
Pipe Capacity

Pipe	D	Slope	Area	R	Q Provided	Q Required	Velocity
	(in)	(%)	(ft^2)		(cfs)	(cfs)	(ft/s)
Hayden Drive	18	4	1.77	0.375	21.07	7.79	4.41
McNary Drive	18	27	1.77	0.375	54.73	5.77	3.27
Pinetop Street	36	1	7.07	0.750	66.88	54.73	7.74

Manning's Equation:

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

A = Area
R = D/4
S = Slope
n = 0.013



ANALYSIS POINTS

Street Capacity Calculations

Half street.

Pinetop Street - AP #1

24' F-F Street Section with 8" curb

Slope= 0.04

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	0.001	0.17	0.00	0.00	0.00	0.49	0.00	0.86	0.008
0.02	0.003	0.34	0.01	0.00	0.00	0.78	0.02	0.97	0.019
0.04	0.013	0.68	0.02	0.02	0.03	1.24	0.05	1.09	0.045
0.06	0.029	1.02	0.03	0.05	0.09	1.62	0.10	1.16	0.073
0.08	0.051	1.36	0.04	0.10	0.20	1.96	0.16	1.22	0.104
0.1	0.080	1.70	0.05	0.18	0.36	2.28	0.23	1.27	0.136
0.12	0.115	2.04	0.06	0.30	0.59	2.57	0.31	1.31	0.170
0.125	0.125	2.13	0.06	0.33	0.66	2.64	0.33	1.32	0.178

For water depths greater than 0.125 ft but less than 0.325 ft

Y1= Y-0.125

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)
0.13	0.136	2.38	0.06	0.35	0.70	2.59	0.34	1.26	0.176
0.16	0.226	3.91	0.06	0.59	1.18	2.61	0.42	1.15	0.192
0.20	0.416	5.95	0.07	1.23	2.46	2.96	0.59	1.17	0.245
0.22	0.541	6.97	0.08	1.72	3.44	3.18	0.70	1.19	0.277
0.24	0.686	8.00	0.09	2.33	4.66	3.40	0.82	1.22	0.312
0.28	1.036	10.04	0.10	3.98	7.97	3.85	1.08	1.28	0.386
0.30	1.241	11.06	0.11	5.05	10.09	4.07	1.22	1.31	0.425
0.325	1.525	12.33	0.12	6.62	13.24	4.34	1.41	1.34	0.475

For water depths greater than 0.325 ft but less than 0.667 ft

Y2= Y - 0.365

A3= A2 + Y2*12

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)
0.325	1.525	12.33	0.12	6.62	13.24	4.34	1.41	1.34	0.475
0.36	**1.897**	**12.36**	**0.15**	**9.51**	**19.01**	**5.01**	**1.78**	**1.48**	**0.588**
0.40	2.425	12.41	0.20	14.28	28.56	5.89	2.36	1.64	0.749
0.45	3.025	12.46	0.24	20.59	41.17	6.81	3.06	1.79	0.935
0.50	3.625	12.51	0.29	27.76	55.51	7.66	3.83	1.91	1.122
0.55	4.225	12.56	0.34	35.73	71.47	8.46	4.65	2.01	1.312
0.60	4.825	12.61	0.38	44.47	88.94	9.22	5.53	2.10	1.504
0.667	5.629	12.67	0.44	57.29	114.58	10.18	6.79	2.20	1.765

Street Capacity Calculations

Pinetop Street - AP #2
24' F-F Street Section with 8" curb
Slope= 0.01

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	0.001	0.17	0.00	0.00	0.00	0.25	0.00	0.43	0.003
0.02	0.003	0.34	0.01	0.00	0.00	0.39	0.01	0.48	0.007
0.04	0.013	0.68	0.02	0.01	0.02	0.62	0.02	0.54	0.017
0.06	0.029	1.02	0.03	0.02	0.05	0.81	0.05	0.58	0.028
0.08	0.051	1.36	0.04	0.05	0.10	0.98	0.08	0.61	0.040
0.1	0.080	1.70	0.05	0.09	0.18	1.14	0.11	0.63	0.053
0.12	0.115	2.04	0.06	0.15	0.30	1.29	0.15	0.65	0.066
0.125	0.125	2.13	0.06	0.17	0.33	1.32	0.17	0.66	0.070

For water depths greater than 0.125 ft but less than 0.325 ft

Y1= Y-0.125
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)
0.13	0.136	2.38	0.06	0.18	0.35	1.29	0.17	0.63	0.068
0.16	0.226	3.91	0.06	0.29	0.59	1.30	0.21	0.57	0.073
0.20	0.416	5.95	0.07	0.62	1.23	1.48	0.30	0.58	0.093
0.22	0.541	6.97	0.08	0.86	1.72	1.59	0.35	0.60	0.106
0.24	0.686	8.00	0.09	1.17	2.33	1.70	0.41	0.61	0.120
0.28	1.036	10.04	0.10	1.99	3.98	1.92	0.54	0.64	0.150
0.30	1.241	11.06	0.11	2.52	5.05	2.03	0.61	0.65	0.166
0.325	1.525	12.33	0.12	3.31	6.62	2.17	0.71	0.67	0.186

For water depths greater than 0.325 ft but less than 0.667 ft

Y2= Y - 0.365
A3= A2 + Y2*12
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)
0.325	1.525	12.33	0.12	3.31	6.62	2.17	0.71	0.67	0.186
0.36	1.897	12.36	0.15	4.75	9.51	2.51	0.89	0.74	0.235
0.40	2.425	12.41	0.20	7.14	14.28	2.94	1.18	0.82	0.305
0.45	3.025	12.46	0.24	10.29	20.59	3.40	1.53	0.89	0.387
0.51	**3.772**	**12.52**	**0.30**	**14.82**	**29.64**	**3.93**	**2.01**	**0.97**	**0.490**
0.55	4.225	12.56	0.34	17.87	35.73	4.23	2.33	1.00	0.554
0.60	4.825	12.61	0.38	22.23	44.47	4.61	2.76	1.05	0.639
0.667	5.629	12.67	0.44	28.64	57.29	5.09	3.39	1.10	0.755

Street Capacity Calculations

Pinetop Street - AP #3
24' F-F Street Section with 8" curb
Slope= 0.008

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	0.001	0.17	0.00	0.00	0.00	0.22	0.00	0.39	0.002
0.02	0.003	0.34	0.01	0.00	0.00	0.35	0.01	0.43	0.006
0.04	0.013	0.68	0.02	0.01	0.01	0.55	0.02	0.49	0.014
0.06	0.029	1.02	0.03	0.02	0.04	0.72	0.04	0.52	0.023
0.08	0.051	1.36	0.04	0.04	0.09	0.88	0.07	0.55	0.034
0.1	0.080	1.70	0.05	0.08	0.16	1.02	0.10	0.57	0.045
0.12	0.115	2.04	0.06	0.13	0.26	1.15	0.14	0.58	0.056
0.125	0.125	2.13	0.06	0.15	0.30	1.18	0.15	0.59	0.059

For water depths greater than 0.125 ft but less than 0.325 ft

Y1= Y-0.125
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)
0.13	0.136	2.38	0.06	0.16	0.31	1.16	0.15	0.57	0.058
0.16	0.226	3.91	0.06	0.26	0.53	1.17	0.19	0.51	0.061
0.20	0.416	5.95	0.07	0.55	1.10	1.33	0.27	0.52	0.078
0.22	0.541	6.97	0.08	0.77	1.54	1.42	0.31	0.53	0.089
0.24	0.686	8.00	0.09	1.04	2.08	1.52	0.36	0.55	0.101
0.28	1.036	10.04	0.10	1.78	3.56	1.72	0.48	0.57	0.127
0.30	1.241	11.06	0.11	2.26	4.51	1.82	0.55	0.59	0.140
0.325	1.525	12.33	0.12	2.96	5.92	1.94	0.63	0.60	0.158

For water depths greater than 0.325 ft but less than 0.667 ft

Y2= Y - 0.365
A3= A2 + Y2*12
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)
0.325	1.525	12.33	0.12	2.96	5.92	1.94	0.63	0.60	0.158
0.36	1.897	12.36	0.15	4.25	8.50	2.24	0.80	0.66	0.200
0.40	2.425	12.41	0.20	6.39	12.77	2.63	1.05	0.73	0.261
0.45	3.025	12.46	0.24	9.21	18.41	3.04	1.37	0.80	0.331
0.50	3.625	12.51	0.29	12.41	24.83	3.42	1.71	0.85	0.403
0.55	4.225	12.56	0.34	15.98	31.96	3.78	2.08	0.90	0.476
0.61	**4.991**	**12.62**	**0.40**	**21.02**	**42.04**	**4.21**	**2.59**	**0.95**	**0.571**
0.667	5.629	12.67	0.44	25.62	51.24	4.55	3.04	0.98	0.651

Street Capacity Calculations

Pinetop Street - AP #4
28' F-F Street Section with 8" curb
Slope= 0.008

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	0.001	0.17	0.00	0.00	0.00	0.22	0.00	0.39	0.002
0.02	0.003	0.34	0.01	0.00	0.00	0.35	0.01	0.43	0.006
0.04	0.013	0.68	0.02	0.01	0.01	0.55	0.02	0.49	0.014
0.06	0.029	1.02	0.03	0.02	0.04	0.72	0.04	0.52	0.023
0.08	0.051	1.36	0.04	0.04	0.09	0.88	0.07	0.55	0.034
0.1	0.080	1.70	0.05	0.08	0.16	1.02	0.10	0.57	0.045
0.12	0.115	2.04	0.06	0.13	0.26	1.15	0.14	0.58	0.056
0.125	0.125	2.13	0.06	0.15	0.30	1.18	0.15	0.59	0.059

For water depths greater than 0.125 ft but less than 0.365 ft

Y1= Y-0.125
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)
0.13	0.136	2.38	0.06	0.16	0.31	1.16	0.15	0.57	0.058
0.16	0.226	3.91	0.06	0.26	0.53	1.17	0.19	0.51	0.061
0.20	0.416	5.95	0.07	0.55	1.10	1.33	0.27	0.52	0.078
0.22	0.541	6.97	0.08	0.77	1.54	1.42	0.31	0.53	0.089
0.24	0.686	8.00	0.09	1.04	2.08	1.52	0.36	0.55	0.101
0.28	1.036	10.04	0.10	1.78	3.56	1.72	0.48	0.57	0.127
0.30	1.241	11.06	0.11	2.26	4.51	1.82	0.55	0.59	0.140
0.365	2.045	14.37	0.14	4.36	8.72	2.13	0.78	0.62	0.187

For water depths greater than 0.325 ft but less than 0.667 ft

Y2= Y - 0.365
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)
0.365	2.045	14.37	0.14	4.36	8.72	2.13	0.78	0.62	0.187
0.36	1.919	14.36	0.13	3.92	7.84	2.04	0.73	0.60	0.174
0.40	2.535	14.41	0.18	6.22	12.45	2.46	0.98	0.68	0.236
0.45	3.235	14.46	0.22	9.32	18.65	2.88	1.30	0.76	0.307
0.50	3.935	14.51	0.27	12.89	25.78	3.28	1.64	0.82	0.379
0.55	4.635	14.56	0.32	16.90	33.80	3.65	2.01	0.87	0.453
0.61	5.528	14.62	0.38	22.60	45.20	4.09	2.51	0.92	0.548
0.667	**6.273**	**14.67**	**0.43**	**27.83**	**55.67**	**4.44**	**2.96**	**0.96**	**0.629**

CALLE QUIETA

CALLE SERENA

MARIPC

VALLE

ZONE A

GORRION

CORDONIZ

AZUELO

GOLONDRINA

GAVIOTA

TECOLOTE

DUERKSEN ROAD

CAMINO VISTA

CAMINO VIENTO DRIVE

VISTA

CAMINO SOLEDAD DE LUZ

CALLE CUMBRE

CAMINO VISTA

ZONE X

MILL ROAD

MILL ROAD

ROAD

MILL ROAD

WIND

ONE

LOOP

Diversion Channel

ZONE A

100 – YEAR FLOOD CONFINED TO CONSTRUCTED CHANNEL

CITY OF ALBUQUERQUE
350002

San Antonio Diversion Channel

35

De Arroyo

LIMIT OF DETAILED STUDY

TRAIL

NORTH VIEW

WESTWARD LANE

NORTHERN TRAILS END

PLACE QUAKER PLACE

FRIENDLY COURT

JONES PLACE

FRIENDLY

HEIGHTS PLACE

TRISCO

DRIVE

RM21

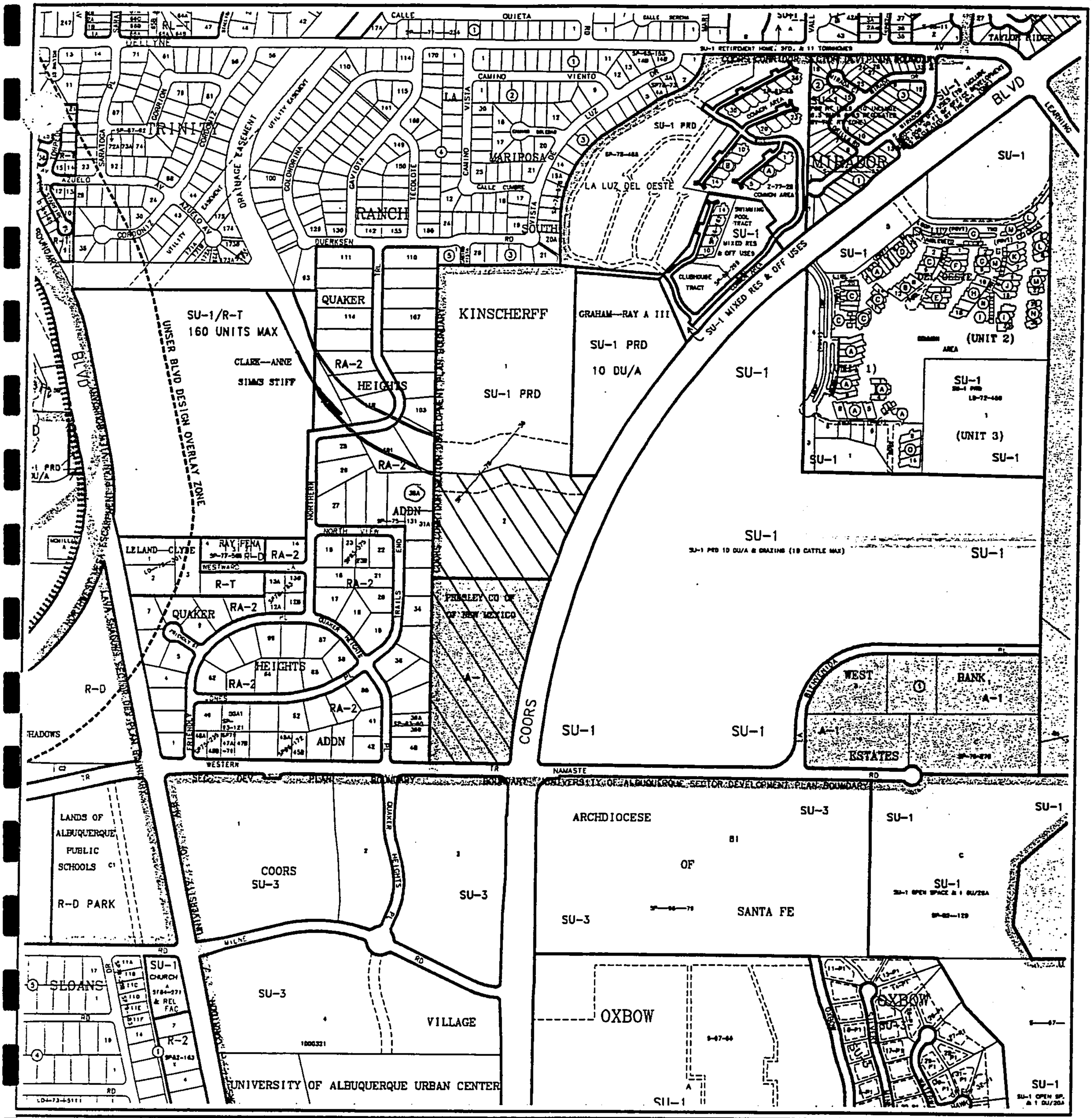
NAMASTE ROAD

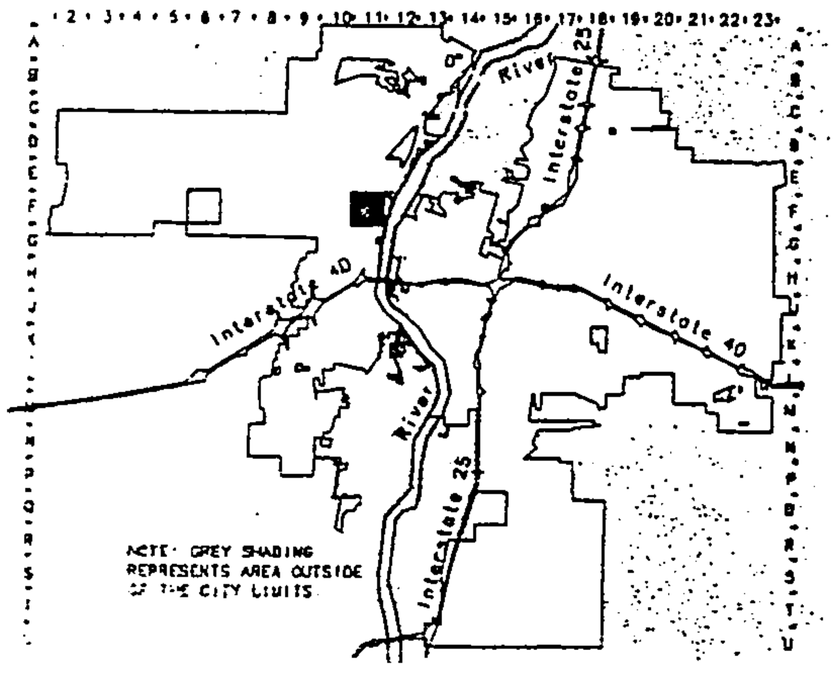
LA

ROAD

TANO

FIRM MAP 35001C0114 D





CITY OF
Albuquerque

A Albuquerque G eographic I nformation S ystem
PLANNING DEPARTMENT

GRAPHIC SCALE IN FEET

250 0 750 1000

Zone Atlas Page

F-11-Z

Map Amended through July 28, 2000