DRAINAGE REPORT
FOR

Seville Estates

Prepared by:

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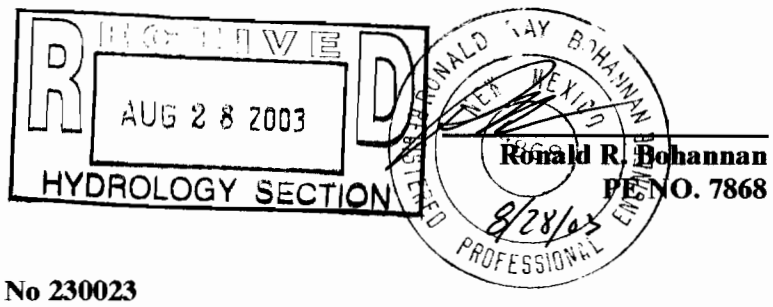
Prepared for:
AMC Development Services

August, 2003

I certify that this report was prepared under my supervision, and I am a registered professional engineer in the State of New Mexico in good standing.



Ronald R. Bohannan
PE NO. 7868

Job No 230023

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Prelude

This report is being prepared at the request of the current owner, AMC Development Services, who proposes to develop a 115 unit single-family subdivision.

Location

The subject site is located between Irving Boulevard and the Calabacillas Arroyo just west of Kayenta Boulevard and consists of Tract 1-B-1-A, Seville. The exact location of the site is shown highlighted on the enclosed Zone Atlas page number A-10. The site will be built in one phase and contains 26.635 acres more or less.

Existing Drainage Conditions

The site is currently undeveloped and naturally sheet flows from the south to the north. The undeveloped flow of 42.82 cfs drains to the Calabacillas Arroyo located along the north property line.

No offsite flows enter the subdivision. The existing Ventana Ranch Subdivision is located to the south and cuts off any flows from that direction. Kayenta Boulevard runs along the east property line and cuts off the flows from that direction. Vacant property is located on the west side of the site and drains from south to north sheet flowing into the Calabacillas Arroyo. The Calabacillas Arroyo is located on the north side of the site and collects the flows from this property.

Flood Plain

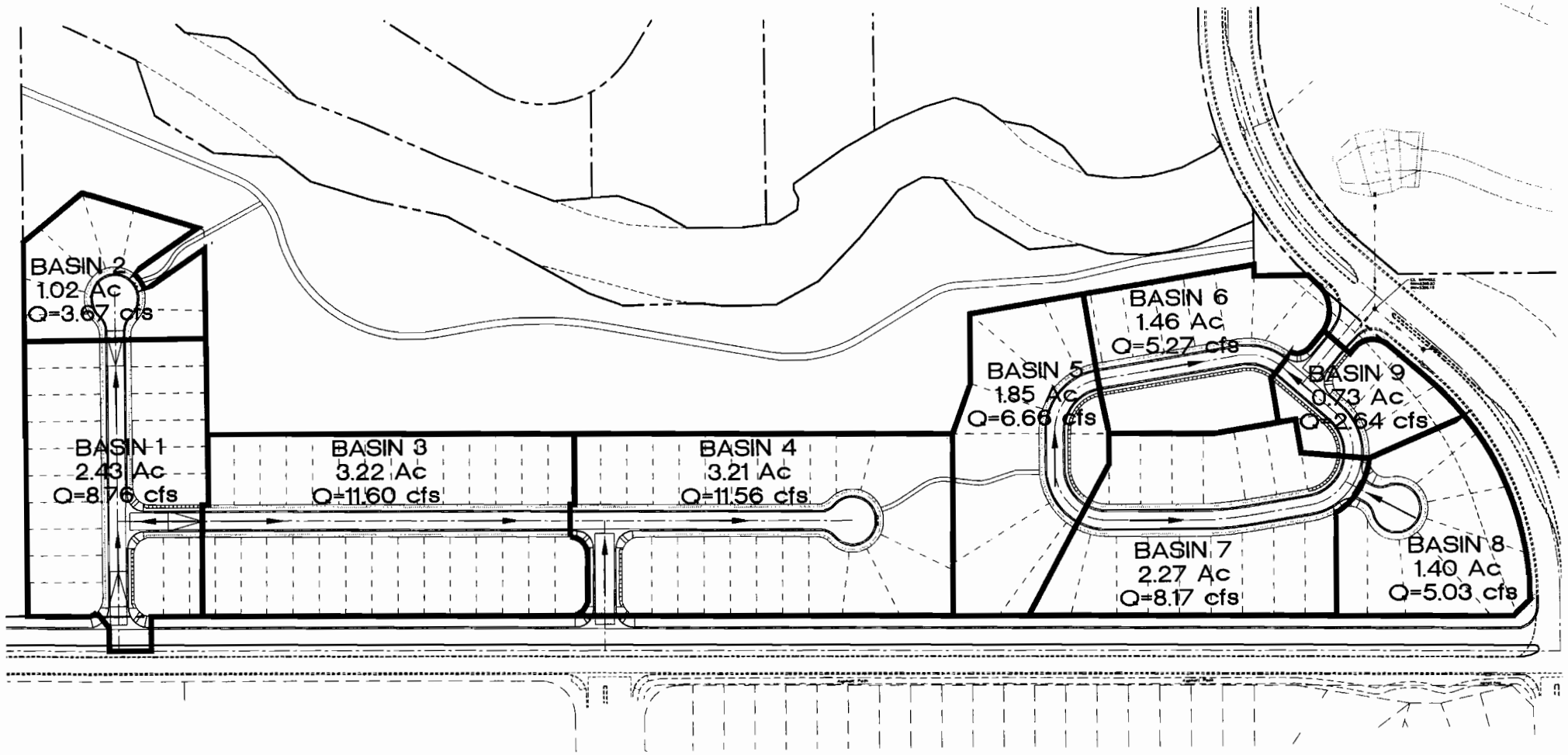
The site is located on FIRM Map 35001C0103 D as shown on the attached excerpt. The map shows that a portion of the site does lie within a 100-year flood plain. However, this portion of the site falls within the AMAFCA Prudent Line Easement and will not be developed. The remainder of the site does not fall within any 100-year flood plan.

The proposed lots also fall outside of the AMAFCA Prudent Line Easement shown on the plat and established by a previous plat filed September 12, 2002 which is located in Book 2002C, page 312. This easement will be dedicated to AMAFCA in Fee Simple by this plat.

Proposed Drainage Management Plan

The proposed site is divided into 9 basins with the site draining to the east and to the west. The flows traveling east then captured in a series of drop inlets and conveyed, via a storm sewer, to an existing 30" RCP stubbed into the property. This 30" RCP drains directly to the Calabacillas Arroyo by way of an existing energy dissipater. The flows traveling west are captured in a drop inlet and conveyed, via a storm sewer, to an existing energy dissipater located in the Calabacillas Arroyo. There will also be limited grading within the Prudent Line to flatten slopes and allow for a pedestrian path along the Calabacillas Arroyo.

Basins 1 and 2 will discharge a total of 12.43 cfs. Guadiana Road has capacity to convey the flows to a drop inlet with a 4" roll curb through Basin 1 and an 8" standard curb in Basin 2. The single 'C' inlet located at the end of Guadiana Road will capture the flows and convey them to the Calabacillas Arroyo via a storm sewer. Basins 3 and 4 will discharge a total of 23.16 cfs. Duero Avenue has capacity to convey the flows to a drop inlet with a 4" roll curb through Basin 3 and an 8" standard curb in Basin 4. The double 'C' inlet at the end of Duero Avenue will capture the flows and convey them to the Calabacillas Arroyo via a new storm sewer and the existing 30" storm sewer. Basins 5-9 will discharge a total of 27.78 cfs. Sierra Nevada Circle has capacity to convey the flow to a drop inlet with a 4" roll curb through Basins 5-8 and an 8" standard curb in Basin 9. A series of single 'C' inlets at Mulhacen Road will capture the flows and combine with the flows from Basins 3 and 4. These flows will then flow to the Calabacillas Arroyo via the existing 30" storm sewer.



PROPOSED BASIN MAP

AMAFCA is requiring a water quality manhole on the storm sewer prior to the flows being discharged into the Calabacillas Arroyo. These water quality manholes will remove the debris and oil from the "first flush" storm runoff before it is discharged into the arroyo.

Irving Boulevard will continue to the east and then north down Kayenta Boulevard. An existing series of drop inlets will capture the flows and convey them to the Calabacillas Arroyo via an existing 30" storm sewer. Any flows passing over the inlets will continue down Kayenta Boulevard and discharge into the arroyo at the bridge.

The site has an emergency overflow in the event of a storm greater than the 100-year storm or poor maintenance of the storm drain facilities. The water will pond at the low point until it reaches Mulhacen Road, the main entrance to the subdivision, and then will flow down Kayenta Boulevard to the Calabacillas Arroyo. At no time will the water surface elevation be greater than any house pad prior to flowing out the entrance.

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

This site will discharge 63.36 cfs into the Calabacillas Arroyo with 50.94 cfs entering the arroyo via an existing storm sewer and the rest flowing down Kayenta Boulevard and 12.43 cfs entering the arroyo via an new storm sewer at the end of Guadiana Road. The on-site streets will capture the flow from the lots and convey it to drop inlets located throughout the site. All of the streets have capacity for the developed flows. A water quality manhole is required by AMAFCA before the flows enter the arroyo.

Weighted E Method

Existing On-Site Basins

											100-Year			10-Year		
Basin	Area (sf)	Area (acres)	Treatment A %	Treatment A (acres)	Treatment B %	Treatment B (acres)	Treatment C %	Treatment C (acres)	Treatment D %	Treatment D (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

											100-Year			10-Year		
Basin	Area (sf)	Area (acres)	Treatment A %	Treatment A (acres)	Treatment B %	Treatment B (acres)	Treatment C %	Treatment C (acres)	Treatment D %	Treatment D (acres)	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs
1	105,908	2.43	0%	0	20%	0.49	20%	0.49	60%	1.46	1.514	0.307	8.76	0.876	0.177	5.31
2	44,334	1.02	0%	0	20%	0.20	20%	0.20	60%	0.61	1.514	0.128	3.67	0.876	0.074	2.22
3	140,336	3.22	0%	0	20%	0.64	20%	0.64	60%	1.93	1.514	0.406	11.60	0.876	0.235	7.04
4	139,821	3.21	0%	0	20%	0.64	20%	0.64	60%	1.93	1.514	0.405	11.56	0.876	0.234	7.01
5	80,515	1.85	0%	0	20%	0.37	20%	0.37	60%	1.11	1.514	0.233	6.66	0.876	0.135	4.04
6	63,683	1.46	0%	0	20%	0.29	20%	0.29	60%	0.88	1.514	0.184	5.27	0.876	0.107	3.19
7	98,841	2.27	0%	0	20%	0.45	20%	0.45	60%	1.36	1.514	0.286	8.17	0.876	0.166	4.96
8	60,842	1.40	0%	0	20%	0.28	20%	0.28	60%	0.84	1.514	0.176	5.03	0.876	0.102	3.05
9	31,975	0.73	0%	0	20%	0.15	20%	0.15	60%	0.44	1.514	0.093	2.64	0.876	0.054	1.60
Total	766,255	17.59		0		3.52		3.52		10.55		2.219	63.36		1.284	38.42

Equations:

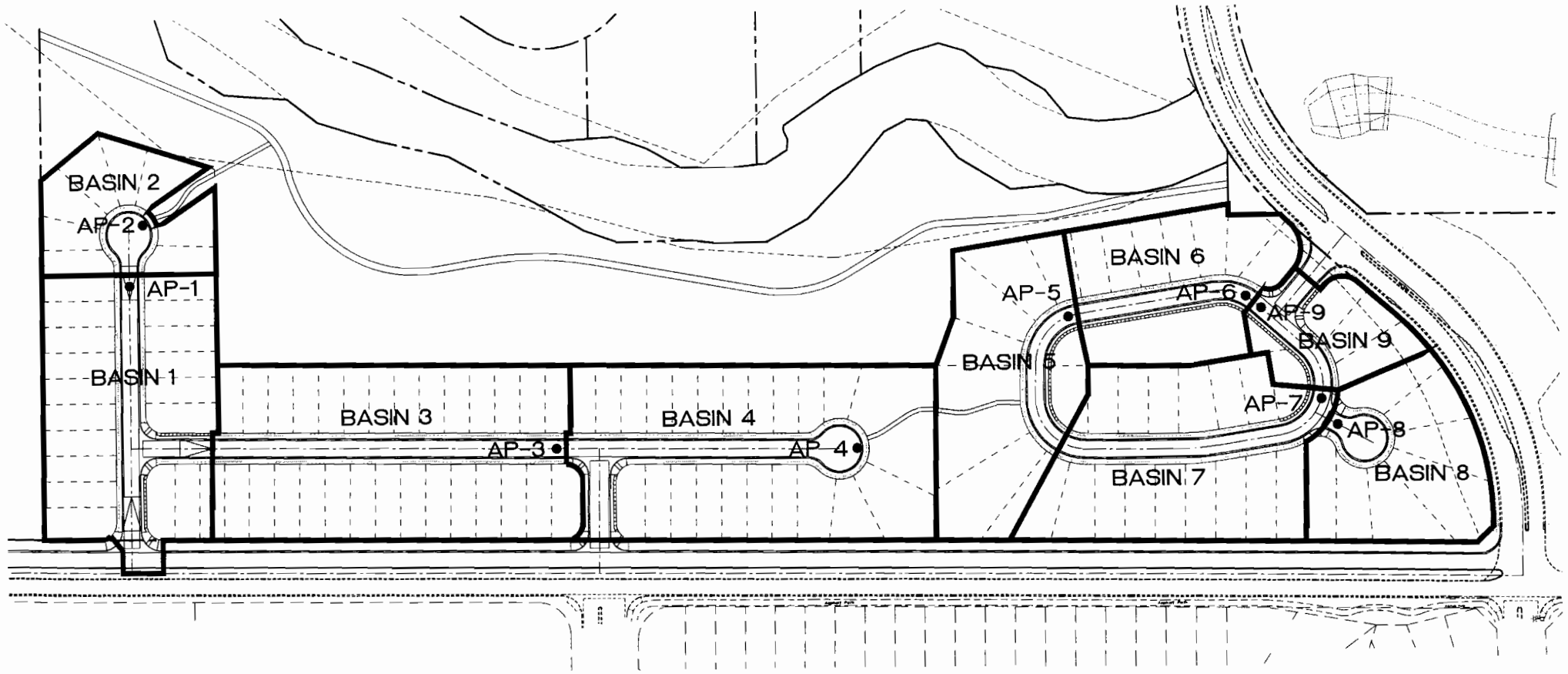
Weighted E = Ea*Aa + Eb*Ab + Ec*Ac + Ed*Ad / (Total Area)

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



STREET ANALYSIS POINT MAP

Street Capacity Calculations

Guadiana Road - AP #1
28' F-F Street Section with 4" curb
Slope= 0.08

For water depths less than 0.0625 feet

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

Q_{rqd}=8.76 cfs

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	0.33	0.00	0.00	0.00	0.71	0.01	1.25	0.01334
0.02	0.0064	0.66	0.01	0.01	0.01	1.12	0.02	1.40	0.03086
0.025	0.0100	0.83	0.01	0.01	0.03	1.30	0.03	1.45	0.04039
0.035	0.0196	1.16	0.02	0.03	0.06	1.63	0.06	1.54	0.06059
0.045	0.0324	1.49	0.02	0.06	0.13	1.93	0.09	1.60	0.08198
0.052	0.0433	1.72	0.03	0.09	0.18	2.13	0.11	1.64	0.09754
0.06	0.0576	1.98	0.03	0.13	0.27	2.34	0.14	1.68	0.11584
0.0625	0.0625	2.06	0.03	0.15	0.30	2.40	0.15	1.69	0.12166

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	0.0635	2.09	0.03	0.15	0.31	2.41	0.15	1.69	0.1224
0.1	0.1727	3.98	0.04	0.53	1.05	3.05	0.31	1.70	0.19585
0.13	0.3114	5.51	0.06	1.13	2.27	3.64	0.47	1.78	0.26871
0.195	0.7664	8.82	0.09	3.72	7.43	4.85	0.95	1.94	0.44504
0.2075	**0.8781**	**9.46**	**0.09**	**4.45**	**8.90**	**5.07**	**1.05**	**1.96**	**0.48096**
0.23	1.0989	10.61	0.10	5.99	11.99	5.45	1.25	2.00	0.54689
0.2325	1.1250	10.74	0.10	6.18	12.36	5.50	1.28	2.01	0.55431
0.3025	1.9825	14.31	0.14	13.13	26.25	6.62	2.00	2.12	0.7688

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	14.31	0.14	13.20	26.41	6.64	2.01	2.12	0.77142
0.3039	2.0021	14.31	0.14	13.34	26.68	6.66	2.03	2.13	0.77613
0.3062	2.0343	14.31	0.14	13.70	27.40	6.73	2.06	2.14	0.78818
0.31	2.0875	14.31	0.15	14.30	28.60	6.85	2.12	2.17	0.8081
0.3125	2.1225	14.32	0.15	14.70	29.40	6.93	2.16	2.18	0.82121
0.32	2.2275	14.32	0.16	15.93	31.85	7.15	2.29	2.23	0.86061
0.3317	2.3913	14.34	0.17	17.92	35.83	7.49	2.49	2.29	0.92225
0.333	2.4095	14.34	0.17	18.14	36.29	7.53	2.51	2.30	0.92911

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	14.44	0.17	18.41	36.82	7.55	2.53	2.30	0.9348
0.3601	2.80726	15.69	0.18	22.04	44.07	7.85	2.83	2.31	1.00764
0.38	3.122725	16.69	0.19	25.26	50.52	8.09	3.07	2.31	1.06714
0.4196	3.809389	18.67	0.20	32.65	65.29	8.57	3.60	2.33	1.18949
0.4603	4.596832	20.70	0.22	41.67	83.35	9.07	4.17	2.35	1.31992
0.504	5.534525	22.89	0.24	53.11	106.22	9.60	4.84	2.38	1.46444
0.513	5.7395	23.34	0.25	55.70	111.40	9.70	4.98	2.39	1.49472

Street Capacity Calculations

Guadiana Road - AP #2
28' F-F Street Section with 8" curb
Slope= 0.02

For water depths less than 0.125 feet

Y= Water depth

Area = 8*Y^2

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

n= 0.017

Q_{rqd}=12.43 cfs

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	0.35	0.00	0.61	0.005
0.02	0.003	0.34	0.01	0.00	0.00	0.55	0.01	0.69	0.012
0.04	0.013	0.68	0.02	0.01	0.02	0.87	0.03	0.77	0.028
0.06	0.029	1.02	0.03	0.03	0.07	1.14	0.07	0.82	0.046
0.08	0.051	1.36	0.04	0.07	0.14	1.39	0.11	0.86	0.066
0.1	0.080	1.70	0.05	0.13	0.26	1.61	0.16	0.90	0.086
0.12	0.115	2.04	0.06	0.21	0.42	1.82	0.22	0.92	0.108
0.125	0.125	2.13	0.06	0.23	0.47	1.87	0.23	0.93	0.114

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	0.25	0.50	1.83	0.24	0.89	0.112
0.16	0.226	3.91	0.06	0.42	0.83	1.84	0.30	0.81	0.121
0.20	0.416	5.95	0.07	0.87	1.74	2.10	0.42	0.83	0.154
0.22	0.541	6.97	0.08	1.21	2.43	2.25	0.49	0.84	0.175
0.24	0.686	8.00	0.09	1.65	3.30	2.40	0.58	0.86	0.197
0.28	1.036	10.04	0.10	2.82	5.63	2.72	0.76	0.91	0.245
0.36	**1.908**	**13.86**	**0.14**	**6.29**	**12.57**	**3.30**	**1.17**	**0.97**	**0.343**
0.363	2.010	14.24	0.14	6.74	13.47	3.35	1.21	0.98	0.353

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	2.010	14.24	0.14	6.74	13.47	3.35	1.22	0.98	0.354
0.36	1.884	14.23	0.13	6.05	12.10	3.21	1.14	0.95	0.332
0.40	2.500	14.28	0.18	9.67	19.35	3.87	1.55	1.08	0.442
0.45	3.200	14.33	0.22	14.56	29.12	4.55	2.05	1.20	0.568
0.48	3.550	14.35	0.25	17.29	34.58	4.87	2.31	1.25	0.632
0.55	4.600	14.43	0.32	26.54	53.08	5.77	3.17	1.37	0.826
0.61	5.493	14.49	0.38	35.57	71.13	6.47	3.97	1.46	0.994
0.667	6.238	14.55	0.43	43.86	87.71	7.03	4.69	1.52	1.136

Street Capacity Calculations

Duero Avenue - AP #3
28' 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

Q_{rqd}=11.60 cfs

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	0.33	0.00	0.00	0.00	0.25	0.00	0.44	0.003
0.02	0.0064	0.66	0.01	0.00	0.01	0.40	0.01	0.50	0.00721
0.025	0.0100	0.83	0.01	0.00	0.01	0.46	0.01	0.51	0.00955
0.035	0.0196	1.16	0.02	0.01	0.02	0.58	0.02	0.54	0.0146
0.045	0.0324	1.49	0.02	0.02	0.04	0.68	0.03	0.57	0.02001
0.052	0.0433	1.72	0.03	0.03	0.07	0.75	0.04	0.58	0.02399
0.06	0.0576	1.98	0.03	0.05	0.10	0.83	0.05	0.59	0.0287
0.0625	0.0625	2.06	0.03	0.05	0.11	0.85	0.05	0.60	0.03021

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	0.0635	2.09	0.03	0.05	0.11	0.85	0.05	0.60	0.03038
0.1	0.1727	3.98	0.04	0.19	0.37	1.08	0.11	0.60	0.04871
0.13	0.3114	5.51	0.06	0.40	0.80	1.29	0.17	0.63	0.06773
0.175	0.6039	7.80	0.08	0.96	1.92	1.59	0.28	0.67	0.09972
0.21	0.9014	9.59	0.09	1.63	3.26	1.81	0.38	0.70	0.12659
0.23	1.0989	10.61	0.10	2.12	4.24	1.93	0.44	0.71	0.14255
0.2612	1.4469	12.20	0.12	3.05	6.11	2.11	0.55	0.73	0.16823
0.3025	1.9825	14.31	0.14	4.64	9.28	2.34	0.71	0.75	0.20347

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	14.31	0.14	4.67	9.34	2.35	0.71	0.75	0.20425
0.3039	2.0021	14.31	0.14	4.72	9.43	2.36	0.72	0.75	0.20564
0.3062	2.0343	14.31	0.14	4.84	9.69	2.38	0.73	0.76	0.2092
0.31	2.0875	14.31	0.15	5.06	10.11	2.42	0.75	0.77	0.21509
0.3125	2.1225	14.32	0.15	5.20	10.39	2.45	0.77	0.77	0.21897
0.325	**2.2975**	**14.33**	**0.16**	**5.93**	**11.85**	**2.58**	**0.84**	**0.80**	**0.23846**
0.33	2.3675	14.33	0.17	6.23	12.46	2.63	0.87	0.81	0.24629
0.333	2.4095	14.34	0.17	6.41	12.83	2.66	0.89	0.81	0.251

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)
0.334	2.423525	14.39	0.17	6.46	12.92	2.67	0.89	0.81	0.25177
0.3601	2.80726	15.69	0.18	7.79	15.58	2.78	1.00	0.82	0.27238
0.38	3.122725	16.69	0.19	8.93	17.86	2.86	1.09	0.82	0.28868
0.4196	3.809389	18.67	0.20	11.54	23.08	3.03	1.27	0.82	0.32243
0.4603	4.596832	20.70	0.22	14.73	29.47	3.21	1.48	0.83	0.35865
0.504	5.534525	22.89	0.24	18.78	37.55	3.39	1.71	0.84	0.39903
0.513	5.7395	23.34	0.25	19.69	39.39	3.43	1.76	0.84	0.40751

Street Capacity Calculations

Duero Avenue - AP #4
28' F-F Street Section with 8" curb
Slope= 0.025

For water depths less than 0.125 feet

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

Q_{rqd}=23.16 cfs

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	0.39	0.00	0.68	0.006
0.02	0.003	0.34	0.01	0.00	0.00	0.62	0.01	0.77	0.014
0.04	0.013	0.68	0.02	0.01	0.03	0.98	0.04	0.86	0.033
0.06	0.029	1.02	0.03	0.04	0.07	1.28	0.08	0.92	0.054
0.08	0.051	1.36	0.04	0.08	0.16	1.55	0.12	0.97	0.076
0.1	0.080	1.70	0.05	0.14	0.29	1.80	0.18	1.00	0.100
0.12	0.115	2.04	0.06	0.23	0.47	2.03	0.24	1.03	0.125
0.125	0.125	2.13	0.06	0.26	0.52	2.09	0.26	1.04	0.132

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	0.28	0.55	2.04	0.27	1.00	0.130
0.16	0.226	3.91	0.06	0.47	0.93	2.06	0.33	0.91	0.141
0.20	0.416	5.95	0.07	0.97	1.95	2.34	0.47	0.92	0.180
0.22	0.541	6.97	0.08	1.36	2.72	2.51	0.55	0.94	0.204
0.24	0.686	8.00	0.09	1.84	3.69	2.69	0.65	0.97	0.229
0.28	1.036	10.04	0.10	3.15	6.30	3.04	0.85	1.01	0.285
0.30	1.241	11.06	0.11	3.99	7.98	3.22	0.96	1.03	0.314
0.365	2.045	14.37	0.14	7.70	15.41	3.77	1.37	1.10	0.413

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)
0.34	1.695	14.35	0.12	5.64	11.28	3.33	1.13	1.01	0.343
0.36	1.919	14.36	0.13	6.93	13.86	3.61	1.29	1.07	0.388
0.38	2.255	14.39	0.16	9.06	18.12	4.02	1.53	1.15	0.456
0.41	**2.675**	**14.42**	**0.19**	**12.03**	**24.06**	**4.50**	**1.84**	**1.24**	**0.541**
0.45	3.235	14.46	0.22	16.48	32.96	5.09	2.29	1.34	0.656
0.55	4.635	14.56	0.32	29.87	59.74	6.44	3.54	1.53	0.948
0.59	5.195	14.60	0.36	36.06	72.12	6.94	4.10	1.59	1.066
0.667	6.273	14.67	0.43	49.20	98.40	7.84	5.23	1.69	1.297

Street Capacity Calculations

Sierra Nevada Circle - AP #5
28' F-F Street Section with 4" curb
Slope= 0.08

For water depths less than 0.0625 feet

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

Q_{rqd}=6.66 cfs

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	0.33	0.00	0.00	0.00	0.71	0.01	1.25	0.01334
0.02	0.0064	0.66	0.01	0.01	0.01	1.12	0.02	1.40	0.03086
0.025	0.0100	0.83	0.01	0.01	0.03	1.30	0.03	1.45	0.04039
0.035	0.0196	1.16	0.02	0.03	0.06	1.63	0.06	1.54	0.06059
0.045	0.0324	1.49	0.02	0.06	0.13	1.93	0.09	1.60	0.08198
0.052	0.0433	1.72	0.03	0.09	0.18	2.13	0.11	1.64	0.09754
0.06	0.0576	1.98	0.03	0.13	0.27	2.34	0.14	1.68	0.11584
0.0625	0.0625	2.06	0.03	0.15	0.30	2.40	0.15	1.69	0.12166

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	0.0635	2.09	0.03	0.15	0.31	2.41	0.15	1.69	0.1224
0.1	0.1727	3.98	0.04	0.53	1.05	3.05	0.31	1.70	0.19585
0.13	0.3114	5.51	0.06	1.13	2.27	3.64	0.47	1.78	0.26871
0.188	**0.7073**	**8.47**	**0.08**	**3.34**	**6.68**	**4.73**	**0.89**	**1.92**	**0.42517**
0.21	0.9014	9.59	0.09	4.61	9.22	5.11	1.07	1.97	0.4882
0.23	1.0989	10.61	0.10	5.99	11.99	5.45	1.25	2.00	0.54689
0.27	1.5539	12.65	0.12	9.49	18.99	6.11	1.65	2.07	0.66769
0.3025	1.9825	14.31	0.14	13.13	26.25	6.62	2.00	2.12	0.7688

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	14.31	0.14	13.20	26.41	6.64	2.01	2.12	0.77142
0.3039	2.0021	14.31	0.14	13.34	26.68	6.66	2.03	2.13	0.77613
0.3062	2.0343	14.31	0.14	13.70	27.40	6.73	2.06	2.14	0.78818
0.31	2.0875	14.31	0.15	14.30	28.60	6.85	2.12	2.17	0.8081
0.3125	2.1225	14.32	0.15	14.70	29.40	6.93	2.16	2.18	0.82121
0.325	2.2975	14.33	0.16	16.77	33.53	7.30	2.37	2.26	0.88693
0.33	2.3675	14.33	0.17	17.62	35.24	7.44	2.46	2.28	0.91328
0.333	2.4095	14.34	0.17	18.14	36.29	7.53	2.51	2.30	0.92911

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)
0.334	2.423525	14.39	0.17	18.28	36.55	7.54	2.52	2.30	0.93195
0.3601	2.80726	15.69	0.18	22.04	44.07	7.85	2.83	2.31	1.00764
0.38	3.122725	16.69	0.19	25.26	50.52	8.09	3.07	2.31	1.06714
0.4196	3.809389	18.67	0.20	32.65	65.29	8.57	3.60	2.33	1.18949
0.4603	4.596832	20.70	0.22	41.67	83.35	9.07	4.17	2.35	1.31992
0.504	5.534525	22.89	0.24	53.11	106.22	9.60	4.84	2.38	1.46444
0.513	5.7395	23.34	0.25	55.70	111.40	9.70	4.98	2.39	1.49472

Street Capacity Calculations

Sierra Nevada Circle - AP #6
28' F-F Street Section with 4" curb
Slope= 0.0424

For water depths less than 0.0625 feet

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

Q_{rqd}=11.93 cfs

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	0.33	0.00	0.00	0.00	0.52	0.01	0.91	0.00878
0.02	0.0064	0.66	0.01	0.01	0.01	0.82	0.02	1.02	0.02052
0.025	0.0100	0.83	0.01	0.01	0.02	0.95	0.02	1.06	0.02695
0.035	0.0196	1.16	0.02	0.02	0.05	1.19	0.04	1.12	0.0406
0.045	0.0324	1.49	0.02	0.05	0.09	1.40	0.06	1.17	0.05511
0.052	0.0433	1.72	0.03	0.07	0.13	1.55	0.08	1.20	0.06569
0.06	0.0576	1.98	0.03	0.10	0.20	1.70	0.10	1.22	0.07814
0.0625	0.0625	2.06	0.03	0.11	0.22	1.75	0.11	1.23	0.08211

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	0.0635	2.09	0.03	0.11	0.22	1.75	0.11	1.23	0.08261
0.1	0.1727	3.98	0.04	0.38	0.77	2.22	0.22	1.24	0.13224
0.13	0.3114	5.51	0.06	0.83	1.65	2.65	0.34	1.30	0.182
0.188	0.7073	8.47	0.08	2.43	4.87	3.44	0.65	1.40	0.28942
0.21	0.9014	9.59	0.09	3.35	6.71	3.72	0.78	1.43	0.33282
0.23	1.0989	10.61	0.10	4.36	8.73	3.97	0.91	1.46	0.37327
0.257	**1.3973**	**11.98**	**0.12**	**6.00**	**12.00**	**4.30**	**1.10**	**1.49**	**0.42921**
0.3025	1.9825	14.31	0.14	9.56	19.11	4.82	1.46	1.54	0.52654

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	14.31	0.14	9.61	19.22	4.83	1.46	1.55	0.52838
0.3039	2.0021	14.31	0.14	9.71	19.43	4.85	1.47	1.55	0.53169
0.3062	2.0343	14.31	0.14	9.97	19.95	4.90	1.50	1.56	0.54015
0.31	2.0875	14.31	0.15	10.41	20.82	4.99	1.55	1.58	0.55415
0.3125	2.1225	14.32	0.15	10.70	21.40	5.04	1.58	1.59	0.56337
0.325	2.2975	14.33	0.16	12.21	24.41	5.31	1.73	1.64	0.60957
0.33	2.3675	14.33	0.17	12.83	25.66	5.42	1.79	1.66	0.62811
0.333	2.4095	14.34	0.17	13.21	26.42	5.48	1.83	1.67	0.63924

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)
0.334	2.423525	14.39	0.17	13.31	26.61	5.49	1.83	1.67	0.6412
0.3601	2.80726	15.69	0.18	16.04	32.09	5.71	2.06	1.68	0.69337
0.38	3.122725	16.69	0.19	18.39	36.78	5.89	2.24	1.68	0.73444
0.4196	3.809389	18.67	0.20	23.77	47.53	6.24	2.62	1.70	0.819
0.4603	4.596832	20.70	0.22	30.34	60.68	6.60	3.04	1.71	0.9093
0.504	5.534525	22.89	0.24	38.66	77.33	6.99	3.52	1.73	1.00948
0.513	5.7395	23.34	0.25	40.55	81.10	7.07	3.62	1.74	1.03048

Street Capacity Calculations

Sierra Nevada Circlet - AP #7
28' F-F Street Section with 4" curb
Slope= 0.0465

For water depths less than 0.0625 feet

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

Q_{rqd}=13.20 cfs

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	0.33	0.00	0.00	0.00	0.54	0.01	0.95	0.00935
0.02	0.0064	0.66	0.01	0.01	0.01	0.86	0.02	1.07	0.02181
0.025	0.0100	0.83	0.01	0.01	0.02	0.99	0.02	1.11	0.02863
0.035	0.0196	1.16	0.02	0.02	0.05	1.24	0.04	1.17	0.0431
0.045	0.0324	1.49	0.02	0.05	0.10	1.47	0.07	1.22	0.05847
0.052	0.0433	1.72	0.03	0.07	0.14	1.62	0.08	1.25	0.06968
0.06	0.0576	1.98	0.03	0.10	0.21	1.78	0.11	1.28	0.08287
0.0625	0.0625	2.06	0.03	0.11	0.23	1.83	0.11	1.29	0.08707

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	0.0635	2.09	0.03	0.12	0.23	1.84	0.12	1.29	0.08759
0.1	0.1727	3.98	0.04	0.40	0.80	2.33	0.23	1.30	0.14021
0.13	0.3114	5.51	0.06	0.86	1.73	2.78	0.36	1.36	0.19287
0.195	0.7664	8.82	0.09	2.83	5.67	3.70	0.72	1.48	0.32092
0.21	0.9014	9.59	0.09	3.51	7.03	3.90	0.82	1.50	0.35233
0.222	1.0175	10.20	0.10	4.13	8.25	4.05	0.90	1.52	0.37787
0.262	**1.4565**	**12.24**	**0.12**	**6.64**	**13.28**	**4.56**	**1.19**	**1.57**	**0.4653**
0.3025	1.9825	14.31	0.14	10.01	20.01	5.05	1.53	1.62	0.55699

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	14.31	0.14	10.07	20.13	5.06	1.53	1.62	0.55893
0.3039	2.0021	14.31	0.14	10.17	20.34	5.08	1.54	1.62	0.56242
0.3062	2.0343	14.31	0.14	10.44	20.89	5.13	1.57	1.64	0.57134
0.31	2.0875	14.31	0.15	10.90	21.80	5.22	1.62	1.65	0.58608
0.3125	2.1225	14.32	0.15	11.21	22.41	5.28	1.65	1.66	0.59579
0.32	2.2275	14.32	0.16	12.14	24.28	5.45	1.74	1.70	0.62497
0.3317	2.3913	14.34	0.17	13.66	27.32	5.71	1.89	1.75	0.67063
0.333	2.4095	14.34	0.17	13.83	27.66	5.74	1.91	1.75	0.67571

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	14.44	0.17	14.04	28.07	5.76	1.93	1.75	0.67985
0.3601	2.80726	15.69	0.18	16.80	33.60	5.98	2.16	1.76	0.73291
0.38	3.122725	16.69	0.19	19.26	38.52	6.17	2.34	1.76	0.7763
0.4196	3.809389	18.67	0.20	24.89	49.78	6.53	2.74	1.78	0.86562
0.4603	4.596832	20.70	0.22	31.77	63.54	6.91	3.18	1.80	0.96097
0.504	5.534525	22.89	0.24	40.49	80.98	7.32	3.69	1.82	1.06673
0.513	5.7395	23.34	0.25	42.47	84.93	7.40	3.80	1.82	1.08891

Street Capacity Calculations

Pico de Aneto Court - AP #8
28' F-F Street Section with 4" curb
Slope= 0.08

For water depths less than 0.0625 feet

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

Q_{rqd}=5.03 cfs

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	0.33	0.00	0.00	0.00	0.71	0.01	1.25	0.01334
0.02	0.0064	0.66	0.01	0.01	0.01	1.12	0.02	1.40	0.03086
0.025	0.0100	0.83	0.01	0.01	0.03	1.30	0.03	1.45	0.04039
0.035	0.0196	1.16	0.02	0.03	0.06	1.63	0.06	1.54	0.06059
0.045	0.0324	1.49	0.02	0.06	0.13	1.93	0.09	1.60	0.08198
0.052	0.0433	1.72	0.03	0.09	0.18	2.13	0.11	1.64	0.09754
0.06	0.0576	1.98	0.03	0.13	0.27	2.34	0.14	1.68	0.11584
0.0625	0.0625	2.06	0.03	0.15	0.30	2.40	0.15	1.69	0.12166

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	0.0635	2.09	0.03	0.15	0.31	2.41	0.15	1.69	0.1224
0.1	0.1727	3.98	0.04	0.53	1.05	3.05	0.31	1.70	0.19585
0.13	0.3114	5.51	0.06	1.13	2.27	3.64	0.47	1.78	0.26871
0.15	0.4289	6.53	0.07	1.73	3.45	4.03	0.60	1.83	0.32079
0.175	**0.6039**	**7.80**	**0.08**	**2.71**	**5.42**	**4.49**	**0.79**	**1.89**	**0.38877**
0.23	1.0989	10.61	0.10	5.99	11.99	5.45	1.25	2.00	0.54689
0.2612	1.4469	12.20	0.12	8.64	17.27	5.97	1.56	2.06	0.64075
0.3025	1.9825	14.31	0.14	13.13	26.25	6.62	2.00	2.12	0.7688

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	14.31	0.14	13.20	26.41	6.64	2.01	2.12	0.77142
0.3039	2.0021	14.31	0.14	13.34	26.68	6.66	2.03	2.13	0.77613
0.3062	2.0343	14.31	0.14	13.70	27.40	6.73	2.06	2.14	0.78818
0.31	2.0875	14.31	0.15	14.30	28.60	6.85	2.12	2.17	0.8081
0.3125	2.1225	14.32	0.15	14.70	29.40	6.93	2.16	2.18	0.82121
0.32	2.2275	14.32	0.16	15.93	31.85	7.15	2.29	2.23	0.86061
0.3317	2.3913	14.34	0.17	17.92	35.83	7.49	2.49	2.29	0.92225
0.333	2.4095	14.34	0.17	18.14	36.29	7.53	2.51	2.30	0.92911

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	14.44	0.17	18.41	36.82	7.55	2.53	2.30	0.9348
0.3601	2.80726	15.69	0.18	22.04	44.07	7.85	2.83	2.31	1.00764
0.38	3.122725	16.69	0.19	25.26	50.52	8.09	3.07	2.31	1.06714
0.4196	3.809389	18.67	0.20	32.65	65.29	8.57	3.60	2.33	1.18949
0.4603	4.596832	20.70	0.22	41.67	83.35	9.07	4.17	2.35	1.31992
0.504	5.534525	22.89	0.24	53.11	106.22	9.60	4.84	2.38	1.46444
0.513	5.7395	23.34	0.25	55.70	111.40	9.70	4.98	2.39	1.49472

Street Capacity Calculations

Sierra Nevada Circle - AP #9
28' F-F Street Section with 8" curb
Slope= 0.0543

For water depths less than 0.125 feet

Y= Water depth

Area = 8*Y^2

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

n= 0.017

Q_{rqd}=15.84 cfs

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	0.57	0.01	1.01	0.010
0.02	0.003	0.34	0.01	0.00	0.01	0.91	0.02	1.13	0.023
0.04	0.013	0.68	0.02	0.02	0.04	1.44	0.06	1.27	0.054
0.06	0.029	1.02	0.03	0.05	0.11	1.89	0.11	1.36	0.089
0.08	0.051	1.36	0.04	0.12	0.23	2.29	0.18	1.42	0.126
0.1	0.080	1.70	0.05	0.21	0.42	2.65	0.27	1.48	0.165
0.12	0.115	2.04	0.06	0.34	0.69	2.99	0.36	1.52	0.205
0.125	0.125	2.13	0.06	0.38	0.77	3.08	0.38	1.53	0.216

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	0.41	0.82	3.01	0.39	1.47	0.213
0.16	0.226	3.91	0.06	0.69	1.37	3.04	0.49	1.34	0.233
0.20	0.416	5.95	0.07	1.44	2.87	3.45	0.69	1.36	0.298
0.22	0.541	6.97	0.08	2.00	4.00	3.70	0.81	1.39	0.337
0.24	0.686	8.00	0.09	2.72	5.43	3.96	0.95	1.42	0.378
0.28	1.036	10.04	0.10	4.64	9.28	4.48	1.25	1.49	0.467
0.328	**1.561**	**12.48**	**0.13**	**7.95**	**15.91**	**5.09**	**1.67**	**1.57**	**0.581**
0.365	2.045	14.37	0.14	11.35	22.71	5.55	2.03	1.62	0.673

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	11.35	22.71	5.55	2.03	1.62	0.673
0.36	1.919	14.36	0.13	10.22	20.43	5.32	1.90	1.57	0.633
0.40	2.535	14.41	0.18	16.21	32.43	6.40	2.56	1.78	0.828
0.45	3.235	14.46	0.22	24.29	48.58	7.51	3.38	1.97	1.050
0.47	3.515	14.48	0.24	27.87	55.73	7.93	3.73	2.04	1.140
0.55	4.635	14.56	0.32	44.02	88.05	9.50	5.22	2.26	1.502
0.59	5.195	14.60	0.36	53.14	106.29	10.23	6.04	2.35	1.685
0.667	6.273	14.67	0.43	72.51	145.02	11.56	7.71	2.49	2.043

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

DROP INLET CALCULATIONS

Basin	TYPE OF INLET	AREA (SF)	Q (CFS)	H (FT)	H ALLOW (FT)
2	Single 'C'	4.36	12.43	0.3506	0.67
4	Double 'C'	8.72	23.16	0.3043	0.67
6	Single 'C'	4.36	13.89	0.4378	0.67
9	Single 'C'	4.36	13.89	0.4378	0.67

ORIFICE EQUATION

Q = CA sqrt(2gH)

C = 0.6

g = 32.2

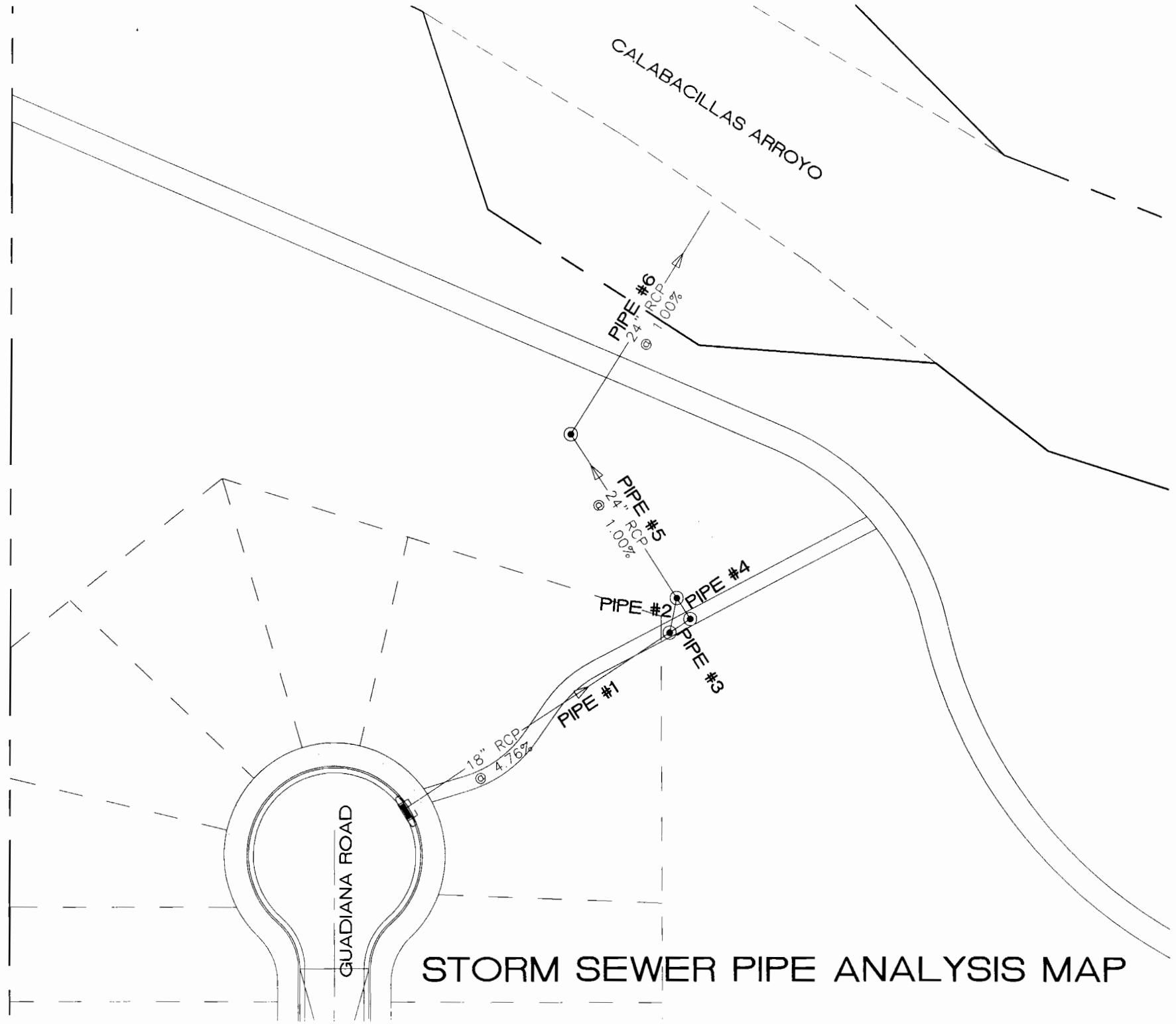
Pipe Capacity

Pipe	D	Slope	Area	R	Q Provided	Q Required	Velocity
	(in)	(%)	(ft^2)		(cfs)	(cfs)	(ft/s)
1	18	4.76	1.77	0.375	22.98	12.43	7.03
2	18	2.00	1.77	0.375	14.90	12.43	7.03
3	18	8.40	1.77	0.375	30.53	12.43	7.03
4	18	8.40	1.77	0.375	30.53	12.43	7.03
5	24	1.00	3.14	0.500	22.68	12.43	3.96
6	24	1.00	3.14	0.500	22.68	12.43	3.96
7	24	3.80	3.14	0.500	44.22	23.16	7.37
8	24	3.87	3.14	0.500	44.62	23.16	7.37
9	24	8.00	3.14	0.500	64.16	23.16	7.37
10	24	8.00	3.14	0.500	64.16	23.16	7.37
11	24	4.54	3.14	0.500	48.33	23.16	7.37
12	24	3.75	3.14	0.500	43.93	23.16	7.37
13	24	0.80	3.14	0.500	20.29	13.89	4.42
14	30	0.90	4.91	0.625	39.02	37.05	7.55
15	24	0.80	3.14	0.500	20.29	13.89	4.42
16	30	1.60	4.91	0.625	52.02	50.94	10.38
17	24	2.00	3.14	0.500	32.08	32.00	10.19
18	24	1.00	3.14	0.500	22.68	18.94	6.03
19	24	1.00	3.14	0.500	22.68	18.94	6.03
20	30	1.60	4.91	0.625	52.02	50.94	10.38
21	30	2.00	4.91	0.625	58.16	50.94	10.38

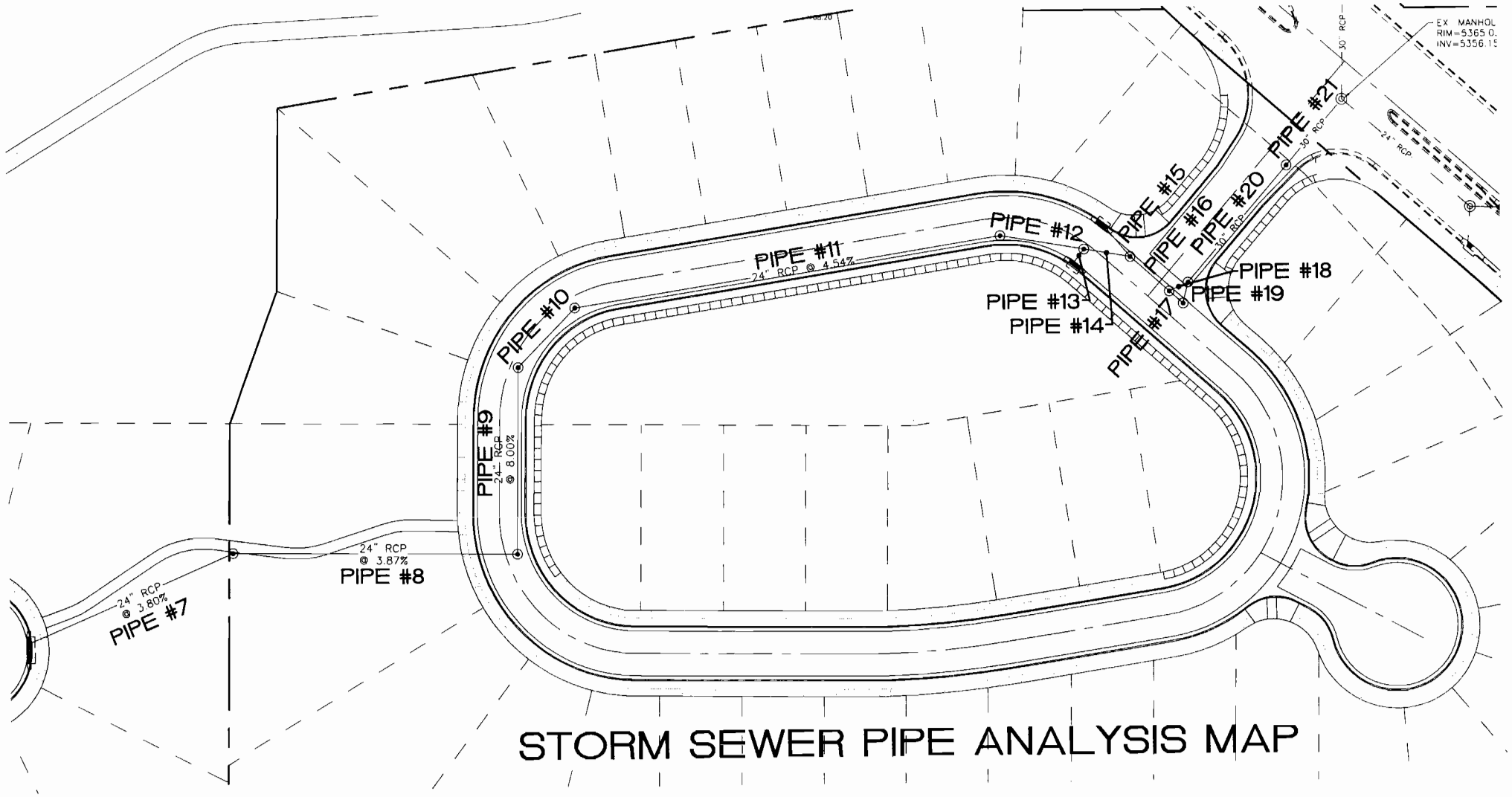
Manning's Equation:

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

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



STORM SEWER PIPE ANALYSIS MAP



STORM SEWER PIPE ANALYSIS MAP