CITY OF
Albuquerque

March 4,1998

Ronald R. Bohannan
Tierra West LLC
4421 Mcleod Rd. Suite D
Albuquerque, New Mexico 87109

RE: REVISED DRAINAGE PLAN FOR MASTER DRAINAGE FOR TRACT 5 RENAISSANCE CENTER & ECONO LUBE N TUNE (F16-D5H) ENGINEER'S STAMP DATED 2/13/98

Dear Mr. Bohannan:

Based on the information provided on your February 13,1998 submittal, the above referenced Master Plan is approved for Preliminary & Final Plat, Site Development for Subdivision and Building,Grading, and Building Permit for Econo Lube & Tune.

Please attach a copy of the approved plan for Econo Lube & Tune to the construction sets prior to sign-off by Hydrology.

Also, prior to Certificate of Occupancy release, Engineer Certification per the DPM checklist will be required.

If I can be of further assistance, please feel free to contact me at 924-3986.

C: Andrew Garcia
File

Sincerely

Bernie J. Montoya

Bernie J. Montoya CE
Associate Engineer

CITY OF
Albuquerque

January 17, 1997

Martin J. Chávez, Mayor

Ronald Bohannan
Tierra West Dev.
4421 McLeod Rd. NE
Suite D
Albuquerque, NM 87109

RE: TRACT 5-B OF RENAISSANCE CENTER (F16-D5H). GRADING PLAN FOR SITE DEVELOPMENT PLAN FOR BUILDING PERMIT, BUILDING PERMIT, AND SO #19 PERMIT APPROVALS. ENGINEER'S STAMP DATED JANUARY 9, 1997.

Dear Mr. Bohannan:

Based on the information provided on your January 14, 1997 submittal, the above referenced project is approved for Building Permit and SO #19 Permit.

Please attach a copy of the approved plans to the construction sets prior to sign-off by Hydrology.

A separate permit is required for construction within City right-of-way. A copy of this approval letter must be on hand when applying for the excavation permit.

Prior to Certificate of Occupancy, an Engineer's Certification will be required.

If I can be of further assistance, please feel free to contact me at 768-3622.

Sincerely,

Lisa Ann Manwill
Engineering Assoc./Hyd.

c: Arlene Portillo
Andrew Garcia
File

DRAINAGE REPORT
FOR

TRACT 5 OF RENAISSNACE CENTER

Prepared by:

Tierra West Development Management Services
4421 McLeod Rd., NE, Suite D
Albuquerque, New Mexico 87109

April, 1996

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 RAY BOHANNAN
NEW MEXICO
7868
REGISTERED PROFESSIONAL ENGINEER

Ronald R. Bohannan
PE NO. 7868

RECEIVED
APR 23 1996
PROJECT DIVISION

Job No 940035T

LOCATION AND LOCATION MAP

The purpose of this Grading and Drainage Plan is to present the drainage management plan for Tract 5-B of Renaissance Center for Site Development Plan and Grading/Drainage approval. The site is located in the North Renaissance Center at the Southeast corner of Montano Road and Mercantile Avenue as shown on the attached Vicinity Map F-16. The site contains approximately 6.6 acres and proposes to construct approximately 42,000 sf of Commercial buildings. Union Saving Bank and House of Carpets are presently operational due East of the site.

EXISTING DRAINAGE CONDITIONS

The site is currently undeveloped with an existing runoff of 14.63 cfs. The runoff sheet flows towards the northwest corner of the site and overflows into Mercantile Avenue and Montano Road. The Union Bank site located to the east of Tract 5-B ponds on site and has a control release to an underground storm line running through the Tract. This plan was approved under drainage file F-16/D5E prepared by Mark Goodwin & Associates. This storm drain line will continue to be rerouted into the storm drain system in Tract 5-B. All water drains to the "Renaissance Detention Pond" located due west of Renaissance Center. This pond is released over 24 hours. All of the Union Bank drainage is ponded on-site. A minimal amount of drainage is routed to a storm drain line that runs through Tract 5.

FEMA MAP AND SOIL CONDITIONS

The site is located in FEMA Map section 350002 panel 16 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 soil types from the Soil Conservation Service Survey of Bernilillo County. These are a Wink-Embudo complex and a Bluepoint-Kokan association. The Wink-Embudo complex has a moderate hazard of water erosion and medium runoff. The Bluepoint-Kokan association has slow runoff and moderate to severe hazard of water erosion.

ON-SITE DRAINAGE MANAGEMENT PLAN

The site is subject to limited discharge due to downstream conditions. According to the Renaissance Master Plan only 0.1cfs/acre can be discharged from the site. The total basin area contributing to the storm sewer system is 6.4 acres, consequently, 0.64 cfs of runoff is allowed for Tract 5. The site has been divided into eleven different detention basins in order to pond the storm water and allow the release rate to be controlled. There are two different routes taking place within the site. The two routes have a combined discharge of 0.58 cfs which is less than 0.64 cfs and within the guidelines. Since the ponds drain over a six hour period, the runoff calculations were performed using the 100-year (24-hour) storm. Three entrances will act as emergency spillways for the site.

Route 1

Basin 2 will drain to basin 1 with a discharge of 1.49 cfs.

Basin 1 will drain to an existing drop inlet in Mercantile Avenue with a discharge of 0.14 cfs limited by a 1- 7/16 inch orifice plate.

Route 2

Basin 11 will drain to basin 10 with a discharge of 0.92 cfs.

Basin 10 will drain to basin 7 with a discharge of 0.50 cfs.

Basin 9 will drain to basin 8 with a discharge of 0.09 cfs.

Basin 8 will drain to basin 7 with a discharge of 0.19 cfs.

.44
.14
.58

Basin 7 will drain to basin 6 with a discharge of 0.72 cfs.

Basin 6 will drain to basin 4 with a discharge of 0.31 cfs.

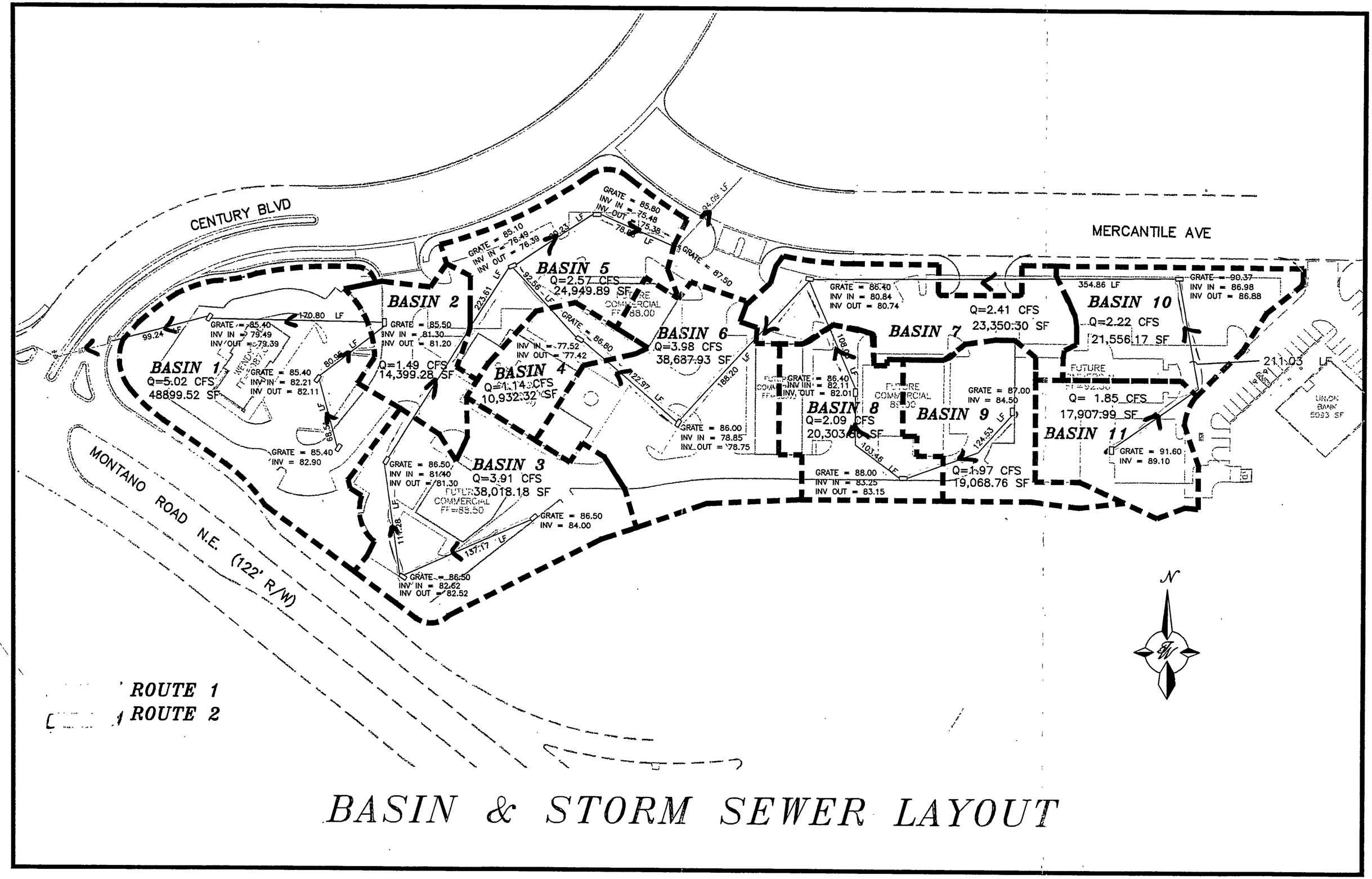
Basin 4 will drain to basin 5 with a discharge of 0.67 cfs.

Basin 3 will drain to basin 5 with a discharge of 0.10 cfs.

Basin 5 will drain to an existing drop inlet in Mercantile Avenue with a discharge of 0.44 cfs limited by a 2-1/4 inch orifice plate.

RUNOFF SUMMARY TABLE

	UNDER PROPPED CONDITIONS	UNDER EXISTING CONDITIONS
Q-100 (CFS)	28.65	14.63
Q-10 (CFS)	18.52	6.00



BASIN & STORM SEWER LAYOUT

CALCULATION
TABLE OF CONTENTS

SECTION I - RUNOFF CALCULATIONS

Sample Calculations For The Basins
Runoff Summary Table
Drop Inlet Calculations
Basin Layout

SECTION II - PONDING CALCULATIONS

100-Year Water Surface Elevation / Orifice Plate Size Tables
Orifice Plate Location Map
Ponds 1 through 11 Spreadsheet Calculations

SECTION III - AHYMO INPUT, SUMMARY OUTPUT, OUTPUT FILES (ROUTE 1 OF PONDING) 100 - Year, 24-Hour Storm Runoff

SECTION IV - AHYMO INPUT, SUMMARY OUTPUT, OUTPUT FILES (ROUTE 2 OF PONDING) 100 - Year, 24-Hour Storm Runoff

SECTION V - AHYMO INPUT, SUMMARY OUTPUT (FOR ALL THE BASINS UNDER EXISTING AND PROPOSED CONDITIONS) For 100-year & 10-year runoff

SAMPLE CALCULATIONS FOR THE BASINS

The site is @ Zone 2, Basin area = 1.1226 acres

LAND TREATMENT

Treatment D:

D = 10 %

Treatment B:

B = 90.00 %

DEPTH (INCHES) @ 100-YEAR STORM

P_{60} = 2.01 inches

P_{360} = 2.35 inches

P_{1440} = 2.75 inches

DEPTH (INCHES) @ 10-YEAR STORM

P_{60} = 2.01 x 0.667
= 1.34 inches

P_{360} = 1.57

P_{1440} = 1.83

See the summary output from AHYMO calculations.

Also see the following summary tables.

DRAINAGE BASINS

SUB-BASIN	AREA (SF)	AREA (AC)	AREA (MI²)
1	48899.52	1.1226	0.001754
2	14399.28	0.3306	0.000517
3	38018.18	0.8728	0.001364
4	10932.31	0.2510	0.000392
5	24949.89	0.5728	0.000895
6	38687.93	0.8882	0.001388
7	23350.30	0.5360	0.000838
8	20303.85	0.4661	0.000728
9	19068.76	0.4378	0.000684
10	21556.17	0.4949	0.000773
11	17907.99	0.4111	0.000642
TOTAL	278074.17	6.3837045	0.0099745

BASINS RUNOFF CALCULATION RESULTS

	UNDER PROPOSED CONDITIONS		*UNDER EXISTING CONDITIONS*	
BASIN	Q-100 CFS	Q-10 CFS	Q-100 CFS	Q-10 CFS
1	5.02	3.25	2.56	1.05
2	1.49	0.96	0.76	0.31
3	3.91	2.53	2.00	0.82
4	1.14	0.73	0.58	0.24
5	2.57	1.66	1.31	0.54
6	3.98	2.57	2.03	0.83
7	2.41	1.56	1.23	0.50
8	2.09	1.35	1.07	0.44
9	1.97	1.27	1.01	0.41
10	2.22	1.44	1.14	0.47
11	1.85	1.20	0.94	0.39
TOTAL	28.65	18.52	14.63	6

SEE THE FOLLOWING SHEET FOR SAMPLE CALCULATION ON THE BASINS RUNOFF

ALSO SEE AHYMO SUMMARY OUTPUT FILE

STORM DROP INLET (EFFECTIVE AREA-IN PONDING SECTION)
(SINGLE-D @ the ponding section)

Area @ the Grate:

L = 40" - 2 (½"$_{ENDS}$) - 7 (½"$_{MIDDLE\ BARS}$)
= 35 ½"

W = 25 - 13 (½"$_{MIDDLE\ BARS}$) = 18 ½"
= 18 ½"

Area = (35.5 x 18.50)/144
= 4.56 SF

Effective are = 4.56 - .5 (4.56)$_{Clogging\ Factor}$
= 2.28 SF @ the Grate

ORIFICE EQUATION

$Q = CA\sqrt{(2gH)}$
C = 0.6
A = 2.28 sf
g = 32.2
H = Ponding Depth
Q = Runoff (CFS)

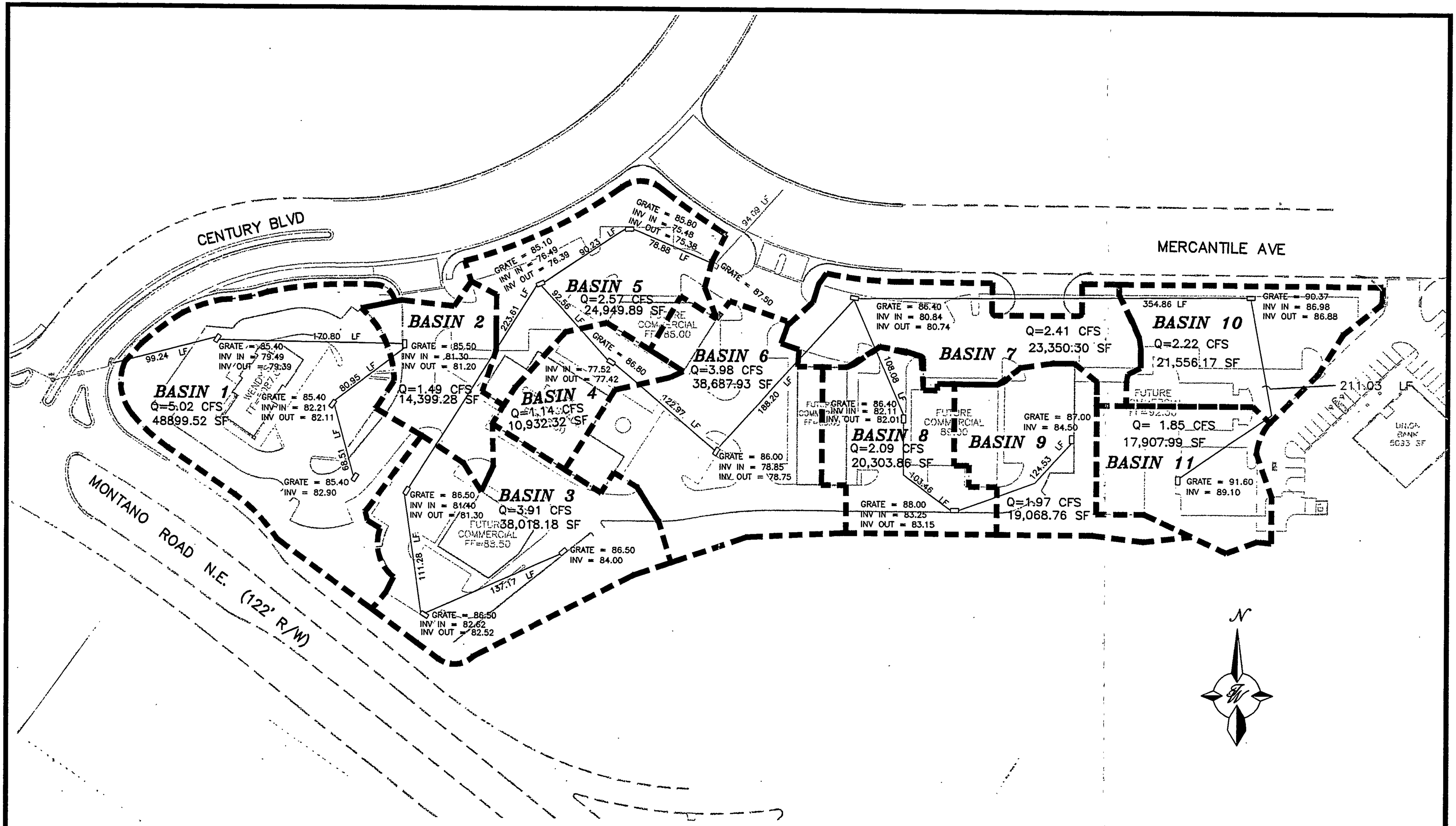
Water Surface Elevation Based On Using Single D Inlets:

Solve for H:

$H = (Q/CA)^2 / (2g)$

see the following table for drop inlet and water depth based on the type of inlet used.

BASIN	TYPE OF INLET	Q (CFS)	WATER DEPTH (FT)
1	1-SGL "D"	5.02	0.21
2	1-SGL "D"	1.49	0.02
3	1-SGL "D"	3.91	0.13
4	1-SGL "D"	1.14	0.01
5	1-SGL "D"	2.57	0.05
6	1-SGL "D"	3.98	0.13
7	1-SGL "D"	2.41	0.05
8	1-SGL "D"	2.09	0.04
9	1-SGL "D"	1.97	0.03
10	1-SGL "D"	2.22	0.04
11	1-SGL "D"	1.85	0.03



BASIN & STORM SEWER LAYOUT

100-YEAR WATER SURFACE ELEVATION

POND	DEPTH (FT)
1	5086.50
2	5086.50*
3	5087.70
4	5087.23
5	5086.52
6	5087.34
7	5087.46
8	5087.68
9	5088.10
10	5091.46
11	5092.27

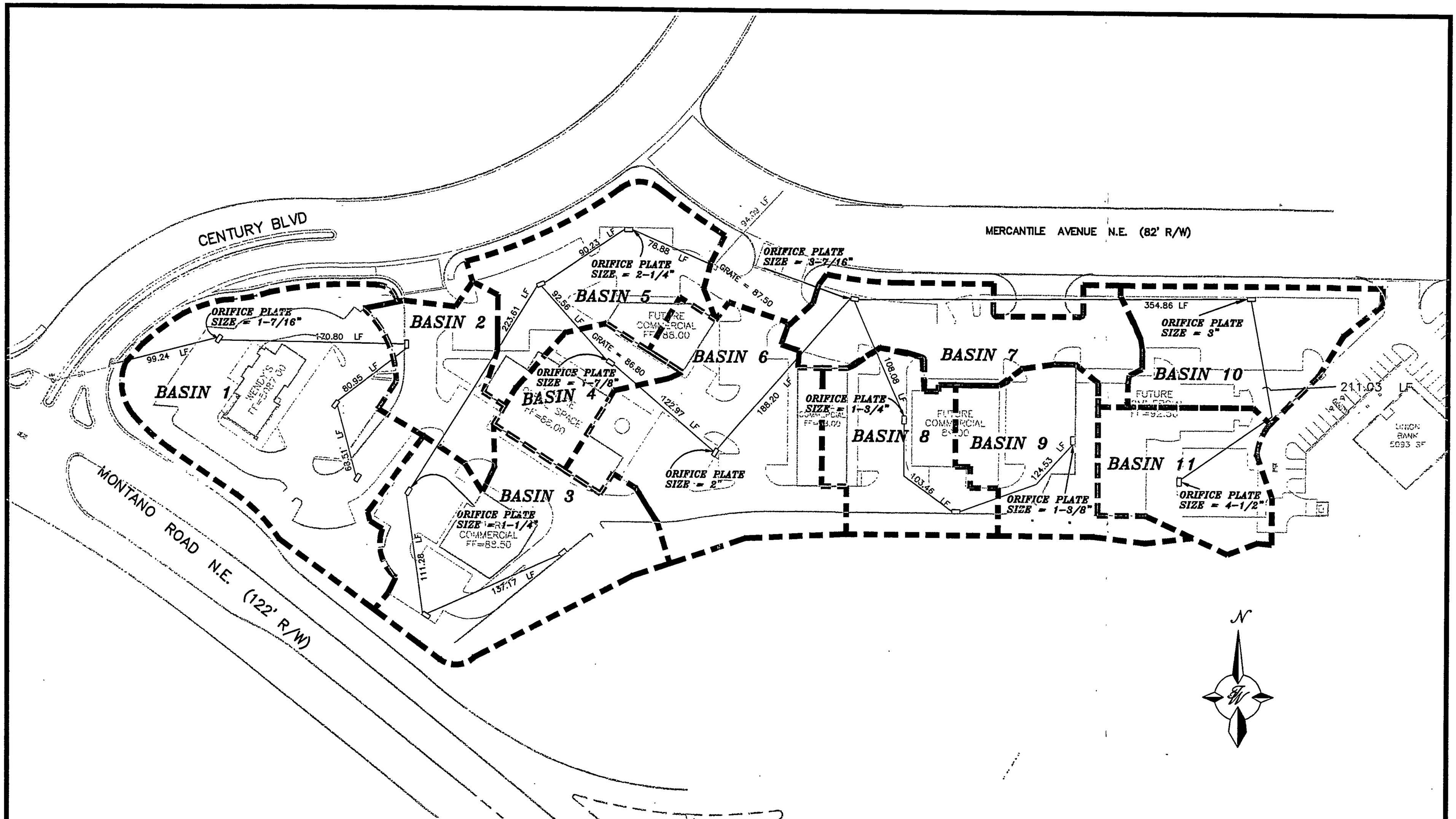
* Pond acts simultaneously with pond 1

DROP INLET TABLE

POND	ORIFICE PLATE SIZE
1	1 - 7/16"
3	1 - 1/4"
4	1 - 7/8"
5	2 - 1/4"
6	2"
7	3 - 7/16"
8	1 - 3/4"
9	1 - 3/8"
10	3"
11	4 - 1/2"

SEE THE FOLLOWING SHEET FOR ORIFICE PLATE LOCATIONS

ALSO SEE GRADING AND DRAINAGE PLAN FOR ORIFICE PLATE DETAIL



ORIFICE PLATE LOCATION

POND VOLUME CALCULATIONS

POND #1

Volume = 6.94 * D (from bottom of the inlet to the top of inlet)

Inlet Depth =5.35'

Ab - Bottom Of The Pond Surface Area (Top of the inlet)
At - Top Of The Pond Surface Area
D - Water Depth (From top of inlet)
Dt - Total Pond Depth (From top of inlet to maximum water detph)
C - Change In Surface Area / Water Depth

Volume = $0.5 * Ab * D + 0.5 * C * D^2$

C = (At - Ab) / Dt

Ab =	6.94	SF	
At =	22,936.96	SF	(@ Elev. of 86.50)
Dt =	1.10	FT	(Ponding depth from top of the inlet to 86.50)
Dia =	1.4375	IN	
Radius =	0.71875	IN	
C =	20845.47	FT / LF-DEPTH	

H (FT)	D (FT)	VOLUME (AC-FT)	Q (CFS)	FULL ELEV.
0.00	0.00	0.00000	0.00	5079.39
1.00	1.00	0.00016	0.05	5080.39
2.00	2.00	0.00032	0.08	5081.39
3.00	3.00	0.00048	0.09	5082.39
4.00	4.00	0.00064	0.11	5083.39
6.01	6.01	0.00096	0.13	5085.40
6.11	0.10	0.00336	0.13	5085.50
6.31	0.30	0.02252	0.14	5085.70
6.51	0.50	0.06082	0.14	5085.90
6.71	0.70	0.11826	0.14	5086.10
6.91	0.90	0.19484	0.14	5086.30
7.11	1.10	0.29057	0.14	5086.50
7.61	1.60	0.61362	0.15	5087.00

$Q = CA\sqrt{2gH}$
C = 0.60
A = ¶ r^2
g = 32.2
H = water depht, measured from the center of the orifice plate

POND VOLUME CALCULATIONS

POND #3

Volume = 6.94 * D (from bottom of the inlet to the top of inlet)

Inlet Depth =5.20'

Ab - Bottom Of The Pond Surface Area (Top of the inlet)
At - Top Of The Pond Surface Area
D - Water Depth (From top of inlet)
Dt - Total Pond Depth (From top of inlet to maximum water detph)
C - Change In Surface Area / Water Depth

Volume = $0.5 * Ab * D + 0.5 * C * D^2$

C = (At - Ab) / Dt

Ab =	6.94	SF
At =	19,826.74	SF
Dt =	1.50	FT
Dia =	1.25	IN
Radius =	0.625	IN
C =	13213.20	FT / LF-DEPTH

H (FT)	D (FT)	VOLUME (AC-FT)	Q (CFS)	FULL ELEV.
0.00	0.00	0.00000	0.00	5081.30
2.50	2.50	0.00040	0.06	5083.80
5.20	5.20	0.00083	0.09	5086.50
5.40	0.20	0.00691	0.09	5086.70
5.60	0.40	0.02513	0.10	5086.90
5.80	0.60	0.05548	0.10	5087.10
6.00	0.80	0.09796	0.10	5087.30
6.20	1.00	0.15257	0.10	5087.50
6.40	1.20	0.21932	0.10	5087.70
6.70	1.50	0.34220	0.11	5088.00

$Q = CA\sqrt{2gH}$
C = 0.60
A = ¶ r^2
g = 32.2
H = water depht, measured from the center of the orifice plate

POND VOLUME CALCULATIONS

POND #4

Volume = 6.94 * D (from bottom of the inlet to the top of inlet)

Inlet Depth =9.38'

Ab - Bottom Of The Pond Surface Area (Top of the inlet)
At - Top Of The Pond Surface Area
D - Water Depth (From top of inlet)
Dt - Total Pond Depth (From top of inlet to maximum water detph)
C - Change In Surface Area / Water Depth

Volume = $0.5 * Ab * D + 0.5 * C * D^2$

C = (At - Ab) / Dt

Ab =	6.94	SF
At =	3,595.60	SF
Dt =	0.60	FT
Dia =	2.875	IN
Radius =	1.4375	IN
C =	5981.10	FT / LF-DEPTH

H (FT)	D (FT)	VOLUME (AC-FT)	Q (CFS)	FULL ELEV.
0.00	0.00	0.00000	0.00	5077.42
2.50	2.50	0.00040	0.33	5079.92
5.00	5.00	0.00080	0.48	5082.42
7.50	7.50	0.00119	0.59	5084.92
9.38	9.38	0.00149	0.66	5086.80
9.48	0.10	0.00219	0.66	5086.90
9.58	0.20	0.00426	0.67	5087.00
9.68	0.30	0.00770	0.67	5087.10
9.78	0.40	0.01251	0.67	5087.20
9.88	0.50	0.01870	0.68	5087.30
9.98	0.60	0.02626	0.68	5087.40

$Q = CA\sqrt{2gH}$
C = 0.60
$A = \P r^2$
g = 32.2
H = water depht, measured from the center of the orifice plate

POND VOLUME CALCULATIONS

POND #5

Volume = 6.94 * D (from bottom of the inlet to the top of inlet)

Inlet Depth =9.72'

Ab - Bottom Of The Pond Surface Area (Top of the inlet)
At - Top Of The Pond Surface Area
D - Water Depth (From top of inlet)
Dt - Total Pond Depth (From top of inlet to maximum water detph)
C - Change In Surface Area / Water Depth

Volume = $0.5 * Ab * D + 0.5 * C * D^2$

C = (At - Ab) / Dt

Ab =	6.94	SF
At =	10,021.77	SF
Dt =	1.90	FT
Dia =	2.25	IN
Radius =	1.125	IN
C =	5270.96	FT / LF-DEPTH

H (FT)	D (FT)	VOLUME (AC-FT)	Q (CFS)	FULL ELEV.
0.00	0.00	0.00000	0.00	5075.38
2.50	2.50	0.00040	0.21	5077.88
5.00	5.00	0.00080	0.29	5080.38
7.50	7.50	0.00119	0.36	5082.88
9.72	9.72	0.00155	0.41	5085.10
9.92	0.20	0.00398	0.42	5085.30
10.12	0.40	0.01126	0.42	5085.50
10.32	0.60	0.02338	0.43	5085.70
10.52	0.80	0.04033	0.43	5085.90
10.72	1.00	0.06213	0.43	5086.10
10.92	1.20	0.08877	0.44	5086.30
11.12	1.40	0.12024	0.44	5086.50
11.32	1.60	0.15656	0.45	5086.70
11.62	1.90	0.22011	0.45	5087.00

$Q = CA\sqrt{2gH}$
C = 0.60
$A = \P r^2$
g = 32.2
H = water depht, measured from the center of the orifice plate

POND VOLUME CALCULATIONS

POND #6

Volume = 6.94 * D (from bottom of the inlet to the top of inlet)

Inlet Depth =7.25

Ab - Bottom Of The Pond Surface Area (Top of the inlet)
At - Top Of The Pond Surface Area
D - Water Depth (From top of inlet)
Dt - Total Pond Depth (From top of inlet to maximum water detph)
C - Change In Surface Area / Water Depth

Volume = $0.5 * Ab * D + 0.5 * C * D^2$

C = (At - Ab) / Dt

Ab =	6.94	SF
At =	22,610.51	SF
Dt =	1.40	FT
Dia =	2	IN
Radius =	1	IN
C =	16145.41	FT / LF-DEPTH

H (FT)	D (FT)	VOLUME (AC-FT)	Q (CFS)	FULL ELEV.
0.00	0.00	0.00000	0.00	5078.75
2.50	2.50	0.00040	0.16	5081.25
5.00	5.00	0.00080	0.23	5083.75
7.25	7.25	0.00116	0.28	5086.00
7.45	0.20	0.00858	0.29	5086.20
7.75	0.50	0.04753	0.29	5086.50
8.05	0.80	0.11983	0.30	5086.80
8.35	1.10	0.22548	0.30	5087.10
8.65	1.40	0.36450	0.31	5087.40

$Q = CA\sqrt{2gH}$
C = 0.60
$A = \P r^2$
g = 32.2
H = water depht, measured from the center of the orifice plate

POND VOLUME CALCULATIONS

POND #7

Volume = 6.94 * D (from bottom of the inlet to the top of inlet)

Inlet Depth =5.58'

Ab - Bottom Of The Pond Surface Area (Top of the inlet)
At - Top Of The Pond Surface Area
D - Water Depth (From top of inlet)
Dt - Total Pond Depth (From top of inlet to maximum water detph)
C - Change In Surface Area / Water Depth

Volume = $0.5 * Ab * D + 0.5 * C * D^2$

C = (At - Ab) / Dt

Ab =	6.94	SF
At =	6,696.16	SF
Dt =	1.10	FT
Dia =	3.4375	IN
Radius =	1.71875	IN
C =	6081.11	FT / LF-DEPTH

H (FT)	D (FT)	VOLUME (AC-FT)	Q (CFS)	FULL ELEV.
0.00	0.00	0.00000	0.00	5082.01
2.00	2.00	0.00032	0.42	5084.01
4.00	4.00	0.00064	0.61	5086.01
4.39	4.39	0.00070	0.64	5086.40
4.69	0.30	0.00701	0.66	5086.70
4.99	0.60	0.02588	0.68	5087.00
5.29	0.90	0.05731	0.70	5087.30
5.49	1.10	0.08525	0.72	5087.50

$Q = CA\sqrt{2gH}$
C = 0.60
$A = \pi r^2$
g = 32.2
H = water depht, measured from the center of the orifice plate

POND VOLUME CALCULATIONS

POND #8

Volume = 6.94 * D (from bottom of the inlet to the top of inlet)

Inlet Depth =4.39

Ab - Bottom Of The Pond Surface Area (Top of the inlet)
At - Top Of The Pond Surface Area
D - Water Depth (From top of inlet)
Dt - Total Pond Depth (From top of inlet to maximum water detph)
C - Change In Surface Area / Water Depth

Volume = $0.5 * Ab * D + 0.5 * C * D^2$

C = (At - Ab) / Dt

Ab =	6.94	SF
At =	5,177.89	SF
Dt =	1.60	FT
Dia =	1.75	IN
Radius =	0.875	IN
C =	3231.85	FT / LF-DEPTH

H (FT)	D (FT)	VOLUME (AC-FT)	Q (CFS)	FULL ELEV.
0.00	0.00	0.00000	0.00	5082.01
1.00	1.00	0.00016	0.08	5083.01
3.00	3.00	0.00048	0.14	5085.01
4.39	4.39	0.00070	0.17	5086.40
4.69	0.30	0.00406	0.17	5086.70
4.99	0.60	0.01410	0.18	5087.00
5.29	0.90	0.03082	0.18	5087.30
5.59	1.20	0.05421	0.19	5087.60
5.99	1.60	0.09579	0.20	5088.00

$Q = CA\sqrt{2gH}$
C = 0.60
$A = \P r^2$
g = 32.2
H = water depht, measured from the center of the orifice plate

POND VOLUME CALCULATIONS

POND #9

Volume = 6.94 * D (from bottom of the inlet to the top of inlet)

Inlet Depth =2.50'

Ab - Bottom Of The Pond Surface Area (Top of the inlet)
At - Top Of The Pond Surface Area
D - Water Depth (From top of inlet)
Dt - Total Pond Depth (From top of inlet to maximum water detph)
C - Change In Surface Area / Water Depth

Volume = $0.5 * Ab * D + 0.5 * C * D^2$

C = (At - Ab) / Dt

Ab =	6.94	SF
At =	7,215.00	SF
Dt =	1.50	FT
Dia =	1.375	IN
Radius =	0.6875	IN
C =	4805.37	FT / LF-DEPTH

H (FT)	D (FT)	VOLUME (AC-FT)	Q (CFS)	FULL ELEV.
0.00	0.00	0.00000	0.00	5084.50
1.00	1.00	0.00016	0.05	5085.50
2.00	2.00	0.00032	0.07	5086.50
2.50	2.50	0.00040	0.08	5087.00
2.60	0.10	0.00096	0.08	5087.10
2.80	0.30	0.00539	0.08	5087.30
3.00	0.50	0.01423	0.09	5087.50
3.20	0.70	0.02748	0.09	5087.70
3.40	0.90	0.04515	0.09	5087.90
3.60	1.10	0.06723	0.09	5088.10
3.80	1.30	0.09372	0.10	5088.30
4.00	1.50	0.12462	0.10	5088.50

$Q = CA\sqrt{2gH}$
C = 0.60
$A = \P r^2$
g = 32.2
H = water depht, measured from the center of the orifice plate

POND VOLUME CALCULATIONS

POND #10

Volume = 6.94 * D (from bottom of the inlet to the top of inlet)

Inlet Depth =3.49'

Ab - Bottom Of The Pond Surface Area (Top of the inlet)
At - Top Of The Pond Surface Area
D - Water Depth (From top of inlet)
Dt - Total Pond Depth (From top of inlet to maximum water detph)
C - Change In Surface Area / Water Depth

Volume = $0.5 * Ab * D + 0.5 * C * D^2$

C = (At - Ab) / Dt

Ab =	6.94	SF
At =	8,302.76	SF
Dt =	1.18	FT
Dia =	3	IN
Radius =	1.5	IN
C =	7030.36	FT / LF-DEPTH

H (FT)	D (FT)	VOLUME (AC-FT)	Q (CFS)	FULL ELEV.
0.00	0.00	0.00000	0.00	5086.88
1.00	1.00	0.00016	0.22	5087.88
2.00	2.00	0.00032	0.32	5088.88
3.49	3.49	0.00056	0.43	5090.37
3.59	0.10	0.00137	0.44	5090.47
3.79	0.30	0.00784	0.45	5090.67
3.99	0.50	0.02077	0.46	5090.87
4.19	0.70	0.04015	0.48	5091.07
4.39	0.90	0.06599	0.49	5091.27
4.67	1.18	0.11301	0.50	5091.55

$Q = CA\sqrt{2gH}$
C = 0.60
A = ¶ r^2
g = 32.2
H = water depht, measured from the center of the orifice plate

POND VOLUME CALCULATIONS

POND #11

Volume = 6.94 * D (from bottom of the inlet to the top of inlet)

Inlet Depth =2.50'

Ab - Bottom Of The Pond Surface Area (Top of the inlet)
At - Top Of The Pond Surface Area
D - Water Depth (From top of inlet)
Dt - Total Pond Depth (From top of inlet to maximum water detph)
C - Change In Surface Area / Water Depth

Volume = $0.5 * Ab * D + 0.5 * C * D^2$

C = (At - Ab) / Dt

Ab =	6.94	SF
At =	1,691.02	SF
Dt =	0.70	FT
Dia =	4.5	IN
Radius =	2.25	IN
C =	2405.83	FT / LF-DEPTH

H (FT)	D (FT)	VOLUME (AC-FT)	Q (CFS)	FULL ELEV.
0.00	0.00	0.00000	0.00	5089.10
1.00	1.00	0.00016	0.48	5090.10
2.00	2.00	0.00032	0.72	5091.10
2.50	2.50	0.00040	0.81	5091.60
2.60	0.10	0.00068	0.83	5091.70
2.80	0.30	0.00291	0.86	5091.90
3.00	0.50	0.00734	0.89	5092.10
3.20	0.70	0.01399	0.92	5092.30

$Q = CA\sqrt{2gH}$
C = 0.60
$A = \P r^2$
g = 32.2
H = water depht, measured from the center of the orifice plate

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =04/17/1996

INPUT FILE = r1 USER NO.= R_BOHANN.I01

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	PAGE = 1 NOTATION
START										TIME= .00
RAINFALL TYPE= 2										RAIN24= 2.750
COMPUTE NM HYD	101.00	-	1	.00052	1.49	.063	2.27936	1.500	4.511	PER IMP= 90.00
COMPUTE NM HYD	102.00	-	2	.00175	5.02	.213	2.27930	1.500	4.472	PER IMP= 90.00
ADD HYD	102.10	1& 2	3	.00227	6.51	.276	2.27932	1.500	4.481	
ROUTE RESERVOIR	502.00	3	1	.00227	.14	.217	1.79218	1.400	.096	AC-FT= .291
FINISH										

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =04/19/1996

INPUT FILE = r2 USER NO.= R_BOHANN.I01

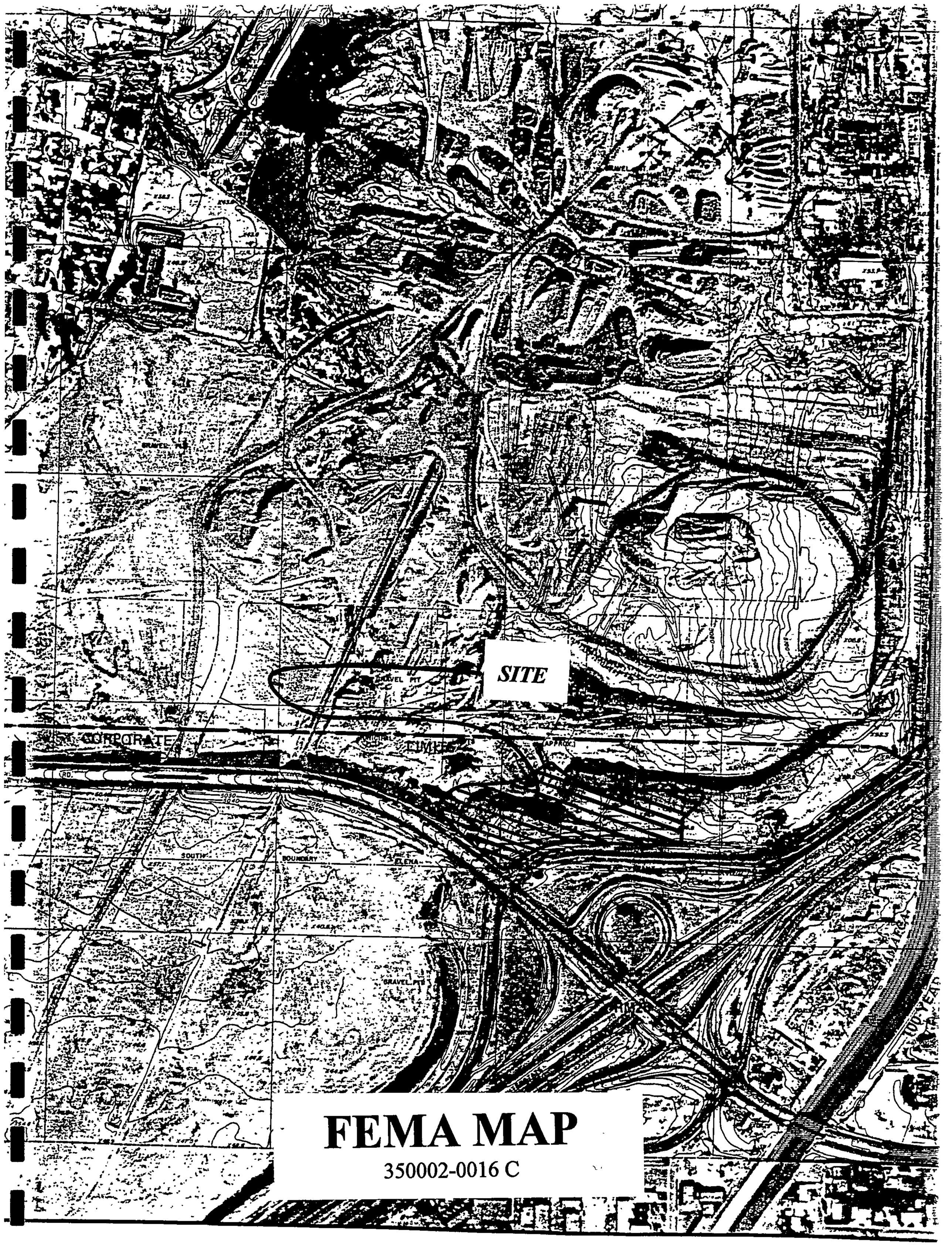
COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
START										TIME= .00
RAINFALL TYPE= 2										RAIN24= 2.750
COMPUTE NM HYD	101.00	-	1	.00064	1.85	.078	2.27935	1.500	4.501	PER IMP= 90.00
ROUTE RESERVOIR	501.00	1	2	.00064	.92	.078	2.28085	1.667	2.228	AC-FT= .013
COMPUTE NM HYD	102.00	-	3	.00077	2.22	.094	2.27934	1.500	4.491	PER IMP= 90.00
ADD HYD	102.10	2& 3	1	.00142	3.10	.172	2.28002	1.500	3.427	
ROUTE RESERVOIR	502.00	1	2	.00142	.50	.172	2.28090	2.166	.549	AC-FT= .098
COMPUTE NM HYD	103.00	-	1	.00068	1.97	.083	2.27934	1.500	4.497	PER IMP= 90.00
ROUTE RESERVOIR	503.00	1	3	.00068	.09	.083	2.27873	1.500	.206	AC-FT= .067
COMPUTE NM HYD	104.00	-	1	.00073	2.09	.088	2.27934	1.500	4.495	PER IMP= 90.00
ADD HYD	104.10	1& 3	4	.00141	2.18	.172	2.27904	1.500	2.417	
ROUTE RESERVOIR	504.00	4	1	.00141	.19	.172	2.27866	2.333	.212	AC-FT= .062
ADD HYD	104.10	1& 2	3	.00283	.69	.344	2.27978	2.166	.381	
COMPUTE NM HYD	105.00	-	2	.00084	2.41	.102	2.27933	1.500	4.490	PER IMP= 90.00
ADD HYD	105.10	2& 3	1	.00367	3.05	.446	2.27968	1.500	1.302	
ROUTE RESERVOIR	505.00	1	3	.00367	.72	.446	2.27953	2.833	.305	AC-FT= .080
COMPUTE NM HYD	106.00	-	1	.00139	3.98	.169	2.27931	1.500	4.477	PER IMP= 90.00
ADD HYD	105.10	1& 3	2	.00505	4.66	.614	2.27947	1.500	1.439	
ROUTE RESERVOIR	506.00	2	1	.00505	.31	.470	1.74310	6.933	.095	AC-FT= .335
COMPUTE NM HYD	107.00	-	2	.00039	1.14	.048	2.27939	1.500	4.526	PER IMP= 90.00
ADD HYD	107.10	1& 2	3	.00545	1.43	.517	1.78171	1.500	.409	
ROUTE RESERVOIR	507.00	3	1	.00545	.67	.517	1.78044	1.833	.193	AC-FT= .014
COMPUTE NM HYD	108.00	-	2	.00136	3.91	.166	2.27931	1.500	4.477	PER IMP= 90.00
ROUTE RESERVOIR	508.00	2	3	.00136	.10	.154	2.12051	1.467	.115	AC-FT= .219
ADD HYD	108.10	1& 3	2	.00681	.77	.671	1.84856	1.833	.177	
COMPUTE NM HYD	109.00	-	1	.00090	2.57	.109	2.27933	1.500	4.488	PER IMP= 90.00
ADD HYD	109.10	1& 2	3	.00770	3.34	.780	1.89861	1.500	.678	
ROUTE RESERVOIR	509.00	3	1	.00770	.44	.681	1.65828	2.933	.089	AC-FT= .124
FINISH										

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =04/17/1996

INPUT FILE = A:\AHYMO\SUB.DAT USER NO.= R_BOHANN.I01

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	PAGE = 1 NOTATION
START										TIME= .00
RAINFALL TYPE= 1										RAIN6= 2.350
COMPUTE NM HYD	101.00	-	1	.00175	5.02	.185	1.98165	1.500	4.472	PER IMP= 90.00
COMPUTE NM HYD	102.00	-	1	.00052	1.49	.055	1.98165	1.500	4.511	PER IMP= 90.00
COMPUTE NM HYD	103.00	-	1	.00136	3.91	.144	1.98165	1.500	4.477	PER IMP= 90.00
COMPUTE NM HYD	104.00	-	1	.00039	1.14	.041	1.98165	1.500	4.526	PER IMP= 90.00
COMPUTE NM HYD	105.00	-	1	.00090	2.57	.095	1.98165	1.500	4.488	PER IMP= 90.00
COMPUTE NM HYD	106.00	-	1	.00139	3.98	.147	1.98165	1.500	4.477	PER IMP= 90.00
COMPUTE NM HYD	107.00	-	1	.00084	2.41	.089	1.98165	1.500	4.490	PER IMP= 90.00
COMPUTE NM HYD	108.00	-	1	.00073	2.09	.077	1.98165	1.500	4.495	PER IMP= 90.00
COMPUTE NM HYD	109.00	-	1	.00068	1.97	.072	1.98165	1.500	4.497	PER IMP= 90.00
COMPUTE NM HYD	110.00	-	1	.00077	2.22	.082	1.98165	1.500	4.491	PER IMP= 90.00
COMPUTE NM HYD	111.00	-	1	.00064	1.85	.068	1.98165	1.500	4.501	PER IMP= 90.00
START										TIME= .00
RAINFALL TYPE= 1										RAIN6= 1.570
COMPUTE NM HYD	101.00	-	1	.00175	3.25	.115	1.23172	1.500	2.894	PER IMP= 90.00
COMPUTE NM HYD	102.00	-	1	.00052	.96	.034	1.23172	1.500	2.916	PER IMP= 90.00
COMPUTE NM HYD	103.00	-	1	.00136	2.53	.090	1.23172	1.500	2.897	PER IMP= 90.00
COMPUTE NM HYD	104.00	-	1	.00039	.73	.026	1.23172	1.500	2.923	PER IMP= 90.00
COMPUTE NM HYD	105.00	-	1	.00090	1.66	.059	1.23172	1.500	2.904	PER IMP= 90.00
COMPUTE NM HYD	106.00	-	1	.00139	2.57	.091	1.23172	1.500	2.897	PER IMP= 90.00
COMPUTE NM HYD	107.00	-	1	.00084	1.56	.055	1.23172	1.500	2.904	PER IMP= 90.00
COMPUTE NM HYD	108.00	-	1	.00073	1.35	.048	1.23172	1.500	2.907	PER IMP= 90.00
COMPUTE NM HYD	109.00	-	1	.00068	1.27	.045	1.23172	1.500	2.907	PER IMP= 90.00
COMPUTE NM HYD	110.00	-	1	.00077	1.44	.051	1.23171	1.500	2.905	PER IMP= 90.00
COMPUTE NM HYD	111.00	-	1	.00064	1.20	.042	1.23172	1.500	2.910	PER IMP= 90.00
START										TIME= .00
RAINFALL TYPE= 1										RAIN6= 2.350
COMPUTE NM HYD	101.00	-	1	.00175	2.56	.073	.77821	1.533	2.285	PER IMP= .00
COMPUTE NM HYD	102.00	-	1	.00052	.76	.021	.77821	1.533	2.304	PER IMP= .00
COMPUTE NM HYD	103.00	-	1	.00136	2.00	.057	.77821	1.533	2.287	PER IMP= .00
COMPUTE NM HYD	104.00	-	1	.00039	.58	.016	.77821	1.533	2.311	PER IMP= .00
COMPUTE NM HYD	105.00	-	1	.00090	1.31	.037	.77821	1.533	2.292	PER IMP= .00
COMPUTE NM HYD	106.00	-	1	.00139	2.03	.058	.77821	1.533	2.287	PER IMP= .00
COMPUTE NM HYD	107.00	-	1	.00084	1.23	.035	.77821	1.533	2.293	PER IMP= .00
COMPUTE NM HYD	108.00	-	1	.00073	1.07	.030	.77821	1.533	2.296	PER IMP= .00
COMPUTE NM HYD	109.00	-	1	.00068	1.01	.028	.77821	1.533	2.296	PER IMP= .00
COMPUTE NM HYD	110.00	-	1	.00077	1.14	.032	.77821	1.533	2.295	PER IMP= .00
COMPUTE NM HYD	111.00	-	1	.00064	.94	.027	.77821	1.533	2.298	PER IMP= .00
START										TIME= .00
RAINFALL TYPE= 1										RAIN6= 1.570
COMPUTE NM HYD	101.00	-	1	.00175	1.05	.026	.27828	1.533	.938	PER IMP= .00
COMPUTE NM HYD	102.00	-	1	.00052	.31	.008	.27828	1.533	.946	PER IMP= .00
COMPUTE NM HYD	103.00	-	1	.00136	.82	.020	.27828	1.533	.939	PER IMP= .00
COMPUTE NM HYD	104.00	-	1	.00039	.24	.006	.27828	1.533	.949	PER IMP= .00
COMPUTE NM HYD	105.00	-	1	.00090	.54	.013	.27828	1.533	.941	PER IMP= .00
COMPUTE NM HYD	106.00	-	1	.00139	.83	.021	.27828	1.533	.939	PER IMP= .00
COMPUTE NM HYD	107.00	-	1	.00084	.50	.012	.27828	1.533	.942	PER IMP= .00
COMPUTE NM HYD	108.00	-	1	.00073	.44	.011	.27828	1.533	.942	PER IMP= .00

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
COMPUTE NM HYD	109.00	-	1	.00068	.41	.010	.27828	1.533	.943	PER IMP= .00
COMPUTE NM HYD	110.00	-	1	.00077	.47	.011	.27828	1.533	.942	PER IMP= .00
COMPUTE NM HYD	111.00	-	1	.00064	.39	.010	.27828	1.533	.943	PER IMP= .00
FINISH										



FEMA MAP

350002-0016 C

ELENA

GALLEGOS

SU FOR SAND & GRAVEL EXTR & REL ACT & USES PERM IN M-1 ZONE

GRANT

BOARD OF EDUCATION

MISSION AVENUE ELEMENTARY SCHOOL

VINEYARD ADDN NO 1

AYERS ADDN NO 1

M-H SU-PERMIT MH PARK

RENAISSANCE

SU FOR R-3 USES

SU FOR C-2 USES

CENTER

SU FOR IP USES

SITE

C-2 USES W/ INCIDENTAL STORAGE

ABQ GRAVEL PRODUCTS

SU-1 IP & AMUSEMENT FAC OF A PERM CHARACTER (NOT ADULT ESTABLISHMENT)

SUNDTS INDUSTRIAL

MONTANO

INTERSTATE 25

MONTGOMERY COMPLEX

R-3 COMPLEX

CHURCH & REL FAC

FOR USES PERMISSIVE IN THE C-3 AND IP ZONES

SCALE IN FEET

250 0 500 1000

PHOTOCOPY--NOT TO SCALE

North

Albuquerque Geographic Information System

City of Albuquerque

© Planning Department

Map Amended through July 11, 1994

NOTE: GREY SHADING REPRESENTS AREA OUTSIDE OF THE CITY LIMITS

LEGAL DESCRIPTION

T11N

R3E

SEC 24

UNIFORM PROPERTY CODE

1-016-081

F-16-Z

CITY OF ALBUQUERQUE

THREE HUNDRED YEARS 1706 • 2006
ALBUQUERQUE
Making History

Planning Department
Transportation Development Services Section

March 6, 2006

Ronald R. Bohannan, P.E.
8509 Jefferson NE
Albuquerque, NM 87113

Re: Certification Submittal for Final Building Certificate of Occupancy for Petsmart-Renaissance Center, [F-16 / D5H]
1410 Mercantile Avenue NE
Engineer's Stamp Dated 03/02/06

Dear Mr. Bohannan:

The TCL / Letter of Certification submitted on March 3, 2006 is sufficient for acceptance by this office for final Certificate of Occupancy (C.O.). Notification has been made to the Building and Safety Section.

Sincerely,

Nilo E. Salgado-Fernandez, P.E.
Senior Traffic Engineer
Development and Building Services
Planning Department

c: Engineer
Hydrology file
CO Clerk

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

TIERRA WEST, LLC

8509 Jefferson NE
Albuquerque, NM 87113

(505) 858-3100
fax (505) 858-1118

twllc@tierrawestllc.com
1-800-245-3102

March 2, 2006

Mr. Nilo Salgado-Fernandez, PE
Development and Building Services
Public Works Department
PO Box 1293
Albuquerque, NM 87103

RE: DRB Approved Site Plan Certification for Permanent Certificate of Occupancy
Petsmart – Renaissance Center
1421 Mercantile Avenue NE

Dear Mr. Salgado-Fernandez:

Tierra West, LLC requests a Permanent Certification of the DRB approved Site Plan for Building Permit for Petsmart located at 1421 Mercantile Avenue NE. Enclosed, please find the information sheet, the Administrative Amendment Amended Site Plan for Building Permit and the Site Plan for Building Permit (for reference). Field verification of the site was completed by our office and the portion completed is in substantial compliance with the approved plan. Therefore, we are requesting Certification of the Site Plan for Building Permit for a Permanent Certificate of Occupancy.

If you have any questions or need additional information regarding this matter, please do not hesitate to contact me.

Sincerely,

RONALD RAY BOHANNAN
NEW MEXICO
7868
REGISTERED PROFESSIONAL ENGINEER

Ronald R. Bohannan, PE

Enclosure/s

cc: John Sedberry

JN: 24017
RRB/bf/kdk

24017niloperm COtclpetsmart030206

RECEIVED
MAR 03 2006
HYDROLOGY SECTION

CITY OF ALBUQUERQUE

THREE HUNDRED YEARS 1706 * 2006
ALBUQUERQUE
Making History

March 7, 2006

Mr. Ronald Bohannan, P.E.
TIERRA WEST, LLC
8509 Jefferson St. NE
Albuquerque, NM 87113

Re: PETSMART - MERCANTILE
1410 Mercantile Avenue NE
Approval of Permanent Certificate of Occupancy (C.O.)
Engineer's Stamp dated 03/01/2005 (F-16/D5H)
Certification dated 03/06/2006

Dear Ron,

Based upon the information provided in your submittal received 03/07/2006, the above referenced certification is approved for release of Permanent Certificate of Occupancy by Hydrology.

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

Sincerely,

Arlene V. Portillo

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

C: C.O. Clerk
Sarah Abeyta
File

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

CITY OF ALBUQUERQUE

March 21, 2005

Ronald Bohannan, P.E.
Tierra West, LLC
8509 Jefferson NE
Albuquerque, NM 87113

Re: PetsMart, 1410 Mercantile Ave NE, Grading and Drainage Plan
Engineer's Stamp dated 3-01-05 (F16-D005H)

Dear Mr. Bohannan,

Based upon the information provided in your submittal received 3-02-05, the above referenced plan is approved for Building Permit. Please attach a copy of this approved plan to the construction sets prior to sign-off by Hydrology. Prior to Certificate of Occupancy release, Engineer Certification per the DPM checklist will be required.

This project requires a National Pollutant Discharge Elimination System (NPDES) permit. If you have any questions regarding this permit please feel free to call the DMD Storm Drainage Design section at 768-3654 (Charles Caruso).

If you have any questions, you can contact me at 924-3981.

Sincerely,

Kristal D. Metro
Engineering Associate, Planning Dept.
Development and Building Services

C: Charles Caruso, DMD Storm Drainage Design
File

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

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

December 14, 2000

Ronald R. Bohannan, P.E.
TIERRA WEST, LLC
8509 Jefferson NE
Albuquerque, NM 87113

Re: Grading and Drainage Certification –Arby's Restaurant, 1416 Mercantile (F-16/D5H)

Engineer's Stamp dated 1-17-2000

Engineering Certification dated 12-14-2000

Dear Mr. Bohannan:

Based upon the information provided in your submittal dated 12-14-2000, the above referenced site is approved for Certificate of Occupancy.

If I can be of further assistance, you can contact me at 924-3986.

Sincerely,

Bradley L. Bingham

Bradley L. Bingham, PE
Hydrology Review Engineer

C: Teresa Martin
file

THE CITY OF ALBUQUERQUE IS AN EQUAL OPPORTUNITY/REASONABLE ACCOMMODATION EMP

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

October 26, 1999

Ron Bohannan, PE
Tierra West, LLC
4421 McLeod NE, Ste. D
Albuquerque, NM 87109

Re: Arbys @ Tract 5B2B1, Renaissance Center,
Drainage Report & Grading Plan
Engineer's Stamp dated 1-17-00 (F16/D5H)

Dear Mr. Bohannan,

Based upon the information provided in your submittal dated 1-18-00, the above referenced site is approved for Building Permit, Preliminary Plat, Site Development Plan for Subdivision, Site Development Plan for Building Permit and Grading Permit. This approval is for the Arby's site only. Please add the orifice plate size to pond 1 inlet on your grading plan.

Please attach a copy of this approved plan to the construction sets prior to sign-off by Hydrology.

Also, prior to Certificate of Occupancy release, Engineer Certification per the DPM checklist will be required.

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

Sincerely,

Bradley L. Bingham

Bradley L. Bingham, PE
Hydrology Review Engineer

C: file

THE CITY OF ALBUQUERQUE IS AN EQUAL OPPORTUNITY/REASONABLE ACCOMMODATION EMPLOYER

DRAINAGE REPORT

for

Arby's at Tract 5

Prepared by

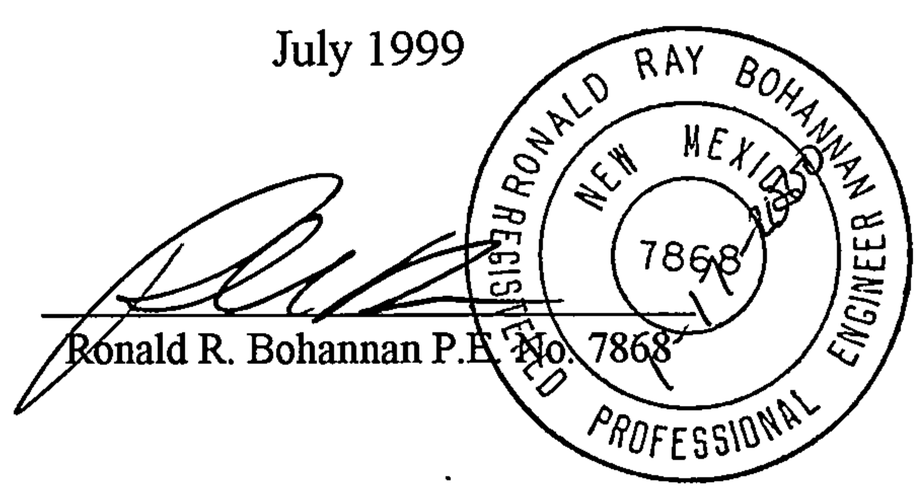
Tierra West, LLC
4421 McLeod Road NE, Suite D
Albuquerque, New Mexico 87109

Prepared for

Union Pension Transaction Trust 93-2 NM
4411 McLeod Rd, NE Suite G
Albuquerque, New Mexico 87109

RECEIVED
JAN 1 8 2000
HYDROLOGY SECTION

July 1999



Ronald R. Bohannan P.E. No. 7868

Location

The site is a proposed Arby's Restaurant of 2952 square feet. It is located south of Mercantile Avenue between Montano Road and Interstate 25 in the Renaissance Center. The legal description of the site is Tract 5B2B of the North Renaissance Center. The site is shown on the attached Zone Atlas Map F-16 and contains approximately 5.35 acres. Arby's is located in the southwest corner of Tract 5B2B and will contain approximately 0.85 acres. The purpose of this report is to provide the drainage analysis and management plan for the site.

Existing Drainage Conditions

The site is part of the existing Renaissance Master Drainage Plan which states that only 0.1 cfs/acre may be discharged from the site. The site is also part of a previous drainage report for Tract 5B2 of the Renaissance Center (F16-D5H). The report was prepared while developing the Wendy's restaurant site. That report also prepared a master plan for the entire Tract 5B2. However, there have been many changes to the overall site plan and consequently, a new drainage master plan was submitted and approved (March 4, 1998). This current report follows the approved drainage master plan.

The site is currently undeveloped. There are no offsite flows entering the site. There is an existing Wendy's restaurant to the west of the site, located on Tract 5B2A. There is also an existing Union Bank located to the east of the site. The development of the Union Bank prevents any offsite flows from entering the site. Mercantile Avenue and Interstate 25 intercept any offsite flows from the north and south.

FIRM Map and Soil Conditions

The site is located on FIRM Map 35001C0138 D as shown on the attached excerpt. The map shows that the site does not lie within any 100 year flood plains.

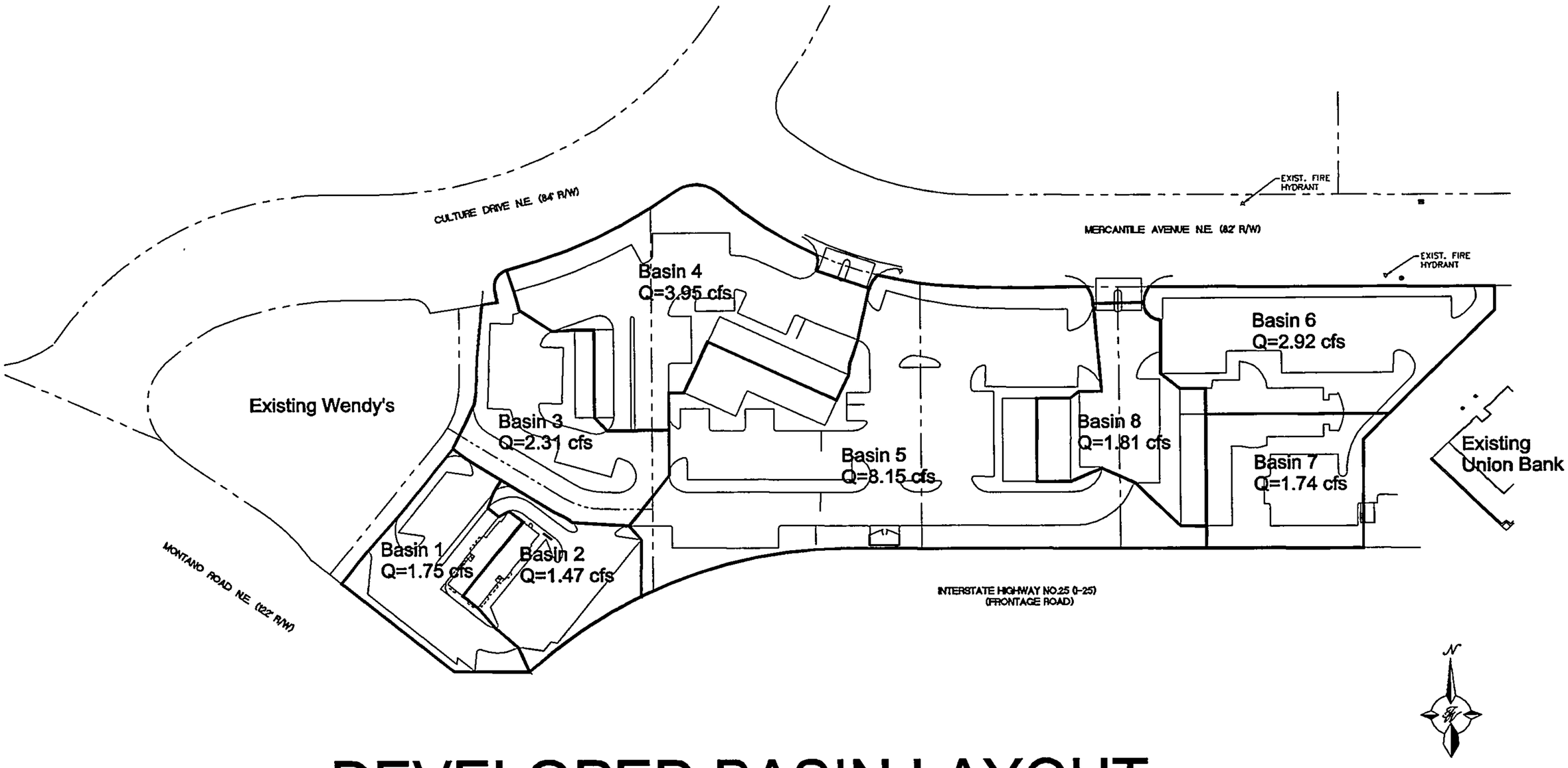
The site contains two soil types from the Soil Conservation Service Soil Survey of Bernalillo County. These are a Wink-Embudo complex and a Bluepoint-Kokan association. The Wink-Embudo complex has a moderate hazard of water erosion and medium runoff. The Bluepoint-Kokan association has slow runoff and moderate to severe hazard of water erosion. However, the site is the location of an old gravel pit and the existing soils are a blend of native materials.

On-Site Drainage Management Plan

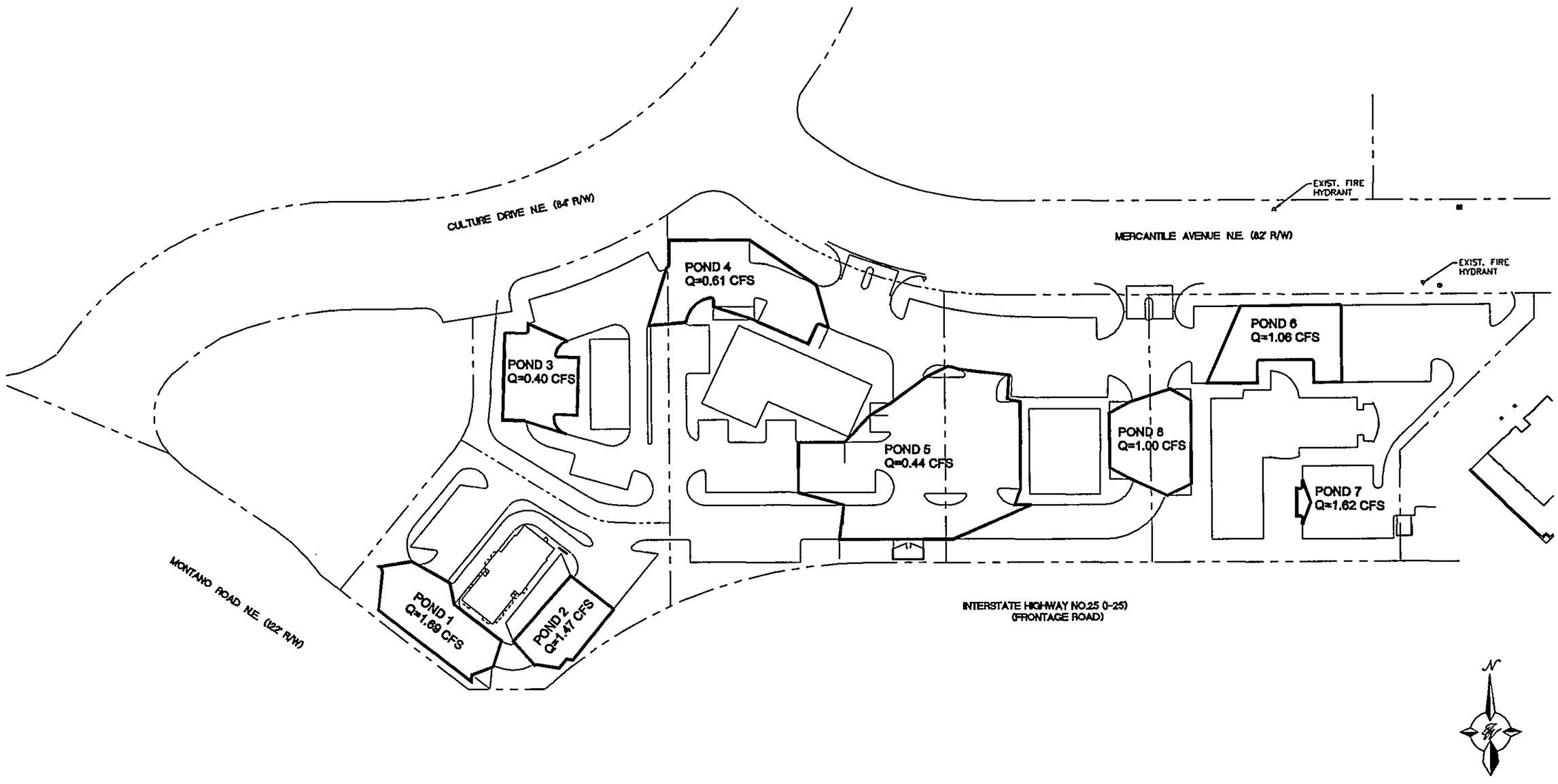
The site has been divided into eight proposed basins in order to pond the drainage and control the rate of runoff. The Arby's site contains Basins 1 and 2. The basin delineation is shown on the attached "Developed Basin Layout" and within each basin is located a pond, shown on the "Pond Location" exhibit. There are two proposed routes for the storm drain system.

Route 1

Route 1 will drain to the existing Wendy's site and consists of Basins 1 and 2. The Wendy's site has a blanket drainage easement that allows offsite flows to be routed through. The easement was recorded on January 8, 1997 in volume 97C, folio 12. Pond 2 will drain to Pond 1 at a rate of 1.47 cfs. Pond 1 will drain to the existing Wendy's site at a rate of 1.69 cfs limited by a 6" orifice plate. Pond 1 and 2 will act as one pond because of the limited discharge from Pond 1. No changes are being proposed for the existing Wendy's site. The existing site has capacity for the additional flows and will discharge 0.14 cfs into an existing drop inlet in Mercantile Avenue.



DEVELOPED BASIN LAYOUT



PROPOSED POND LAYOUT

Route 2

Route 2 consists of the remaining six basins. Basins 3 thru 8 will drain to a proposed drop inlet in Mercantile Avenue and then to the existing storm drain system.

Pond 7 will drain to Pond 6 at a rate of 1.62 cfs limited by a 6" orifice plate.

Pond 6 will drain to Pond 8 at a rate of 1.06 cfs limited by a 4" orifice plate.

Pond 8 will drain to Pond 5 at a rate of 1.00 cfs limited by a 4-1/8" orifice plate.

Pond 3 will drain to Pond 4 at a rate of 0.40 cfs limited by a 2-7/8" orifice plate.

Pond 4 will drain to Pond 5 at a rate of 0.61 cfs limited by a 2-7/8" orifice plate.

Pond 5 will drain to Mercantile Avenue at a rate of 0.50 cfs limited by a 2-1/2" orifice plate.

The total runoff from the site from both routes is 0.58 cfs. The Wendy's restaurant site consists of 1.0157 acres. This is an allowable discharge from both sites of 0.64 cfs. The proposed discharge of 0.58 cfs is less than the discharge permitted by the Renaissance Master Drainage Plan.

Arby's is within the pond in Basin 1 which will overflow in the event of a storm larger that 100 years to the driveway on the west side of the site. The on-site ponds will all overflow into the west driveway or out the entrances to Mercantile Avenue.

Summary

There are two proposed routes for the storm sewer. Route 1 will discharge through the existing Wendy's restaurant site at a rate of 0.14 cfs. Route 2 will discharge to a proposed drop inlet in Mercantile Avenue of 0.44 cfs. The combined discharge of 0.58 cfs is less than the allowable discharge of 0.64 cfs.

RUNOFF CALCULATIONS

The site is @ Zone 2

LAND TREATMENT

Proposed
D = 90%
B = 10 %

Existing
B = 100%

DEPTH (INCHES) @ 100-YEAR STORM

P_{60} = 2.01 inches

P_{360} = 2.35 inches

P_{1440} = 2.75 inches

DEPTH (INCHES) @ 10-YEAR STORM

P_{60} = 2.01 x 0.667
= 1.34 inches

P_{360} = 1.57

P_{1440} = 1.83

See the summary output from AHYMO calculations.

Drainage Basins

Proposed

BASIN	AREA (SF)	AREA (AC)	AREA (MI^2)
1	16915.75	0.3883	0.000607
2	14161.57	0.3251	0.000508
3	22400.03	0.5142	0.000803
4	38440.66	0.8825	0.001379
5	79504.81	1.8252	0.002852
6	28324.45	0.6502	0.001016
7	16810.68	0.3859	0.000603
8	17507.64	0.4019	0.000628
Total	234065.59	5.3734	0.008396

Existing

BASIN	AREA (SF)	AREA (AC)	AREA (MI^2)
1	234065.59	5.3734	0.008396

Runoff Calculation Results

Proposed

BASIN	Q-100 CFS	Q-10 CFS	V-100 AC-FT	V-10 AC-FT
1	1.75	1.13	0.064	0.040
2	1.47	0.95	0.054	0.033
3	2.31	1.49	0.085	0.053
4	3.95	0.26	0.146	0.009
5	8.15	5.28	0.301	0.187
6	2.92	1.89	0.107	0.067
7	1.74	1.12	0.064	0.040
8	1.81	1.17	0.066	0.041
Total	24.10	13.29	0.887	0.470

Existing

BASIN	Q-100 CFS	Q-10 CFS	V-100 AC-FT	V-10 AC-FT
1	12.25	5.03	0.348	0.125

Pond Summary

Pond	Type of Inlet	Basin Q (cfs)	Q out (cfs)	Depth * (ft)	Max WSE	Max Storage (ac-ft)	Max Storage (ft^3)	Orifice Size (in)	Pipe Size (in)
1	Single 'D'	1.75	1.69	1.00	86.54	0.0632	2752.99	6.00	10
2	Single 'D'	1.47	1.47	0.50	86.54	0.0211	919.12	None	8
3	Single 'D'	2.31	0.40	1.00	85.78	0.0538	2343.53	2.875	6
4	Single 'D'	3.95	0.61	1.50	84.88	0.1450	6316.20	2.875	6
5	Single 'D'	8.15	0.44	2.50	84.69	0.6020	26223.12	2.500	8
6	Single 'D'	2.71	1.06	1.00	90.70	0.0708	3084.05	4.00	8
7	Single 'D'	1.66	1.62	1.00	89.79	0.0012	52.27	6.00	8
8	Single 'D'	1.77	1.00	1.25	87.92	0.0766	3336.70	4.13	8

* Depth from top of pond to top of grate. Does not include depth of drop inlet.

VOLUME CALCULATIONS

Ponds 1 and 2

	Botton Area (ft^2)	Top Area (ft^2)	Total Depth (ft)	C	Orifice Diameter (in)	Orifice Area (ft^2)
Pond 1	6.80	5,457.07	1.00	5450.27	6	0.1963495
Pond 2	6.80	3,622.47	0.50	7231.34		

Elev.	Depth (ft)		Volume (ac-ft)			Q (cfs)
	Pond 1	Pond 2	Pond 1	Pond 2	Combined	
83.1	0	0	0		0.0000	0.0000
84.7	1.6	0	0.0002		0.0002	1.0985
86.00	2.9	1.3	0.0005	0.0002	0.0007	1.5390
86.20	3.1	1.5	0.0030	0.0002	0.0032	1.5961
86.40	3.3	1.7	0.0105	0.0003	0.0108	1.6511
86.60	3.5	1.9	0.0231	0.0003	0.0234	1.7044
86.75	3.65	2.05	0.0358	0.0003	0.0361	1.7433
86.80	3.7	2.1	0.0406	0.0005	0.0412	1.7560
86.95	3.85	2.25	0.0571	0.0037	0.0607	1.7938
87.00	3.9	2.3	0.0632	0.0055	0.0687	1.8062
87.15		2.45		0.0137	0.0137	1.8430
87.25		2.55		0.0211	0.0211	1.8671

<u>Orifice Equation</u>

Q = CA SQRT(2gH)

C = 0.6

A = Area

g = 32.2

H (Ft) = Depth of water above center of orifice

Q (CFS)= Flow

<u>Volume Calculation</u>

Ab - Bottom Of The Pond Surface Area

At - Top Of The Pond Surface Area

D - Water Depth

Dt - Total Pond Depth

C - Change In Surface Area / Water Depth

Volume = Ab * D + 0.5 * C * D^2

C = (At - Ab) / Dt

VOLUME CALCULATIONS

POND 3

Ab - Bottom Of The Pond Surface Area
At - Top Of The Pond Surface Area
D - Water Depth
Dt - Total Pond Depth
C - Change In Surface Area / Water Depth

Volume = Ab * D + 0.5 * C * D^2
C = (At - Ab) / Dt

Ab =	6.80
At =	4,645.23
Dt =	1.00
C =	4638.43

ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	Q (CFS)
82.34	0	0	0.0000
84.84	2.5	0.0004	0.3349
85.04	2.7	0.0026	0.3487
85.24	2.9	0.0090	0.3619
85.44	3.1	0.0197	0.3747
85.64	3.3	0.0346	0.3871
85.84	3.5	0.0538	0.3991

<u>Orifice Equation</u>
Q = CA SQRT(2gH)

C =	0.6
Diameter (in	2.875
Area (ft^2)=	0.045082
g =	32.2
H (Ft) =	Depth of water above center of orifice
Q (CFS)=	Flow

VOLUME CALCULATIONS

POND 4

Ab - Bottom Of The Pond Surface Area
At - Top Of The Pond Surface Area
D - Water Depth
Dt - Total Pond Depth
C - Change In Surface Area / Water Depth

Volume = Ab * D + 0.5 * C * D^2
C = (At - Ab) / Dt

Ab	=	6.80
At	=	8,353.04
Dt	=	1.50
C	=	5564.16

ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	Q (CFS)
80.14	0	0	0.0000
83.55	6.58	0.0010	0.5517
83.75	6.78	0.0036	0.5602
83.95	6.98	0.0113	0.5685
84.15	7.18	0.0241	0.5768
84.35	7.38	0.0420	0.5849
84.55	7.58	0.0651	0.5929
84.75	7.78	0.0932	0.6008
84.95	7.98	0.1264	0.6086
85.05	8.08	0.1450	0.6124

<u>Orifice Equation</u>
Q = CA SQRT(2gH)

C =	0.6
Diameter (in	2.875
Area (ft^2)=	0.045082
g =	32.2
H (Ft) =	Depth of water above center of orifice
Q (CFS)=	Flow .

VOLUME CALCULATIONS

POND 5

Ab - Bottom Of The Pond Surface Area
At - Top Of The Pond Surface Area
D - Water Depth
Dt - Total Pond Depth
C - Change In Surface Area / Water Depth

Volume = Ab * D + 0.5 * C * D^2
C = (At - Ab) / Dt

Ab =	6.80
At =	20,944.16
Dt =	2.50
C =	8374.94

ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	Q (CFS)
77.39	0	0	0.0000
82.22	4.83	0.0008	0.3568
82.42	5.03	0.0046	0.3643
82.62	5.23	0.0162	0.3716
82.82	5.43	0.0355	0.3788
83.02	5.63	0.0624	0.3858
83.22	5.83	0.0970	0.3928
83.42	6.03	0.1394	0.3996
83.62	6.23	0.1894	0.4062
83.82	6.43	0.2471	0.4128
84.02	6.63	0.3125	0.4193
84.22	6.83	0.3856	0.4257
84.42	7.03	0.4664	0.4320
84.62	7.23	0.5548	0.4381
84.72	7.33	0.6020	0.4412

<u>Orifice Equation</u>
Q = CA SQRT(2gH)

C =	0.6
Diameter (in	2.5
Area (ft^2)=	0.034088
g =	32.2
H (Ft) =	Depth of water above center of orifice
Q (CFS)=	Flow

VOLUME CALCULATIONS

POND 6

Ab - Bottom Of The Pond Surface Area
At - Top Of The Pond Surface Area
D - Water Depth
Dt - Total Pond Depth
C - Change In Surface Area / Water Depth

Volume = $Ab * D + 0.5 * C * D^2$
C = (At - Ab) / Dt

Ab =	6.80
At =	6,083.01
Dt =	1.00
C =	6076.21

ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	Q (CFS)
84.17	0	0	0.0000
89.70	5.53	0.0009	0.9731
89.90	5.73	0.0037	0.9911
90.10	5.93	0.0121	1.0087
90.30	6.13	0.0261	1.0261
90.50	6.33	0.0456	1.0432
90.70	6.53	0.0708	1.0599

<u>Orifice Equation</u>
Q = CA SQRT(2gH)

C =	0.6
Diameter (in	4
Area (ft^2)=	0.087266
g =	32.2
H (Ft) =	Depth of water above center of orifice
Q (CFS)=	Flow

VOLUME CALCULATIONS

POND 7

Ab - Bottom Of The Pond Surface Area
At - Top Of The Pond Surface Area
D - Water Depth
Dt - Total Pond Depth
C - Change In Surface Area / Water Depth

Volume = Ab * D + 0.5 * C * D^2
C = (At - Ab) / Dt

Ab =	6.80
At =	245.73
Dt =	1.00
C =	238.93

ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	Q (CFS)
86.6	0	0	0.0000
89.60	3	0.0005	1.5678
89.80	3.2	0.0006	1.6238
90.00	3.4	0.0010	1.6780
90.10	3.5	0.0012	1.7044

<u>Orifice Equation</u>
Q = CA SQRT(2gH)

C =	0.6
Diameter (in	6
Area (ft^2)=	0.19635
g =	32.2
H (Ft) =	Depth of water above center of orifice
Q (CFS)=	Flow

VOLUME CALCULATIONS

POND 8

Ab - Bottom Of The Pond Surface Area
At - Top Of The Pond Surface Area
D - Water Depth
Dt - Total Pond Depth
C - Change In Surface Area / Water Depth

Volume = Ab * D + 0.5 * C * D^2
C = (At - Ab) / Dt

Ab =	6.80
At =	5,290.25
Dt =	1.25
C =	4226.76

ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	Q (CFS)
82.72	0	0	0.0000
86.74	4.02	0.0006	0.8766
86.94	4.22	0.0026	0.8991
87.14	4.42	0.0085	0.9210
87.34	4.62	0.0182	0.9424
87.54	4.82	0.0318	0.9634
87.74	5.02	0.0493	0.9839
87.94	5.22	0.0707	1.0040
87.99	5.27	0.0766	1.0090

<u>Orifice Equation</u>
Q = CA SQRT(2gH)

C =	0.6
Diameter (in	4.125
Area (ft^2)=	0.092806
g =	32.2
H (Ft) =	Depth of water above center of orifice
Q (CFS)=	Flow

Storm Drain Inlet Grate Capacity

Single 'D'

Area of Grate

Double 'D' Length = 6 ft- 4.75 in
= 6.395833' / 2

Single 'D' Length = 3.20 ft

Width = 2 ft-1.5 in
= 2.125'

Area = 2.125 x 3.20
= 6.80 ft^2

Effective Area of Grate

Length = 38.375" - 7(1/2" $_{\text{middle bars}}$)
= 34.875"
= 2.906'

Width = 25.5" - 13(1/2" $_{\text{middle bars}}$)
= 19"
= 1.583'

Area = 1.583 x 2.906
= 4.601 ft^2

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

DROP INLET CALCULATIONS

ORIFICE EQUATION

Q = CA sqrt(2gH)

C = 0.6

g = 32.2

POND	TYPE OF INLET	AREA (SF)	Q (CFS)	H (FT)	H ALLOW (FT)
1	Single 'D'	2.30	1.75	0.0250	1
2	Single 'D'	2.30	1.47	0.0176	0.64
3	Single 'D'	2.30	2.31	0.0435	1
4	Single 'D'	2.30	3.95	0.1272	1.5
5	Single 'D'	2.30	8.15	0.5416	2.5
6	Single 'D'	2.30	2.71	0.0599	1
7	Single 'D'	2.30	1.66	0.0225	1
8	Single 'D'	2.30	1.77	0.0255	1.25

Sample Problem

Pond 1:

H = (Q/CA)^2 / (2g)

H = (1.75/0.6*2.30) ^ 2 / (2*32.2)

H = 0.0250

Depth of Pond = 1', therefore height of water on top of inlet of 0.0250' is okay.

Storm Drain Inlet Grate Capacity

Single 'D'

Area of Grate

Double 'D' Length = 6 ft- 4.75 in
= 6.395833' / 2

Single 'D' Length = 3.20 ft

Width = 2 ft-1.5 in
= 2.125'

Area = 2.125 x 3.20
= 6.80 ft^2

Effective Area of Grate

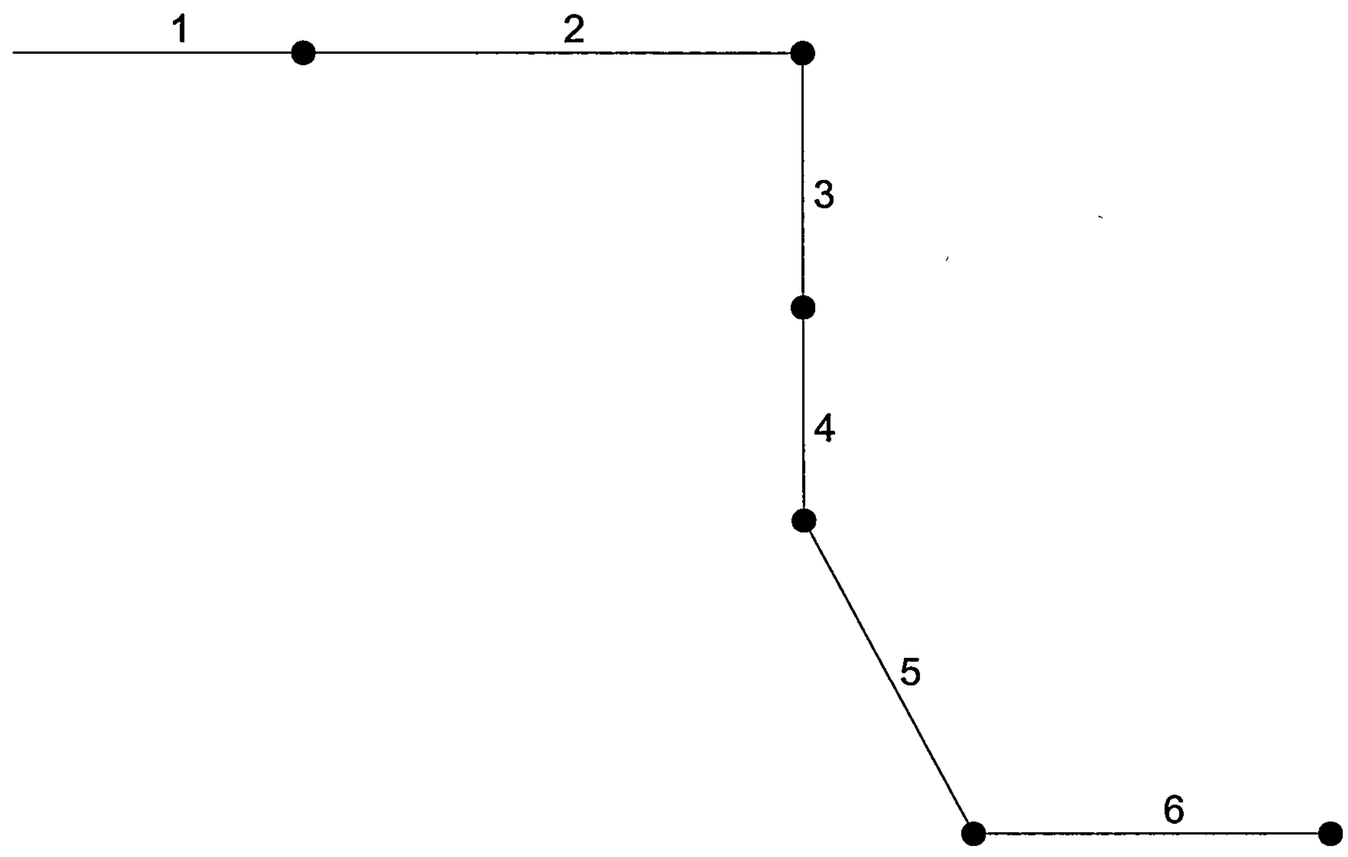
Length = 38.375" - 7(1/2" $_{\text{middle bars}}$)
= 34.875"
= 2.906'

Width = 25.5" - 13(1/2" $_{\text{middle bars}}$)
= 19"
= 1.583'

Area = 1.583 x 2.906
= 4.601 ft^2

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

Plan View



Proj. file: 9948-RT1.STM	IDF file: SAMPLE.IDF	No. Lines: 6	07-15-1999

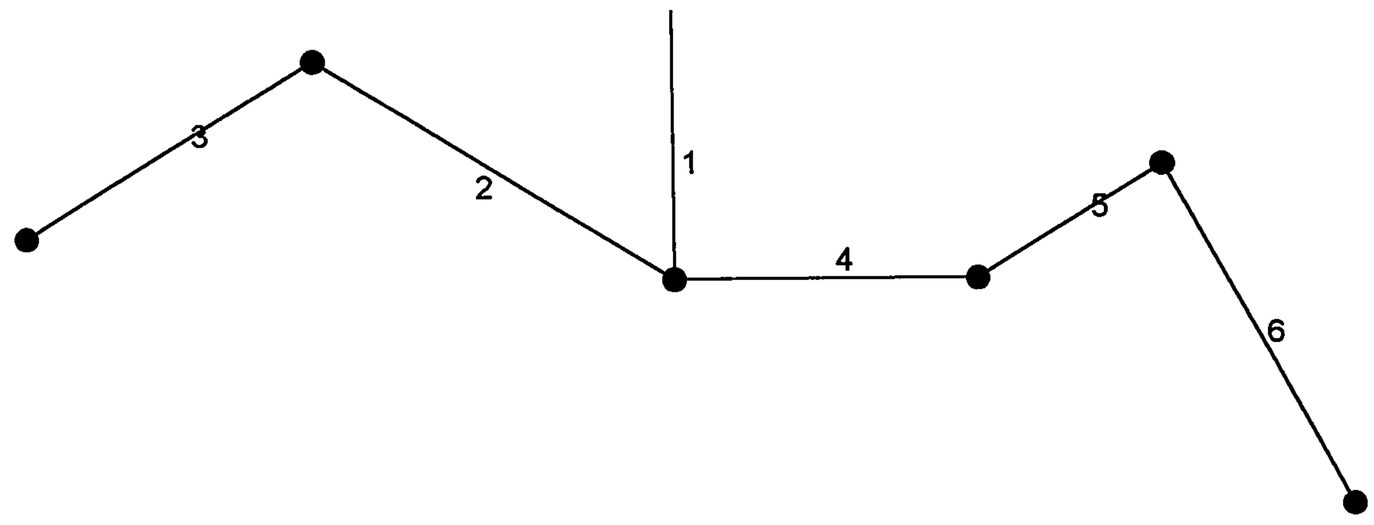
Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	Dns line No.
1	OUT TO CB-1	0.14	8 c	99.2	78.40	79.39	0.998	79.07	79.57	0.06	End
2	CB1 TO CB2	0.14	8 c	170.8	79.39	81.30	1.118	79.62	81.48	0.06	1
3	CB2 TO CB3	0.14	8 c	80.9	81.30	82.21	1.124	81.53	82.39	0.06	2
4	CB3 TO CB4	0.14	8 c	68.2	82.21	82.90	1.012	82.44	83.08	0.06	3
5	CB4 TO DI1	1.59	10 c	115.0	82.90	83.10	0.174	83.46*	84.37*	0.13	4
6	DI1 TO DI2	1.42	8 c	122.0	83.10	83.71	0.500	84.50*	86.19*	0.26	5

PROJECT FILE: 9948-RT1.STM | I-D-F FILE: SAMPLE.IDF | TOTAL NO. LINES: 6 | RUN DATE: 01-10-2000

NOTES: c = circular; e = elliptical; b = box; Return period = 100 Yrs.; * Indicates surcharge condition.

Plan View



Proj. file: 9948-RT2.STM	IDF file: SAMPLE.IDF	No. Lines: 6	01-10-2000

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	Dns line No.
1	EX TO DI5	0.50	8 c	160.0	75.74	77.39	1.031	76.41	77.72	0.13	End
2	DI5 TO DI4	0.63	6 c	263.0	77.39	80.14	1.046	77.85*	80.96*	0.16	1
3	DI4 TO DI3	0.42	6 c	210.0	80.14	82.34	1.048	81.12	82.67	0.15	2
4	DI5 TO DI8	0.97	8 c	193.0	77.39	82.72	2.762	77.72	83.05	0.47	1
5	DI8 TO DI6	1.06	8 c	135.0	82.72	84.17	1.074	83.53	84.66	0.23	4
6	DI6 TO DI7	1.61	8 c	235.0	84.17	86.60	1.034	84.89*	89.07*	0.33	5

PROJECT FILE: 9948-RT2.STM | I-D-F FILE: SAMPLE.IDF | TOTAL NO. LINES: 6 | RUN DATE: 01-10-2000

NOTES: c = circular; e = elliptical; b = box; Return period = 100 Yrs.; * Indicates surcharge condition.

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =01/04/2000
INPUT FILE = a:e.dat USER NO.= R_BOHANN.I01

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
START										TIME= .00
RAINFALL TYPE= 1										RAIN6= 2.350
COMPUTE NM HYD	100.10	-	1	.00840	12.25	.348	.77821	1.533	2.279	PER IMP= .00
START										TIME= .00
RAINFALL TYPE= 1										RAIN6= 1.570
COMPUTE NM HYD	110.10	-	1	.00840	5.03	.125	.27828	1.533	.935	PER IMP= .00
FINISH										

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =07/13/1999
INPUT FILE = a:p.dat USER NO.= R_BOHANN.I01

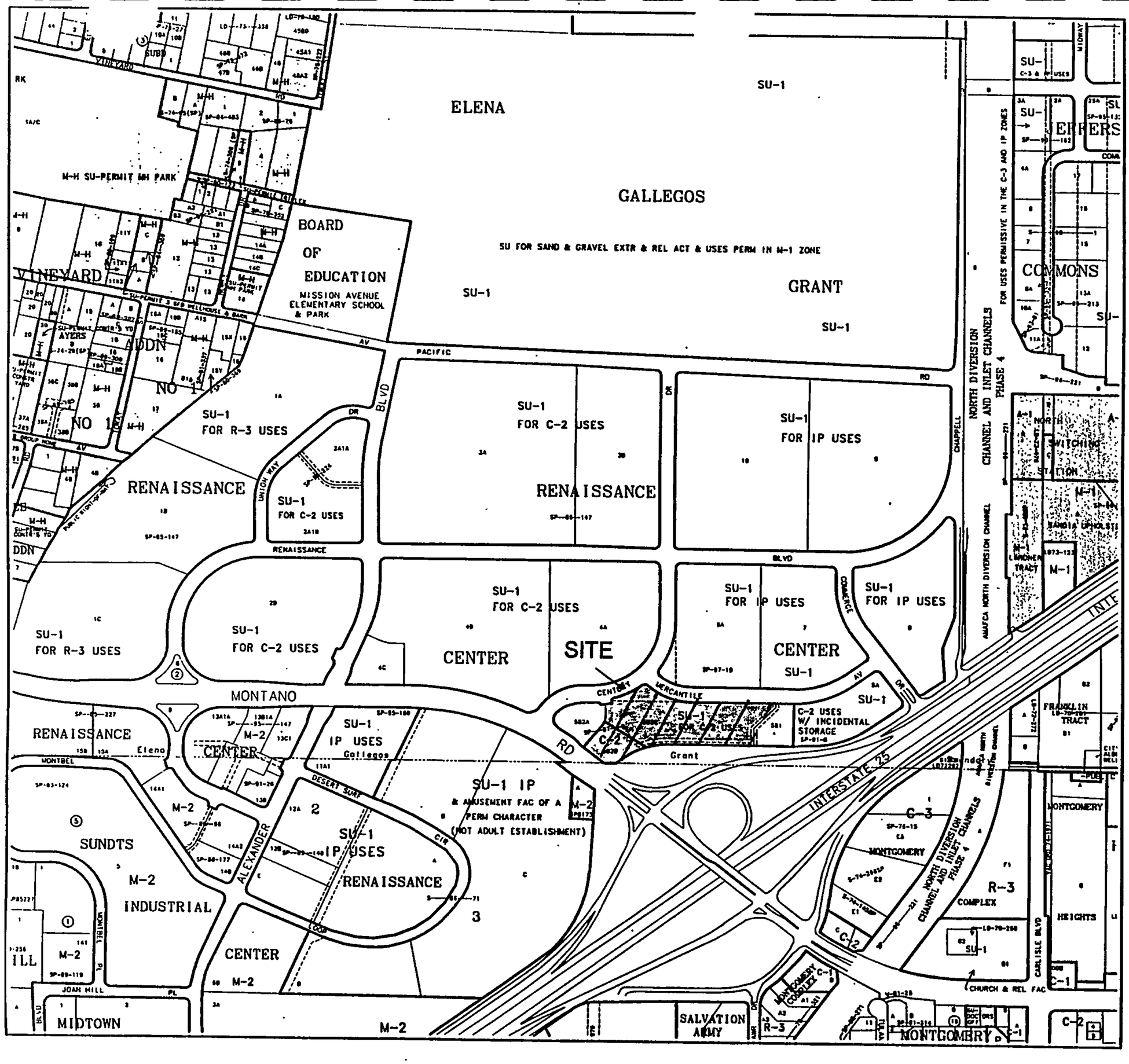
COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	PAGE = 1 NOTATION
START										TIME= .00
RAINFALL TYPE= 1										RAIN6= 2.350
COMPUTE NM HYD	100.10	-	1	.00061	1.75	.064	1.98165	1.500	4.503	PER IMP= 90.00
COMPUTE NM HYD	100.20	-	1	.00051	1.47	.054	1.98165	1.500	4.511	PER IMP= 90.00
COMPUTE NM HYD	100.30	-	1	.00080	2.31	.085	1.98165	1.500	4.491	PER IMP= 90.00
COMPUTE NM HYD	100.40	-	1	.00138	3.95	.146	1.98165	1.500	4.477	PER IMP= 90.00
COMPUTE NM HYD	100.50	-	1	.00285	8.15	.301	1.98165	1.500	4.467	PER IMP= 90.00
COMPUTE NM HYD	100.60	-	1	.00102	2.92	.107	1.98165	1.500	4.485	PER IMP= 90.00
COMPUTE NM HYD	100.70	-	1	.00060	1.74	.064	1.98165	1.500	4.503	PER IMP= 90.00
COMPUTE NM HYD	100.80	-	1	.00063	1.81	.066	1.98165	1.500	4.503	PER IMP= 90.00
START										TIME= .00
RAINFALL TYPE= 1										RAIN6= 1.570
COMPUTE NM HYD	110.10	-	1	.00061	1.13	.040	1.23172	1.500	2.911	PER IMP= 90.00
COMPUTE NM HYD	110.20	-	1	.00051	.95	.033	1.23172	1.500	2.916	PER IMP= 90.00
COMPUTE NM HYD	110.30	-	1	.00080	1.49	.053	1.23172	1.500	2.904	PER IMP= 90.00
COMPUTE NM HYD	110.20	-	1	.00014	.26	.009	1.23171	1.500	2.969	PER IMP= 90.00
COMPUTE NM HYD	110.50	-	1	.00285	5.28	.187	1.23172	1.500	2.891	PER IMP= 90.00
COMPUTE NM HYD	110.60	-	1	.00102	1.89	.067	1.23172	1.500	2.901	PER IMP= 90.00
COMPUTE NM HYD	110.70	-	1	.00060	1.12	.040	1.23172	1.500	2.911	PER IMP= 90.00
COMPUTE NM HYD	110.80	-	1	.00063	1.17	.041	1.23172	1.500	2.910	PER IMP= 90.00
FINISH										

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =01/04/2000
INPUT FILE = A:JUNK.DAT USER NO.= R_BOHANN.I01

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION	
START										TIME=	.00
RAINFALL TYPE= 2										RAIN24=	2.750
COMPUTE NM HYD	100.20	-	2	.00051	1.47	.062	2.27937	1.500	4.511	PER IMP=	90.00
COMPUTE NM HYD	100.10	-	1	.00061	1.75	.074	2.27935	1.500	4.503	PER IMP=	90.00
ADD HYD	102.10	1& 2	1	.00112	3.22	.136	2.27936	1.500	4.506		
ROUTE RESERVOIR	501.10	1	2	.00112	1.69	.136	2.27927	1.667	2.366	AC-FT=	.020
COMPUTE NM HYD	100.90	-	1	.00175	5.02	.213	2.27930	1.500	4.472	PER IMP=	90.00
ADD HYD	102.10	1& 2	1	.00287	6.66	.349	2.27929	1.500	3.626		
ROUTE RESERVOIR	501.10	1	2	.00287	.14	.217	1.41902	1.400	.076	AC-FT=	.291
FINISH											

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =01/07/2000
INPUT FILE = a:pond2.dat USER NO.= R_BOHANN.I01

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION	
START										TIME=	.00
RAINFALL TYPE= 2										RAIN24=	2.750
COMPUTE NM HYD	100.30	-	3	.00080	2.31	.098	2.27933	1.500	4.491	PER IMP=	90.00
ROUTE RESERVOIR	501.30	3	1	.00080	.40	.098	2.27911	2.100	.769	AC-FT=	.048
COMPUTE NM HYD	100.40	-	4	.00138	3.95	.168	2.27931	1.500	4.477	PER IMP=	90.00
ADD HYD	103.40	1& 4	4	.00218	4.32	.265	2.27923	1.500	3.095		
ROUTE RESERVOIR	501.40	4	1	.00218	.61	.265	2.27889	2.300	.434	AC-FT=	.115
COMPUTE NM HYD	100.70	-	7	.00058	1.66	.070	2.27935	1.500	4.505	PER IMP=	90.00
ROUTE RESERVOIR	501.70	7	2	.00058	1.62	.070	2.27929	1.533	4.397	AC-FT=	.001
COMPUTE NM HYD	100.60	-	6	.00094	2.71	.115	2.27932	1.500	4.486	PER IMP=	90.00
ADD HYD	107.60	6& 2	6	.00152	4.32	.185	2.27931	1.500	4.445		
ROUTE RESERVOIR	501.60	6	3	.00152	1.06	.185	2.28172	2.000	1.089	AC-FT=	.071
COMPUTE NM HYD	100.80	-	8	.00062	1.77	.075	2.27935	1.500	4.503	PER IMP=	90.00
ADD HYD	108.60	3& 8	8	.00214	2.80	.260	2.28104	1.500	2.048		
ROUTE RESERVOIR	501.80	8	3	.00214	1.00	.260	2.28210	3.033	.734	AC-FT=	.069
COMPUTE NM HYD	100.50	-	5	.00285	8.15	.347	2.27929	1.500	4.467	PER IMP=	90.00
ADD HYD	108.50	5& 3	5	.00499	9.10	.607	2.28049	1.500	2.850		
ADD HYD	105.40	5& 1	5	.00717	9.68	.872	2.28001	1.500	2.110		
ROUTE RESERVOIR	501.50	5	3	.00717	.44	.662	1.73222	5.933	.096	AC-FT=	.587
FINISH											



GRAPHIC SCALE IN FEET

250 0 500 1000

CITY OF Albuquerque

Albuquerque Geographic Information System

PLANNING DEPARTMENT

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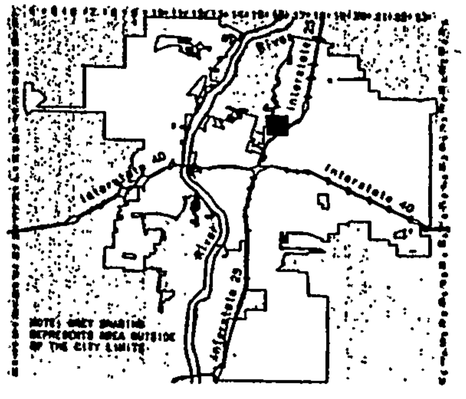
Map Amended through February 15, 1997



LEGAL DESCRIPTION

T11N

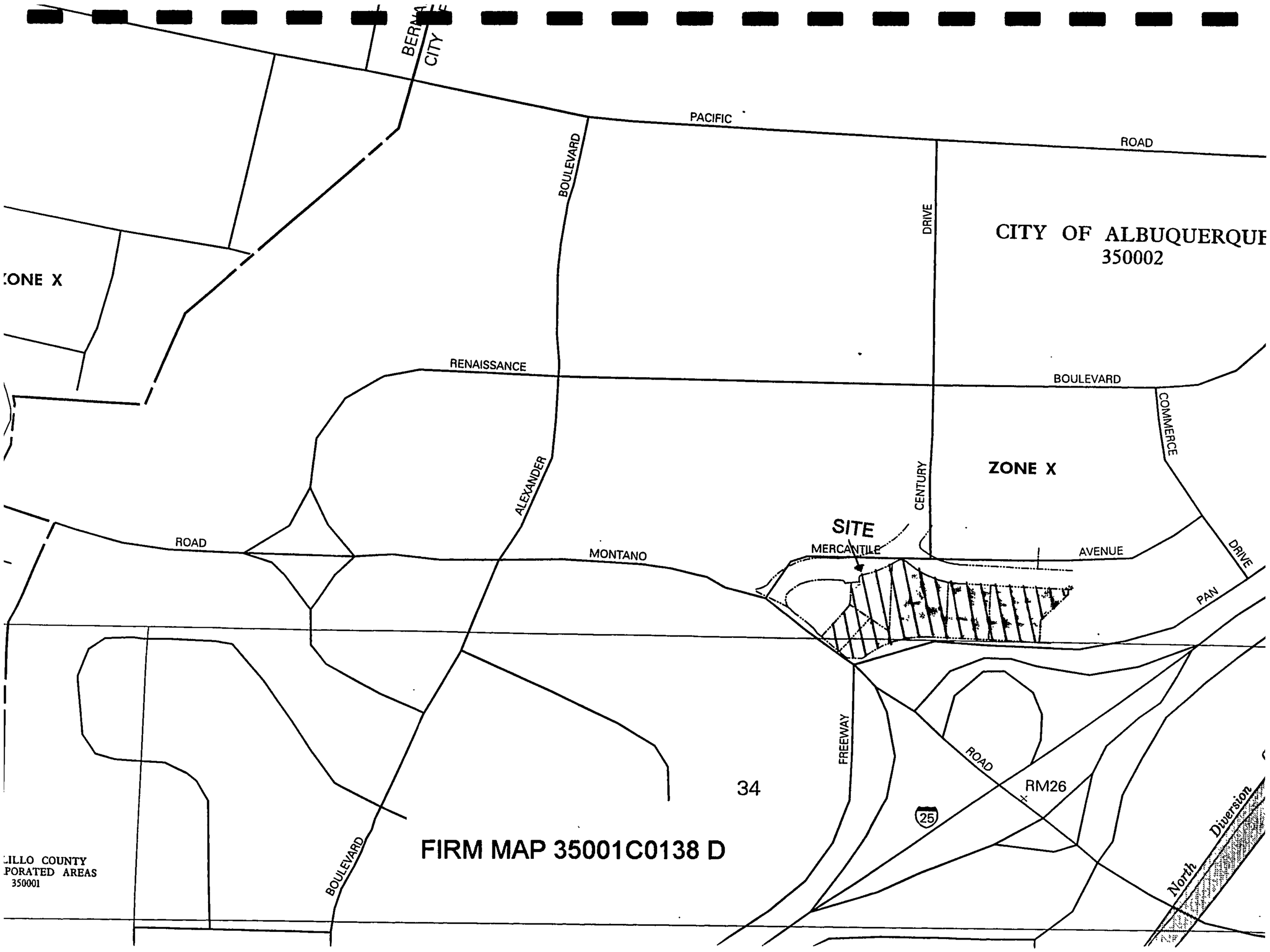
R3E

SEC 34

UNIFORM PROPERTY CODE

1-016-061

F-16-Z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