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

July 27, 1995

Ronald R. Bohannan
Tierra West Development Management Service
4421 McLeod Road NE
Suite D
Albuquerque, NM 87109

RE: BOOBERRY MOBILE HOME SUBDIVISION (M21/D6A) DRAINAGE REPORT FOR PRELIMINARY PLAT APPROVAL AND SITE DEVELOPMENT PLAN FOR SUBDIVISION APPROVAL. ENGINEER'S STAMP DATED 6-30-95.

Dear Mr. Bohannan:

Based on the information provided on your July 14, 1995 submittal, the above referenced site is approved for Preliminary Plat and Site Development for Subdivision.

I have enclosed a copy of Pond Design Criteria for your reference. Please note that all retention ponds over 18 inches deep require a safety fence.

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

Sincerely,

Lisa Ann Manwill
Engineering Associate

c: File
Andrew Garcia

LAM/lam

Enclosure

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

DRAINAGE INFORMATION SHEET

PROJECT TITLE: *BOOBERRY MOBILE HOME SUBDIVISION* ZONE ATLAS/DRNG. FILE #: *M-21 / U G A*

DRB #: _____ EPC #: *Z-95-69* WORK ORDER #: _____

LEGAL DESCRIPTION: *RECO CORPORATION*

CITY ADDRESS: _____

ENGINEERING FIRM: *TIERRA WEST DEV. MAGT. SER.* CONTACT: *RONALD R. BOHANNAN OR SHAHAB BIAZAR*

ADDRESS: *4421 McCleod Rd. NE Suite D, 87109* PHONE: *(505) 883-7592*

OWNER: *HEIGHTS REALTY LTD.* CONTACT: *TIM EICHENBERG*

ADDRESS: *1305 SAN PEDRO, NE, ALB., 87110* PHONE: *(505) 265-7555*

ARCHITECT: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

SURVEYOR: *PRECISION SURVEYING* CONTACT: *LARRY MEDRANO*

ADDRESS: _____ PHONE: *(505) 839-0569*

CONTRACTOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

TYPE OF SUBMITTAL:

- X DRAINAGE REPORT
- ___ DRAINAGE PLAN
- ___ CONCEPTUAL GRADING & DRAINAGE PLAN
- ___ GRADING PLAN
- ___ EROSION CONTROL PLAN
- ___ ENGINEER'S CERTIFICATION
- ___ OTHER

PRE-DESIGN MEETING:

- X YES
- ___ NO
- ___ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

- ___ SKETCH PLAN APPROVAL
- X PRELIMINARY PLAT APPROVAL
- X S. DEV. PLAN FOR SUB'D. APPROVAL
- ___ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
- ___ SECTOR PLAN APPROVAL
- ___ FINAL PLAN APPROVAL
- ___ FOUNDATION PERMIT APPROVAL
- ___ BUILDING PERMIT APPROVAL
- ___ CERTIFICATE OF OCCUPANCY APPROVAL
- ___ GRADING PERMIT APPROVAL
- ___ PAVING PERMIT APPROVAL
- ___ S. A. D. DRAINAGE REPORT
- ___ DRAINAGE REQUIREMENTS
- ___ OTHER _____ (SPECIFY)

DATE SUBMITTED: *07 / 12 / 95*

BY: *SHAHAB BIAZAR*

RECEIVED
JUL 14 1995
HYDROLOGY DIVISION

DRAINAGE REPORT

FOR

"BOOBERRY" MOBILE HOME SUBDIVISION

Prepared by

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

Prepared for

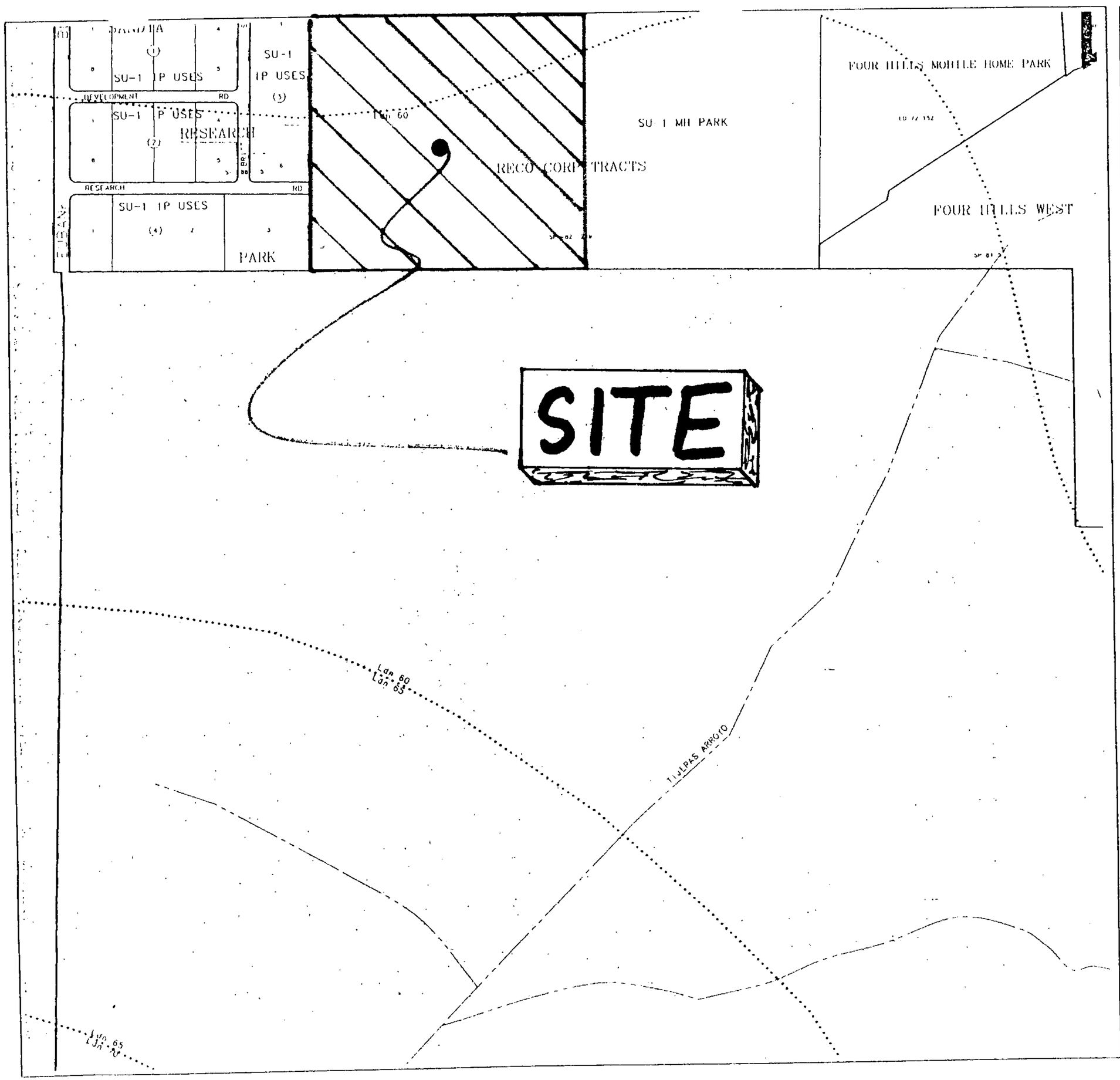
Tim Eichenberg
Heights Realty Ltd.
1305 San Pedro, NE
Albuquerque, New Mexico 87110

JULY, 1995

RECEIVED
JUL 14 1995
HYDROLOGY DIVISION

Ronald R. Bohannan P.E. No. 7868

RONALD RAY BOHANNAN
NEW MEXICO
7868
REGISTERED PROFESSIONAL ENGINEER



SCALE IN FEET

250 0 500 1000

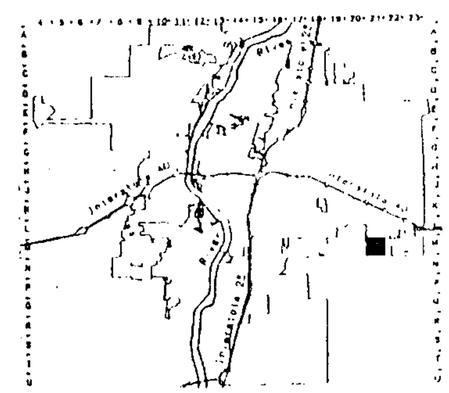
PHOTOCOPY-NOT TO SCALE

North

AGIS

© Planning Department

Map Amended through July 29, 1993



LEGAL DESCRIPTION

T10N

R4E

SEC 28

UNIFORM PROPERTY CODE

1-021 065

M-21-Z

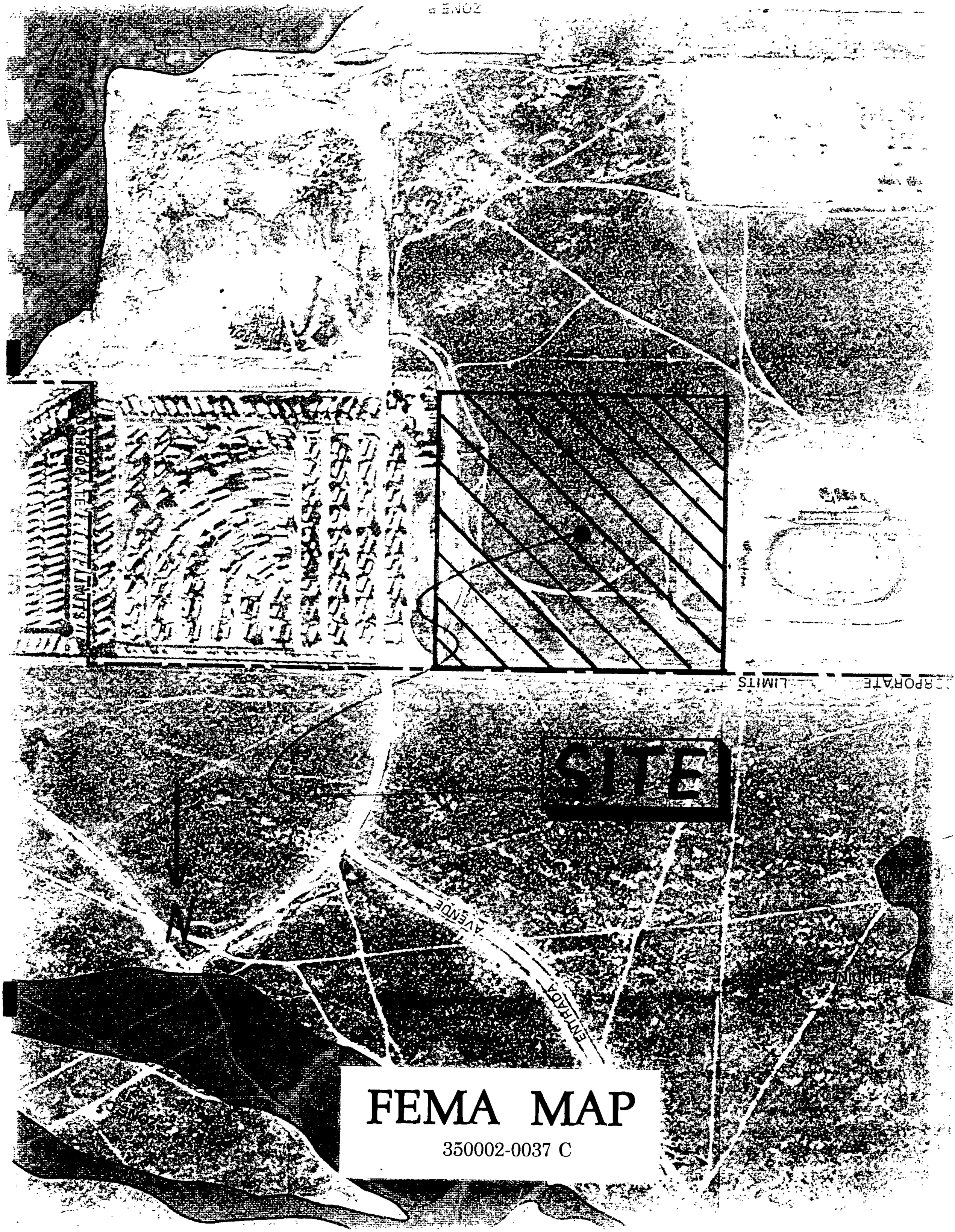
LOCATION AND LOCATION MAP

Booberry Mobile Home Subdivion is a 217 units Mobile Home subdivision. The site is Reco Corporation Tract located approximately 1100 feet east of Eubank Boulevard and south side of Gibson Boulevard containing 40.11 acres. See highlighted Vicinity Map M-21 for location of the site. The purpose of this drainage submittal is to do the drainage analysis for this subdivision. We are requesting that this plan be reviewed for Preliminary Plat, Site Plan for subdivision purpose, and grading and drainage plan approval. The site is currently zoned SU-1 for PRD and is identified as the Reco Corporation Tracts.

EXISTING CONDITIONS

The site currently is undeveloped and sheet flows from east to west to an existing detention pond located on Sandia Research Park just east of Eubank. There is an existing Mobile Home Park (Shaw Mobile Home Park) immediately east of this tract of land which drains to the south and does not impact the site. There are no off-site flows entering the site. The historical undeveloped flow rate from the site amounted to 104.11 cfs. The site is located within FEMA MAP panel # 350002-0037C and does not fall within any existing flood plain.

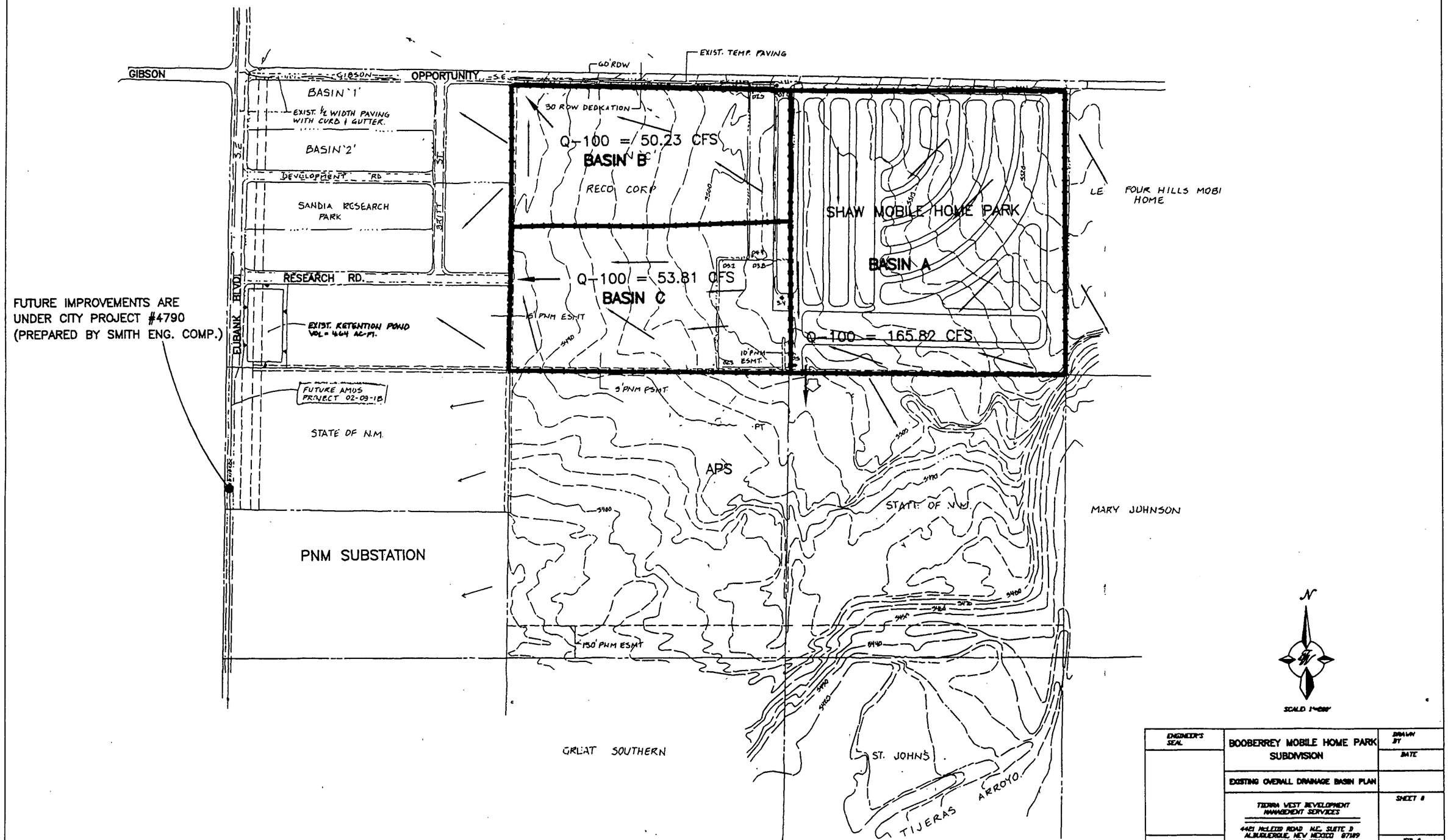
Attached is a copy of drawing on the overall existing drainage basin. Basin A drains west and south with a runoff of 183.92 cfs. Basin B with a runoff of 14.39 cfs sheet flows north to Opportunity Avenue. Basin C with a runoff of 42.65 cfs sheet flows west and north to Opportunity Avenue. Basin D drains to the west to Research Road to an existing retention pond at a flow rate of 42.13 cfs.



FEMA MAP

350002-0037 C

MANZANO MESA



ENGINEER'S SEAL	BOOBERREY MOBILE HOME PARK SUBDIVISION	DRAWN BY
		DATE
	EXISTING OVERALL DRAINAGE BASIN PLAN	
	TIERRA WEST DEVELOPMENT MANAGEMENT SERVICES 4421 McLEOD ROAD N.E. SUITE D ALBUQUERQUE, NEW MEXICO 87109 (505)883-7592	SHEET #
RONALD R. BOHANNAN P.E. 8796		JOB #

ON-SITE DRAINAGE MANAGEMENT PLAN

Based on our last meeting with Fred Aguirre on June 28, 1995, it was decided to pond the entire runoff on site, and design the storm sewer for future full discharge to future storm sewer improvements on Eubank Boulevard (See notes included in this report in Appendix A). The future storm sewer improvements are under City Project #4790 prepared by Smith Engineering Company. The site has been divided into several basins (see Grading & Drainage Plan in map pocket) in order to do street flow capacity analysis. All the basins drain to Cranberry Road, and then from there all the runoff is picked up and carried to a retention pond through a series of drop inlets.

Research Road is used for the emergency overflow where the runoff will drain to the west to an existing detention basin.

INFRASTRUCTURE LIST

A copy of the overall infrastructure list is included as part of this report.

Size	Type Improvement	Location	From	To
36"	Storm Sewer	Cranberry Rd.	Research Rd.	Barberry Rd.
48"	Storm Sewer	Research Rd.	Cranberry Rd.	Pond
48"	Storm Sewer	Research Rd.	Cranberry Rd.	Eubank
	Retention Pond			
	Manholes, Catch basins, and RCP included with Storm Sewer			
	Storm Sewer Modifications			

CALCULATION INDEX

Runoff Calculations

Runoff Summary Tables For The Existing Overall Drainage Basins

Runoff Summary Tables For Subbasins

Drop Inlet, SD-MH, & Drainage Pipe Summary Tables

Street Capacity, Drop Inlet, & Drainage Pipe Calculations

Ponding Calculation

Infrastructure List

100-YR & 10-YR Runoff AHYMO Input and Summary Output
(Under Existing and Proposed Conditions)

100-YR & 10-YR Runoff AHYMO Input and Summary Output
(Existing Overall Drainage Basins)

AHYMO Input & Summary Output files for the Subbasins

Appendix A
(Pre-Design Meeting Letter)

RUNOFF

CALCULATIONS

DRAINAGE CALCULATIONS

The site is @ Zone 3

LAND TREATMENT

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

DEPTH (INCHES) @ 100-YEAR STORM

P_{60} = 2.14 inches

P_{360} = 2.60 inches

P_{1440} = 3.10 inches

DEPTH (INCHES) @ 10-YEAR STORM

P_{60} = 2.14 x 0.667
= 1.43 inches

P_{360} = 1.73

P_{1440} = 2.07

See the following Tables:

BASIN AREA

BASIN	AREA (AC-FT)	AREA (SF)	AREA (MI^2)
ENTIRE SITE	40.11	1747191.60	0.062672

100-YEAR (6-HR) STORM

	PROPOSED		EXISITNG	
BASIN	CFS	AC-FT	CFS	AC-FT
ENTIRE SITE	169.12	6.182	104.11	3.078

10-YEAR (6-HR) STORM

	PROPOSED		EXISITNG	
BASIN	CFS	AC-FT	CFS	AC-FT
ENTIRE SITE	104.66	3.622	46.78	1.188

See the summary output from AHYMO calculations.

RUNOFF

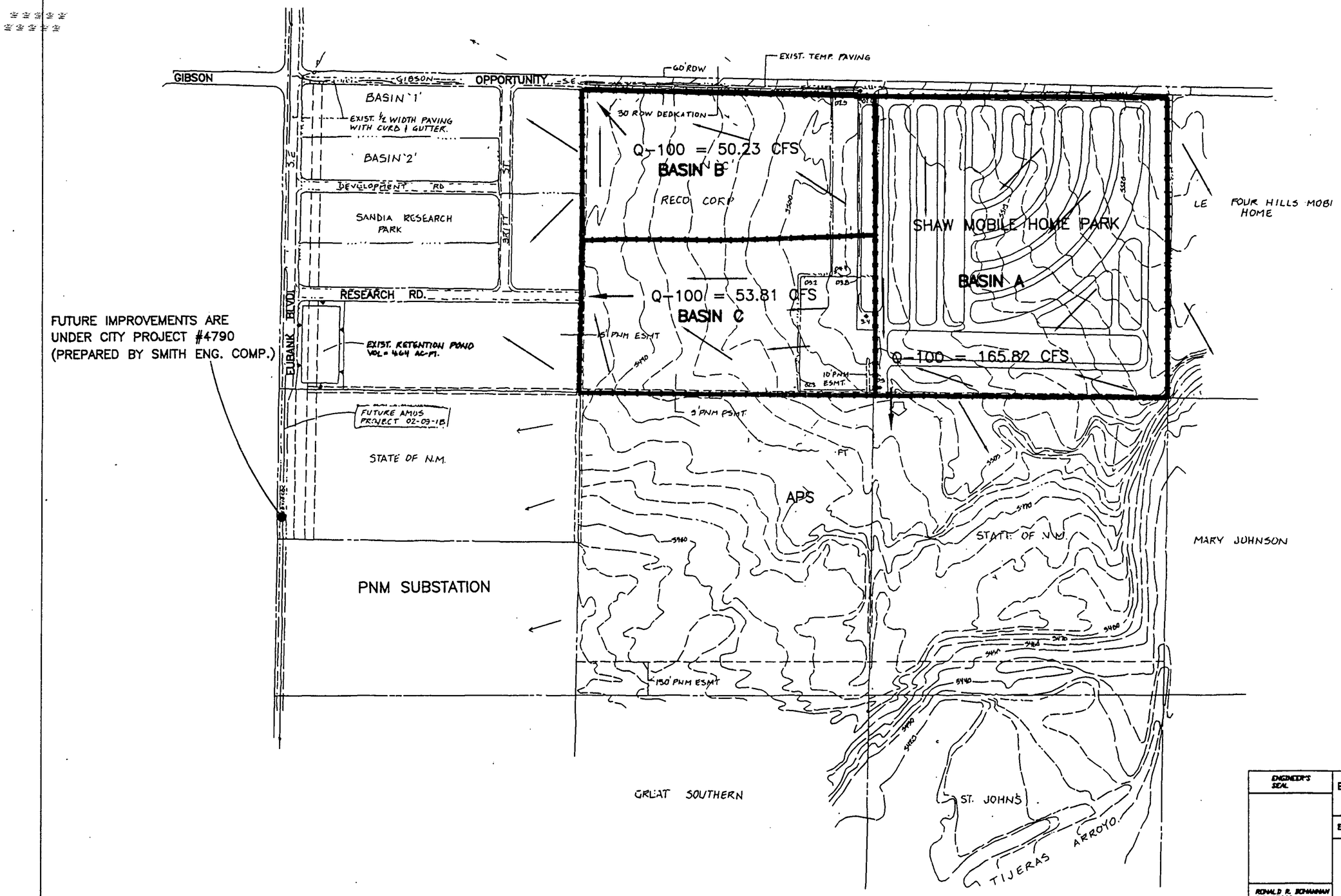
SUMMARY TABLES

FOR THE

EXISTING OVERALL

DRAINAGE BASINS

MANZANO MESA



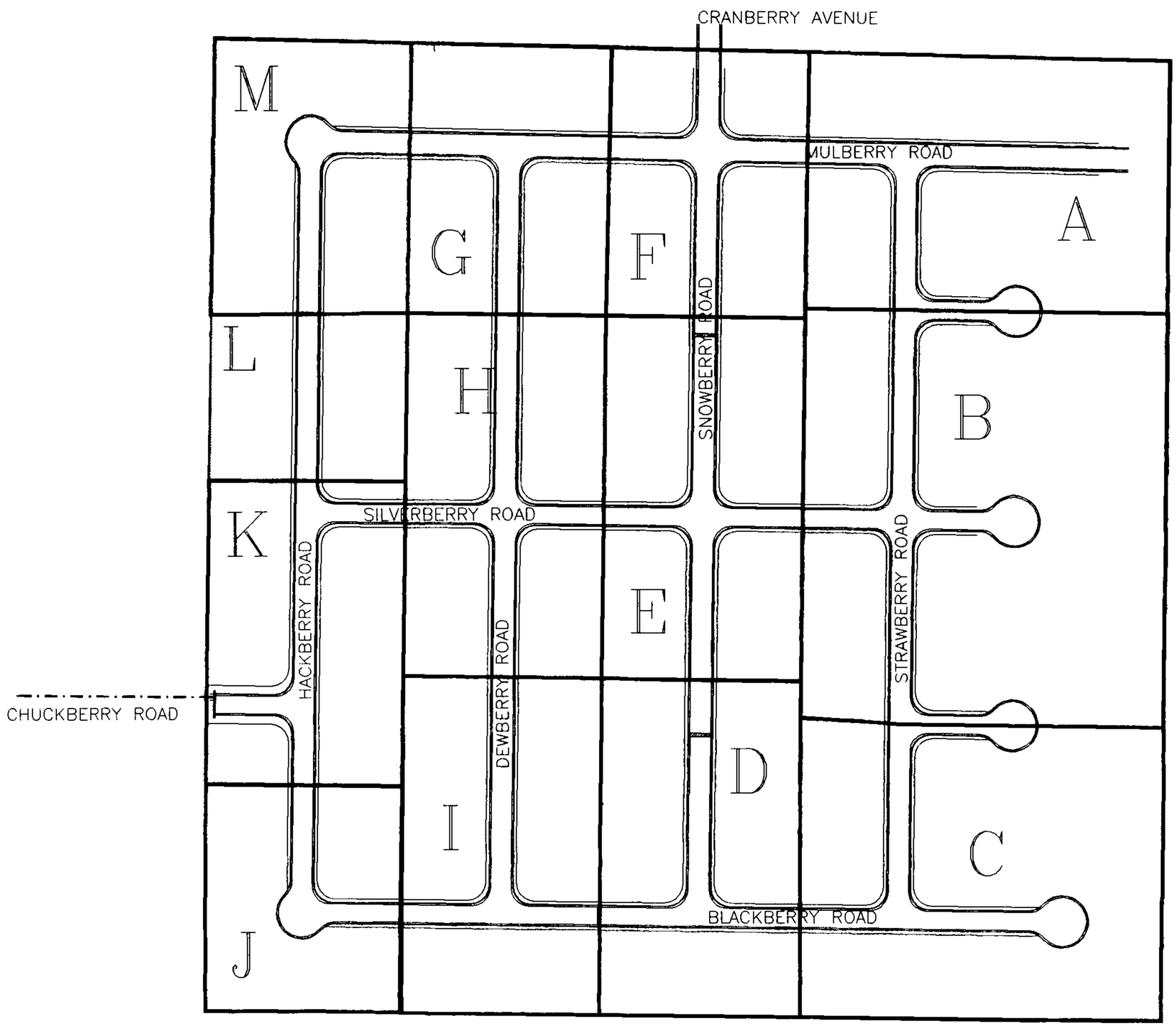
ENGINEER'S SEAL	BOOBERREY MOBILE HOME PARK SUBDIVISION	DRAWN BY
		DATE
	EXISTING OVERALL DRAINAGE BASIN PLAN	
	TIERRA WEST DEVELOPMENT MANAGEMENT SERVICES 4421 McLEOD ROAD N.E. SUITE B ALBUQUERQUE, NEW MEXICO 87109 (505)883-7792	SHEET #
RONALD R. BOHANNAN P.E. 8706G		JOB #

RUNOFF

SUMMARY TABLES

FOR THE

EXISTING THE SUBBASINS



GRAPHIC SCALE

100 0 50 100

SCALE: 1"=100'

ENGINEER'S SEAL	BOOBERRY MOBILE HOME SUBDIVISION	DRAWN BY PVG
		DATE 5-12-95
	SUBBASIN LAYOUT	9513S.DWG
	TIERRA WEST DEVELOPMENT MANAGEMENT SERVICES 4421 McLEOD ROAD, N.E., SUITE D ALBUQUERQUE, NEW MEXICO 87109 (505)883-7592	SHEET # OF
RONALD R BOHANNAN P.E. #7868		JOB # 950013

100\950013\9513S.DWG\PVG\6-21-95

SUBBASIN AREAS

BASIN	AREA (SF)	AREA (AC-FT)	AREA (MI^2)
A	169324.33	3.8871	0.006074
B	278059.39	6.3833	0.009974
C	197505.63	4.5341	0.007085
D	123584.46	2.8371	0.004433
E	133378.67	3.0619	0.004784
F	96730.76	2.2206	0.003470
G	98262.52	2.2558	0.003525
H	133378.67	3.0619	0.004784
I	122858.82	2.8204	0.004407
J	82369.62	1.8909	0.002955
K	111758.64	2.5656	0.004009
L	61285.48	1.4069	0.002198
M	99036.58	2.2736	0.003552

SUBBASIN 100-YR & 10-YR RUNOFFS

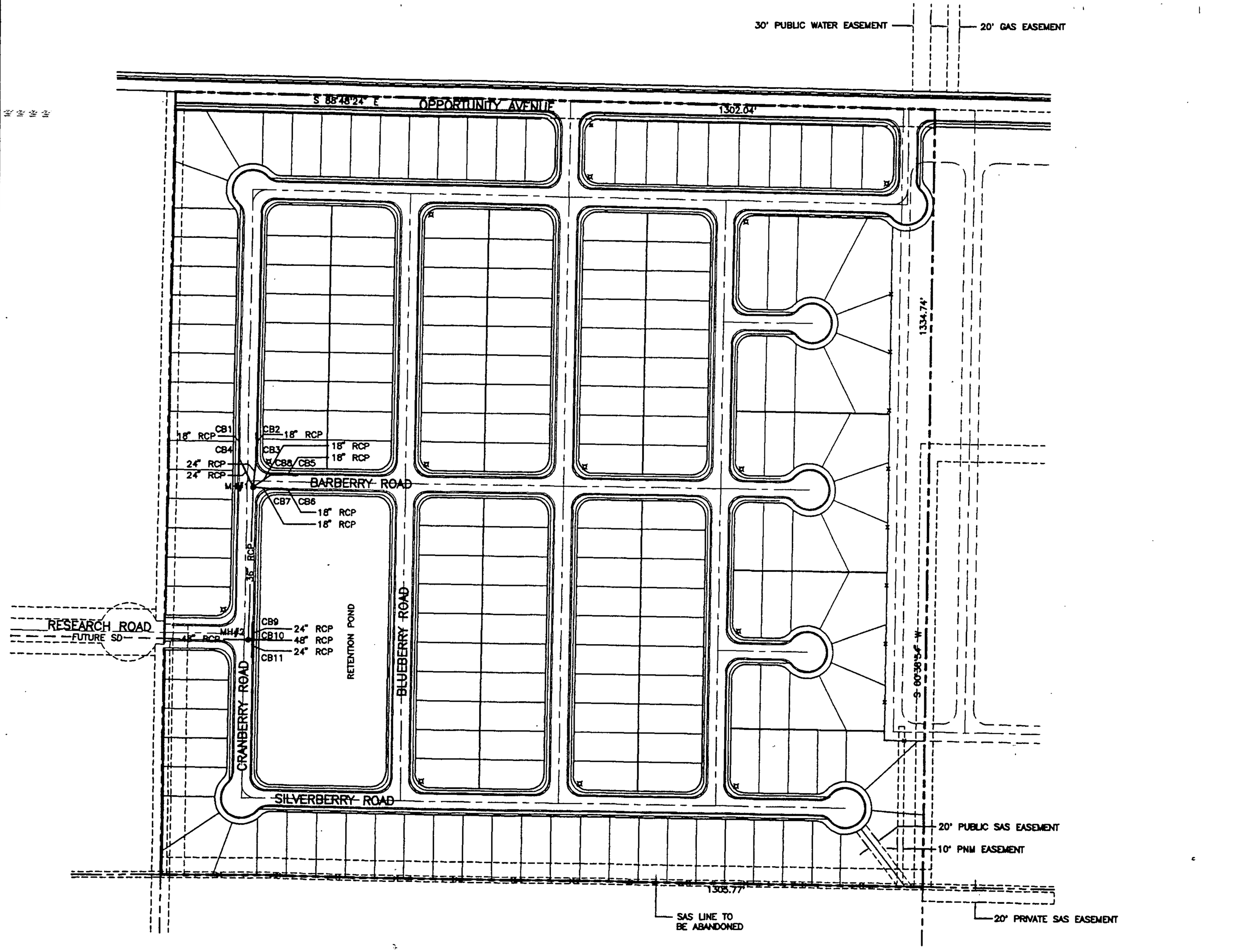
BASIN	Q (100-YEAR) CFS	V (100-YEAR) AC-FT	Q (10-YEAR) CFS	V (10-YEAR) AC-FT
A	16.41	0.599	10.15	0.351
B	26.93	0.984	16.67	0.576
C	19.14	0.699	11.84	0.409
D	11.98	0.437	7.41	0.256
E	12.93	0.472	8.00	0.277
F	9.38	0.342	5.81	0.201
G	9.53	0.348	5.90	0.204
H	12.93	0.472	8.00	0.277
I	11.91	0.435	7.37	0.255
J	7.99	0.291	4.95	0.171
K	10.84	0.395	6.71	0.232
L	5.95	0.217	3.68	0.127
M	9.60	0.350	5.94	0.205

DROP INLET,

SD-MH,

DRAINAGE PIPE

SUMMERY TABLE



LEGEND

- BOUNDARY LINE
- LOT LINE
- EASEMENT LINE
- CENTER LINE
- CURB AND GUTTER
- SIDEWALK
- WALL
- FENCE
- EXISTING ROAD
- STREET LIGHT PER CITY STD.

N

GRAPHIC SCALE

100 0 50 100

SCALE: 1"=100'

TIERRA WEST DEVELOPMENT MANAGEMENT SERVICES
4421 McLEOD ROAD, N.E., SUITE D
ALBUQUERQUE, NEW MEXICO 87109
(505)883-7882

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

BOOBERRY MOBILE HOME SUBDIVISION
MASTER STORM SEWER PLAN

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
DRC CHAIRMAN			WATER		
TRANSPORTATION			WASTE WATER		
HYDROLOGY					

PROJECT NO.	MAP NO.	SHEET	OF
	M-21-Z		

100\950013\9513MSSP.DWG\PVG\7-10-95

AS BUILT INFORMATION
CONTRACTOR / WORK STAKED BY / INSPECTOR'S ACCEPTANCE BY / FIELD VERIFICATION BY / DRAWINGS CORRECTED BY — DATE
MICRO-FILM INFORMATION
RECORDED BY — DATE
NO.

BENCH MARKS
AC3 "SUSAN"
CENTRAL STATION DATA
NM STATE PLANE COORDINATES
Central Zone
X=413805.44
Y=1478986.78
G-G=0.99964907
Δα=-00°06'56"
ELEV=5444.48

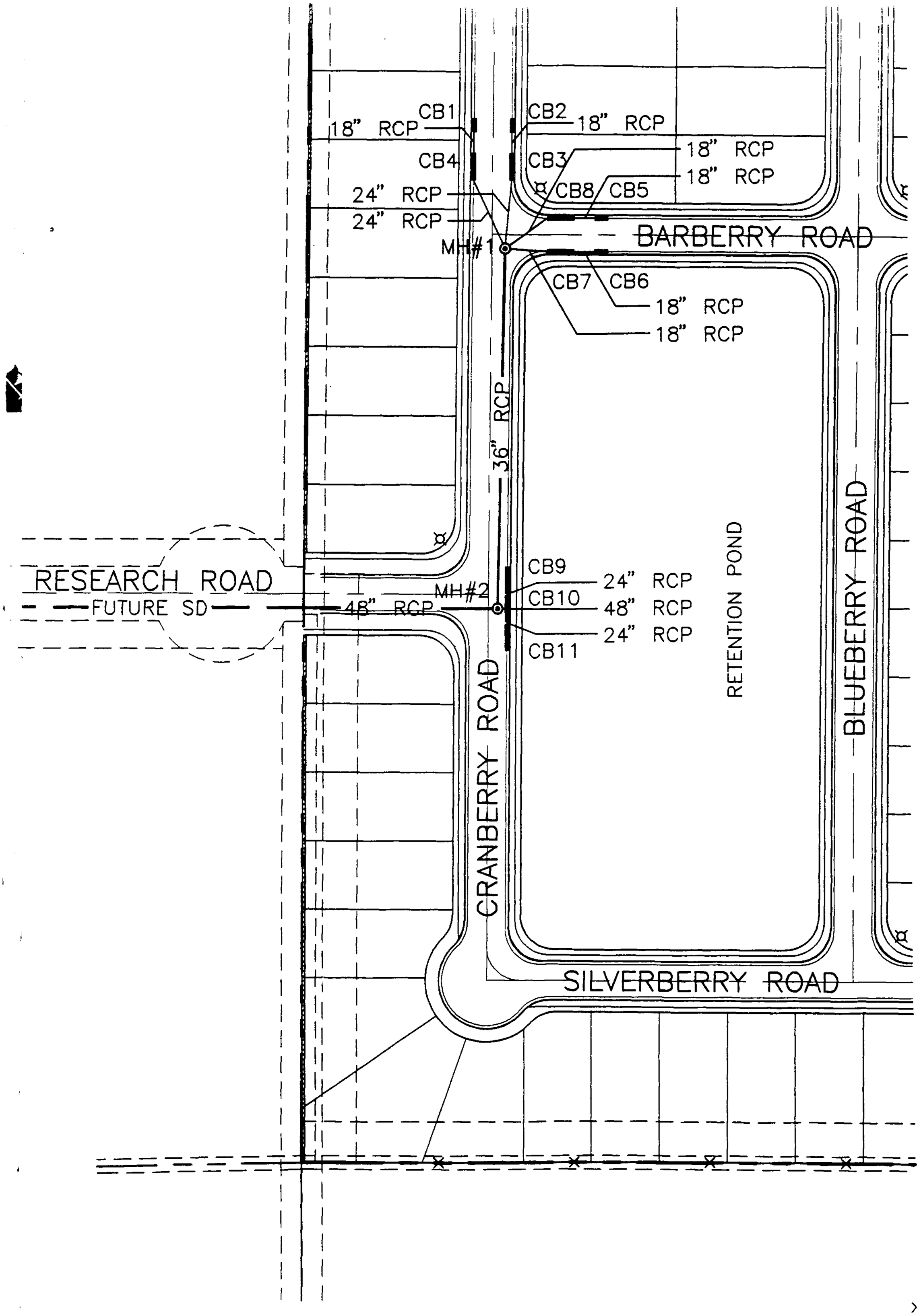
SURVEY INFORMATION
FIELD NOTES
NO. | BY | DATE

ENGINEER'S SEAL

NO.	DATE	REMARKS	BY

REVISIONS

		DATE
DESIGNED BY	RWB	6-95
DRAWN BY	PVG	6-95
CHECKED BY	RWB	6-95


CB1
CB2
18" RCP
18" RCP
18" RCP
CB4
CB3
18" RCP
24" RCP
CB8
CB5
24" RCP
BARBERRY ROAD
MH#1
CB7
CB6
18" RCP
18" RCP
36" RCP
RESEARCH ROAD
FUTURE SD
48" RCP
MH#2
CB9
24" RCP
CB10
48" RCP
24" RCP
CB11
RETENTION POND
CRANBERRY ROAD
BLUEBERRY ROAD
SILVERBERRY ROAD

CATCH BASIN & MANHOLES

CATCH BASIN	TYPE	MIN. HEIGHT "V" FT	Qu-g CFS	Dn-g FT	S-g %	Qi CFS
CB1 + CB2	A	4.16	50.87	0.67	0.600	16.00
CB3 + CB4	DBL C	4.66	34.87	0.67	0.600	15.20
CB5 + CB6	A	4.16	52.79	0.59	1.300	16.80
CB7 + CB8	DBL C	4.66	35.99	0.52	1.300	16.00
CB9	DBL A	3.83	*	*	*	30.23
CB10	DBL A	4.83	*	*	*	30.23
CB11	DBL A	3.83	*	*	*	30.23

MANHOLE	SIZE	MH LOSS (FT)
MH1	8' MH	0.10
MH2	8' MH	0.18

* PONDING SECTION

MH LOSS = $0.05*V^2/2g$

_SEE THE FOLLWOWING SHEETS FOR CALCULATIONS

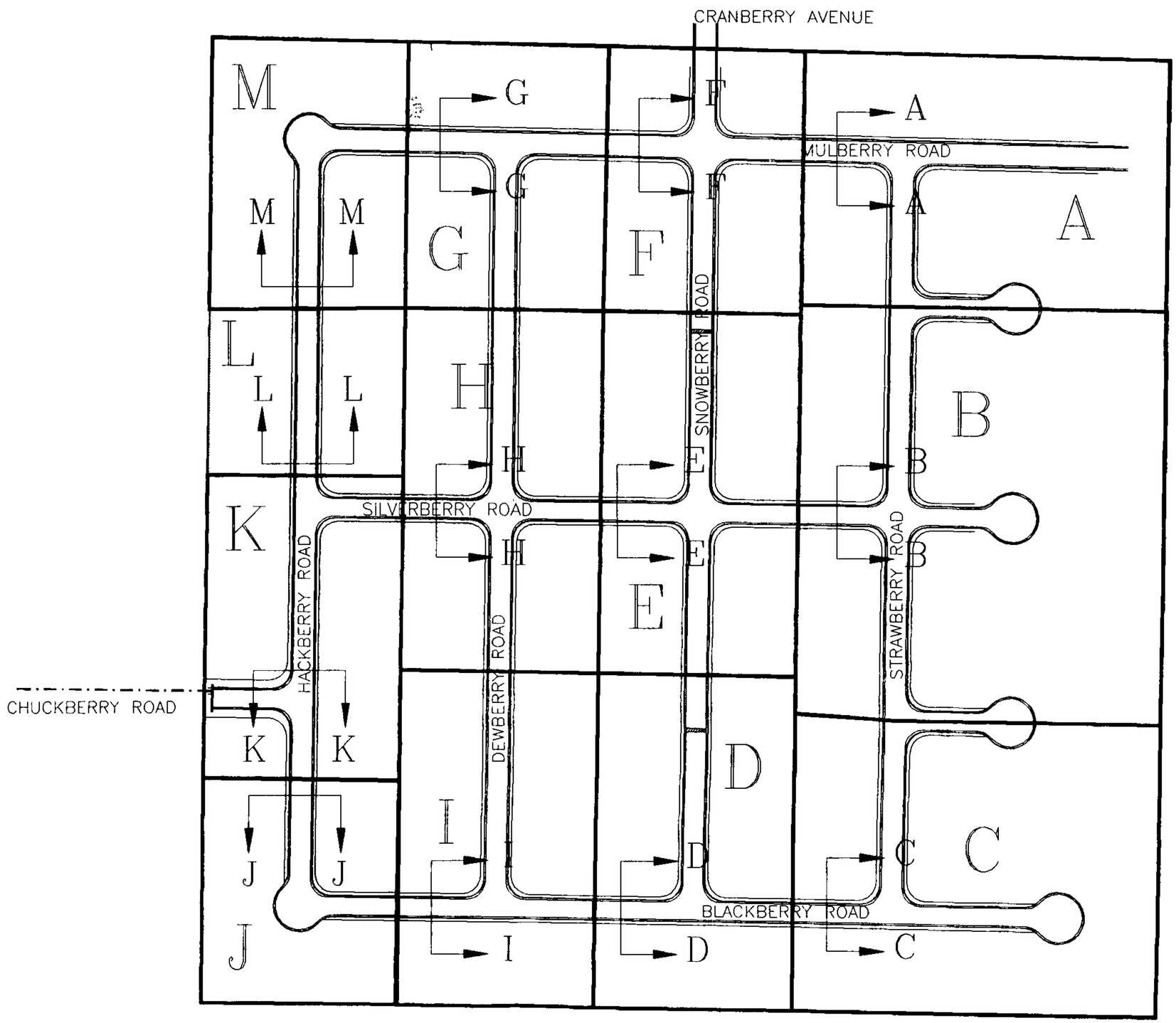
_ALSO SEE ATTACHED DRAWING FOR CATCH BASINS AND STORM SEWER LOCATION

DRAINAGE PIPES SUMMARY TABLE

CONNECTION	PIPE SIZE	LENGTH FT	FLOW DEPTH FT	ACTUAL FLOW CFS	ACTUAL VELOCITY FT/S
CB 1 & 2 TO CB 3 & 4	18" @ 0.60%	15.00	1.12	8.00	5.65
CB3 TO MH 1	24" @ 0.60%	45.47	1.38	15.60	6.75
CB4 TO MH 1	24" @ 0.60%	50.91	1.38	15.60	6.75
CB 5 & 6 TO CB 7 & 8	18" @ 0.60%	15.00	1.17	8.40	5.68
CB 7 TO MH 1	24" @ 0.60%	27.37	1.43	16.40	6.80
CB 8 TO MH 1	24" @ 0.60%	34.39	1.43	16.40	6.80
MH 1 TO MH 2	36" @ 1.00%	89.26	2.20	64.00	11.54
CB 9 & 11 TO CB 10	24" @ 2.00%	1.00	1.45	30.23	12.43
CB 10 TO MH 2	36" @ 2.00%	1.50	2.20	90.68	16.33
MH 2 TO RETENTION POND	48" @ 1.20%	54.25	2.99	154.68	15.37
MH 2 TO FUTURE CONNECTION	48" @ 1.20%	138.25	2.99	154.68	15.37

_SEE THE FOLLOWING SHEETS FOR CALCULATIONS
_ALSO SEE ATTACHED DRAWING FOR STORM SEWER LOCATIONS

STREET CAPACITY ANALYSIS, DROP INLET, & DRAINAGE PIPE CALCULATIONS



8" Curb

4" Curb

N

GRAPHIC SCALE

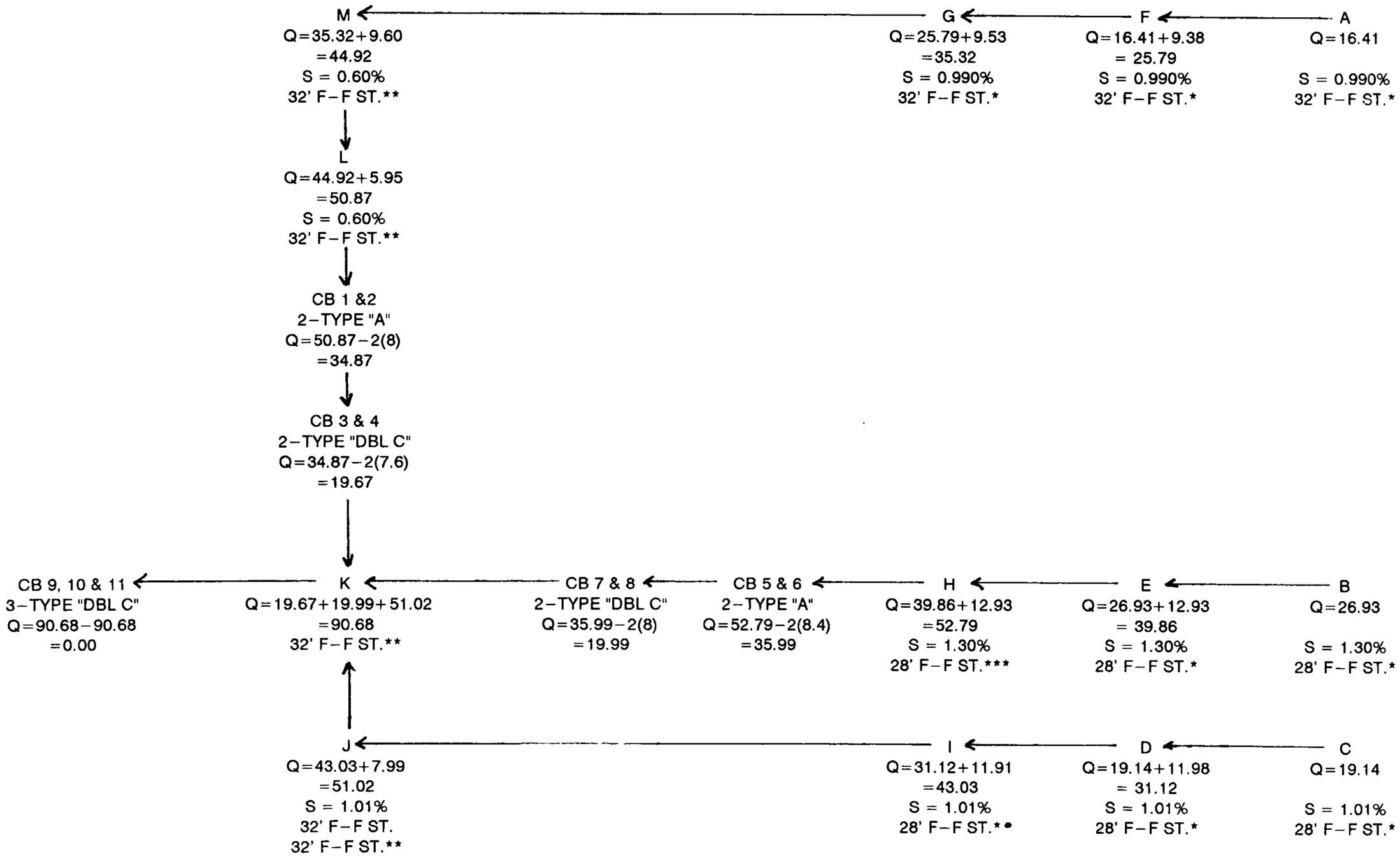
100 0 50 100

SCALE: 1"=100'

ENGINEER'S SEAL	BOOBERRY MOBILE HOME SUBDIVISION	DRAWN BY PVG
	CROSS SECTIONS USED FOR STREET CAPACITY	DATE 5-12-95
		95135.DWG
	TIERRA WEST DEVELOPMENT MANAGEMENT SERVICES	SHEET #
	4421 McLEOD ROAD, N.E., SUITE D ALBUQUERQUE, NEW MEXICO 87109 (505)883-7592	OF
RONALD R. BOHANNAN P.E. #7868		JOB # 950013

100\950013\95135.DWG\PVG\6-21-95

FLOW PATH (Q-100)



* 4" CURB
** 8" CURB
*** COMBINATION OF 4" & 8" CURB

STREET CAPACITY ANALYSIS
WITHIN BASINS B, E, H, C, D, I
(28' F-F)

INPUT FILE

```
BASIN B
100 26.93 0.01300
10 16.67 0.01300
BASIN E
100 39.86 0.01300
10 24.67 0.01300
BASIN H
100 52.79 0.01300
10 32.67 0.01300
BASIN C
100 19.14 0.010100
10 11.84 0.010100
BASIN D
100 31.12 0.010100
10 19.25 0.010100
BASIN I
100 43.03 0.00600
10 26.62 0.00600

END OF THE FILE
999 0.00 0.00
```

OUTPUT FILES

28-FT F-F, 4" CURB STREET SECTION
STREET CAPACITY BASED ON 100-YR STORM

FLOW CFS	SLOPE FT/FT	Dn FT	Vn FT/S	D*V FT²/S	Fr	E FT	D2 FT
26.93	.01300	.423	3.481	1.472	.943	.611	----
39.86	.01300	.490	3.812	1.869	.959	.716	----
52.79	.01300	.544	4.074	2.217	.973	.802	----
19.14	.01010	.389	2.923	1.138	.826	.522	----
31.12	.01010	.469	3.266	1.530	.841	.634	----
43.03	.00600	.582	2.891	1.683	.668	.712	----

END OF THE OUTPUT FILE

28-FT F-F, 4" CURB STREET SECTION
STREET CAPACITY BASED ON 10-YR STORM

FLOW CFS	SLOPE FT/FT	Dn FT	Vn FT/S	D*V FT²/S	Fr	E FT	D2 FT
16.67	.01300	.351	3.129	1.097	.931	.503	----
24.67	.01300	.409	3.412	1.395	.940	.590	----
32.67	.01300	.455	3.639	1.656	.951	.661	----
11.84	.01010	.324	2.591	.840	.802	.428	----
19.25	.01010	.390	2.926	1.141	.826	.523	----
26.62	.00600	.487	2.580	1.257	.651	.590	----

END OF THE OUTPUT FILE

28-FT F-F, 8" CURB STREET SECTION
STREET CAPACITY BASED ON 100-YR STORM

FLOW CFS	SLOPE FT/FT	Dn FT	Vn FT/S	D*V FT²/S	Fr	E FT	D2 FT
52.79	.01300	.593	5.043	2.989	1.154	.988	.716
43.03	.00600	.636	3.681	2.343	.813	.847	----

END OF THE OUTPUT FILE

28-FT F-F, 8" CURB STREET SECTION
STREET CAPACITY BASED ON 10-YR STORM

FLOW CFS	SLOPE FT/FT	Dn FT	Vn FT/S	D*V FT²/S	Fr	E FT	D2 FT
32.67	.01300	.499	4.173	2.080	1.042	.769	.526
11.84	.01010	.382	2.586	.989	.737	.486	----

END OF THE OUTPUT FILE

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

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

HALF STREET CALCULATIONS

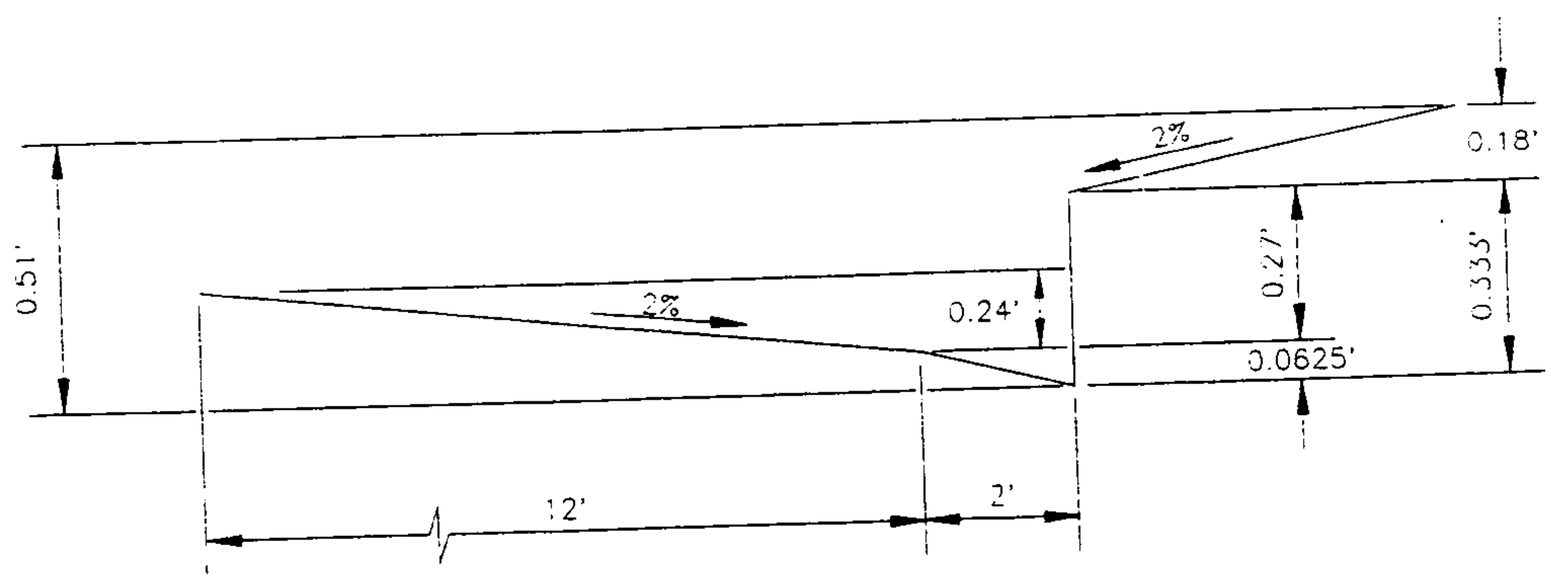
$@Y \leq 0.0625$
$A1 = ½\ Y\ (Y/0.03125) = 16Y^2$
$P1 = SQRT[Y^2 + (Y/0.03125)^2] + Y = SQRT(1025\ Y^2) + Y$

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

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

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

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



28' F–F
4" CURB

NOT TO SCALE

FINDING STREET CAPACITY – 28 F–F CROSS–SECTION FOR 8" CURB

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

HALF STREET CALCULATIONS

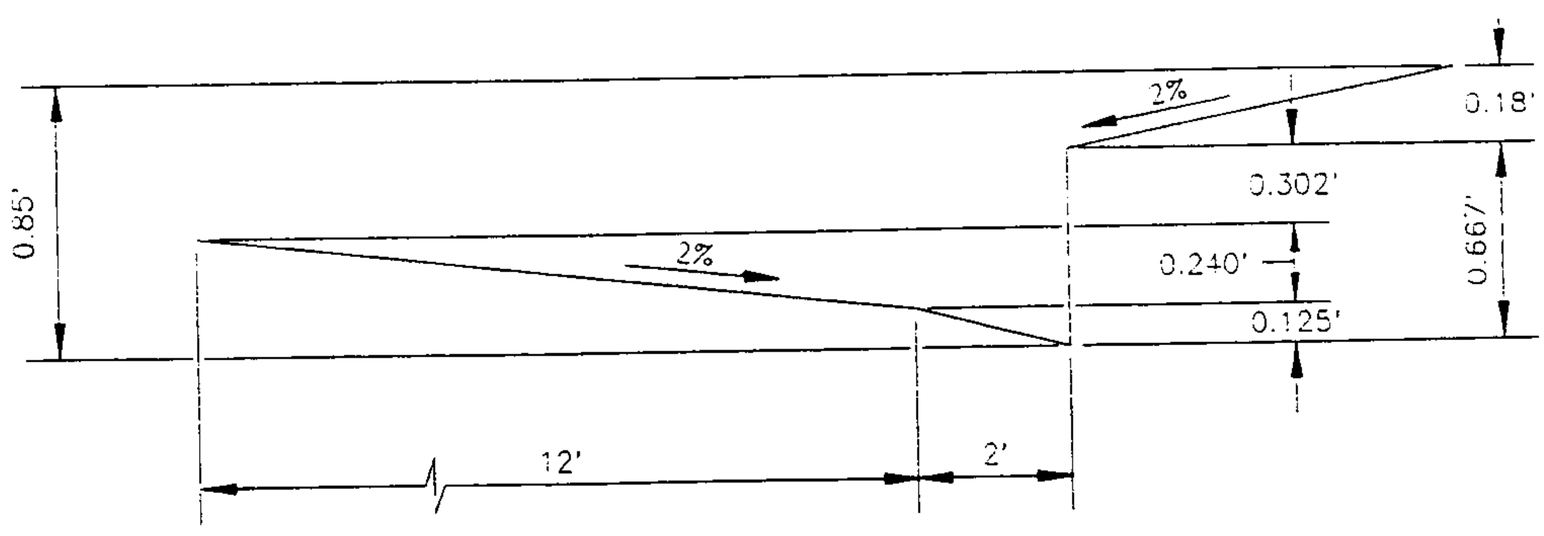
$@Y \leq 0.125$
$A1 = \frac{1}{2} Y\ (Y/0.0625) = 8Y^2$
$P1 = SQRT[Y^2 + (Y/0.0625)^2] + Y = SQRT(257\ Y^2) + Y$

$@\ 0.125 < Y \leq 0.365\ \ \&\ \ Y1 = Y - 0.125$
$A2 = A1 + \frac{1}{2}Y1\ (Y1/0.02) + 2Y1 = A1 + 25Y1^2 + 2Y1$
$P2 = P1 + SQRT[Y1^2 + (Y1/0.02)^2] + Y1 = P1 + SQRT(2501\ Y1^2) + Y1$

$@\ 0.365 < Y \leq 0.667\ \ \&\ \ Y2 = Y - 0.365$
$A3 = A2 + 14Y2 + \frac{1}{2}Y2[Y2/(0.02)] = A2 + 14\ Y2$
$P3 = P2 + SQRT(Y2^2 + [Y2/(0.02)]^2) = P2 + Y2$

$@\ 0.667 < Y \leq 0.847\ \ \&\ \ Y3 = Y - 0.667$
$A4 = A3 + 14Y3 + \frac{1}{2}Y3[Y3/(0.02)] = A3 + 14\ Y3 + 25\ Y3^2$
$P4 = P3 + SQRT(Y3^2 + [Y3/(0.02)]^2) = P3 + SQRT(2501\ Y3^2)$

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



28' F–F
8" CURB

NOT TO SCALE

STREET CAPACITY ANALYSIS
WITHIN BASINS A, F, G, M, L, J
(32' F-F)

INPUT FILE

```
BASIN A
100 16.41 0.00990
10 10.15 0.00990
BASIN F
100 25.79 0.00990
10 15.96 0.00990
BASIN G
100 35.32 0.00990
10 21.86 0.00990
BASIN M
100 44.92 0.00600
10 27.80 0.00600
BASIN L
100 106.94 0.00600
10 66.18 0.00600
BASIN J
100 51.02 0.01010
10 31.57 0.01010

END OF THE FILE
999 0.00 0.00
```

OUTPUT FILES

32-FT F-F, 4" CURB STREET SECTION
STREET CAPACITY BASED ON 100-YR STORM

FLOW CFS	SLOPE FT/FT	Dn FT	Vn FT/S	D*V FT²/S	Fr	E FT	D2 FT
16.41	.00990	.369	2.699	.996	.783	.482	----
25.79	.00990	.432	3.029	1.308	.812	.574	----
35.32	.00990	.483	3.280	1.583	.832	.650	----
44.92	.00600	.575	2.891	1.662	.672	.705	----
50.87	.00600	.601	2.983	1.794	.678	.740	----
51.02	.01010	.548	3.627	1.988	.863	.752	----

END OF THE OUTPUT FILE

32-FT F-F, 4" CURB STREET SECTION
STREET CAPACITY BASED ON 10-YR STORM

FLOW CFS	SLOPE FT/FT	Dn FT	Vn FT/S	D*V FT²/S	Fr	E FT	D2 FT
10.15	.00990	.312	2.389	.746	.753	.401	----
15.96	.00990	.365	2.680	.979	.781	.477	----
21.86	.00990	.408	2.904	1.183	.802	.538	----
27.80	.00600	.484	2.561	1.240	.648	.586	----
31.48	.00600	.506	2.643	1.338	.654	.615	----
31.57	.01010	.462	3.212	1.484	.833	.622	----

END OF THE OUTPUT FILE

32-FT F-F, 8" CURB STREET SECTION
STREET CAPACITY BASED ON 100-YR STORM

FLOW CFS	SLOPE FT/FT	Dn FT	Vn FT/S	D*V FT²/S	Fr	E FT	D2 FT
44.92	.00600	.634	3.558	2.257	.787	.831	----
50.87	.00600	.665	3.737	2.485	.807	.882	----
51.02	.01010	.604	4.380	2.644	.993	.902	----

END OF THE OUTPUT FILE

32-FT F-F, 8" CURB STREET SECTION
STREET CAPACITY BASED ON 10-YR STORM

FLOW CFS	SLOPE FT/FT	Dn FT	Vn FT/S	D*V FT²/S	Fr	E FT	D2 FT
27.80	.00600	.535	2.944	1.574	.709	.669	----
31.48	.00600	.558	3.092	1.725	.730	.706	----
31.57	.01010	.512	3.623	1.855	.892	.716	----

END OF THE OUTPUT FILE

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

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

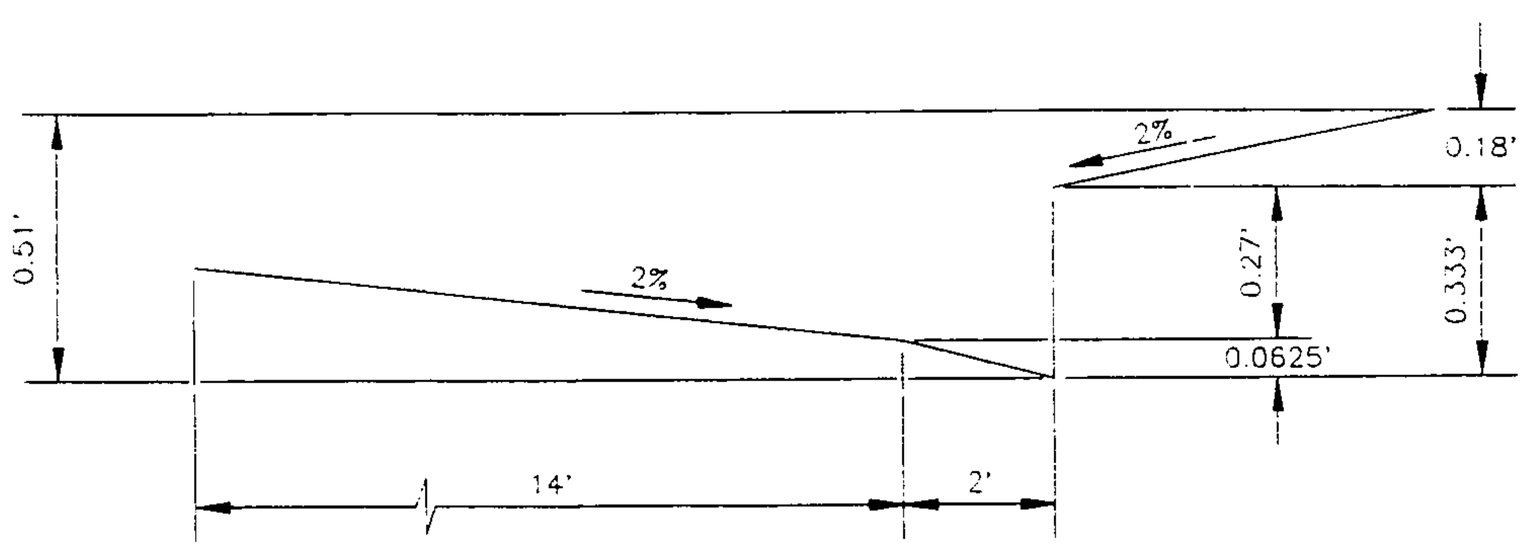
HALF STREET CALCULATIONS

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

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

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

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



32' F–F
4" CURB

NOT TO SCALE

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

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

<u>HALF STREET CALCULATIONS</u>

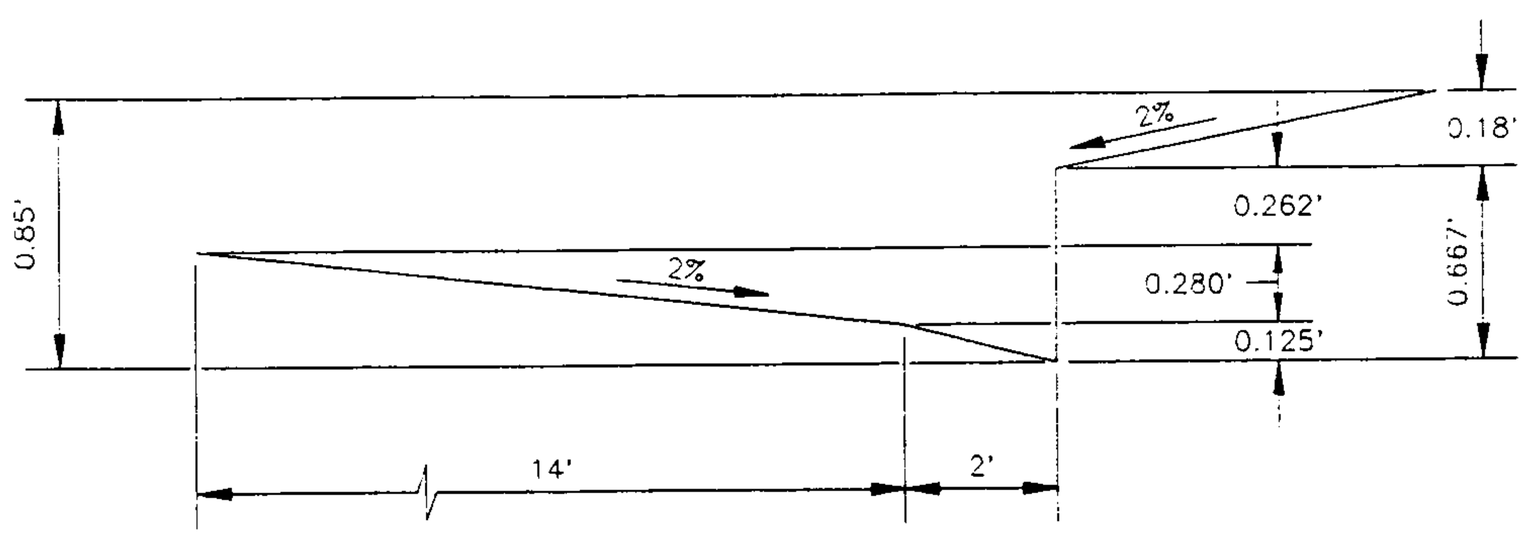
$@Y \leq 0.125$
$A1 = ½\ Y\ (Y/0.0625) = 8Y^2$
$P1 = SQRT[Y^2 + (Y/0.0625)^2] + Y = SQRT(257\ Y^2) + Y$

$@\ 0.125 < Y \leq 0.405$ & $Y1 = Y - 0.125$
$A2 = A1 + ½Y1\ (Y1/0.02) + 2Y1 = A1 + 25Y1^2 + 2Y1$
$P2 = P1 + SQRT[Y1^2 + (Y1/0.02)^2] + Y1 = P1 + SQRT(2501\ Y1^2) + Y1$

$@\ 0.405 < Y \leq 0.667$ & $Y2 = Y - 0.405$
$A3 = A2 + 16Y2 + ½Y2[Y2/(0.02)] = A2 + 16\ Y2$
$P3 = P2 + SQRT(Y2^2 + [Y2/(0.02)]^2) = P2 + Y2$

$@\ 0.667 < Y \leq 0.847$ & $Y3 = Y - 0.667$
$A4 = A3 + 16Y3 + ½Y3[Y3/(0.02)] = A3 + 16\ Y3 + 25\ Y3^2$
$P4 = P3 + SQRT(Y3^2 + [Y3/(0.02)]^2) = P3 + SQRT(2501\ Y3^2)$

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



32' F–F
8" CURB

NOT TO SCALE

---------- 32-FT F-F, 8" CURB STREET SECTION ----------

---------- STREET CAPACITY BASED ON 100-YR STORM ----------

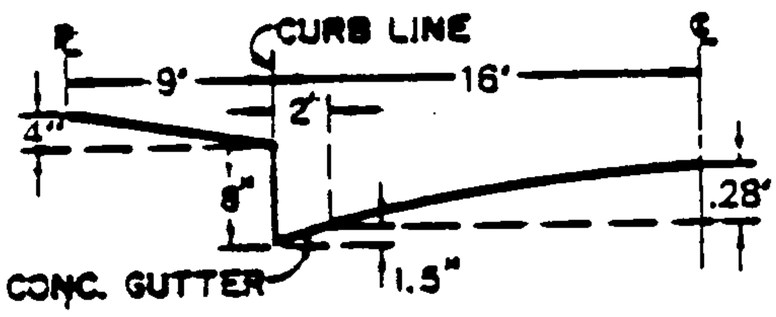
FLOW CFS	SLOPE FT/FT	Dn FT	Vn FT/S	D*V FT»/S	Fr	E FT	D2 FT
50.87	.00600	.665	3.737	2.485	.807	.882	----

---------- END OF THE OUTPUT FILE ----------

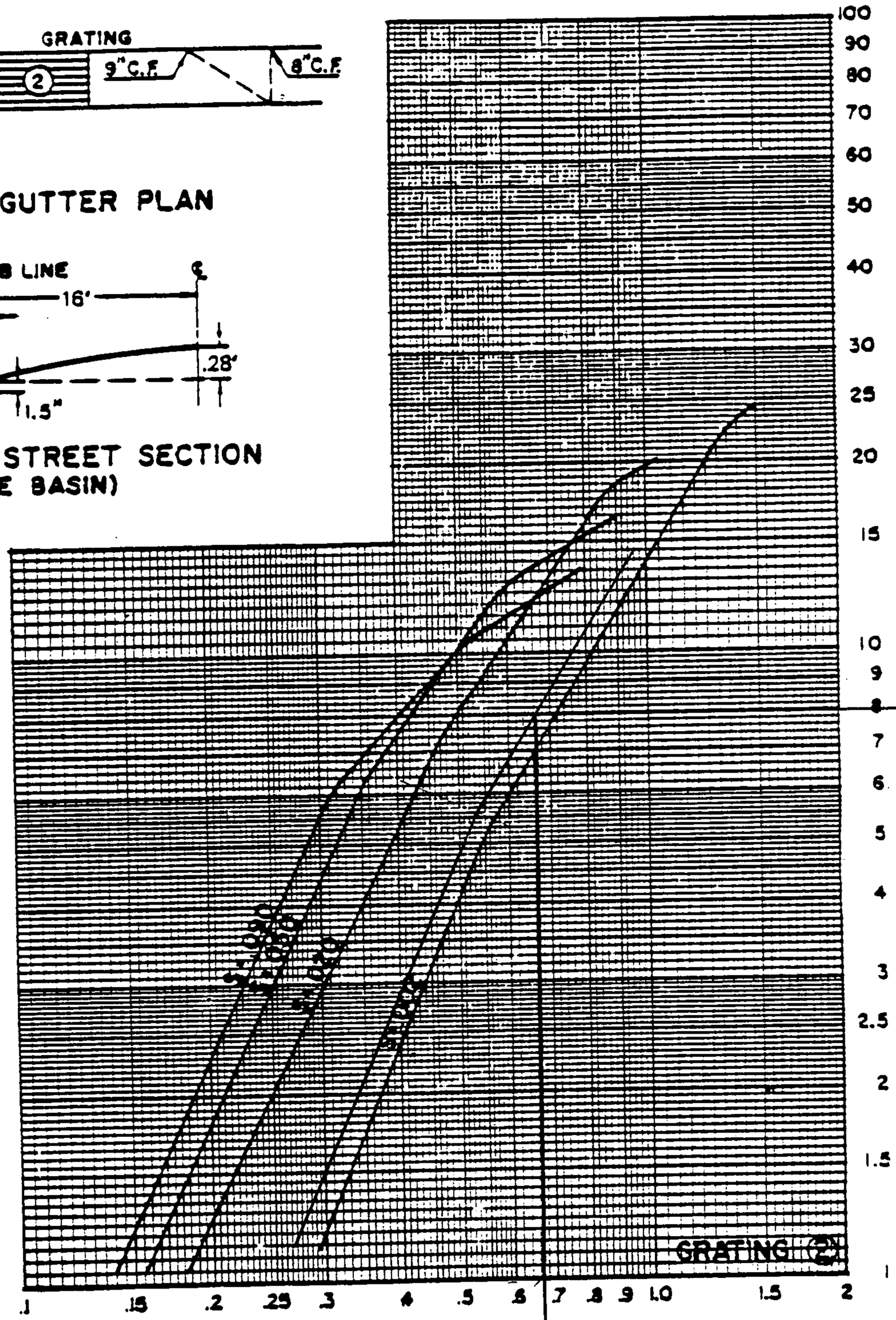
Catch Basin 1 of 2

GRATING CAPACITIES FOR TYPE "A", "C" and "D"

GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



8 cfs

D = 0.67'

S = 0.006 ft/ft

---------- 32-FT F-F, 8" CURB STREET SECTION ----------

---------- STREET CAPACITY BASED ON 100-YR STORM ----------

FLOW	SLOPE	Dn	Vn	D*V	Fr	E	D2
CFS	FT/FT	FT	FT/S	FT»/S		FT	FT
34.87	.00600	.578	3.219	1.861	.746	.739	----

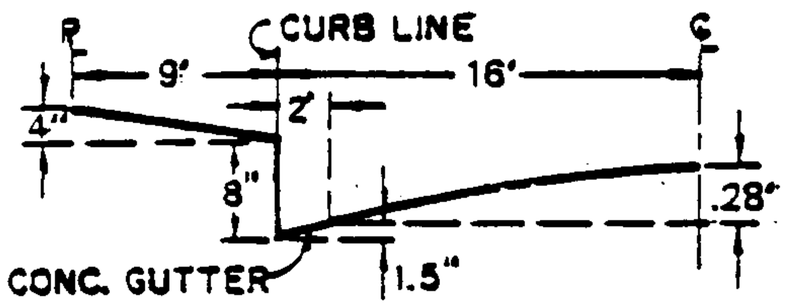
---------- END OF THE OUTPUT FILE ----------

Q = 50.87 - 2(8) - 34.87

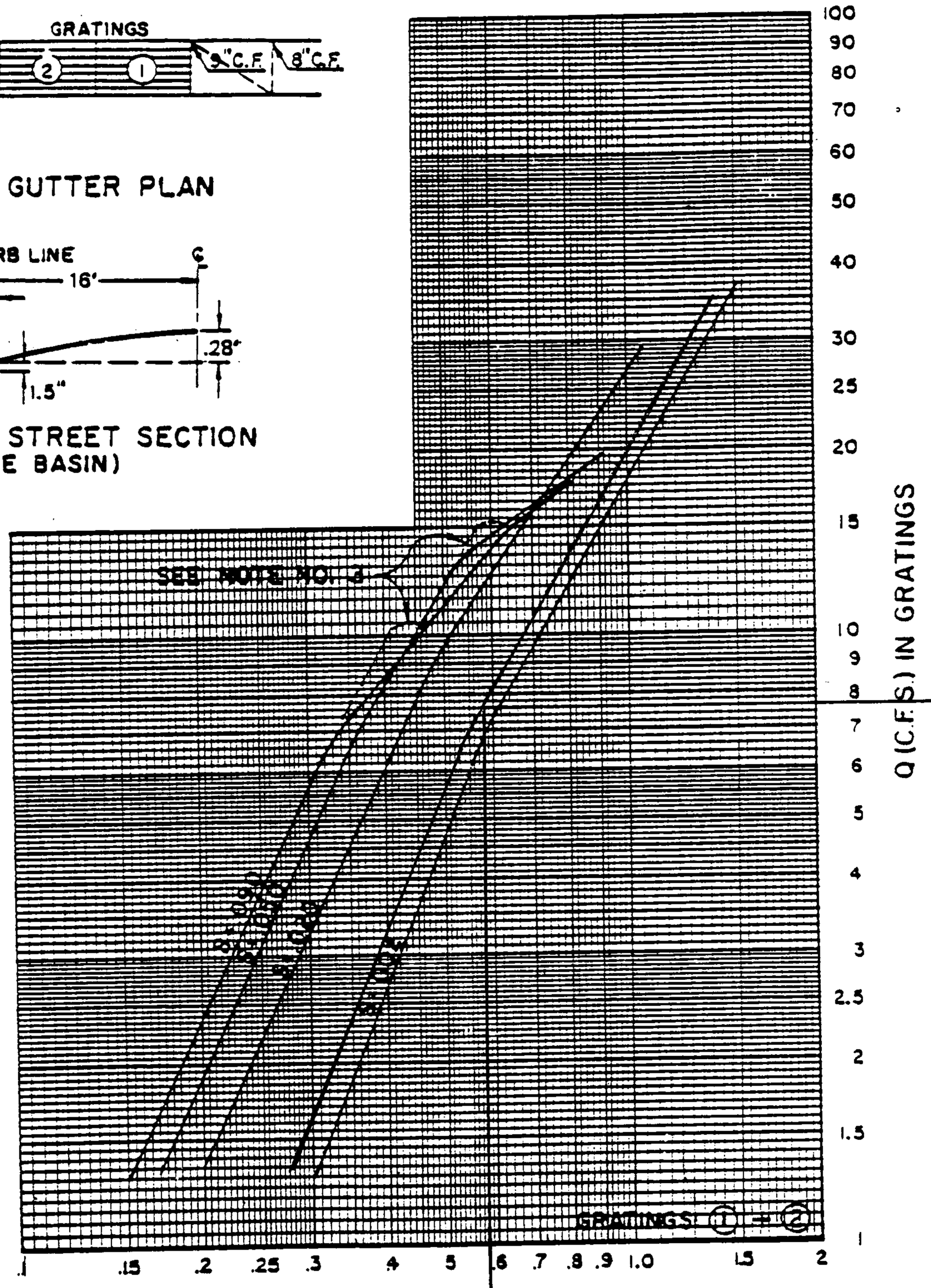
Calc Book 3 & 4

GRATING CAPACITIES FOR TYPE DOUBLE "C," AND "D"

GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



D = 0.58'

S = 0.006 ft/ft

OVERALL DRAINAGE BASINS

BASIN	AREA (SF)	AREA (AC-FT)	AREA (MI^2)
A	1713188.00	39.3292	0.061452
B	842924.00	19.3508	0.030236
C	902964.00	20.7291	0.032389

OVERALL DRAINAGE BASIN 100-YR & 10-YR RUNOFFS

BASIN	Q (100-YEAR) CFS	V (100-YEAR) AC-FT	Q (10-YEAR) CFS	V (10-YEAR) AC-FT
A	165.82	6.061	102.63	3.552
B	50.23	1.485	22.57	0.573
C	53.81	1.591	24.18	0.614

---------- 28-FT F-F, 8" CURB STREET SECTION ----------

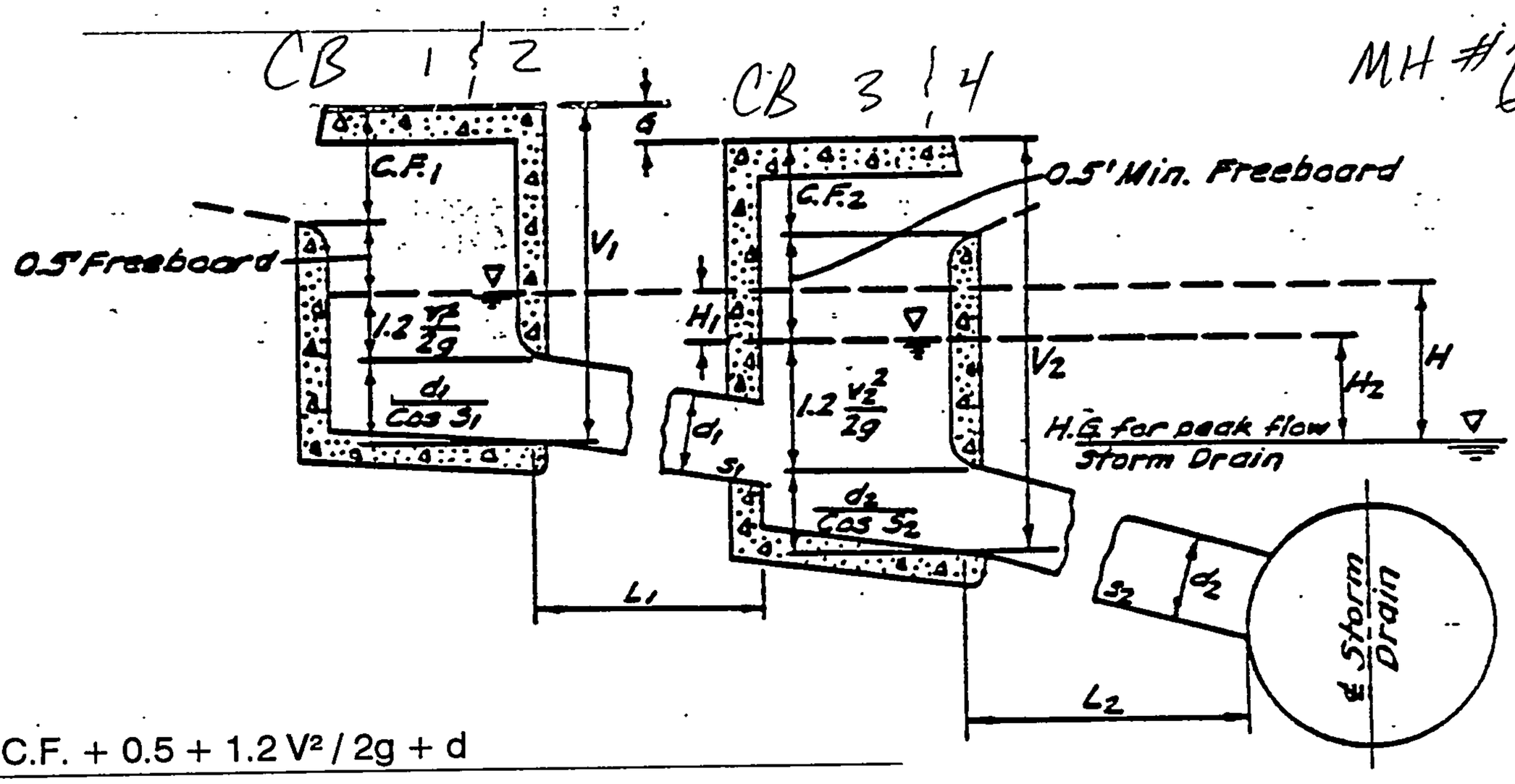
---------- STREET CAPACITY BASED ON 100-YR STORM ----------

FLOW	SLOPE	Dn	Vn	D*V	Fr	E	D2
CFS	FT/FT	FT	FT/S	FT»/S		FT	FT
52.79	.01300	.593	5.043	2.989	1.154	.988	.716

---------- END OF THE OUTPUT FILE ----------

CATCH BASINS IN SERIES

MH #1



$V1 = C.F. + 0.5 + 1.2\,V^2 / 2g + d$

$V2 = C.F.1 + 0.5 + H1 + 1.2\,V2^2 / 2g + d2 + G$

$H1 = 1.2 / 2g\,(V1^2 - V2^2) + (d1 - d2)$, IF $H1 < 0$ THEN SET $H1 = 0$

$V1 = 1.33 + 1.2(5.65^2)/2(32.2) + 1.50'$
$= 3.42'$

Min Elev. From Grate to Invert $= 1.50 + (1' - 10")$
$= 3.33$

$\therefore\ V1 = 3.33 + 0.83 = 4.16 > 3.42$

Set $V1 = 4.16$

$V2 = 1.33 + 1.2(6.75^2)/2(32.2) + 2.0$
$= 4.18'$

Min Elev. From Grate to Invert $= 2.0 + (1' - 10")$
$= 3.83$

$\therefore\ V2 = 3.83 + 0.83 = 4.66 > 3.42$

Set $V2 = 4.66'$

Circular Channel Analysis & Design
Solved with Manning's Equation

Open Channel - Uniform flow

Worksheet Name:

Comment: CATCH BASIN 1 & 2 TO 3 & 4

Solve For Actual Depth

Given Input Data:

Diameter.....	1.50 ft
Slope.....	0.0060 ft/ft
Manning's n.....	0.012
Discharge.....	8.00 cfs

Computed Results:

Depth.....	1.12 ft
Velocity.....	5.65 fps
Flow Area.....	1.42 sf
Critical Depth....	1.10 ft
Critical Slope....	0.0063 ft/ft
Percent Full.....	74.70 %
Full Capacity.....	8.81 cfs
QMAX @.94D.....	9.48 cfs
Froude Number.....	0.96 (flow is Subcritical)

Circular Channel Analysis & Design
Solved with Manning's Equation

Open Channel - Uniform flow

Worksheet Name:

Comment: CATCH BASIN 3 & 4 TO MH#1

Solve For Actual Depth

Given Input Data:

Diameter.....	2.00 ft
Slope.....	0.0060 ft/ft
Manning's n.....	0.012
Discharge.....	15.60 cfs

Computed Results:

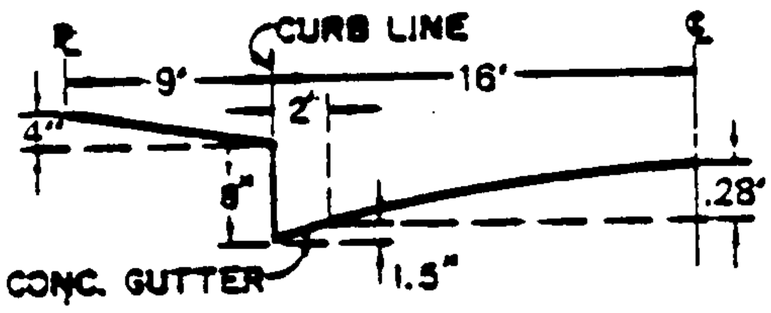
Depth.....	1.38 ft
Velocity.....	6.75 fps
Flow Area.....	2.31 sf
Critical Depth....	1.42 ft
Critical Slope....	0.0055 ft/ft
Percent Full.....	69.02 %
Full Capacity.....	18.98 cfs
QMAX @.94D.....	20.42 cfs
Froude Number.....	1.06 (flow is Supercritical)

Open Channel Flow Module, Version 3.12 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

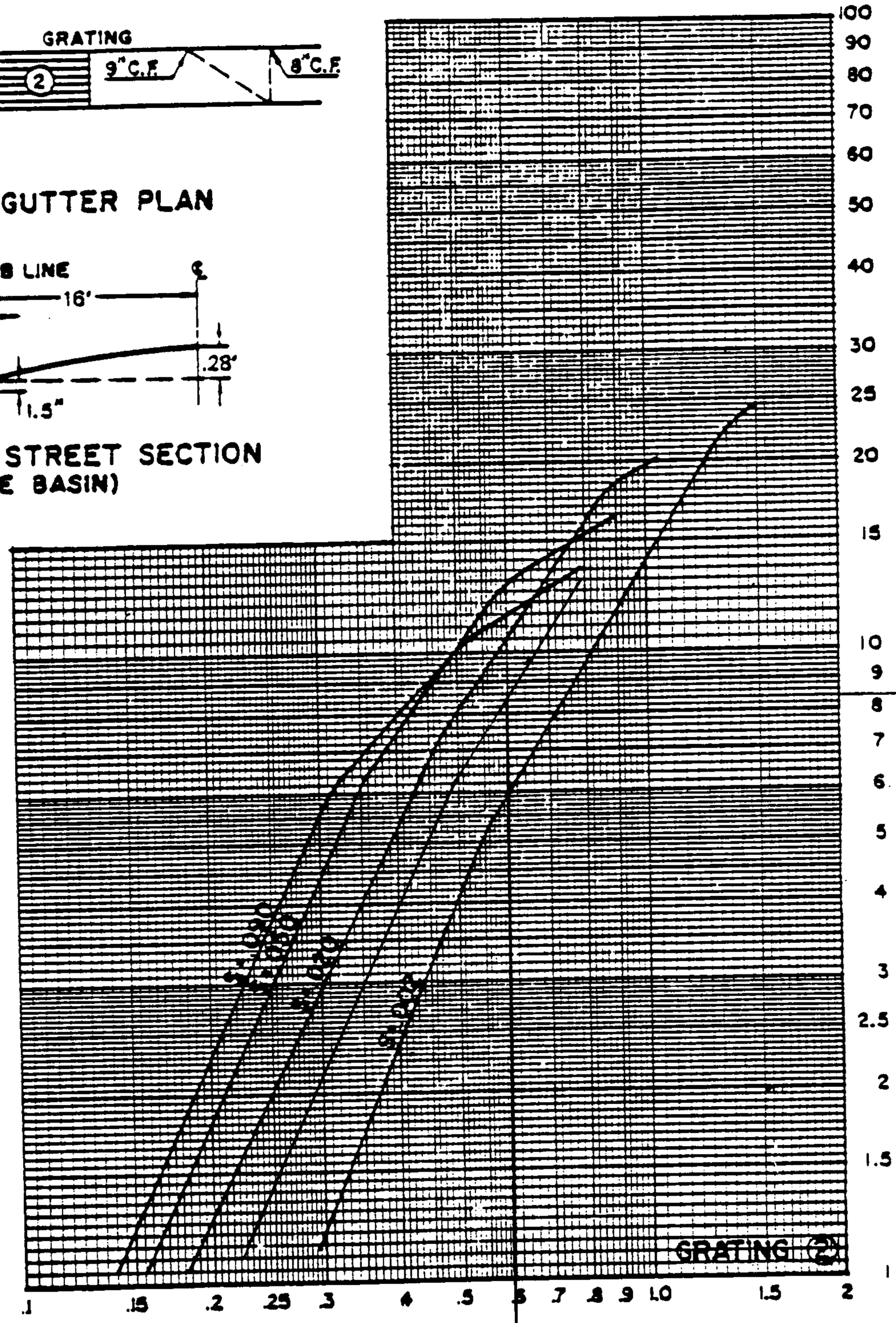
Catch Basins 5 & 6

GRATING CAPACITIES FOR TYPE "A", "C" and "D"

GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



D = DEPTH OF FLOW (FT.) ABOVE NORMAL GUTTER GRADE

D = 0.593'

S = 0.0130 Ft/Ft

0.59'

---------- 28-FT F-F, 8" CURB STREET SECTION ----------

---------- STREET CAPACITY BASED ON 100-YR STORM ----------

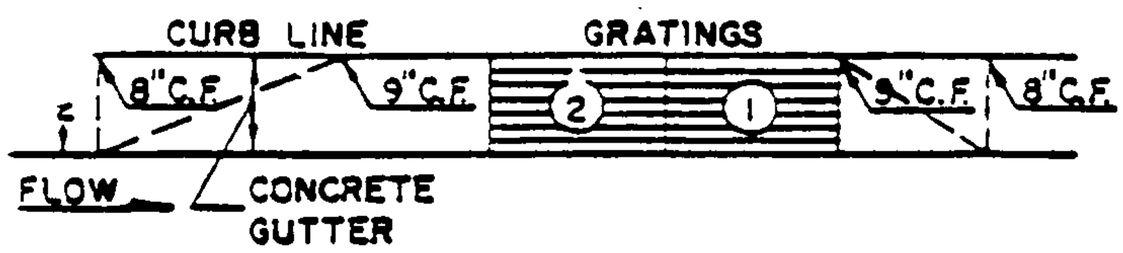
FLOW CFS	SLOPE FT/FT	Dn FT	Vn FT/S	D*V FT»/S	Fr	E FT	D2 FT
35.99	.01300	.515	4.336	2.235	1.064	.807	.560

---------- END OF THE OUTPUT FILE ----------

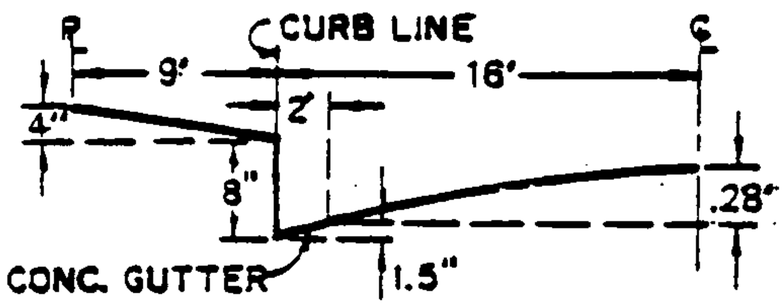
$Q = 52.79 - 2(8.4) = 35.99$ cfs

Cor Lains 7 & 2

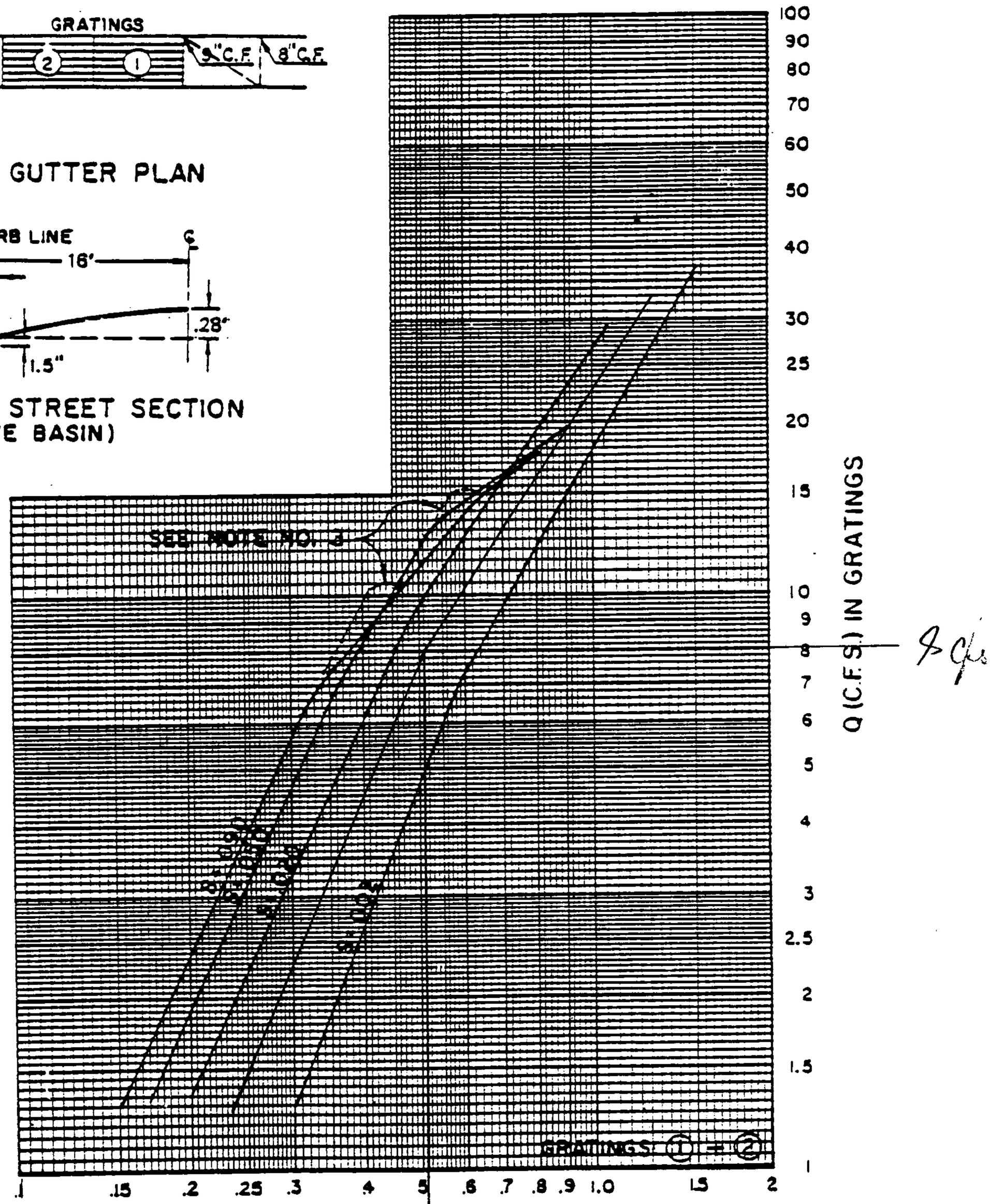
GRATING CAPACITIES FOR TYPE DOUBLE "C," AND "D"



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



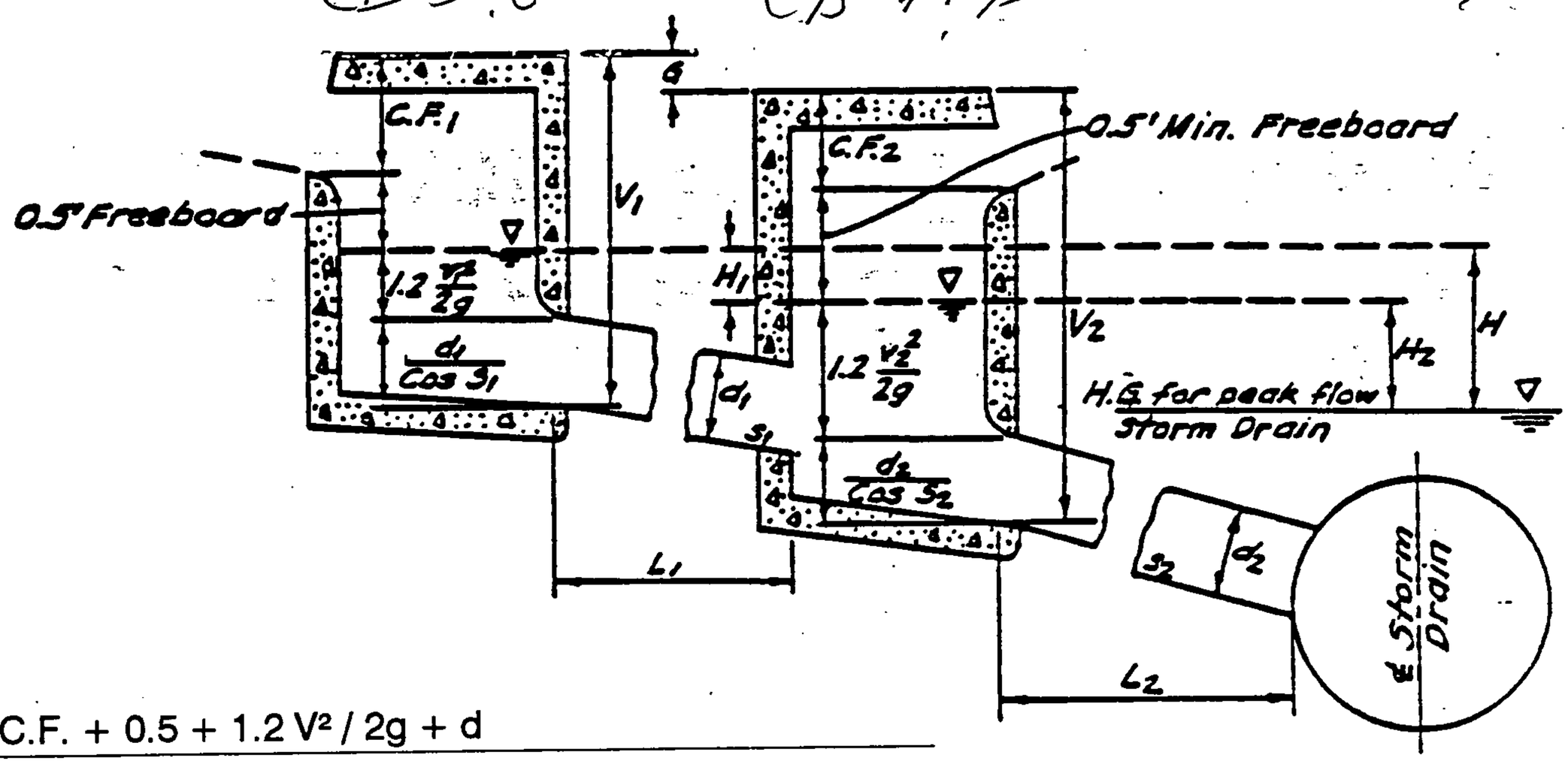
8 cfs

D = 0.51'
S = 0.013 ft/ft

0.51'

CATCH BASINS IN SERIES

~~CB 5 & 6~~ CB 7 & 8 MH #1



V1 = C.F. + 0.5 + 1.2 V² / 2g + d

V2 = C.F.1 + 0.5 + H1 + 1.2 V2² / 2g + d2 + G

H1 = 1.2 / 2g (V1² – V2²) + (d1 – d2), IF H1 < 0 THEN SET H1 = 0

V1 = 1.33 + 1.2 (5.68²) / 2(32.2) + 1.50
= 3.43

Min Elev. From Grate To Invert = 1.50' + (1' = 10")
= 5.33

V1 = 5.33 + 0.83 = 4.16 > 3.43

Set V1 = 4.16

V2 = 1.33 + 1.2 (6.80²) / 2(32.2) + 2.0
= 4.19

Min Elev. From Grate To Invert = 2.0' + (1' = 10")
= 3.83

V2 = 3.83 + 0.83 = 4.66 > 4.19

Set V2 = 4.66'

Circular Channel Analysis & Design
Solved with Manning's Equation

Open Channel - Uniform flow

Worksheet Name:

Comment: CATCH BASIN 5 & 6 TO 7 & 8

Solve For Actual Depth

Given Input Data:

Diameter.....	1.50 ft
Slope.....	0.0060 ft/ft
Manning's n.....	0.012
Discharge.....	8.40 cfs

Computed Results:

Depth.....	1.17 ft
Velocity.....	5.68 fps
Flow Area.....	1.48 sf
Critical Depth....	1.12 ft
Critical Slope....	0.0066 ft/ft
Percent Full.....	78.03 %
Full Capacity.....	8.81 cfs
QMAX @.94D.....	9.48 cfs
Froude Number.....	0.92 (flow is Subcritical)

Open Channel Flow Module, Version 3.12 (c) 1990
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Circular Channel Analysis & Design
Solved with Manning's Equation

Open Channel - Uniform flow

Worksheet Name:

Comment: CATCH BASIN 7 & 8 TO MH#1

Solve For Actual Depth

Given Input Data:

Diameter.....	2.00 ft
Slope.....	0.0060 ft/ft
Manning's n.....	0.012
Discharge.....	16.40 cfs

Computed Results:

Depth.....	1.43 ft
Velocity.....	6.80 fps
Flow Area.....	2.41 sf
Critical Depth....	1.46 ft
Critical Slope....	0.0057 ft/ft
Percent Full.....	71.73 %
Full Capacity.....	18.98 cfs
QMAX @.94D.....	20.42 cfs
Froude Number.....	1.04 (flow is Supercritical)

Open Channel Flow Module, Version 3.12 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

Circular Channel Analysis & Design
Solved with Manning's Equation

Open Channel - Uniform flow

Worksheet Name:

Comment: MH#1 TO MH#2

Solve For Actual Depth

Given Input Data:

Diameter.....	3.00 ft
Slope.....	0.0100 ft/ft
Manning's n.....	0.012
Discharge.....	64.00 cfs

Computed Results:

Depth.....	2.20 ft
Velocity.....	11.54 fps
Flow Area.....	5.54 sf
Critical Depth....	2.57 ft
Critical Slope....	0.0073 ft/ft
Percent Full.....	73.19 %
Full Capacity.....	72.26 cfs
QMAX @.94D.....	77.73 cfs
Froude Number.....	1.41 (flow is Supercritical)

STORM DROP INLET (EFFECTIVE AREA-IN PONDING SECTION) CATCH BASINS 9, 10, & 11

Area @ 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 8.41
= 8.41 SF

Effective are = 8.41 - .5 $(8.41)_{Clogging\ Factor}$

= 4.21 SF @ the Grate

Are @ the Throat:

L = 88 ¾" = 7.3958'

H = 10 ¾" - 4 ½"
= 6 ¼" = 0.5208'

Area = 7.3958 x 0.5208
= 3.85 SF @ the Throat

Total Area

Area = 4.21_{Grate} + 3.85_{Throat}

= 8.06 SF

Checking the number of inlets required:

$Q = CA\sqrt{2gh}$

Q = 90.68 CFS
C = 0.60
A = 3 (8.06) = 24.18 SF
g = 32.2
h = ?

Solve the equation for h:

$h = (Q / CA)^2/2g$
$= [\ 90.68 / (0.60 \times 24.18)\ ]^2 / (2 \times 32.2)$
= 0.61' << 0.87'

Use 3 inlets @ the ponding section.

Circular Channel Analysis & Design
Solved with Manning's Equation

Open Channel - Uniform flow

Worksheet Name:

Comment: CATCH BASIN 9 & 11 TO 10

Solve For Actual Depth

Given Input Data:

Diameter.....	2.00 ft
Slope.....	0.0200 ft/ft
Manning's n.....	0.012
Discharge.....	30.23 cfs

Computed Results:

Depth.....	1.45 ft
Velocity.....	12.43 fps
Flow Area.....	2.43 sf
Critical Depth....	1.87 ft
Critical Slope....	0.0132 ft/ft
Percent Full.....	72.28 %
Full Capacity.....	34.66 cfs
QMAX @.94D.....	37.28 cfs
Froude Number.....	1.88 (flow is Supercritical)

Circular Channel Analysis & Design
Solved with Manning's Equation

Open Channel - Uniform flow

Worksheet Name:

Comment: CATCH BASIN 10 TO MH#2

Solve For Actual Depth

Given Input Data:

Diameter.....	3.00 ft
Slope.....	0.0200 ft/ft
Manning's n.....	0.012
Discharge.....	90.68 cfs

Computed Results:

Depth.....	2.20 ft
Velocity.....	16.33 fps
Flow Area.....	5.55 sf
Critical Depth....	2.85 ft
Critical Slope....	0.0136 ft/ft
Percent Full.....	73.30 %
Full Capacity.....	102.19 cfs
QMAX @.94D.....	109.92 cfs
Froude Number.....	1.99 (flow is Supercritical)

Open Channel Flow Module, Version 3.12 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

Circular Channel Analysis & Design
Solved with Manning's Equation

Open Channel - Uniform flow

Worksheet Name:

Comment: MH#2 TO POND AND FUTURE CONNECTION

Solve For Actual Depth

Given Input Data:

Diameter.....	4.00 ft
Slope.....	0.0120 ft/ft
Manning's n.....	0.012
Discharge.....	154.68 cfs

Computed Results:

Depth.....	2.99 ft
Velocity.....	15.37 fps
Flow Area.....	10.07 sf
Critical Depth....	3.63 ft
Critical Slope....	0.0086 ft/ft
Percent Full.....	74.68 %
Full Capacity.....	170.47 cfs
QMAX @.94D.....	183.37 cfs
Froude Number.....	1.59 (flow is Supercritical)

PONDING

CALCULATIONS

Pond Calculations:

The site is @ Zone 3

Area = 40.11 Acre

Land Treatment:

D = 60%, C = 20%, B = 20%

Weighted E For The Runoff

$$E = \frac{20(0.92)}{100} + \frac{20(1.29)}{100} + \frac{60(2.36)}{100}$$

E = 1.858 inches.

V_{360} = 1.858/12 x 40.11 = 6.210 Ac-Ft

$$V_{10\,DAY} = V_{360} + A_D \cdot \frac{(P_{10} - P_{360})}{12}$$

will req safety fencing if 6'ft deep?

$V_{10\text{-}DAY}$ = 6.210 + 24.066 x (4.90 - 2.60)/12
= 10.8227 Ac-Ft = 471439 CF

Pond bottom area (@ 5580') = 70,889.51 SF
Pond Top area (@ 5586') = 93,318.07 SF

Volume Provided = (70,889.51 + 93,318.07)/2 x 6
= 49,622.74 CF > 471439 CF

492,622

~~maybe~~ decimal is missing ?

~~471,439~~

INFRASTRUCTURE

LIST

DRB Case No. _____
Project Number _____
Date Submitted _____
Prelim. Plat Approved _____
Prelim. Plat Expires _____

EXHIBIT "A"
to Subdivision Improvements Agreement
DEVELOPMENT REVIEW BOARD (DRB) REQUIRED INFRASTRUCTURE LISTING
for Booberry Mobile Home Subdivision

Following is a summary of Public/Private Infrastructure required to be constructed or financially guaranteed to be constructed for the above development. This summary is not necessarily a complete listing. During the design process, if the City determines that appurtenant items have not been included in the summary, those items will be included in the listing and related financial guarantee, if the items normally are the Subdivider responsibility. In addition, any unforeseen items which arise during construction which are necessary to complete the project and which normally are the Subdivider's responsibility are the responsibility of the Subdivider and will be included in the financial guarantee provided to the City.

Size	Type Improvement	Location	From	To
24'/F-F	Arterial Street Curb & Gutter Sidewalks 6' (South Side)	Opportunity Avenue	West P.L.	East P.L.
32'/F-F	Residential Street Curb & Gutter Sidewalks 4' (Both Side)*	Strawberry Rd.	Cranberry Rd.	Hackberry Rd.
28'/F-F	Residential Street Curb & Gutter Sidewalks 4' (Both Side)*	Dewberry Rd.	Snowberry Rd.	East End Cul De Sac
28'/F-F	Residential Street Curb & Gutter Sidewalks 4' (Both Side)*	Barberry Rd.	Cranberry Rd.	East End Cul De Sac
28'/F-F	Residential Street Curb & Gutter Sidewalks 4' (Both Sides)*	Research Rd.	West P.L.	Cranberry Rd.
28'/F-F	Residential Street Curb & Gutter Sidewalks 4' (Both Sides)*	Research Ct.	Snowberry Rd.	East End Cul De Sac
28'/F-F	Residential Street Curb & Gutter Sidewalks 4' (Both Sides)*	Silverberry Rd.	Cranberry Rd.	East End Cul De Sac
32'/F-F	Residential Street Curb & Gutter Sidewalks 4' (Both Sides)*	Cranberry Rd.	Silverberry Rd.	Strawberry Rd.
32'/F-F	Residential Street Curb & Gutter Sidewalks 4' (Both Sides)*	Blueberry Rd.	Silverberry Rd.	Strawberry Rd.
32'/F-F	Residential Street Curb & Gutter Sidewalks 4' (Both Sides)*	Chuckberry Rd.	Silverberry Rd.	Opportunity Ave.
32'/F-F	Residential Street Curb & Gutter Sidewalks 4' (Both Sides)*	Snowberry Rd.	Silverberry Rd.	Strawberry Rd.
32'/F-F	Residential Street Curb & Gutter Sidewalks 4' (Both Sides)*	Hackberry Rd.	Strawberry Rd.	Opportunity Ave.

6"	Water PVC Line	Opportunity Avenue	West P.L.	East P.L.
6"	Water PVC Line	Strawberry Rd.	Cranberry Rd.	Hackberry Rd.
6"	Water PVC Line	Dewberry Rd.	Snowberry Rd.	East End Cul De Sac
6"	Water PVC Line	Barberry Rd.	Cranberry Rd.	East End Cul De Sac
6"	Water PVC Line	Research Rd.	West P.L.	Cranberry Rd.
6"	Water PVC Line	Research Ct.	Snowberry Rd.	East End Cul De Sac
6"	Water PVC Line	Silverberry Rd.	Cranberry Rd.	East End Cul De Sac
6"	Water PVC Line	Cranberry Rd.	Silverberry Rd.	Strawberry Rd.
6"	Water PVC Line	Blueberry Rd.	Silverberry Rd.	Strawberry Rd.
6"	Water PVC Line	Chuckberry Rd.	Silverberry Rd.	Opportunity Ave.
6"	Water PVC Line	Snowberry Rd.	Silverberry Rd.	Strawberry Rd.
6"	Water PVC Line	Hackberry Rd.	Strawberry Rd.	Opportunity Ave.

Water infrastructure to include
valves, fittings, valve boxes, fire hydrants,
service connections, as required

8"	SAS Gravity Line	Opportunity Avenue	West P.L.	East P.L.
8"	SAS Gravity Line	Strawberry Rd.	Cranberry Rd.	Hackberry Rd.
8"	SAS Gravity Line	Dewberry Rd.	Snowberry Rd.	East End Cul De Sac
8"	SAS Gravity Line	Barberry Rd.	Cranberry Rd.	East End Cul De Sac
8"	SAS Gravity Line	Research Rd.	West P.L.	Cranberry Rd.
8"	SAS Gravity Line	Research Ct.	Snowberry Rd.	East End Cul De Sac
8"	SAS Gravity Line	Silverberry Rd.	Cranberry Rd.	East End Cul De Sac
8"	SAS Gravity Line	Cranberry Rd.	Silverberry Rd.	Strawberry Rd.
8"	SAS Gravity Line	Blueberry Rd.	Silverberry Rd.	Strawberry Rd.
8"	SAS Gravity Line	Chuckberry Rd.	Silverberry Rd.	Opportunity Ave.
8"	SAS Gravity Line	Snowberry Rd.	Silverberry Rd.	Strawberry Rd.
8"	SAS Gravity Line	Hackberry Rd.	Strawberry Rd.	Opportunity Ave.
8"	SAS Gravity Line	20' P.U.E	End Cul De Sac (Silverberry Rd.)	S.E. P.L

Sanitary Sewer to include, manholes,
service connections as required

36"	Storm Sewer	Cranberry Rd.	Research Rd.	Barberry Rd.
48"	Storm Sewer	Research Rd.	Cranberry Rd.	Pond
48"	Storm Sewer	Research Rd.	Cranberry Rd.	Eubank

Retention Pond

Manholes, Catch basins, and RCP included with Storm Sewer

Storm Sewer Modifications

	Residential Street Lights Per DPM
	Certified Grading with Private Retaining Walls & Private Drainage (Non-work order item) Required for SIA/Financial Release
*	Internal Sidewalks deferred

Prepared By: _____

Print Name: Ronald R. Bohannan, P.E.

Firm: Tierra West Development Mgmt Services

****

Development Review Board Member Approvals

Transportation Dev.	Date	Utility Dev.	Date	Cult. & Rec	Date
City Engineer/AMAFCA	Date	DRB Chairman	Date		
AMAFCA	Date				

100-YEAR & 10-YEAR

RUNOFF

AHYMO INPUT AND

SUMMARY OUTPUT FILES

(UNDER EXISTING AND PROPOSED CONDITIONS)

```
*****************************************************************
*****                                                       *****
*****              DRAINAGE CALCULATION FOR                 *****
*****         SHAW   MOBILE   HOME   SUBDIVISION            *****
*****                                                       *****
*****************************************************************
*****              UNDER  PROPESED  CONDITIONS              *****
*****                                                       *****
*****************************************************************
*                         100-YR (6-HR)                         *
*****************************************************************
START                TIME=0.0
*****
RAINFALL             TYPE=1 RAIN QUARTER=0.0 IN
                     RAIN ONE=2.14 IN RAIN SIX=2.60 IN
                     RAIN DAY=3.10 IN DT=0.03333 HR
COMPUTE NM HYD       ID=1 HYD NO=101.1 AREA=0.062672 SQ MI
                     PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                     TP=0.1333 HR MASS RAINFALL=-1
*****************************************************************
*                          10-YR   (6-HR)                       *
*****************************************************************
START                TIME=0.0
*****
RAINFALL             TYPE=1 RAIN QUARTER=0.0 IN
                     RAIN ONE=1.43 IN RAIN SIX=1.73 IN
                     RAIN DAY=2.07 IN DT=0.03333 HR
COMPUTE NM HYD       ID=1 HYD NO=110.1 AREA=0.062672 SQ MI
                     PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                     TP=0.1333 HR MASS RAINFALL=-1
*****************************************************************
*****              UNDER  EXISING  CONDITIONS               *****
*****************************************************************
*                         100-YR (6-HR)                         *
*****************************************************************
START                TIME=0.0
*****
RAINFALL             TYPE=1 RAIN QUARTER=0.0 IN
                     RAIN ONE=2.14 IN RAIN SIX=2.60 IN
                     RAIN DAY=3.10 IN DT=0.03333 HR
COMPUTE NM HYD       ID=1 HYD NO=102.1 AREA=0.062672 SQ MI
                     PER A=0.00 PER B=100.00 PER C=0.00 PER D=0.00
                     TP=0.1333 HR MASS RAINFALL=-1
*****************************************************************
*                              10-YR                            *
*****************************************************************
START                TIME=0.0
*****
***** BASIN A
*****
RAINFALL             TYPE=1 RAIN QUARTER=0.0 IN
                     RAIN ONE=1.43 IN RAIN SIX=1.73 IN
                     RAIN DAY=2.07 IN DT=0.03333 HR
COMPUTE NM HYD       ID=1 HYD NO=112.1 AREA=0.062672 SQ MI
                     PER A=0.00 PER B=100.00 PER C=0.00 PER D=0.00
                     TP=0.1333 HR MASS RAINFALL=-1
*****************************************************************
FINISH
```

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =06/29/1995
INPUT FILE = 1.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= 2.600
COMPUTE NM HYD	101.10	-	1	.06267	169.12	6.182	1.84942	1.500	4.216	PER IMP= 60.00
START										TIME= .00
RAINFALL TYPE= 1										RAIN6= 1.730
COMPUTE NM HYD	110.10	-	1	.06267	104.66	3.622	1.08370	1.500	2.609	PER IMP= 60.00
START										TIME= .00
RAINFALL TYPE= 1										RAIN6= 2.600
COMPUTE NM HYD	102.10	-	1	.06267	104.11	3.078	.92096	1.500	2.596	PER IMP= .00
START										TIME= .00
RAINFALL TYPE= 1										RAIN6= 1.730
COMPUTE NM HYD	112.10	-	1	.06267	46.78	1.188	.35547	1.533	1.166	PER IMP= .00
FINISH										

100-YEAR & 10-YEAR

RUNOFF

AHYMO INPUT AND

SUMMARY OUTPUT FILES

(EXISTING OVERALL DRAINAGE BASINS)

```
*****************************************************************
*****                                                       *****
*****              DRAINAGE CALCULATION FOR                 *****
*****       BOOBBERRY   MOBILE   HOME   SUBDIVISION         *****
*****                                                       *****
*****                  OVERALL  SUBBASINS                   *****
*****                                                       *****
*                          100-YR (6-HR)                        *
*****************************************************************
START                TIME=0.0
*****
***** BASIN  A
*****
RAINFALL             TYPE=1 RAIN QUARTER=0.0 IN
                     RAIN ONE=2.14 IN RAIN SIX=2.60 IN
                     RAIN DAY=3.10 IN DT=0.03333 HR
COMPUTE NM HYD       ID=1 HYD NO=101.1 AREA=0.061452 SQ MI
                     PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                     TP=0.1333 HR MASS RAINFALL=-1
*****
***** BASIN  B
*****
COMPUTE NM HYD       ID=1 HYD NO=101.2 AREA=0.030236 SQ MI
                     PER A=0.00 PER B=100.00 PER C=0.00 PER D=0.00
                     TP=0.1333 HR MASS RAINFALL=-1
*****
***** BASIN  C
*****
COMPUTE NM HYD       ID=1 HYD NO=101.3 AREA=0.032389 SQ MI
                     PER A=0.00 PER B=100.00 PER C=0.00 PER D=0.00
                     TP=0.1333 HR MASS RAINFALL=-1
*****************************************************************
*                          10-YR   (6-HR)                       *
*****************************************************************
START                TIME=0.0
*****
***** BASIN  A
*****

RAINFALL             TYPE=1 RAIN QUARTER=0.0 IN
                     RAIN ONE=1.43 IN RAIN SIX=1.73 IN
                     RAIN DAY=2.07 IN DT=0.03333 HR
COMPUTE NM HYD       ID=1 HYD NO=111.1 AREA=0.061452 SQ MI
                     PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                     TP=0.1333 HR MASS RAINFALL=-1
*****
***** BASIN  B
*****
COMPUTE NM HYD       ID=1 HYD NO=111.2 AREA=0.030236 SQ MI
                     PER A=0.00 PER B=100.00 PER C=0.00 PER D=0.00
                     TP=0.1333 HR MASS RAINFALL=-1
*****
***** BASIN  C
*****
COMPUTE NM HYD       ID=1 HYD NO=111.3 AREA=0.032389 SQ MI
                     PER A=0.00 PER B=100.00 PER C=0.00 PER D=0.00
                     TP=0.1333 HR MASS RAINFALL=-1
*****************************************************************
FINISH
```

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =07/12/1995

INPUT FILE = ovr.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=	2.600
COMPUTE NM HYD	101.10	-	1	.06145	165.82	6.061	1.84941	1.500	4.216	PER IMP=	60.00
COMPUTE NM HYD	101.20	-	1	.03024	50.23	1.485	.92096	1.500	2.596	PER IMP=	.00
COMPUTE NM HYD	101.30	-	1	.03239	53.81	1.591	.92096	1.500	2.596	PER IMP=	.00
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	1.730
COMPUTE NM HYD	111.10	-	1	.06145	102.63	3.552	1.08370	1.500	2.610	PER IMP=	60.00
COMPUTE NM HYD	111.20	-	1	.03024	22.57	.573	.35547	1.533	1.166	PER IMP=	.00
COMPUTE NM HYD	111.30	-	1	.03239	24.18	.614	.35547	1.533	1.166	PER IMP=	.00
FINISH											

AHYMO

INPUT & OUTPUT

FILES FOR

SUBBASINS

```
*****************************************************************
*****                                                       *****
*****              DRAINAGE CALCULATION FOR                 *****
*****         SHAW   MOBILE   HOME   SUBDIVISION            *****
*****************************************************************
*****                       SUBBASINS                       *****
*****************************************************************
*                          100-YR (6-HR)                        *
*****************************************************************
START               TIME=0.0
*****
***** SUBBASIN  A
*****
RAINFALL            TYPE=1 RAIN QUARTER=0.0 IN
                    RAIN ONE=2.14 IN RAIN SIX=2.60 IN
                    RAIN DAY=3.10 IN DT=0.03333 HR
COMPUTE NM HYD      ID=1 HYD NO=101.1 AREA=0.006074 SQ MI
                    PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                    TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  B
*****
COMPUTE NM HYD      ID=1 HYD NO=101.2 AREA=0.009974 SQ MI
                    PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                    TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  C
*****
COMPUTE NM HYD      ID=1 HYD NO=101.3 AREA=0.007085 SQ MI
                    PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                    TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  D
*****
COMPUTE NM HYD      ID=1 HYD NO=101.4 AREA=0.004433 SQ MI
                    PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                    TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  E
*****
COMPUTE NM HYD      ID=1 HYD NO=101.5 AREA=0.004784 SQ MI
                    PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                    TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  F
*****
COMPUTE NM HYD      ID=1 HYD NO=101.6 AREA=0.003470 SQ MI
                    PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                    TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  G
*****
COMPUTE NM HYD      ID=1 HYD NO=101.7 AREA=0.003525 SQ MI
                    PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                    TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  H
*****
COMPUTE NM HYD      ID=1 HYD NO=101.8 AREA=0.004784 SQ MI
                    PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
```

```
                    TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  I
*****
COMPUTE NM HYD      ID=1 HYD NO=101.9 AREA=0.004407 SQ MI
                    PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                    TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  J
*****
COMPUTE NM HYD      ID=1 HYD NO=101.10 AREA=0.002955 SQ MI
                    PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                    TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  K
*****
COMPUTE NM HYD      ID=1 HYD NO=101.11 AREA=0.004009 SQ MI
                    PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                    TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  L
*****
COMPUTE NM HYD      ID=1 HYD NO=101.12 AREA=0.002198 SQ MI
                    PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                    TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  M
*****
COMPUTE NM HYD      ID=1 HYD NO=101.13 AREA=0.003552 SQ MI
                    PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                    TP=0.1333 HR MASS RAINFALL=-1
*******************************************************************
*                         10-YR   (6-HR)                          *
*******************************************************************
START               TIME=0.0
*****
***** SUBBASIN  A
*****

RAINFALL            TYPE=1 RAIN QUARTER=0.0 IN
                    RAIN ONE=1.43 IN RAIN SIX=1.73 IN
                    RAIN DAY=2.07 IN DT=0.03333 HR
COMPUTE NM HYD      ID=1 HYD NO=111.1 AREA=0.006074 SQ MI
                    PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                    TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  B
*****
COMPUTE NM HYD      ID=1 HYD NO=111.2 AREA=0.009974 SQ MI
                    PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                    TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  C
*****
COMPUTE NM HYD      ID=1 HYD NO=111.3 AREA=0.007085 SQ MI
                    PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                    TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  D
*****
```

```
COMPUTE NM HYD       ID=1 HYD NO=111.4 AREA=0.004433 SQ MI
                     PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                     TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  E
*****
COMPUTE NM HYD       ID=1 HYD NO=111.5 AREA=0.004784 SQ MI
                     PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                     TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  F
*****
COMPUTE NM HYD       ID=1 HYD NO=111.6 AREA=0.003470 SQ MI
                     PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                     TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  G
*****
COMPUTE NM HYD       ID=1 HYD NO=111.7 AREA=0.003525 SQ MI
                     PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                     TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  H
*****
COMPUTE NM HYD       ID=1 HYD NO=111.8 AREA=0.004784 SQ MI
                     PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                     TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  I
*****
COMPUTE NM HYD       ID=1 HYD NO=111.9 AREA=0.004407 SQ MI
                     PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                     TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  J
*****
COMPUTE NM HYD       ID=1 HYD NO=111.10 AREA=0.002955 SQ MI
                     PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                     TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  K
*****
COMPUTE NM HYD       ID=1 HYD NO=111.11 AREA=0.004009 SQ MI
                     PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                     TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  L
*****
COMPUTE NM HYD       ID=1 HYD NO=111.12 AREA=0.002198 SQ MI
                     PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                     TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  M
*****
COMPUTE NM HYD       ID=1 HYD NO=111.13 AREA=0.003552 SQ MI
                     PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                     TP=0.1333 HR MASS RAINFALL=-1
*********************************************************************
FINISH
```

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =07/07/1995
INPUT FILE = 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	NOTATION	PAGE = 1
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	2.600
COMPUTE NM HYD	101.10	-	1	.00607	16.41	.599	1.84942	1.500	4.221	PER IMP=	60.00
COMPUTE NM HYD	101.20	-	1	.00997	26.93	.984	1.84942	1.500	4.219	PER IMP=	60.00
COMPUTE NM HYD	101.30	-	1	.00709	19.14	.699	1.84942	1.500	4.220	PER IMP=	60.00
COMPUTE NM HYD	101.40	-	1	.00443	11.98	.437	1.84941	1.500	4.223	PER IMP=	60.00
COMPUTE NM HYD	101.50	-	1	.00478	12.93	.472	1.84942	1.500	4.222	PER IMP=	60.00
COMPUTE NM HYD	101.60	-	1	.00347	9.38	.342	1.84942	1.500	4.224	PER IMP=	60.00
COMPUTE NM HYD	101.70	-	1	.00353	9.53	.348	1.84942	1.500	4.224	PER IMP=	60.00
COMPUTE NM HYD	101.80	-	1	.00478	12.93	.472	1.84942	1.500	4.222	PER IMP=	60.00
COMPUTE NM HYD	101.90	-	1	.00441	11.91	.435	1.84942	1.500	4.223	PER IMP=	60.00
COMPUTE NM HYD	101.10	-	1	.00296	7.99	.291	1.84942	1.500	4.226	PER IMP=	60.00
COMPUTE NM HYD	101.11	-	1	.00401	10.84	.395	1.84942	1.500	4.223	PER IMP=	60.00
COMPUTE NM HYD	101.12	-	1	.00220	5.95	.217	1.84942	1.500	4.229	PER IMP=	60.00
COMPUTE NM HYD	101.13	-	1	.00355	9.60	.350	1.84942	1.500	4.224	PER IMP=	60.00
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	1.730
COMPUTE NM HYD	111.10	-	1	.00607	10.15	.351	1.08370	1.500	2.612	PER IMP=	60.00
COMPUTE NM HYD	111.20	-	1	.00997	16.67	.576	1.08370	1.500	2.611	PER IMP=	60.00
COMPUTE NM HYD	111.30	-	1	.00709	11.84	.409	1.08370	1.500	2.612	PER IMP=	60.00
COMPUTE NM HYD	111.40	-	1	.00443	7.41	.256	1.08370	1.500	2.613	PER IMP=	60.00
COMPUTE NM HYD	111.50	-	1	.00478	8.00	.277	1.08370	1.500	2.613	PER IMP=	60.00
COMPUTE NM HYD	111.60	-	1	.00347	5.81	.201	1.08370	1.500	2.614	PER IMP=	60.00
COMPUTE NM HYD	111.70	-	1	.00353	5.90	.204	1.08370	1.500	2.614	PER IMP=	60.00
COMPUTE NM HYD	111.80	-	1	.00478	8.00	.277	1.08370	1.500	2.613	PER IMP=	60.00
COMPUTE NM HYD	111.90	-	1	.00441	7.37	.255	1.08370	1.500	2.613	PER IMP=	60.00
COMPUTE NM HYD	111.10	-	1	.00296	4.95	.171	1.08370	1.500	2.615	PER IMP=	60.00
COMPUTE NM HYD	111.11	-	1	.00401	6.71	.232	1.08370	1.500	2.613	PER IMP=	60.00
COMPUTE NM HYD	111.12	-	1	.00220	3.68	.127	1.08370	1.500	2.617	PER IMP=	60.00
COMPUTE NM HYD	111.13	-	1	.00355	5.94	.205	1.08370	1.500	2.614	PER IMP=	60.00
FINISH											

±9.7 acre-ft

⇒ 422,532 CF

APPENDIX A

(PRE-DESIGN MEETING LETTER)

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
UTILITY DEVELOPMENT DIVISION/HYDROLOGY SECTION

PRE-DESIGN CONFERENCE

DRAINAGE FILE/ZONE ATLAS PAGE NO.: M21 DATE: 6/28/95

EPC NO.: _____ DRB NO.: _____ ZONE: _____

SUBJECT: Shaw Mobile Home Subdivision

STREET ADDRESS: _____

LEGAL DESCRIPTION: RECO CORP TRACT (SP-82-219)

APPROVAL REQUESTED:

X	PRELIMINARY PLAT		FINAL PLAT
X	SITE DEVELOPMENT PLAN		BUILDING PERMIT
	GRADING/PAVING PERMIT		OTHER

ATTENDANCE:	WHO	REPRESENTING
	Ron Bohannan	
	~~Shath~~ Shahab Biazar	

FINDINGS:

1. Verify legal platting status of property.
2. An approved drainage report is required for preliminary plat approval. Include a copy of the infrastructure list/plat.
3. The developed flows shall be programmed towards the future storm drain system in Eubank.
4. The required storm drains in Opportunity and Research must be ~~identified~~ designed for the subject development.
5. Retention ponding acceptable until the Eubank system is available. The retention pond must be designed for a 100yr ten day storm. Drainage covenants/easements required for these ponds.

The undersigned agrees that the above findings are summarized accurately and are only subject to change if further investigation reveals that they are not reasonable or that they are based on inaccurate information.

SIGNED: [signature] SIGNED: [signature]

TITLE: _____ TITLE: TAMS

DATE: 6/28/95 DATE: 6/28/95

[illegible] THE DRAINAGE SUBMITTAL

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

December 15, 1995

Ronald Bohannan
Tierra West Development
4421 McCleod Rd. NE
Suite D
Albuquerque, NM 87109

RE: BERRY HEIGHTS MOBILE HOME SUBDIVISION (M21-D6A) DRAINAGE REPORT FOR SITE DEVELOPMENT PLAN FOR SUBDIVISION, FINAL PLAT, AND GRADING PERMIT APPROVAL. ENGINEER'S STAMP DATED NOVEMBER 28, 1995.

Dear Mr. Bohannan:

Based on the information provided on your November 29, 1995 submittal, the above referenced project is approved for Site Development for Subdivision only. Please address the following comments prior to your next submittal:

1. Give rim and invert elevations of all catch basins. Give invert elevations of 48 inch storm drain pipe.

2. Please state on plan sheet and infrastructure list that your future storm drain runs along Research Rd., from Cranberry Rd. to the future Eubank Blvd. storm drain.

3. Covenants and Easements will be required for your temporary retention pond.

4. Submit a copy of the plat.

5. Please provide location, description and elevation of the Albuquerque control survey vertical datum and a temporary bench mark on site.

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

Sincerely,

Lisa Ann Manwill
Engineering Assoc./Hyd.

c: Andrew Garcia
File

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

DRAINAGE INFORMATION SHEET

PROJECT TITLE: *BERRY HEIGHTS MOBILE HOME SUBDIVISION* ZONE ATLAS/DRNG. FILE #: *M-21 / D6A*

DRB #: 95-523 EPC #: *Z-95-69* WORK ORDER #:

LEGAL DESCRIPTION: *RECO CORPORATION*

CITY ADDRESS:

ENGINEERING FIRM: *TIERRA WEST DEV. MAGT. SER.* CONTACT: *RONALD R. BOHANNAN OR SHAHAB BIAZAR*

ADDRESS: *4421 McCleod Rd. NE Suite D, 87109* PHONE: *(505) 883-7592*

OWNER: *HEIGHTS REALTY LTD.* CONTACT: *TIM EICHENBERG*

ADDRESS: *1305 SAN PEDRO, NE, ALB., 87110* PHONE: *(505) 265-7555*

ARCHITECT: CONTACT:

ADDRESS: PHONE:

SURVEYOR: *PRECISION SURVEYING* CONTACT: *LARRY MEDRANO*

ADDRESS: PHONE: *(505) 839-0569*

CONTRACTOR: CONTACT:

ADDRESS: PHONE:

TYPE OF SUBMITTAL:

- X DRAINAGE REPORT
- DRAINAGE PLAN
- CONCEPTUAL GRADING & DRAINAGE PLAN
- GRADING PLAN
- EROSION CONTROL PLAN
- ENGINEER'S CERTIFICATION
- OTHER

PRE-DESIGN MEETING:

- X YES
- NO
- COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

- SKETCH PLAN APPROVAL
- PRELIMINARY PLAT APPROVAL
- X S. DEV. PLAN FOR SUB'D. APPROVAL
- S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
- SECTOR PLAN APPROVAL
- X FINAL PLAT APPROVAL
- FOUNDATION PERMIT APPROVAL
- BUILDING PERMIT APPROVAL
- CERTIFICATE OF OCCUPANCY APPROVAL
- X GRADING PERMIT APPROVAL
- PAVING PERMIT APPROVAL
- S. A. D. DRAINAGE REPORT
- DRAINAGE REQUIREMENTS
- X *NUMBER OF LOTS DECREASED & CHANGE IN STORM LAYOUT*

DATE SUBMITTED: *11 /28 / 95*

NOV 29 '95

BY: *SHAHAB BIAZAR*

DRAINAGE REPORT

FOR

"BERRY HEIGHTS"

MOBILE HOME SUBDIVISION

Prepared by

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

Prepared for

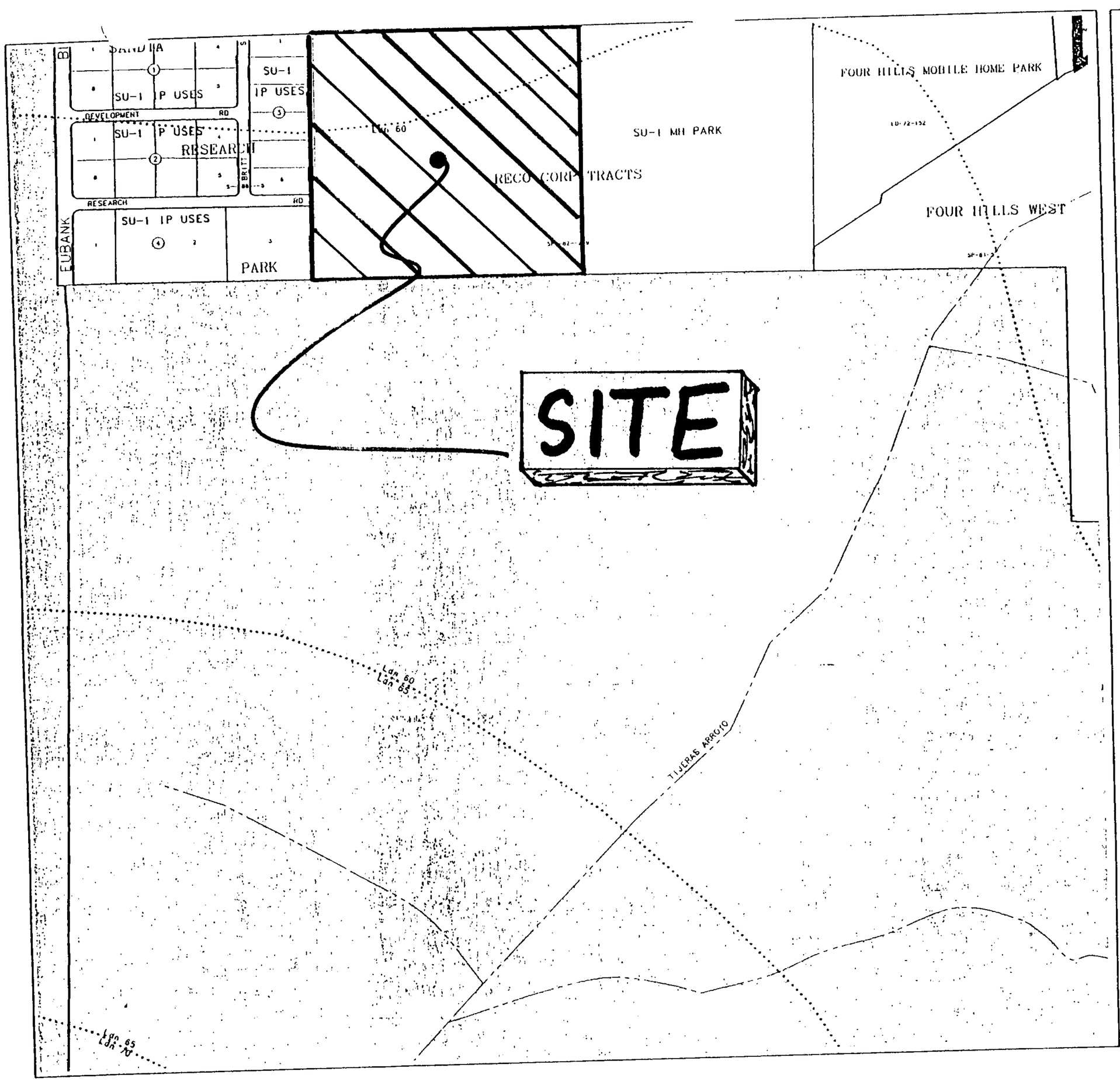
Tim Eichenberg
Heights Realty Ltd.
1305 San Pedro, NE
Albuquerque, New Mexico 87110

NOV 2 9

JULY, 1995
REVISED NOVEMBER, 1995

REGISTERED RONALD RAY BOHANNAN PROFESSIONAL ENGINEER NEW MEXICO 7868

Ronald R. Bohannan P.E. No. 7868



SCALE IN FEET

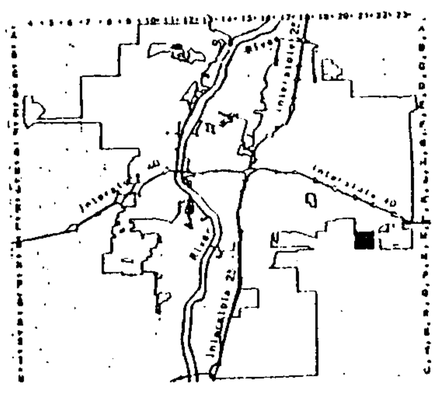
250 0 500 1000

PHOTOCOPY--NOT TO SCALE

North

© Planning Department

Map Amended through July 29, 1993



LEGAL DESCRIPTION

T10N

R4E

SEC 38

UNIFORM PROPERTY CODE

1-021-066

M-21-Z

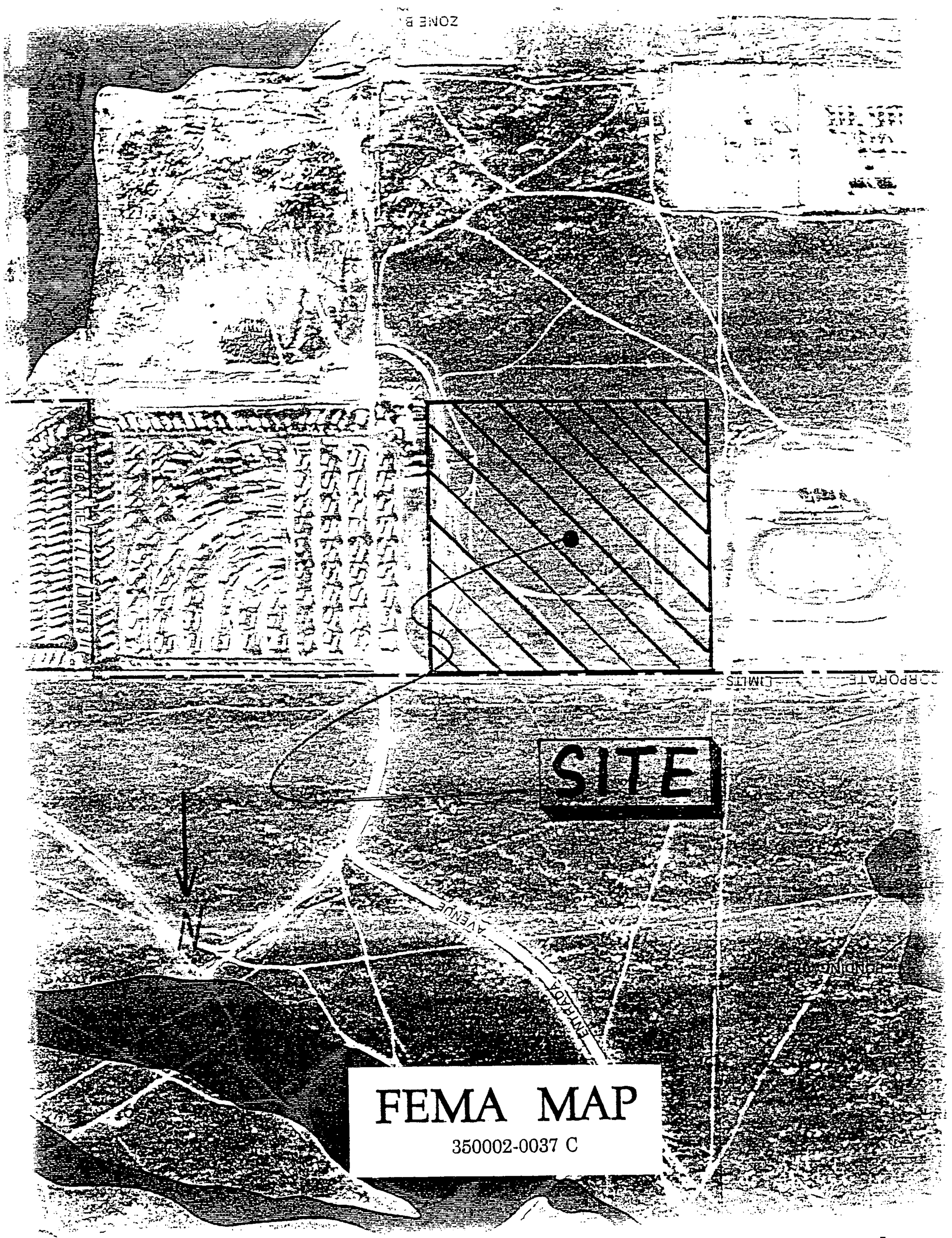
LOCATION AND LOCATION MAP

Berry Heights Mobile Home Subdivion is a 194 unit Mobile Home subdivision. The site is a Reco Corporation Tract located approximately 1100 feet east of Eubank Boulevard and south of Gibson Boulevard containing 33.71 acres. See highlighted Vicinity Map M-21 for location of the site. The purpose of this submittal is to provide the the drainage analysis for the referenced subdivision. We are requesting that this plan be reviewed for Preliminary Plat, Site Plan for subdivision purpose, and grading and drainage plan approval. The site is currently zoned SU-1 for PRD and is identified as the Reco Corporation Tracts.

EXISTING CONDITIONS

The site is currently undeveloped and sheet flows from east to west to an existing detention pond located on Sandia Research Park just east of Eubank. There is an existing mobile home park (Shaw Mobile Home Park) immediately east of this tract of land which drains to the south and does not impact the site. There are no off-site flows entering the site. The historical undeveloped flow rate from the site is 87.78 cfs. The site is located within FEMA MAP panel # 350002-0037C and does not fall within any existing flood plain.

Attached is a copy of the drawing showing the overall existing drainage basin. Basin A drains west and south with a runoff of 165.82 cfs. Basin B with a runoff of 42.50 cfs sheet flows north to Opportunity Avenue. Basin C with a runoff of 45.28 cfs sheet flows west and north to Opportunity Avenue. Basin D drains to the north to Opportunity towards Eubank at a flow rate of 16.27 cfs.


ZONE B
CORPORATE LIMITS
SITE
AVENUE
ENTRADA
FEMA MAP
350002-0037 C

ON-SITE DRAINAGE MANAGEMENT PLAN

Based on our last meeting with Fred Aguirre on June 28, 1995, it was decided to pond the entire runoff on site and to design the storm sewer for full discharge to future storm sewer improvements on Eubank Boulevard. The future storm sewer improvements are under City Project #4790 prepared by Smith Engineering Company. The site has been divided into several basins in order to determine the street flow capacity analysis (see attached Subbasin Layout). All of the basins drain to Cranberry Road, and from there all runoff is picked up and carried to a retention pond through a series of drop inlets.

Research Road is used for the emergency overflow where the runoff will drain to the west to an existing detention basin.

INFRASTRUCTURE LIST

A copy of the overall infrastructure list is included as part of this report.

Size	Type Improvement	Location	From	To
48"	Storm Sewer	Research Rd.	Cranberry Rd.	Retention Pond
	Retention Pond			
	Manholes, Catch basins, and RCP included with Storm Sewer			
	Storm Sewer Modifications			

Calculation Index

Runoff Calculations

Runoff Summary Tables For The Existing Overall Drainage Basins

Runoff Summary Tables For The Subbasins

Street Capacity Analysis

Drop Inlet & Drainage Pipe Calculation

Ponding Calculation

Infrastructure List

100-YR & 10-YR Runoff AHYMO Input and Summary Output
(Existing Overall Drainage Basins)

100-YR & 10-YR Runoff AHYMO Input and Summary Output
(Proposed Subbasins)

Appendix A - Predesign Meeting Letter

RUNOFF

CALCULATIONS

DRAINAGE CALCULATIONS

The site is @ Zone 3

LAND TREATMENT

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

DEPTH (INCHES) @ 100-YEAR STORM

P_{60} = 2.14 inches

P_{360} = 2.60 inches

P_{1440} = 3.10 inches

DEPTH (INCHES) @ 10-YEAR STORM

P_{60} = 2.14 x 0.667
= 1.43 inches

P_{360} = 1.73

P_{1440} = 2.07

See the following Tables for summary of the flow calculatioins

Also, see the summary output from AHYMO calculations.

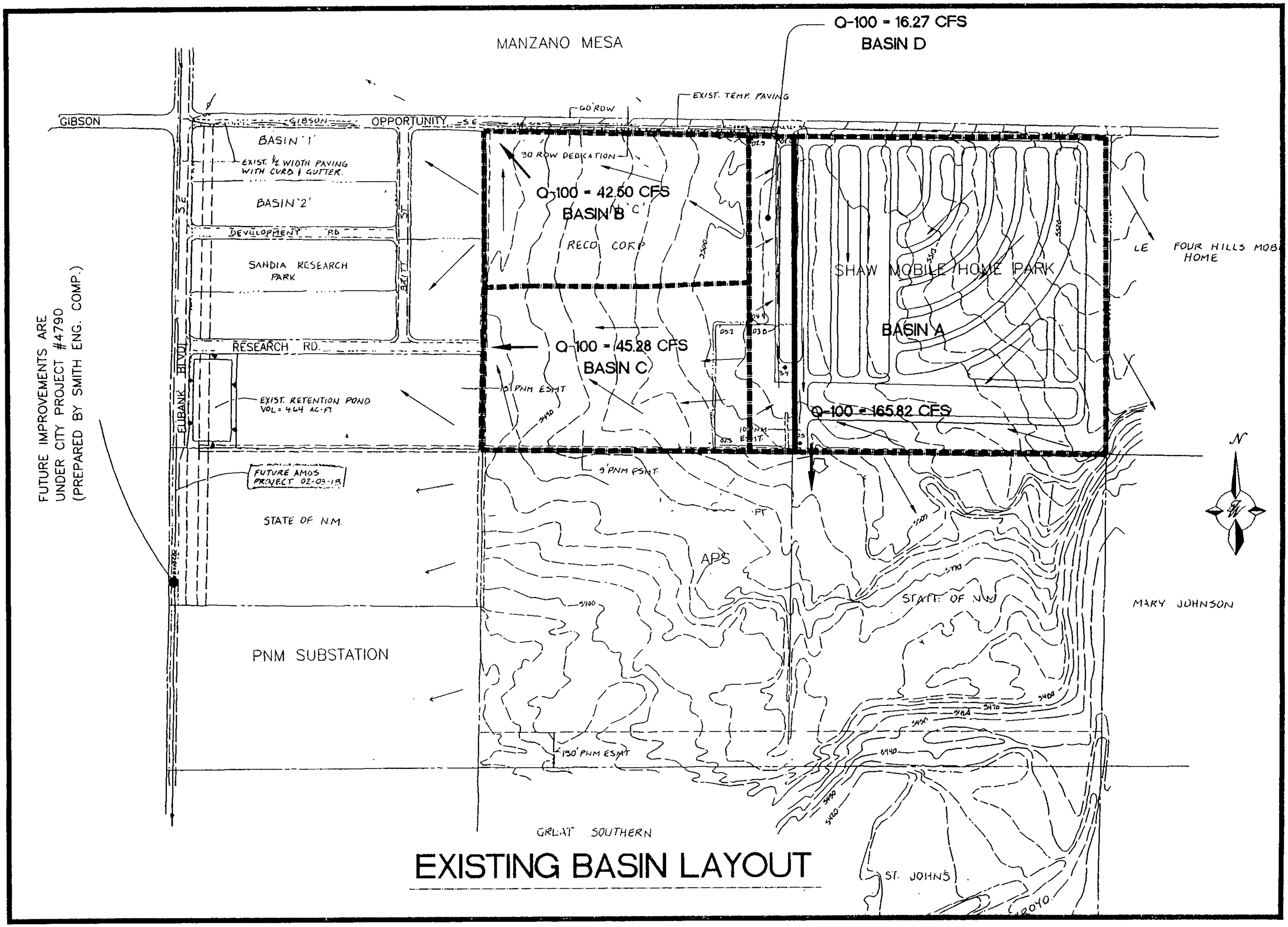
RUNOFF

SUMMARY TABLES

FOR THE

EXISTING OVERALL

DRAINAGE BASINS



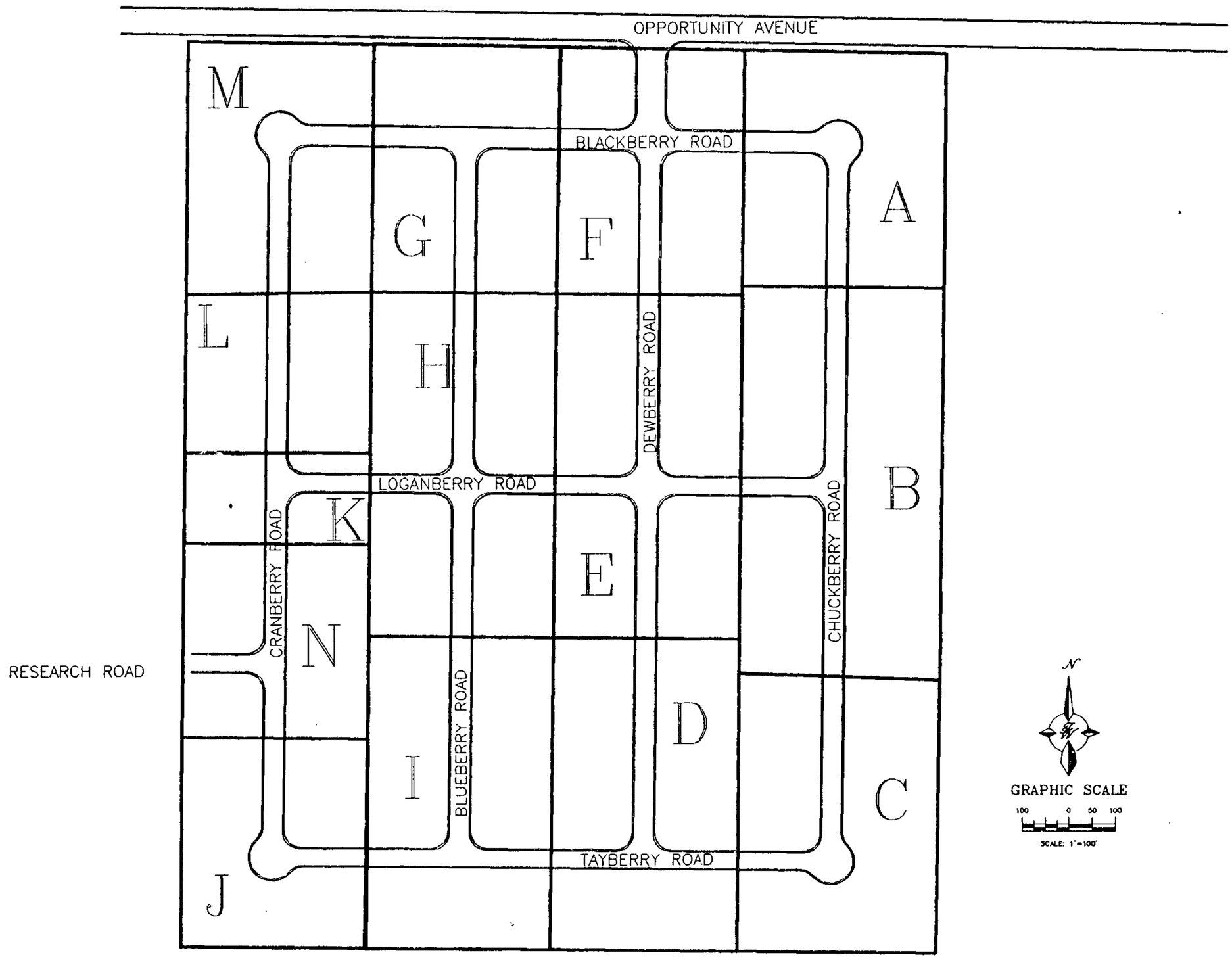
EXISTING BASIN LAYOUT

OVERALL DRAINAGE BASINS

BASIN	AREA (SF)	AREA (AC-FT)	AREA (MI^2)
A	1713188.00	39.3292	0.061452
B	713153.32	16.3717	0.025581
C	759901.93	17.4449	0.027258
D	272832.75	6.2634	0.009787

OVERALL DRAINAGE BASIN 100-YR & 10-YR RUNOFFS

BASIN	Q (100-YEAR) CFS	V (100-YEAR) AC-FT	Q (10-YEAR) CFS	V (10-YEAR) AC-FT
A	165.82	6.061	102.63	3.552
B	42.50	1.256	19.10	0.485
C	45.28	1.339	20.35	0.517
D	16.27	0.481	7.31	0.186


OPPORTUNITY AVENUE
BLACKBERRY ROAD
DEWBERRY ROAD
LOGANBERRY ROAD
CRANBERRY ROAD
CHUCKBERRY ROAD
BLUEBERRY ROAD
TAYBERRY ROAD
RESEARCH ROAD
M
G
F
A
L
H
B
K
E
N
D
I
C
J
N
GRAPHIC SCALE
100 0 50 100
SCALE: 1"=100'

SUBBASIN

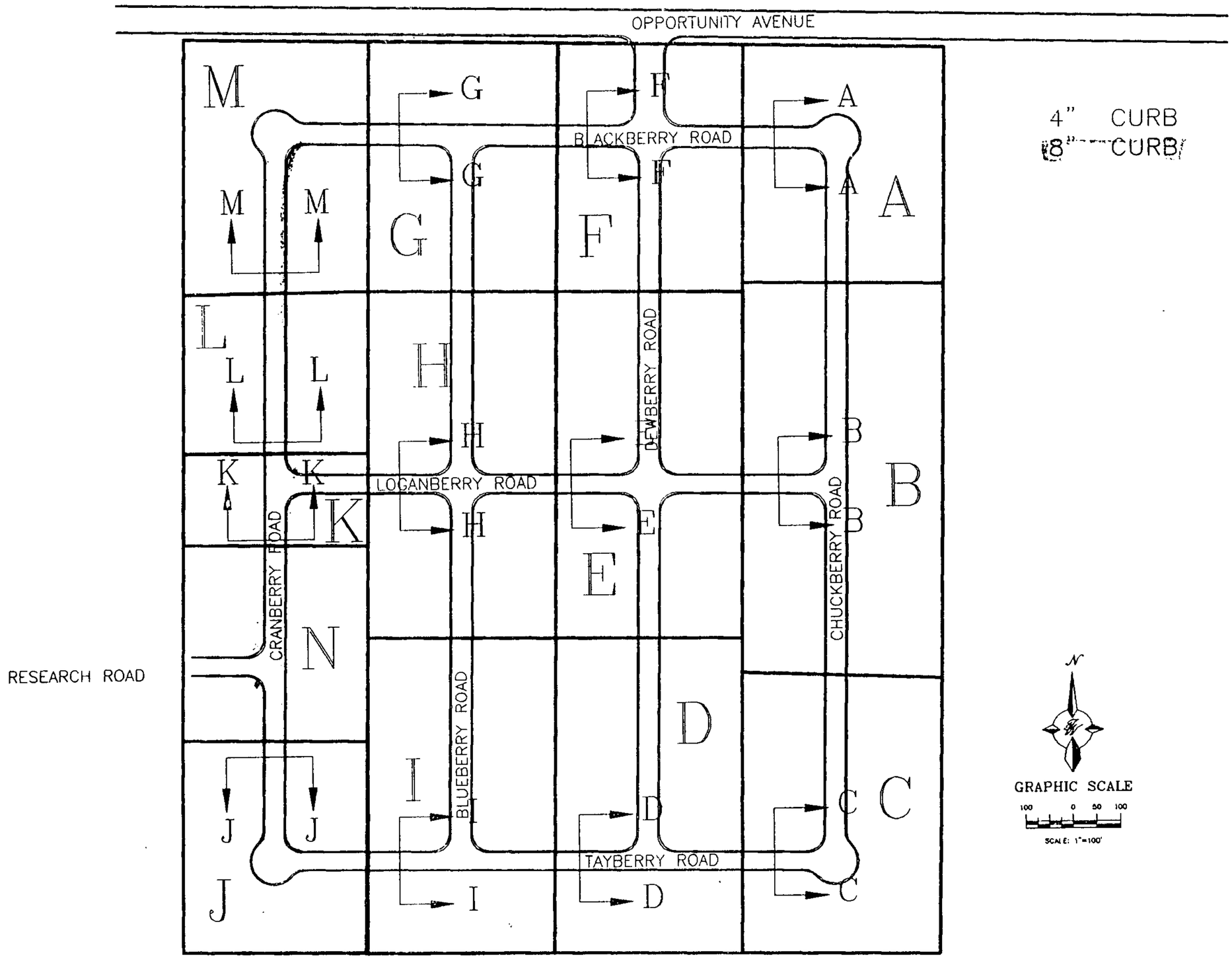
SUBBASIN AREAS

BASIN	AREA (SF)	AREA (AC-FT)	AREA (MI^2)
A	99569.09	2.2858	0.003572
B	161982.66	3.7186	0.005810
C	115791.72	2.6582	0.004153
D	123584.46	2.8371	0.004433
E	133378.67	3.0619	0.004784
F	96730.76	2.2206	0.003470
G	98262.52	2.2558	0.003525
H	133378.67	3.0619	0.004784
I	122858.82	2.8204	0.004407
J	82369.62	1.8909	0.002955
K	35361.47	0.8118	0.001268
L	61285.48	1.4069	0.002198
M	99036.58	2.2736	0.003552
N	76397.17	1.7538	0.002740

SUBBASIN 100-YR & 10-YR RUNOFFS

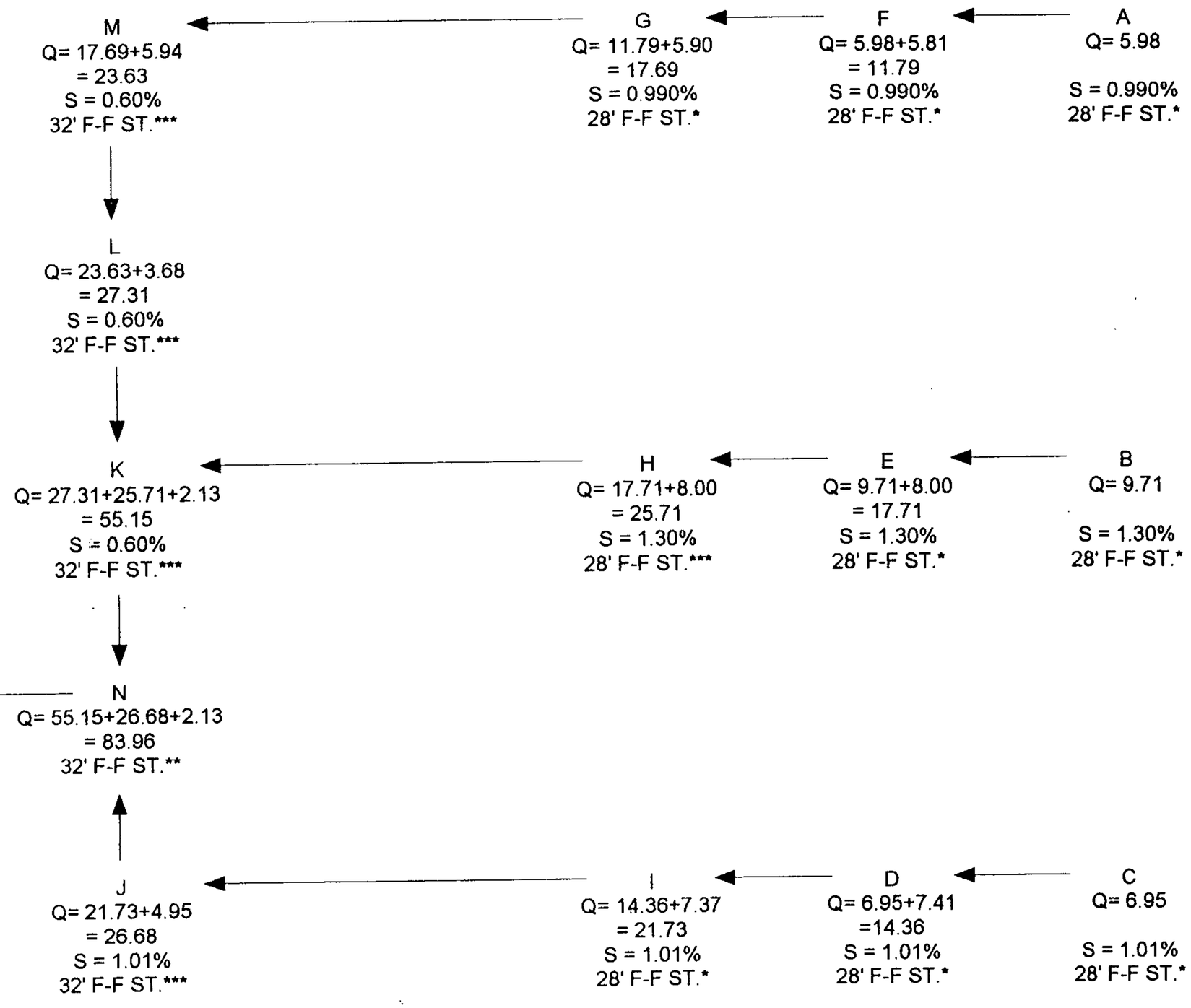
BASIN	Q (100-YEAR) CFS	V (100-YEAR) AC-FT	Q (10-YEAR) CFS	V (10-YEAR) AC-FT
A	9.66	0.352	5.98	0.206
B	15.70	0.573	9.71	0.336
C	11.22	0.410	6.95	0.240
D	11.98	0.437	7.41	0.256
E	12.93	0.472	8.00	0.277
F	9.38	0.342	5.81	0.201
G	9.53	0.348	5.90	0.204
H	12.93	0.472	8.00	0.277
I	11.91	0.435	7.37	0.255
J	7.99	0.291	4.95	0.171
K	3.44	0.125	2.13	0.073
L	5.95	0.217	3.68	0.127
M	9.60	0.350	5.94	0.205
N	7.41	0.270	4.59	0.158

STREET CAPACITY ANALYSIS



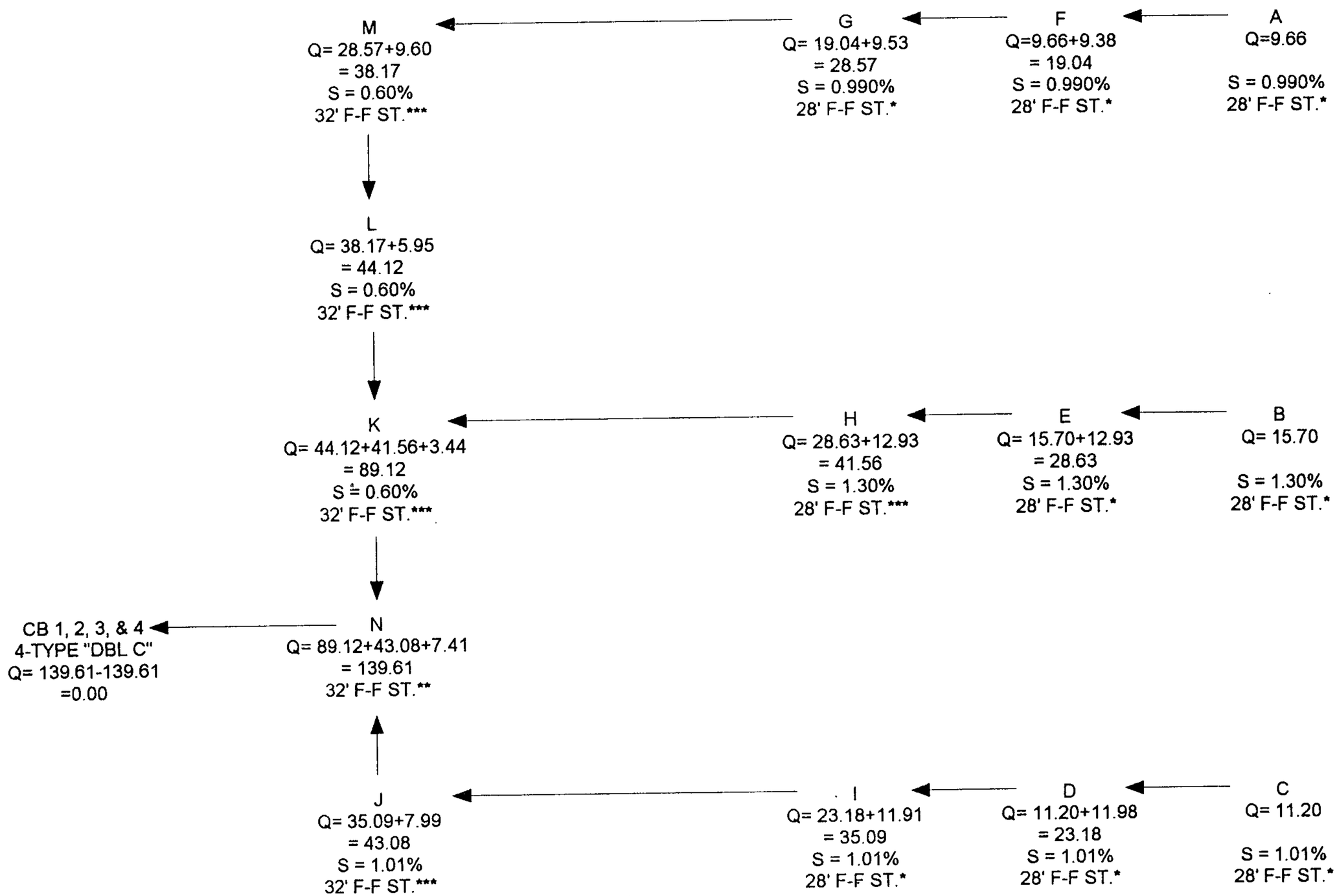
CROSS-SECTIONS

FLOW PATH (Q-10)

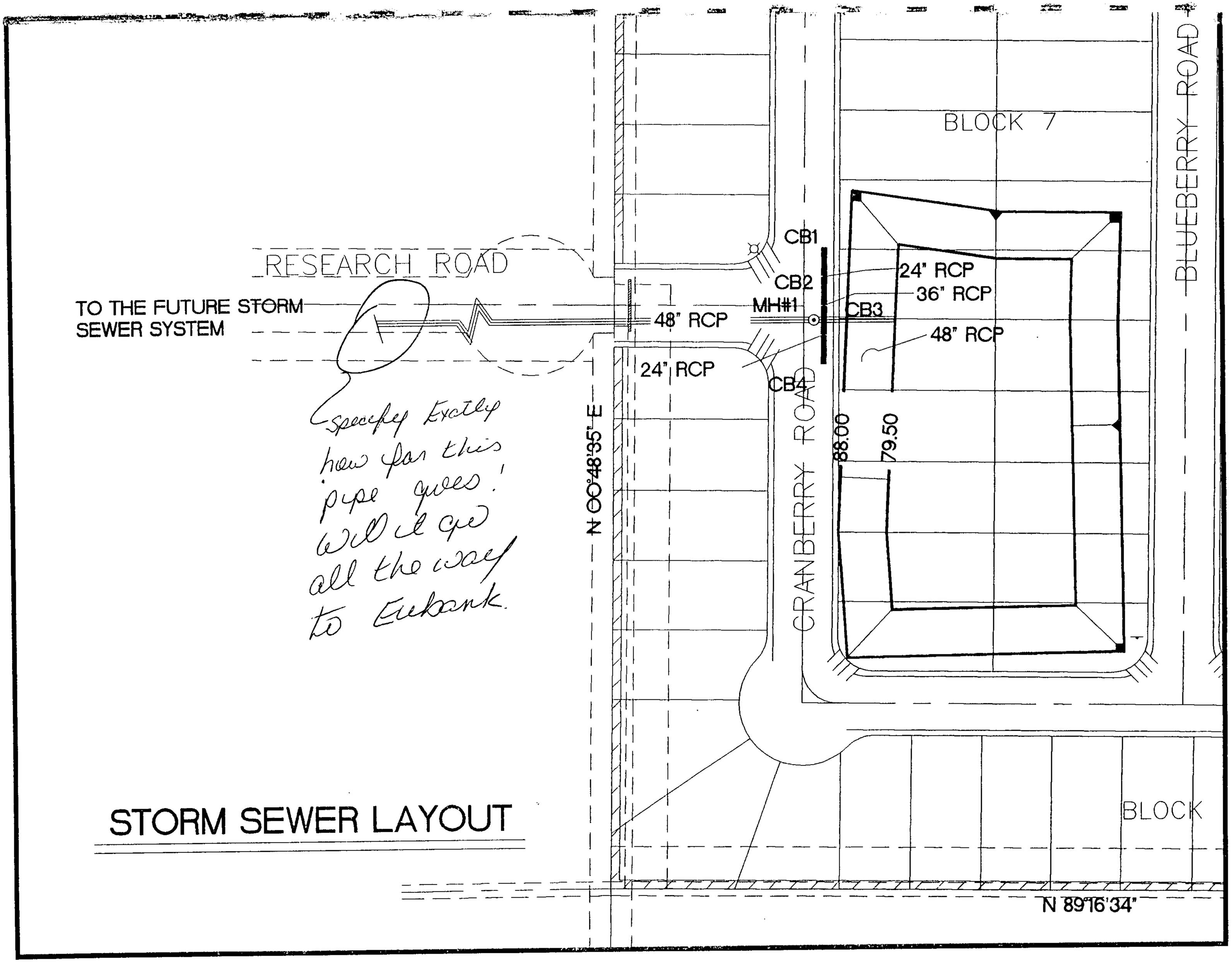


* 4" CURB
** 8" CURB
*** COMBINATION OF 4" & 8" CURB

FLOW PATH (Q-100)



* 4" CURB
** 8" CURB
*** COMBINATION OF 4" & 8" CURB



STORM SEWER LAYOUT

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

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

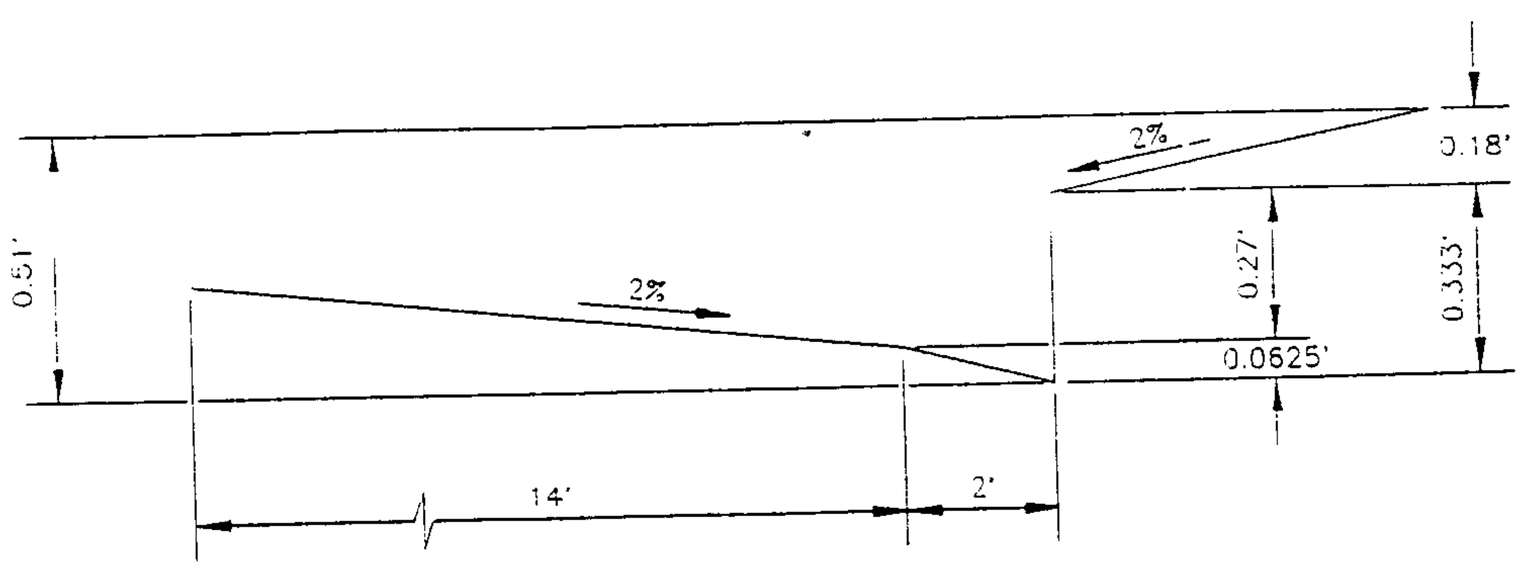
HALF STREET CALCULATIONS

$@Y \leq 0.0625$
$A1 = \frac{1}{2} Y\ (Y/0.03125) = 16Y^2$
$P1 = SQRT[Y^2 + (Y/0.03125)^2] + Y = SQRT(1025\ Y^2) + Y$

$@\ 0.0625 < Y \leq 0.333\ \ \&\ \ Y1 = Y - 0.0625$
$A2 = A1 + \frac{1}{2}Y1\ (Y1/0.02) + 2Y1 = A1 + 25Y1^2 + 2Y1$
$P2 = P1 + SQRT[Y1^2 + (Y1/0.02)^2] + Y1 = P1 + SQRT(2501\ Y^2) + Y1$

$@\ 0.333 < Y \leq 0.513\ \ \&\ \ Y2 = Y - 0.333$
$A3 = A2 + 16Y2 + \frac{1}{2}Y2[Y2/(0.02)] = A2 + 16\ Y2 + 25\ Y2^2$
$P3 = P2 + SQRT(Y2^2 + [Y2/(0.02)]^2) = P2 + SQRT(2501\ Y2^2)$

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



32' F–F
4" CURB

NOT TO SCALE

```
* INPUT FILE FOR 32'-FF STREET SECTION *
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 0 55.15 0.00600
* SECTION M *
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10 23.63 0.00600
* SECTION L *
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10 27.31 0.00600
* SECTION J *
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10 26.68 0.01010
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999 0.00 0.00
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---------- 32-FT F-F, 4" CURB STREET SECTION ----------

---------- STREET CAPACITY BASED ON 10-YR STORM ----------

FLOW CFS	SLOPE FT/FT	Dn FT	Vn FT/S	D*V FT»/S	Fr	E FT	D2 FT
55.15	.00600	.619	3.044	1.885	.682	.763	----
23.63	.00600	.457	2.457	1.124	.640	.551	----
27.31	.00600	.481	2.549	1.227	.648	.582	----
26.68	.01010	.435	3.078	1.340	.822	.583	----

---------- END OF THE OUTPUT FILE ----------

---------- 32-FT F-F, 4" CURB STREET SECTION ----------

---------- STREET CAPACITY BASED ON 100-YR STORM ----------

FLOW CFS	SLOPE FT/FT	Dn FT	Vn FT/S	D*V FT»/S	Fr	E FT	D2 FT
89.19	.00600	.700	3.315	2.320	.698	.871	----
38.17	.00600	.542	2.774	1.505	.664	.662	----
44.12	.00600	.571	2.878	1.644	.671	.700	----
43.08	.01010	.516	3.475	1.793	.853	.704	----

---------- END OF THE OUTPUT FILE ----------

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

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

<u>HALF STREET CALCULATIONS</u>

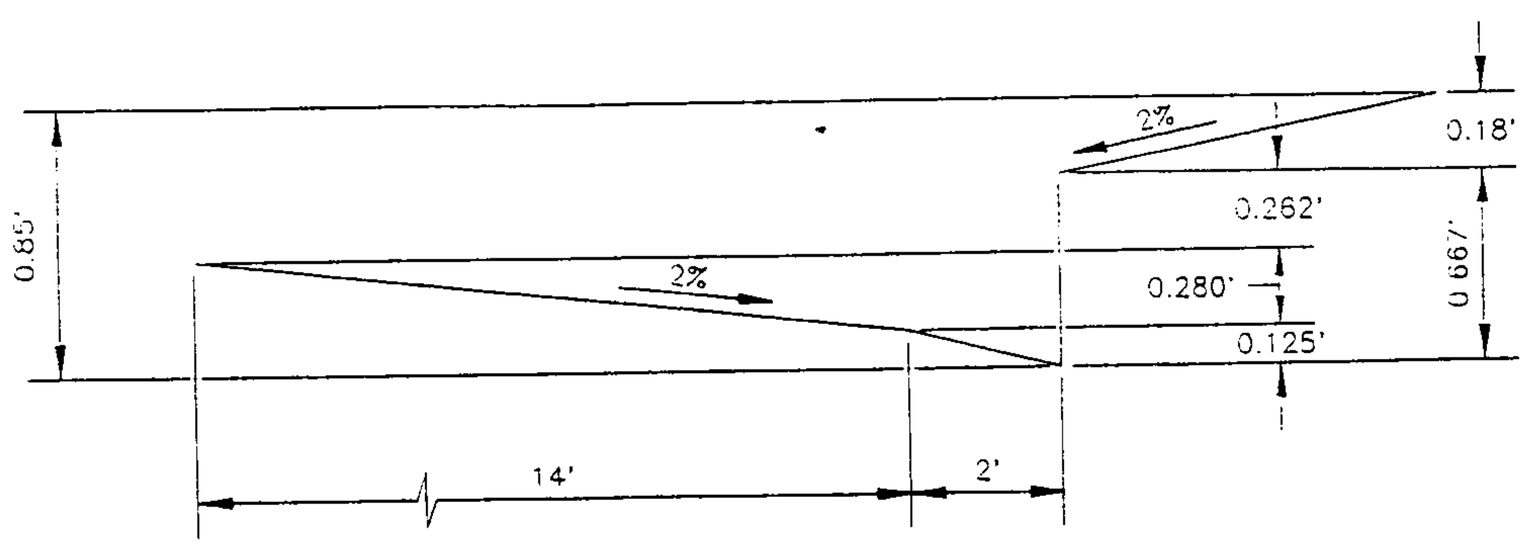
$@Y \leq 0.125$
$A1 = \frac{1}{2} Y\ (Y/0.0625) = 8Y^2$
$P1 = SQRT[Y^2 + (Y/0.0625)^2] + Y = SQRT(257\ Y^2) + Y$

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

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

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

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



32' F–F
8" CURB

NOT TO SCALE

---------- 32-FT F-F, 8" CURB STREET SECTION ----------

---------- STREET CAPACITY BASED ON 10-YR STORM ----------

FLOW CFS	SLOPE FT/FT	Dn FT	Vn FT/S	D*V FT»/S	Fr	E FT	D2 FT
55.15	.00600	.703	3.702	2.604	.778	.916	----
23.63	.00600	.507	2.760	1.400	.683	.626	----
27.31	.00600	.532	2.923	1.554	.706	.664	----
26.68	.01010	.486	3.389	1.646	.857	.664	----

---------- END OF THE OUTPUT FILE ----------

---------- 32-FT F-F, 8" CURB STREET SECTION ----------

---------- STREET CAPACITY BASED ON 100-YR STORM ----------

FLOW CFS	SLOPE FT/FT	Dn FT	Vn FT/S	D*V FT»/S	Fr	E FT	D2 FT
89.19	.00600	.893	3.802	3.396	.709	1.118	----
38.17	.00600	.597	3.336	1.993	.761	.770	----
44.12	.00600	.630	3.533	2.226	.784	.824	----
43.08	.01010	.568	4.097	2.328	.958	.829	----

---------- END OF THE OUTPUT FILE ----------

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

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

<u>HALF STREET CALCULATIONS</u>

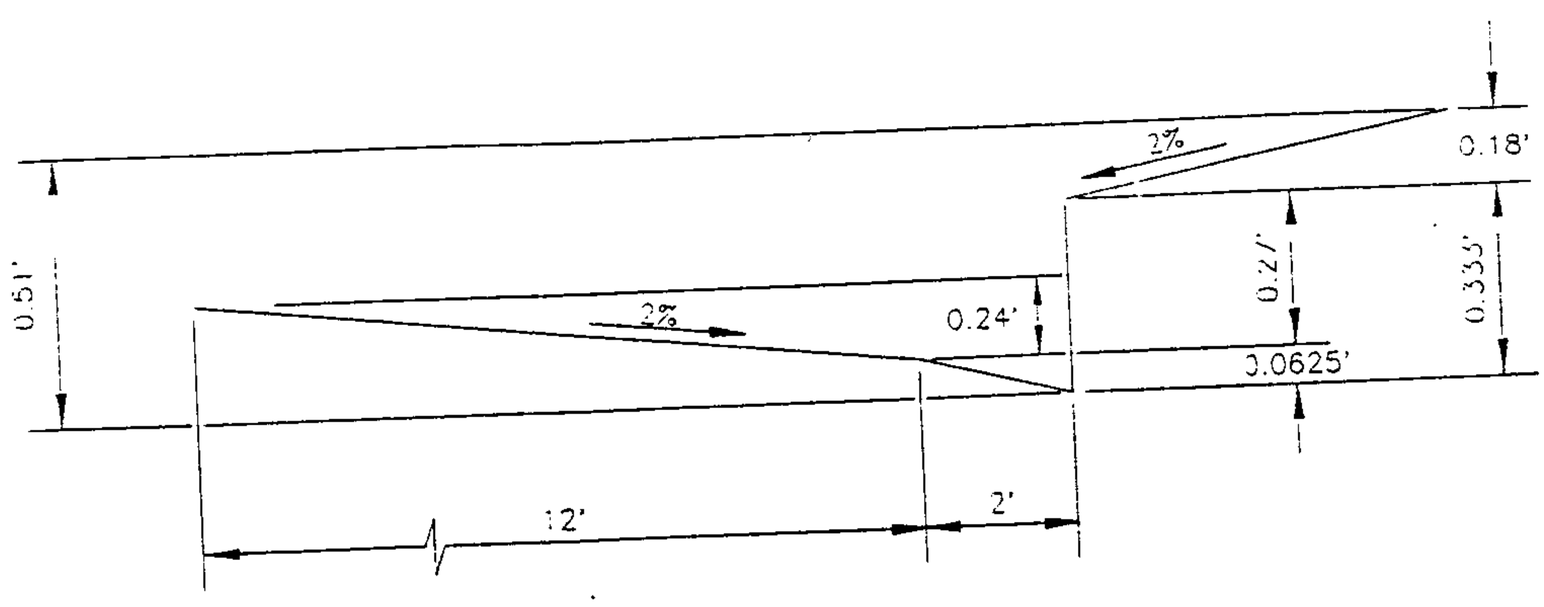
$@Y \leq 0.0625$
$A1 = \frac{1}{2} Y\ (Y/0.03125) = 16Y^2$
$P1 = SQRT[Y^2 + (Y/0.03125)^2] + Y = SQRT(1025\ Y^2) + Y$

$@\ 0.0625 < Y \leq 0.3025\ \&\ \ Y1 = Y - 0.0625$
$A2 = A1 + \frac{1}{2}Y1\ (Y1/0.02) + 2Y1 = A1 + 25Y1^2 + 2Y1$
$P2 = P1 + SQRT[Y1^2 + (Y1/0.02)^2] + Y1 = P1 + SQRT(2501\ Y^2) + Y1$

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

$@\ 0.333 < Y \leq 0.513\ \&\ \ Y3 = Y - 0.333$
$A4 = A3 + 14Y3 + \frac{1}{2}Y3[Y3/(0.02)] = A3 + 14\ Y3 + 25\ Y3^2$
$P4 = P3 + SQRT(Y3^2 + [Y3/(0.02)]^2) = P3 + SQRT(2501\ Y3^2)$

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



28' F–F
4" CURB

NOT TO SCALE

```
* INPUT FILE FOR 28'-FF STREET SECTION *
* SECTION A *
100 9.66 0.00990
10 5.98 0.00990
* SECTION F *
100 19.04 0.00990
10 11.79 0.00990
* SECTION G *
100 28.57 0.00990
10 17.69 0.00990
* SECTION B *
100 15.70 0.01300
10 9.71 0.01300
* SECTION E *
100 28.63 0.01300
10 17.71 0.01300
* SECTION H *
100 41.56 0.01300
10 25.71 0.01300
* SECTION C *
100 11.20 0.010100
10 6.95 0.010100
* SECTION D *
100 23.18 0.010100
10 14.30 0.010100
* SECTION I *
100 35.09 0.010100
10 21.73 0.010100
* END OF THE INPUT FILE *
999 0.00 0.00
```

---------- 28-FT F-F, 4" CURB STREET SECTION ----------

---------- STREET CAPACITY BASED ON 10-YR STORM ----------

FLOW CFS	SLOPE FT/FT	Dn FT	Vn FT/S	D*V FT»/S	Fr	E FT	D2 FT
5.98	.00990	.260	2.096	.544	.725	.328	----
11.79	.00990	.325	2.571	.835	.795	.427	----
17.69	.00990	.379	2.850	1.080	.816	.505	----
9.71	.01300	.293	2.618	.768	.852	.400	----
17.71	.01300	.359	3.170	1.139	.932	.515	----
25.71	.01300	.415	3.444	1.431	.942	.600	----
6.95	.01010	.273	2.191	.597	.740	.347	----
14.30	.01010	.347	2.742	.951	.821	.464	----
21.73	.01010	.409	3.007	1.229	.829	.549	----

---------- END OF THE OUTPUT FILE ----------

---------- 28-FT F-F, 4" CURB STREET SECTION ----------

---------- STREET CAPACITY BASED ON 100-YR STORM ----------

FLOW CFS	SLOPE FT/FT	Dn FT	Vn FT/S	D*V FT»/S	Fr	E FT	D2 FT
9.66	.00990	.306	2.375	.727	.756	.394	----
19.04	.00990	.390	2.897	1.129	.818	.520	----
28.57	.00990	.455	3.177	1.447	.830	.612	----
15.70	.01300	.342	3.089	1.057	.931	.490	----
28.63	.01300	.433	3.530	1.528	.946	.626	----
41.56	.01300	.498	3.850	1.917	.961	.728	----
11.20	.01010	.319	2.534	.808	.791	.418	----
23.18	.01010	.419	3.052	1.279	.831	.564	----
35.09	.01010	.490	3.359	1.646	.846	.665	----

---------- END OF THE OUTPUT FILE ----------

DROP INLET &

DRAINAGE PIPE

CALCULATIONS

STORM DROP INLET (EFFECTIVE AREA-IN PONDING SECTION) CATCH BASINS 1, 2, 3, & 4

Area @ 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 8.41
= 8.41 SF

Effective are = 8.41 - .5 (8.41)$_{Clogging\ Factor}$

= 4.21 SF @ the Grate

Are @ the Throat:

L = 88 ¾" = 7.3958'

H = 10 ¾" - 4 ½"
= 6 ¼" = 0.5208'

Area = 7.3958 x 0.5208
= 3.85 SF @ the Throat

Total Area

Area = 4.21_{Grate} + 3.85_{Throat}

= 8.06 SF

Checking the number of inlets required:

$Q = CA\sqrt{2gh}$

Q = 139.61 CFS
C = 0.60
A = 4 (8.06) = 32.24 SF
g = 32.2
h = ?

Solve the equation for h:

$h = (Q / CA)^2/2g$
$= [\ 139.61 / (0.60 \times 32.24)\ ]^2 / (2 \times 32.2)$
$= 0.81' < 0.87'$

Use 4 DBL-C inlets @ the ponding section.

Checking The Rquired Pipe Size:

$Q = CA\sqrt{2gh}$

From CB1 to CB2 & CB4 to CB3 (using a pipe size of 30"):

$Q = 34.90$ CFS
$C = 0.60$
$A = \Pi r^2 = \Pi(30/24)^2 = 4.91$ SF
$g = 32.2$
Solve for h (head required for the discharge)
$h = (Q / CA)^2/2g$
$= [\ 34.90 / (0.60 \times 4.91)\ ]^2 / (2 \times 32.2)$
$= 2.18'$ (water depth from the center of the pipe)

From CB2 to CB3 (using a pipe size of 36"):

$Q = 69.81$ CFS
$C = 0.60$
$A = \Pi(36/24)^2 = 7.07$ SF
$g = 32.2$
Solve for h (head required for the discharge)
$h = 4.21'$

From CB3 to pond and MH#1 (using a pipe size of 48"):

$Q = 139.61$ CFS
$C = 0.60$
$A = \Pi(48/24)^2 = 12.57$ SF
$g = 32.2$
Solve for h (head required for the discharge)
$h = 5.32'$

DRAINAGE PIPES SUMMARY TABLE

CONNECTION	PIPE SIZE	FLOW CFS	VELOCITY FT/S
CB 1 & 2 TO CB 4 & 3	30"	34.90	7.11
CB2 TO CB3	36"	69.81	9.88
CB3 TO MH 1 & POND	48"	139.61	11.11

_SEE ATTACHED DRAWING FOR STORM SEWER LOCATIONS

PONDING

CALCULATIONS

Pond Calculations:

The site is @ Zone 3

Area = 33.71 Acre

Land Treatment:

D = 60%, C = 20%, B = 20%

Weighted E For The Runoff

$$E = \frac{20(0.92)}{100} + \frac{20(1.29)}{100} + \frac{60(2.36)}{100}$$

E = 1.858 inches.

V_{360} = 1.858/12 x 33.71 = 5.219 Ac-Ft

$$V_{10\,DAY} = V_{360} + A_D \cdot \frac{(P_{10} - P_{360})}{12}$$

$V_{10\text{-}DAY}$ = 5.219 + 20.225 x (4.90 - 2.60)/12
= 9.0955 Ac-Ft = 396,200 CF

Pond bottom area (@ 5579.50') = 32,083.41 SF
Pond Top area (@ 5580.00') = 62,547.76 SF

Volume Provided = (32,083.41 + 62,547.76)/2 x 8.5
= 402,182 CF > 396,200 CF ✓

INFRASTRUCTURE

LIST

DRB Case No. _____
Project Number _____
Date Submitted _____
Prelim. Plat Approved _____
Prelim. Plat Expires _____

EXHIBIT "A"
to Subdivision Improvements Agreement
DEVELOPMENT REVIEW BOARD (DRB) REQUIRED INFRASTRUCTURE LISTING
for Berry Heights Mobile Home Subdivision

Following is a summary of Public/Private Infrastructure required to be constructed or financially guaranteed to be constructed for the above development. This summary is not necessarily a complete listing. During the design process, if the City determines that appurtenant items have not been included in the summary, those items will be included in the listing and related financial guarantee, if the items normally are the Subdivider responsibility. In addition, any unforeseen items which arise during construction which are necessary to complete the project and which normally are the Subdivider's responsibility are the responsibility of the Subdivider and will be included in the financial guarantee provided to the City.

Size	Type Improvement	Location	From	To
24'/F-F	Arterial Street Curb & Gutter Sidewalks 6' (South Side)	Opportunity Avenue	West P.L.	East P.L.
28'/F-F	Residential Street Curb & Gutter Sidewalks 4' (Both Side)*	Blackberry Rd.	Cranberry Rd.	Checkerberry Rd.
28'/F-F	Residential Street Curb & Gutter Sidewalks 4' (Both Side)*	Loganberry Rd.	Cranberry Rd.	Checkerberry Rd.
28'/F-F	Residential Street Curb & Gutter Sidewalks 4' (South Sides)*	Research Rd.	West P.L.	Cranberry Rd.
28'/F-F	Residential Street Curb & Gutter Sidewalks 4' (Both Sides)*	Tayberry Rd.	Cranberry Rd.	Checkerberry Rd.
32'/F-F	Residential Street Curb & Gutter Sidewalks 4' (Both Sides)*	Cranberry Rd.	Tayberry Rd.	Blackberry Rd.
32'/F-F	Residential Street Curb & Gutter Sidewalks 4' (Both Sides)*	Blueberry Rd.	Tayberry Rd.	Blackberry Rd.
32'/F-F	Residential Street Curb & Gutter Sidewalks 4' (Both Sides)*	Dewberry Rd.	Tayberry Rd.	Blackberry Rd.
44'/F-F	Residential Street Curb & Gutter Sidewalks 4' (Both Sides)*	Dewberry Rd.	Blackberry Rd.	Opportunity Ave.
32'/F-F	Residential Street Curb & Gutter Sidewalks 4' (Both Sides)*	Checkerberry Rd.	Tayberry Rd.	Blackberry Rd.
6"	Water PVC Line	Blackberry Rd.	Cranberry Rd.	Checkerberry Rd.
6"	Water PVC Line	Loganberry Rd.	Cranberry Rd.	Checkerberry Rd.
6"	Water PVC Line	Research Rd.	West P.L.	Cranberry Rd.
6"	Water PVC Line	Tayberry Rd.	Cranberry Rd.	Checkerberry Rd.
6"	Water PVC Line	Cranberry Rd.	Tayberry Rd.	Blackberry Rd.
6"	Water PVC Line	Blueberry Rd.	Tayberry Rd.	Blackberry Rd.

6"	Water PVC Line	Dewberry Rd.	Tayberry Rd.	Opportunity Ave.
6"	Water PVC Line	Checkerberry Rd.	Tayberry Rd.	Blackberry Rd.

Water infrastructure to include
valves, fittings, valve boxes, fire hydrants,
service connections, as required

8"	SAS Gravity Line	Blackberry Rd.	Cranberry Rd.	Checkerberry Rd.
8"	SAS Gravity Line	Loganberry Rd.	Cranberry Rd.	Checkerberry Rd.
8"	SAS Gravity Line	Research Rd.	West P.L.	Cranberry Rd.
8"	SAS Gravity Line	Tayberry Rd.	Cranberry Rd.	Checkerberry Rd.
8"	SAS Gravity Line	Cranberry Rd.	Tayberry Rd.	Blackberry Rd.
8"	SAS Gravity Line	Blueberry Rd.	Tayberry Rd.	Blackberry Rd.
8"	SAS Gravity Line	Dewberry Rd.	Tayberry Rd.	Blackberry Rd.
8"	SAS Gravity Line	Checkerberry Rd.	Tayberry Rd.	Blackberry Rd.
8"	SAS Gravity Line	20' P.U.E	Checkerberry Rd. (& Tayberry Rd.)	S.E. P.L

Sanitary Sewer to include, manholes,
service connections as required

48"	Storm Sewer	Research Rd.	Cranberry Rd.	Retention Pond
	Retention Pond	Block 4	Lots 4-9 & 13-18	

Manholes, Catch basins, and RCP included with Storm Sewer

Storm Sewer Modifications

To which Retention Pond? On-site or Eubank?

Residential Street Lights Per DPM

Certified Grading with Private Retaining Walls & Private Drainage (Non-work order item) Required for SIA/Financial Release

Internal Sidewalks deferred

Prepared By: _____

Print Name: Ronald R. Bohannan, P.E.

Firm: Tierra West Development Mgmt Services

****

Development Review Board Member Approvals

_____		_____		_____	
Transportation Dev.	Date	Utility Dev.	Date	Cult. & Rec	Date
_____		_____			
City Engineer/AMAFCA	Date	DRB Chairman	Date		
_____					
AMAFCA	Date				

100-YEAR & 10-YEAR

RUNOFF

AHYMO INPUT AND

SUMMARY OUTPUT FILES

(EXISTING OVERALL DRAINAGE BASINS)

```
*****************************************************************
*****                                                       *****
*****              DRAINAGE CALCULATION FOR                 *****
*****       BOOBBERRY   MOBILE   HOME   SUBDIVISION         *****
*****************************************************************
*****                 OVERALL  SUBBASINS                    *****
*****************************************************************
*                         100-YR (6-HR)                         *
*****************************************************************
START               TIME=0.0
*****
***** BASIN  A
*****
RAINFALL            TYPE=1 RAIN QUARTER=0.0 IN
                    RAIN ONE=2.14 IN RAIN SIX=2.60 IN
                    RAIN DAY=3.10 IN DT=0.03333 HR
COMPUTE NM HYD      ID=1 HYD NO=101.1 AREA=0.061452 SQ MI
                    PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                    TP=0.1333 HR MASS RAINFALL=-1
*****
***** BASIN  B
*****
COMPUTE NM HYD      ID=1 HYD NO=101.2 AREA=0.025581 SQ MI
                    PER A=0.00 PER B=100.00 PER C=0.00 PER D=0.00
                    TP=0.1333 HR MASS RAINFALL=-1
*****
***** BASIN  C
*****
COMPUTE NM HYD      ID=1 HYD NO=101.3 AREA=0.027258 SQ MI
                    PER A=0.00 PER B=100.00 PER C=0.00 PER D=0.00
                    TP=0.1333 HR MASS RAINFALL=-1
*****
***** BASIN  D
*****
COMPUTE NM HYD      ID=1 HYD NO=101.4 AREA=0.009787 SQ MI
                    PER A=0.00 PER B=100.00 PER C=0.00 PER D=0.00
                    TP=0.1333 HR MASS RAINFALL=-1
*****************************************************************
*                         10-YR   (6-HR)                        *
*****************************************************************
START               TIME=0.0
*****
***** BASIN  A
*****

RAINFALL            TYPE=1 RAIN QUARTER=0.0 IN
                    RAIN ONE=1.43 IN RAIN SIX=1.73 IN
                    RAIN DAY=2.07 IN DT=0.03333 HR
COMPUTE NM HYD      ID=1 HYD NO=111.1 AREA=0.061452 SQ MI
                    PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                    TP=0.1333 HR MASS RAINFALL=-1
*****
***** BASIN  B
*****
COMPUTE NM HYD      ID=1 HYD NO=111.2 AREA=0.025581 SQ MI
                    PER A=0.00 PER B=100.00 PER C=0.00 PER D=0.00
                    TP=0.1333 HR MASS RAINFALL=-1
*****
***** BASIN  C
*****
```

```
COMPUTE NM HYD       ID=1 HYD NO=111.3 AREA=0.027258 SQ MI
                     PER A=0.00 PER B=100.00 PER C=0.00 PER D=0.00
                     TP=0.1333 HR MASS RAINFALL=-1
*****
***** BASIN  D
*****
COMPUTE NM HYD       ID=1 HYD NO=111.4 AREA=0.009787 SQ MI
                     PER A=0.00 PER B=100.00 PER C=0.00 PER D=0.00
                     TP=0.1333 HR MASS RAINFALL=-1
*******************************************************************
FINISH
```

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =11/10/1995

INPUT FILE = OVR.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= 2.600
COMPUTE NM HYD	101.10	-	1	.06145	165.82	6.061	1.84941	1.500	4.216	PER IMP= 60.00
COMPUTE NM HYD	101.20	-	1	.02558	42.50	1.256	.92096	1.500	2.596	PER IMP= .00
COMPUTE NM HYD	101.30	-	1	.02726	45.28	1.339	.92096	1.500	2.596	PER IMP= .00
COMPUTE NM HYD	101.40	-	1	.00979	16.27	.481	.92096	1.500	2.597	PER IMP= .00
START										TIME= .00
RAINFALL TYPE= 1										RAIN6= 1.730
COMPUTE NM HYD	111.10	-	1	.06145	102.63	3.552	1.08370	1.500	2.610	PER IMP= 60.00
COMPUTE NM HYD	111.20	-	1	.02558	19.10	.485	.35547	1.533	1.166	PER IMP= .00
COMPUTE NM HYD	111.30	-	1	.02726	20.35	.517	.35547	1.533	1.166	PER IMP= .00
COMPUTE NM HYD	111.40	-	1	.00979	7.31	.186	.35547	1.533	1.167	PER IMP= .00
FINISH										

100-YEAR & 10-YEAR

RUNOFF

AHYMO INPUT AND

SUMMARY OUTPUT FILES

(UNDER EXISTING AND PROPOSED CONDITIONS)

```
*****************************************************************
*****                                                       *****
*****          DRAINAGE CALCULATION FOR                     *****
*****      SHAW   MOBILE   HOME   SUBDIVISION               *****
*****************************************************************
*****                    SUBBASINS                          *****
*****************************************************************
*                       100-YR (6-HR)                           *
*****************************************************************
START              TIME=0.0
*****
***** SUBBASIN  A
*****
RAINFALL           TYPE=1 RAIN QUARTER=0.0 IN
                   RAIN ONE=2.14 IN RAIN SIX=2.60 IN
                   RAIN DAY=3.10 IN DT=0.03333 HR
COMPUTE NM HYD     ID=1 HYD NO=101.1 AREA=0.003572 SQ MI
                   PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                   TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  B
*****
COMPUTE NM HYD     ID=1 HYD NO=101.2 AREA=0.005810 SQ MI
                   PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                   TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  C
*****
COMPUTE NM HYD     ID=1 HYD NO=101.3 AREA=0.004153 SQ MI
                   PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                   TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  D
*****
COMPUTE NM HYD     ID=1 HYD NO=101.4 AREA=0.004433 SQ MI
                   PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                   TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  E
*****
COMPUTE NM HYD     ID=1 HYD NO=101.5 AREA=0.004784 SQ MI
                   PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                   TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  F
*****
COMPUTE NM HYD     ID=1 HYD NO=101.6 AREA=0.003470 SQ MI
                   PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                   TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  G
*****
COMPUTE NM HYD     ID=1 HYD NO=101.7 AREA=0.003525 SQ MI
                   PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                   TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  H
*****
COMPUTE NM HYD     ID=1 HYD NO=101.8 AREA=0.004784 SQ MI
                   PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
```

```
                    TP=0.1333 HR MASS RAINFALL=-1
****
**** SUBBASIN  I
****
COMPUTE NM HYD      ID=1 HYD NO=101.9 AREA=0.004407 SQ MI
                    PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                    TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  J
*****
COMPUTE NM HYD      ID=1 HYD NO=101.10 AREA=0.002955 SQ MI
                    PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                    TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  K
*****
COMPUTE NM HYD      ID=1 HYD NO=101.11 AREA=0.001268 SQ MI
                    PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                    TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  L
*****
COMPUTE NM HYD      ID=1 HYD NO=101.12 AREA=0.002198 SQ MI
                    PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                    TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  M
*****
COMPUTE NM HYD      ID=1 HYD NO=101.13 AREA=0.003552 SQ MI
                    PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                    TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  N
*****
COMPUTE NM HYD      ID=1 HYD NO=101.14 AREA=0.002740 SQ MI
                    PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                    TP=0.1333 HR MASS RAINFALL=-1
*******************************************************************
*                        10-YR   (6-HR)                           *
*******************************************************************
START               TIME=0.0
*****
***** SUBBASIN  A
*****

RAINFALL            TYPE=1 RAIN QUARTER=0.0 IN
                    RAIN ONE=1.43 IN RAIN SIX=1.73 IN
                    RAIN DAY=2.07 IN DT=0.03333 HR
COMPUTE NM HYD      ID=1 HYD NO=111.1 AREA=0.003572 SQ MI
                    PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                    TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  B
*****
COMPUTE NM HYD      ID=1 HYD NO=111.2 AREA=0.005810 SQ MI
                    PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                    TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  C
*****
```

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COMPUTE NM HYD       ID=1 HYD NO=111.3 AREA=0.004153 SQ MI
                     PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                     TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  D
*****
COMPUTE NM HYD       ID=1 HYD NO=111.4 AREA=0.004433 SQ MI
                     PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                     TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  E
*****
COMPUTE NM HYD       ID=1 HYD NO=111.5 AREA=0.004784 SQ MI
                     PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                     TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  F
*****
COMPUTE NM HYD       ID=1 HYD NO=111.6 AREA=0.003470 SQ MI
                     PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                     TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  G
*****
COMPUTE NM HYD       ID=1 HYD NO=111.7 AREA=0.003525 SQ MI
                     PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                     TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  H
*****
COMPUTE NM HYD       ID=1 HYD NO=111.8 AREA=0.004784 SQ MI
                     PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                     TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  I
*****
COMPUTE NM HYD       ID=1 HYD NO=111.9 AREA=0.004407 SQ MI
                     PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                     TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  J
*****
COMPUTE NM HYD       ID=1 HYD NO=111.10 AREA=0.002955 SQ MI
                     PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                     TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  K
*****
COMPUTE NM HYD       ID=1 HYD NO=111.11 AREA=0.001268 SQ MI
                     PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                     TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  L
*****
COMPUTE NM HYD       ID=1 HYD NO=111.12 AREA=0.002198 SQ MI
                     PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                     TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  M
*****
```

```
COMPUTE NM HYD       ID=1 HYD NO=111.13 AREA=0.003552 SQ MI
                     PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                     TP=0.1333 HR MASS RAINFALL=-1
*****
***** SUBBASIN  N
*****
COMPUTE NM HYD       ID=1 HYD NO=111.14 AREA=0.002740 SQ MI
                     PER A=0.00 PER B=20.00 PER C=20.00 PER D=60.00
                     TP=0.1333 HR MASS RAINFALL=-1
*************************************************************************
FINISH
```

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =11/13/1995

INPUT FILE = 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	NOTATION
START										TIME= .00
RAINFALL TYPE= 1										RAIN6= 2.600
COMPUTE NM HYD	101.10	-	1	.00357	9.66	.352	1.84942	1.500	4.224	PER IMP= 60.00
COMPUTE NM HYD	101.20	-	1	.00581	15.70	.573	1.84941	1.500	4.221	PER IMP= 60.00
COMPUTE NM HYD	101.30	-	1	.00415	11.22	.410	1.84942	1.500	4.223	PER IMP= 60.00
COMPUTE NM HYD	101.40	-	1	.00443	11.98	.437	1.84941	1.500	4.223	PER IMP= 60.00
COMPUTE NM HYD	101.50	-	1	.00478	12.93	.472	1.84942	1.500	4.222	PER IMP= 60.00
COMPUTE NM HYD	101.60	-	1	.00347	9.38	.342	1.84942	1.500	4.224	PER IMP= 60.00
COMPUTE NM HYD	101.70	-	1	.00353	9.53	.348	1.84942	1.500	4.224	PER IMP= 60.00
COMPUTE NM HYD	101.80	-	1	.00478	12.93	.472	1.84942	1.500	4.222	PER IMP= 60.00
COMPUTE NM HYD	101.90	-	1	.00441	11.91	.435	1.84942	1.500	4.223	PER IMP= 60.00
COMPUTE NM HYD	101.10	-	1	.00296	7.99	.291	1.84942	1.500	4.226	PER IMP= 60.00
COMPUTE NM HYD	101.11	-	1	.00127	3.44	.125	1.84942	1.500	4.239	PER IMP= 60.00
COMPUTE NM HYD	101.12	-	1	.00220	5.95	.217	1.84942	1.500	4.229	PER IMP= 60.00
COMPUTE NM HYD	101.13	-	1	.00355	9.60	.350	1.84942	1.500	4.224	PER IMP= 60.00
COMPUTE NM HYD	101.14	-	1	.00274	7.41	.270	1.84942	1.500	4.227	PER IMP= 60.00
START										TIME= .00
RAINFALL TYPE= 1										RAIN6= 1.730
COMPUTE NM HYD	111.10	-	1	.00357	5.98	.206	1.08370	1.500	2.614	PER IMP= 60.00
COMPUTE NM HYD	111.20	-	1	.00581	9.71	.336	1.08370	1.500	2.612	PER IMP= 60.00
COMPUTE NM HYD	111.30	-	1	.00415	6.95	.240	1.08370	1.500	2.613	PER IMP= 60.00
COMPUTE NM HYD	111.40	-	1	.00443	7.41	.256	1.08370	1.500	2.613	PER IMP= 60.00
COMPUTE NM HYD	111.50	-	1	.00478	8.00	.277	1.08370	1.500	2.613	PER IMP= 60.00
COMPUTE NM HYD	111.60	-	1	.00347	5.81	.201	1.08370	1.500	2.614	PER IMP= 60.00
COMPUTE NM HYD	111.70	-	1	.00353	5.90	.204	1.08370	1.500	2.614	PER IMP= 60.00
COMPUTE NM HYD	111.80	-	1	.00478	8.00	.277	1.08370	1.500	2.613	PER IMP= 60.00
COMPUTE NM HYD	111.90	-	1	.00441	7.37	.255	1.08370	1.500	2.613	PER IMP= 60.00
COMPUTE NM HYD	111.10	-	1	.00296	4.95	.171	1.08370	1.500	2.615	PER IMP= 60.00
COMPUTE NM HYD	111.11	-	1	.00127	2.13	.073	1.08370	1.500	2.623	PER IMP= 60.00
COMPUTE NM HYD	111.12	-	1	.00220	3.68	.127	1.08370	1.500	2.617	PER IMP= 60.00
COMPUTE NM HYD	111.13	-	1	.00355	5.94	.205	1.08370	1.500	2.614	PER IMP= 60.00
COMPUTE NM HYD	111.14	-	1	.00274	4.59	.158	1.08370	1.500	2.616	PER IMP= 60.00
FINISH										

APPENDIX A

(PRE-DESIGN MEETING LETTER)

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
UTILITY DEVELOPMENT DIVISION/HYDROLOGY SECTION

PRE-DESIGN CONFERENCE

DRAINAGE FILE/ZONE ATLAS PAGE NO.: M21 DATE: 6/28/95

EPC NO.: DRB NO.: ZONE:

SUBJECT: Shaw Mobile Home Subdivision

STREET ADDRESS:

LEGAL DESCRIPTION: RECO CORP TRACT (SP-82-219)

APPROVAL REQUESTED:

X	PRELIMINARY PLAT		FINAL PLAT
X	SITE DEVELOPMENT PLAN		BUILDING PERMIT
	GRADING/PAVING PERMIT		OTHER

ATTENDANCE:	WHO	REPRESENTING
	Ron Bohannan	
	~~Shah~~ Shahab Biazar	

FINDINGS:

1. Verify legal platting status of property.
2. An approved drainage report is required for preliminary plat approval. Include a copy of the infrastructure list / plat.
3. The developed flows shall be programmed towards the future storm drain system in Eubank.
4. The required storm drains in Opportunity and Research must be ~~identified~~ designed for the subject development.
5. Retention ponding acceptable until the Eubank system is available. The retention pond must be designed for a 100 yr ten day storm. Drainage covenants/easements required for these ponds.

The undersigned agrees that the above findings are summarized accurately and are only subject to change if further investigation reveals that they are not reasonable or that they are based on inaccurate information.

SIGNED: SIGNED:

TITLE: TITLE: TWMS

DATE: 6/28/95 DATE: 6/28/95

NOTE PLEASE PROVIDE A COPY OF THIS PRE-DESIGN FORM WITH THE DRAINAGE SUBMITTAL.