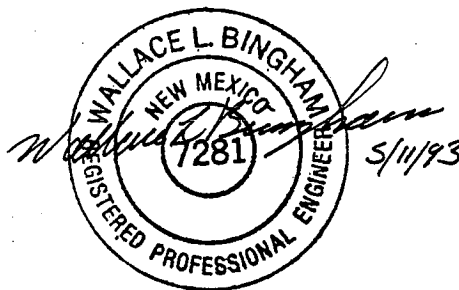


DRAINAGE STUDY
FOR
GOLF COURSE ROAD
MINI STORAGE

May, 1993



DRAINAGE REPORT GOLF COURSE ROAD MINI STORAGE

INTRODUCTION

The Business at 1311 Golf Course Road, (Golf Course Road Mini Storage) is adding to it's storage capacity and screening the area by constructing a perimeter building/screen wall combination. The existing drainage plan is to be altered to better utilize the available area and shift the majority of the runoff to the recently constructed Golf Course Road drainage channel and detention system.

COMPUTATION OF RUNOFF

The hydrology computations were done using the AHYMO Computer Program and criteria contained in section 22.2 of the Development Process Manual, City of Albuquerque.

Latitude 106° 40' 40" and Longitude 35° 14' 5" corresponds to a rainfall of 2.8" in the NOAA Atlas 2, 100-Yr. 6 HR. precipitation map. (copy att.)

Refer to drainage map (copy att.)

The Historical runoff peak flow from the site for the 100 Yr. - 6 Hr. storm is 10.6 cfs. From the slopes of the terrain it is estimated that approximately half the flow went southeast and the rest to the southwest.

The proposed drainage scheme will direct 18.4 cfs to Golf Course Road at analysis point 1 and 4.3 cfs to 29th Street at analysis point 2 without detaining either flow. The flow to 29th Street is less the historical flow in that direction and the flow to Golf Course Road will pass through the detention ponds north of the county line then into the detention pond on the other side of the county line. Any detention on this site would have little or no effect on the flow crossing the county line. Therefore, approval of this scheme is requested without the customary on-site detention.

MARCH. 1992

RUN DATE (MON/DAY/YR) =04/05/1993

USER NO. = CINFRRNM.101

		FROM	TO		PEAK	RUNOFF		TIME TO	CFS	PAGE = 1
	HYDROGRAPH	ID	ID	AREA	DISCHARGE	VOLUME	RUNOFF	PEAK	PER	
COMMAND	IDENTIFICATION	NO.	NO.	(SQ MI)	(CFS)	(AC-FT)	(INCHES)	(HOURS)	ACRE	NOTATION

```
START                                     TIME= .00
```

*S ****COMPUTE 100 YR. HYDROGRAPHS FOR GOLF COURSE ROAD MINI STORAGE

100 yr - 6 hr.

*S HISTORICAL FLOW FOR ENTIRE SITE

RAINFALL TYPE= 1

RAIN6= 2.400

COMPUTE NM HYD	101.10	-	1	.01080	10.58	.302	.52450	1.533	1.531	PER IMP=	.00
----------------	--------	---	---	--------	-------	------	--------	-------	-------	----------	-----

*S COMPUTE RUNOFF FROM AREA 1 (PRESENT CONDITION)

COMPUTE NM HYD	102.10	-	2	.00386	11.19	.443	2.15221	1.500	4.531	PER IMP= 100.00
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*S ROUTE AREA 1 THROUGH AREA TWO AND FOUR

ROUTE	112.10	2	12	.00386	8.66	.443	2.15227	1.567	3.506
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ROUTINE                                112.10      3
*S COMPUTE RUNOFF FROM AREAS 2 AND 4

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COMPUTE NM HYD	103.10	=	3	.00517	10.38	.303	1.09960	1.500	3.138 PER IMP=	.00
----------------	--------	---	---	--------	-------	------	---------	-------	----------------	-----

COMPUTE NM HYD	103.10	5	.000317	18.38	.989	1.03988	1.508	3.138 PER INH =	.00
ADD HYD	102.20	12& 3	2	.00903	18.35	.746	1.54950	1.533	3.175

*S // FLOW TO GOLF COURSE ROAD AT ANALYSIS POINT 1 //

ADD HYD	104.10	12& 3	4	.00903	18.35	.746	1.54950	1.533	3.175
---------	--------	-------	---	--------	-------	------	---------	-------	-------

*S // FLOW AT ANALYSIS POINT 2 //

*S COMPUTE RUNOFF FROM AREA 3 COMBINATION PERVIOUS AND IMPERV

COMPUTE NM HYD	108.00	-	8	.00180	4.27	.148	1.54170	1.500	3.708 PER IMP=	42.00
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FINISH

to 29th Sep.

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START          TIME=0.0
*S ****COMPUTE 100 YR. HYDROGRAPHS FOR GOLF COURSE ROAD MINI STORAGE
*S   HISTORICAL FLOW FOR ENTIRE SITE
*   - AHYMO PER JAN 1991 DPM REVISIONS
* AREA= 6.943 Ac.
* L = 820'
* S = 1.46%
* V = .84 FPS
* TC =8.50 MIN
* UNDEVELOPED AREAS 1,2,3 AND 4
RAINFALL      TYPE = 1 RAIN QUARTER=0.0 RAIN ONE=1.93
              RAIN SIX=2.4 RAIN DAY=2.8
COMPUTE NM HYD  ID=1  HYD NO= 101.1  DA=0.0108 SQ MI
              PER A=100 PER B=0.0 PER C=0.0 PER D=0.0 TP= -.133
              RAIN=-1
PRINT HYD      ID=1    CODE=10
*****
*S COMPUTE RUNOFF FROM AREA 1 (PRESENT CONDITION)
COMPUTE NM HYD  ID=2  HYD NO= 102.1  DA=0.00386 SQ MI
              PER A=0 PER B=0 PER C=0 PER D=100 TP= -.133
              RAIN=-1
PRINT HYD      ID=2    CODE=10
*S ROUTE AREA 1 THROUGH AREA TWO AND FOUR
COMPUTE RATING CURVE RC=1 NO=1 NOSEGS=1
              MIN ELEV=0 MAX ELEV=1
              CH SLP=.003 FP SLP=.003
              N=.030 DIST 40
              DIST ELEV DIST ELEV DIST ELEV
              0 1 8 0 32 0
              40 1
COMPUTE TRAVEL TIME ID= 12 REACH=1 NO VS=1 L=500 SLP=.003
ROUTE          ID=12 HYD= 112.1 INFLOW=2 DT=0.0
PRINT HYD      ID=12 CODE=10
*****
*S COMPUTE RUNOFF FROM AREAS 2 AND 4
COMPUTE NM HYD  ID=3  HYD=103.1 DA=.00517
              PER A=0 PER B=0 PER C=100 PER D=0 TP=-.13
              RAIN=-1
PRINT HYD      ID=3 CODE=10
ADD HYD        ID=2 HYD=102.2 ID=12 ID=3
PRINT HYD      ID=2 CODE=10
*****
*S //////////////// FLOW TO GOLF COURSE ROAD AT ANALYSIS POINT 1 ////////////////
ADD HYD        ID=4 HYD=104.1 ID=12 ID=3
PRINT HYD      ID=4 CODE=10
*****
*S //////////////// FLOW AT ANALYSIS POINT 2 ////////////////
*S COMPUTE RUNOFF FROM AREA 3 COMBINATION PERVIOUS AND IMPERV.
COMPUTE NM HYD  ID=8  HYD=108 DA=0.0018
              PER A=0 PER B=0 PER C=58 PER D=42 TP=-.133
              RAIN=-1
PRINT HYD      ID=8 CODE=10

FINISH

```

AHYMO PROGRAM (AHYMO392) - AMAFCA VERSION OF HYMO - MARCH, 1992
 RUN DATE (MON/DAY/YR) = 04/05/1993
 START TIME (HR:MIN:SEC) = 15:44:28 USER NO. = CINFRNM.I01
 INPUT FILE = GMINI100.DAT

START TIME=0.0
 *S *****COMPUTE 100 YR. HYDROGRAPHS FOR GOLF COURSE ROAD MINI STORAGE
 *S HISTORICAL FLOW FOR ENTIRE SITE
 * - AHYMO PER JAN 1991 DPM REVISIONS
 * AREA= 6.943 Ac.
 * L = 820'
 * S = 1.46%
 * V = .84 FPS
 * TC =8.50 MIN
 * UNDEVELOPED AREAS 1.2,3 AND 4
 RAINFALL TYPE = 1 RAIN QUARTER=0.0 RAIN ONE=1.93
 RAIN SIX=2.4 RAIN DAY=2.8

COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.

DT =	.033333 HOURS	END TIME =	5.999940 HOURS
.0000	.0031	.0064	.0096
.0235	.0271	.0309	.0347
.0511	.0555	.0600	.0646
.0848	.0903	.0961	.1020
.1287	.1362	.1442	.1495
.2037	.2489	.3137	.4021
1.0763	1.2846	1.3718	1.4454
1.6762	1.7238	1.7684	1.8103
1.9563	1.9881	2.0183	2.0469
2.0939	2.0999	2.1057	2.1113
2.1318	2.1366	2.1412	2.1457
2.1626	2.1666	2.1706	2.1744
2.1890	2.1925	2.1960	2.1993
2.2123	2.2154	2.2185	2.2216
2.2333	2.2362	2.2390	2.2417
2.2525	2.2551	2.2577	2.2603
2.2703	2.2727	2.2751	2.2775
2.2868	2.2891	2.2914	2.2936
2.3024	2.3045	2.3067	2.3088
2.3171	2.3191	2.3211	2.3231
2.3310	2.3330	2.3349	2.3368
2.3443	2.3462	2.3480	2.3498
2.3570	2.3588	2.3605	2.3623
2.3692	2.3709	2.3726	2.3743
2.3809	2.3825	2.3842	2.3858
2.3922	2.3938	2.3953	2.3969

COMPUTE NM HYD ID=1 HYD NO= 101.1 DA=0.0108 SQ MI
 PER A=100 PER B=0.0 PER C=0.0 PER D=0.0 TP= -.133
 RAIN=-1

K = .161806HR TP = .133000HR K/TP RATIO = 1.216588 SHAPE CONSTANT, N = 2.924302
 UNIT PEAK = 22.379 CFS UNIT VOLUME = .9990 B = 275.59 P60 = 1.9300
 AREA = .010800 SQ MI IA = .65000 INCHES INF = 1.67000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

PRINT HYD ID=1 CODE=10

PARTIAL HYDROGRAPH 101.10

TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW
HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS
.000	.0	1.000	.0	2.000	1.0	3.000	.1	4.000	.0
.333	.0	1.333	.1	2.333	.5	3.333	.1	4.333	.0
.667	.0	1.667	5.9	2.667	.2	3.667	.0		

RUNOFF VOLUME = .52450 INCHES = .3021 ACRE-Feet
 PEAK DISCHARGE RATE = 10.58 CFS AT 1.533 HOURS BASIN AREA = .0108 SQ. MI.

*S COMPUTE RUNOFF FROM AREA 1 (PRESENT CONDITION)

COMPUTE NM HYD ID=2 HYD NO= 102.1 DA=0.00386 SQ MI
PER A=0 PER B=0 PER C=0 PER D=100 TP= -.133
RAIN=-1

K = .072485HR TP = .133000HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 15.274 CFS UNIT VOLUME = .9987 B = 526.28 P60 = 1.9300
AREA = .003860 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

PRINT HYD ID=2 CODE=10

PARTIAL HYDROGRAPH 102.10

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.667	5.6	3.333	.1	5.000	.1	6.667	.0
.333	.0	2.000	2.8	3.667	.1	5.333	.1		
.667	.0	2.333	.6	4.000	.1	5.667	.1		
1.000	.3	2.667	.3	4.333	.1	6.000	.1		
1.333	3.6	3.000	.2	4.667	.1	6.333	.0		

RUNOFF VOLUME = 2.15221 INCHES = .4431 ACRE-FEET
PEAK DISCHARGE RATE = 11.19 CFS AT 1.500 HOURS BASIN AREA = .0039 SQ. MI.

*S ROUTE AREA 1 THROUGH AREA TWO AND FOUR

COMPUTE RATING CURVE RC=1 NO=1 NOSEGS=1
MIN ELEV=0 MAX ELEV=1
CH SLP=.003 FP SLP=.003
N=.030 DIST 40
DIST ELEV DIST ELEV DIST ELEV
0 1 8 0 32 0
40 1

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.05	1.3	.5
.11	2.6	1.5
.16	4.0	3.1
.21	5.4	5.0
.26	6.9	7.3
.32	8.4	9.9
.37	9.9	12.9
.42	11.5	16.2
.47	13.2	19.9
.53	14.8	23.9
.58	16.6	28.2
.63	18.3	32.9
.68	20.2	37.9
.74	22.0	43.2
.79	23.9	48.8
.84	25.9	54.8
.89	27.9	61.1
.95	29.9	67.7
1.00	32.0	74.7

COMPUTE TRAVEL TIME ID= 12 REACH=1 NO VS=1 L=500 SLP=.003

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	1.285	.48	.3688
.105	2.615	1.55	.2349

.158	3.989	3.06	.1811
.211	5.407	4.97	.1510
.263	6.870	7.26	.1314
.316	8.377	9.91	.1174
.368	9.928	12.90	.1069
.421	11.524	16.24	.0986
.474	13.163	19.90	.0919
.526	14.848	23.90	.0863
.579	16.576	28.23	.0816
.632	18.349	32.88	.0775
.684	20.166	37.86	.0740
.737	22.028	43.17	.0709
.789	23.934	48.80	.0681
.842	25.884	54.77	.0656
.895	27.878	61.07	.0634
.947	29.917	67.70	.0614
1.000	32.000	74.66	.0595

ROUTE ID=12 HYD= 112.1 INFLOW=2 DT=0.0
 PRINT HYD ID=12 CODE=10

PARTIAL HYDROGRAPH 112.10

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.667	7.0	3.333	.2	5.000	.1	6.667	.0
.333	.0	2.000	3.5	3.667	.2	5.333	.1	7.000	.0
.667	.0	2.333	1.2	4.000	.1	5.667	.1	7.333	.0
1.000	.1	2.667	.6	4.333	.1	6.000	.1	7.667	.0
1.333	1.0	3.000	.4	4.667	.1	6.333	.1	8.000	.0

RUNOFF VOLUME = 2.15227 INCHES = .4431 ACRE-Feet
 PEAK DISCHARGE RATE = 8.66 CFS AT 1.567 HOURS BASIN AREA = .0039 SQ. MI.

*S COMPUTE RUNOFF FROM AREAS 2 AND 4

COMPUTE NM HYD ID=3 HYD=103.1 DA=.00517
 PER A=0 PER B=0 PER C=100 PER D=0 TP=-.13
 RAIN=-1

K = .103906HR TP = .130000HR K/TP RATIO = .799277 SHAPE CONSTANT, N = 4.482733
 UNIT PEAK = 15.357 CFS UNIT VOLUME = .9995 B = 386.16 P60 = 1.9300
 AREA = .005170 SQ MI IA = .35000 INCHES INF = .83000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

PRINT HYD ID=3 CODE=10

PARTIAL HYDROGRAPH 103.10

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.000	.0	2.000	1.3	3.000	.0		
.333	.0	1.333	1.4	2.333	.3	3.333	.0		
.667	.0	1.667	5.2	2.667	.1				

RUNOFF VOLUME = 1.09960 INCHES = .3032 ACRE-Feet
 PEAK DISCHARGE RATE = 10.38 CFS AT 1.500 HOURS BASIN AREA = .0052 SQ. MI.

ADD HYD ID=2 HYD=102.2 ID=12 ID=3
 PRINT HYD ID=2 CODE=10

PARTIAL HYDROGRAPH 102.20

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.667	12.2	3.333	.3	5.000	.1	6.667	.0
.333	.0	2.000	4.8	3.667	.2	5.333	.1	7.000	.0
.667	.0	2.333	1.5	4.000	.1	5.667	.1	7.333	.0
1.000	.1	2.667	.7	4.333	.1	6.000	.1	7.667	.0

1.333 2.4 3.000 .4 4.667 .1 6.333 .1 8.000 .0

RUNOFF VOLUME = 1.54950 INCHES = .7462 ACRE-FEET
PEAK DISCHARGE RATE = 18.35 CFS AT 1.533 HOURS BASIN AREA = .0090 SQ. MI.

*S ////////////// FLOW TO GOLF COURSE ROAD AT ANALYSIS POINT 1 //////////////

ADD HYD ID=4 HYD=104.1 ID=12 ID=3

PRINT HYD ID=4 CODE=10

PARTIAL HYDROGRAPH 104.10

TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW
HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS
.000	.0	1.667	12.2	3.333	.3	5.000	.1	6.667	.0
.333	.0	2.000	4.8	3.667	.2	5.333	.1	7.000	.0
.667	.0	2.333	1.5	4.000	.1	5.667	.1	7.333	.0
1.000	.1	2.667	.7	4.333	.1	6.000	.1	7.667	.0
1.333	2.4	3.000	.4	4.667	.1	6.333	.1	8.000	.0

RUNOFF VOLUME = 1.54950 INCHES = .7462 ACRE-FEET
PEAK DISCHARGE RATE = 18.35 CFS AT 1.533 HOURS BASIN AREA = .0090 SQ. MI.

*S ////////////// FLOW AT ANALYSIS POINT 2 //////////////

*S COMPUTE RUNOFF FROM AREA 3 COMBINATION PERVIOUS AND IMPERV.

COMPUTE NM HYD ID=8 HYD=108 DA=0.0018

PER A=0 PER B=0 PER C=58 PER D=42 TP=-.133

RAIN=-1

K = .072485HR TP = .133000HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 2.9915 CFS UNIT VOLUME = .9956 B = 526.28 P60 = 1.9300
AREA = .000756 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

K = .106304HR TP = .133000HR K/TP RATIO = .799277 SHAPE CONSTANT, N = 4.482733
UNIT PEAK = 3.0312 CFS UNIT VOLUME = .9962 B = 386.16 P60 = 1.9300
AREA = .001044 SQ MI IA = .35000 INCHES INF = .83000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

PRINT HYD ID=8 CODE=10

PARTIAL HYDROGRAPH 108.00

TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW
HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS
.000	.0	1.333	1.0	2.667	.1	4.000	.0	5.333	.0
.333	.0	1.667	2.2	3.000	.0	4.333	.0	5.667	.0
.667	.0	2.000	.8	3.333	.0	4.667	.0	6.000	.0
1.000	.1	2.333	.2	3.667	.0	5.000	.0	6.333	.0

RUNOFF VOLUME = 1.54170 INCHES = .1480 ACRE-FEET
PEAK DISCHARGE RATE = 4.27 CFS AT 1.500 HOURS BASIN AREA = .0018 SQ. MI.

FINISH

NORMAL PROGRAM FINISH

END TIME (HR:MIN:SEC) = 15:44:39


```

START          TIME=0.0
*S ****COMPUTE 10 YR. HYDROGRAPHS FOR GOLF COURSE ROAD MINI STORAGE
*S-----
*S   HISTORICAL FLOW FOR ENTIRE SITE
*   - AHYMO PER JAN 1991 DPM REVISIONS
* AREA= 6.943 Ac.
* L = 820'
* S = 1.46%
* V = .84 FPS
* TC =8.50 MIN
* UNDEVELOPED AREAS 1,2,3 AND 4
*S RAINFALL 10 YR. = .67*100 YR. RAINFALL
RAINFALL      TYPE = 1 RAIN QUARTER=0.0 RAIN ONE=1.29
              RAIN SIX=1.7 RAIN DAY=1.88
COMPUTE NM HYD   ID=1  HYD NO= 101.1  DA=0.0108 SQ MI
              PER A=100 PER B=0.0 PER C=0.0 PER D=0.0 TP= -.133
              RAIN=-1
PRINT HYD       ID=1   CODE=10
*****
*S COMPUTE RUNOFF FROM AREA 1 (PRESENT CONDITION)
COMPUTE NM HYD   ID=2  HYD NO= 102.1  DA=0.00386 SQ MI
              PER A=0 PER B=0 PER C=0 PER D=100 TP= -.133
              RAIN=-1
PRINT HYD       ID=2   CODE=10
*S ROUTE AREA 1 THROUGH AREA TWO AND FOUR
COMPUTE RATING CURVE RC=1 NO=1 NOSEGS=1
              MIN ELEV=0 MAX ELEV=1
              CH SLP=.003 FP SLP=.003
              N=.030 DIST 40
              DIST ELEV DIST ELEV DIST ELEV
              0   1   8   0   32  0
              40   1
COMPUTE TRAVEL TIME ID= 12 REACH=1 NO VS=1 L=500 SLP=.003
ROUTE          ID=12 HYD= 112.1 INFLOW=2 DT=0.0
PRINT HYD      ID=12 CODE=10
*****
*S COMPUTE RUNOFF FROM AREAS 2 AND 4
COMPUTE NM HYD   ID=3  HYD=103.1  DA=.00517
              PER A=0 PER B=0 PER C=100 PER D=0 TP=-.13
              RAIN=-1
PRINT HYD       ID=3 CODE=10
ADD HYD         ID=2 HYD=102.2 ID=12 ID=3
PRINT HYD       ID=2 CODE=10
*****
*S ////////// RUNOFF TO GOLF COURSE ROAD AT ANALYSIS POINT 1 //////////
ADD HYD         ID=4 HYD=104.1 ID=12 ID=3
PRINT HYD       ID=4  CODE=10
*****
*S ////////// RUNOFF AT ANALYSIS POINT 2 //////////////////////////
*****
*S COMPUTE RUNOFF FROM AREA 3 COMBINATION PERVIOUS AND IMPERV.
COMPUTE NM HYD   ID=8  HYD=108 DA=0.0018
              PER A=0 PER B=0 PER C=58 PER D=42 TP=-.133
              RAIN=-1
PRINT HYD       ID=8  CODE=10

FINISH

```

AHYMO SUMMARY TABLE (AHYMO392) - AMAFCA VERSION OF HYMO - MARCH, 1992
 INPUT FILE = GMINI10.DAT

RUN DATE (MON/DAY/YR) = 04/05/1993
 USER NO. = CINFRNM.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
*S ****COMPUTE 10 YR. HYDROGRAPHS FOR GOLF COURSE ROAD MINI STORAGE											
*S HISTORICAL FLOW FOR ENTIRE SITE											
*S RAINFALL 10 YR. = .67*100 YR. RAINFALL											
RAINFALL TYPE= 1											
COMPUTE NM HYD	101.10	-	1	.01080	3.43	.097	.16909	1.533	.496 PER IMP=		RAIN6= 1.700
*S COMPUTE RUNOFF FROM AREA 1 (PRESENT CONDITION)											
COMPUTE NM HYD	102.10	-	2	.00386	7.46	.299	1.45000	1.500	3.019 PER IMP=		100.00
*S ROUTE AREA 1 THROUGH AREA TWO AND FOUR											
ROUTE	112.10	2	12	.00386	5.49	.299	1.45006	1.567	2.222		
*S COMPUTE RUNOFF FROM AREAS 2 AND 4											
COMPUTE NM HYD	103.10	-	3	.00517	6.03	.149	.54164	1.500	1.821 PER IMP=		.00
ADD HYD	102.20	12& 3	2	.00903	11.00	.448	.92988	1.533	1.903		
*S ////////// RUNOFF TO GOLF COURSE ROAD AT ANALYSIS POINT 1 //////////											
ADD HYD	104.10	12& 3	4	.00903	11.00	.448	.92988	1.533	1.903		
*S ////////// RUNOFF AT ANALYSIS POINT 2 //////////											
*S COMPUTE RUNOFF FROM AREA 3 COMBINATION PERVIOUS AND IMPERV.											
COMPUTE NM HYD	108.00	-	8	.00180	2.67	.089	.92315	1.500	2.314 PER IMP=		42.00
FINISH											

AHYMO PROGRAM (AHYMO392) - AMAFCA VERSION OF HYMO - MARCH, 1992
 RUN DATE (MON/DAY/YR) = 04/05/1993
 START TIME (HR:MIN:SEC) = 15:47:30 USER NO.= CINFRNM.I01
 INPUT FILE = GMINI10.DAT

START TIME=0.0
 *S *****COMPUTE 10 YR. HYDROGRAPHS FOR GOLF COURSE ROAD MINI STORAGE
 *S HISTORICAL FLOW FOR ENTIRE SITE
 * - AHYMO PER JAN 1991 DPM REVISIONS
 * AREA= 6.943 Ac.
 * L = 820'
 * S = 1.46%
 * V = .84 FPS
 * TC =8.50 MIN
 * UNDEVELOPED AREAS 1.2,3 AND 4
 *S RAINFALL 10 YR. = .67*100 YR. RAINFALL
 RAINFALL TYPE = 1 RAIN QUARTER=0.0 RAIN ONE=1.29
 RAIN SIX=1.7 RAIN DAY=1.88

COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.

DT =	.033333 HOURS			END TIME =			5.999940 HOURS		
.0000	.0035	.0071	.0108	.0145	.0183	.0222			
.0262	.0303	.0344	.0387	.0430	.0475	.0521			
.0568	.0617	.0667	.0718	.0771	.0825	.0882			
.0940	.1000	.1063	.1128	.1196	.1267	.1341			
.1418	.1500	.1586	.1621	.1659	.1700	.1788			
.1984	.2286	.2719	.3310	.4087	.5078	.6311			
.7816	.9208	.9791	1.0283	1.0721	1.1119	1.1485			
1.1826	1.2144	1.2442	1.2722	1.2987	1.3237	1.3474			
1.3698	1.3911	1.4112	1.4304	1.4486	1.4532	1.4577			
1.4620	1.4662	1.4702	1.4741	1.4779	1.4816	1.4852			
1.4886	1.4920	1.4954	1.4986	1.5018	1.5049	1.5080			
1.5110	1.5139	1.5168	1.5196	1.5224	1.5252	1.5279			
1.5306	1.5332	1.5358	1.5383	1.5408	1.5433	1.5458			
1.5482	1.5506	1.5529	1.5553	1.5576	1.5598	1.5621			
1.5643	1.5665	1.5687	1.5709	1.5730	1.5751	1.5772			
1.5793	1.5813	1.5834	1.5854	1.5874	1.5894	1.5913			
1.5933	1.5952	1.5971	1.5990	1.6009	1.6028	1.6046			
1.6065	1.6083	1.6101	1.6119	1.6137	1.6155	1.6172			
1.6190	1.6207	1.6225	1.6242	1.6259	1.6276	1.6292			
1.6309	1.6326	1.6342	1.6359	1.6375	1.6391	1.6407			
1.6423	1.6439	1.6455	1.6471	1.6486	1.6502	1.6517			
1.6533	1.6548	1.6563	1.6578	1.6593	1.6608	1.6623			
1.6638	1.6653	1.6668	1.6682	1.6697	1.6711	1.6726			
1.6740	1.6754	1.6768	1.6782	1.6796	1.6810	1.6824			
1.6838	1.6852	1.6866	1.6879	1.6893	1.6907	1.6920			
1.6934	1.6947	1.6960	1.6974	1.6987	1.7000				

COMPUTE NM HYD ID=1 HYD NO= 101.1 DA=0.0108 SQ MI
 PER A=100 PER B=0.0 PER C=0.0 PER D=0.0 TP= -.133
 RAIN=-1

K = .177904HR TP = .133000HR K/TP RATIO = 1.337625 SHAPE CONSTANT, N = 2.688816
 UNIT PEAK = 20.738 CFS UNIT VOLUME = .9985 B = 255.39 P60 = 1.2900
 AREA = .010800 SQ MI IA = .65000 INCHES INF = 1.67000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

PRINT HYD ID=1 CODE=10

PARTIAL HYDROGRAPH 101.10

TIME	TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW
HRS	HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS
4.000	.000	.0	1.000	.0	2.000	.3	3.000	.0
4.333	.333	.0	1.333	.0	2.333	.2	3.333	.0
4.667	.667	.0	1.667	1.9	2.667	.1	3.667	.0

RUNOFF VOLUME = .16909 INCHES = .0974 ACRE-FEET
 PEAK DISCHARGE RATE = 3.43 CFS AT 1.533 HOURS BASIN AREA = .0108 SQ. MI.

*S COMPUTE RUNOFF FROM AREA 1 (PRESENT CONDITION)

COMPUTE NM HYD ID=2 HYD NO= 102.1 DA=0.00386 SQ MI
 PER A=0 PER B=0 PER C=0 PER D=100 TP= -.133
 RAIN=-1

K = .072485HR TP = .133000HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 15.274 CFS UNIT VOLUME = .9987 B = 526.28 P60 = 1.2900
 AREA = .003860 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

PRINT HYD ID=2 CODE=10

PARTIAL HYDROGRAPH 102.10

TIME	TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW
	FLOW							
HRS	HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS
	.000	.0	1.667	3.7	3.333	.1	5.000	.1
6.667	.0							
	.333	.0	2.000	1.8	3.667	.1	5.333	.1
	.667	.0	2.333	.4	4.000	.1	5.667	.1
	1.000	.4	2.667	.2	4.333	.1	6.000	.1
	1.333	2.4	3.000	.1	4.667	.1	6.333	.0

RUNOFF VOLUME = 1.45000 INCHES = .2985 ACRE-FEET
 PEAK DISCHARGE RATE = 7.46 CFS AT 1.500 HOURS BASIN AREA = .0039 SQ. MI.

*S ROUTE AREA 1 THROUGH AREA TWO AND FOUR

COMPUTE RATING CURVE RC=1 NO=1 NOSEGS=1
 MIN ELEV=0 MAX ELEV=1
 CH SLP=.003 FP SLP=.003
 N=.030 DIST 40
 DIST ELEV DIST ELEV DIST ELEV
 0 1 8 0 32 0
 40 1

RATING CURVE VALLEY SECTION 1.0

WATER	FLOW	FLOW
SURFACE	AREA	RATE
ELEV	SQ FT	CFS
.00	.0	.0
.05	1.3	.5
.11	2.6	1.5
.16	4.0	3.1
.21	5.4	5.0
.26	6.9	7.3
.32	8.4	9.9
.37	9.9	12.9
.42	11.5	16.2
.47	13.2	19.9
.53	14.8	23.9
.58	16.6	28.2
.63	18.3	32.9
.68	20.2	37.9
.74	22.0	43.2
.79	23.9	48.8
.84	25.9	54.8
.89	27.9	61.1
.95	29.9	67.7
1.00	32.0	74.7

COMPUTE TRAVEL TIME ID= 12 REACH=1 NO VS=1 L=500 SLP=.003

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	1.285	.48	.3688
.105	2.615	1.55	.2349
.158	3.989	3.06	.1811
.211	5.407	4.97	.1510
.263	6.870	7.26	.1314
.316	8.377	9.91	.1174
.368	9.928	12.90	.1069
.421	11.524	16.24	.0986
.474	13.163	19.90	.0919
.526	14.848	23.90	.0863
.579	16.576	28.23	.0816
.632	18.349	32.88	.0775
.684	20.166	37.86	.0740
.737	22.028	43.17	.0709
.789	23.934	48.80	.0681
.842	25.884	54.77	.0656
.895	27.878	61.07	.0634
.947	29.917	67.70	.0614
1.000	32.000	74.66	.0595

ROUTE ID=12 HYD= 112.1 INFLOW=2 DT=0.0
 PRINT HYD ID=12 CODE=10

PARTIAL HYDROGRAPH 112.10

TIME HRS	TIME FLOW HRS CFS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
6.667	.000	.0	1.667	4.6	3.333	.2	5.000	.1
7.000	.333	.0	2.000	2.3	3.667	.1	5.333	.1
7.333	.667	.0	2.333	.9	4.000	.1	5.667	.1
7.667	1.000	.1	2.667	.5	4.333	.1	6.000	.1
	1.333	.7	3.000	.3	4.667	.1	6.333	.1

RUNOFF VOLUME = 1.45006 INCHES = .2985 ACRE-FEET
 PEAK DISCHARGE RATE = 5.49 CFS AT 1.567 HOURS BASIN AREA = .0039 SQ. MI.

*S COMPUTE RUNOFF FROM AREAS 2 AND 4

COMPUTE NM HYD ID=3 HYD=103.1 DA=.00517
 PER A=0 PER B=0 PER C=100 PER D=0 TP=-.13
 RAIN=-1

K = .104952HR TP = .130000HR K/TP RATIO = .807325 SHAPE CONSTANT, N = 4.432561
 UNIT PEAK = 15.234 CFS UNIT VOLUME = .9996 B = 383.05 P60 = 1.2900
 AREA = .005170 SQ MI IA = .35000 INCHES INF = .83000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

PRINT HYD ID=3 CODE=10

PARTIAL HYDROGRAPH 103.10

TIME HRS	TIME FLOW HRS CFS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
	.000	.0	1.000	.0	2.000	.4	3.000	.0
	.333	.0	1.333	.4	2.333	.1	3.333	.0
	.667	.0	1.667	2.7	2.667	.0		

RUNOFF VOLUME = .54164 INCHES = .1493 ACRE-FEET
PEAK DISCHARGE RATE = 6.03 CFS AT 1.500 HOURS BASIN AREA = .0052 SQ. MI.

ADD HYD ID=2 HYD=102.2 ID=12 ID=3
PRINT HYD ID=2 CODE=10

PARTIAL HYDROGRAPH 102.20

TIME	TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW
	FLOW							
HRS	HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS
	.000	.0	1.667	7.2	3.333	.2	5.000	.1
6.667	.0							
	.333	.0	2.000	2.7	3.667	.1	5.333	.1
7.000	.0							
	.667	.0	2.333	1.0	4.000	.1	5.667	.1
7.333	.0							
	1.000	.1	2.667	.5	4.333	.1	6.000	.1
7.667	.0							
	1.333	1.1	3.000	.3	4.667	.1	6.333	.1

RUNOFF VOLUME = .92988 INCHES = .4478 ACRE-FEET
PEAK DISCHARGE RATE = 11.00 CFS AT 1.533 HOURS BASIN AREA = .0090 SQ. MI.

*S //////////// RUNOFF TO GOLF COURSE ROAD AT ANALYSIS POINT 1 ////////////
ADD HYD ID=4 HYD=104.1 ID=12 ID=3
PRINT HYD ID=4 CODE=10

PARTIAL HYDROGRAPH 104.10

TIME	TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW
	FLOW							
HRS	HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS
	.000	.0	1.667	7.2	3.333	.2	5.000	.1
6.667	.0							
	.333	.0	2.000	2.7	3.667	.1	5.333	.1
7.000	.0							
	.667	.0	2.333	1.0	4.000	.1	5.667	.1
7.333	.0							
	1.000	.1	2.667	.5	4.333	.1	6.000	.1
7.667	.0							
	1.333	1.1	3.000	.3	4.667	.1	6.333	.1

RUNOFF VOLUME = .92988 INCHES = .4478 ACRE-FEET
PEAK DISCHARGE RATE = 11.00 CFS AT 1.533 HOURS BASIN AREA = .0090 SQ. MI.

*S //////////// RUNOFF AT ANALYSIS POINT 2 ////////////

*S COMPUTE RUNOFF FROM AREA 3 COMBINATION PERVIOUS AND IMPERV.
COMPUTE NM HYD ID=8 HYD=108 DA=0.0018
PER A=0 PER B=0 PER C=58 PER D=42 TP=-.133
RAIN=-1

K = .072485HR TP = .133000HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 2.9915 CFS UNIT VOLUME = .9956 B = 526.28 P60 = 1.2900
AREA = .000756 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

K = .107374HR TP = .133000HR K/TP RATIO = .807325 SHAPE CONSTANT, N = 4.432561
UNIT PEAK = 3.0068 CFS UNIT VOLUME = .9960 B = 383.05 P60 = 1.2900
AREA = .001044 SQ MI IA = .35000 INCHES INF = .83000 INCHES PER HOUR

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

PRINT HYD

ID=8 CODE=10

PARTIAL HYDROGRAPH 108.00

TIME	TIME FLOW	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW
HRS	HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS
	.000	.0	1.333	.5	2.667	.0	4.000	.0
5.333	.0							
	.333	.0	1.667	1.3	3.000	.0	4.333	.0
5.667	.0							
	.667	.0	2.000	.4	3.333	.0	4.667	.0
6.000	.0							
	1.000	.1	2.333	.1	3.667	.0	5.000	.0
6.333	.0							

RUNOFF VOLUME = .92315 INCHES = .0886 ACRE-FEET

PEAK DISCHARGE RATE = 2.67 CFS AT 1.500 HOURS BASIN AREA = .0018 SQ. MI.

FINISH

NORMAL PROGRAM FINISH

END TIME (HR:MIN:SEC) = 15:47:41

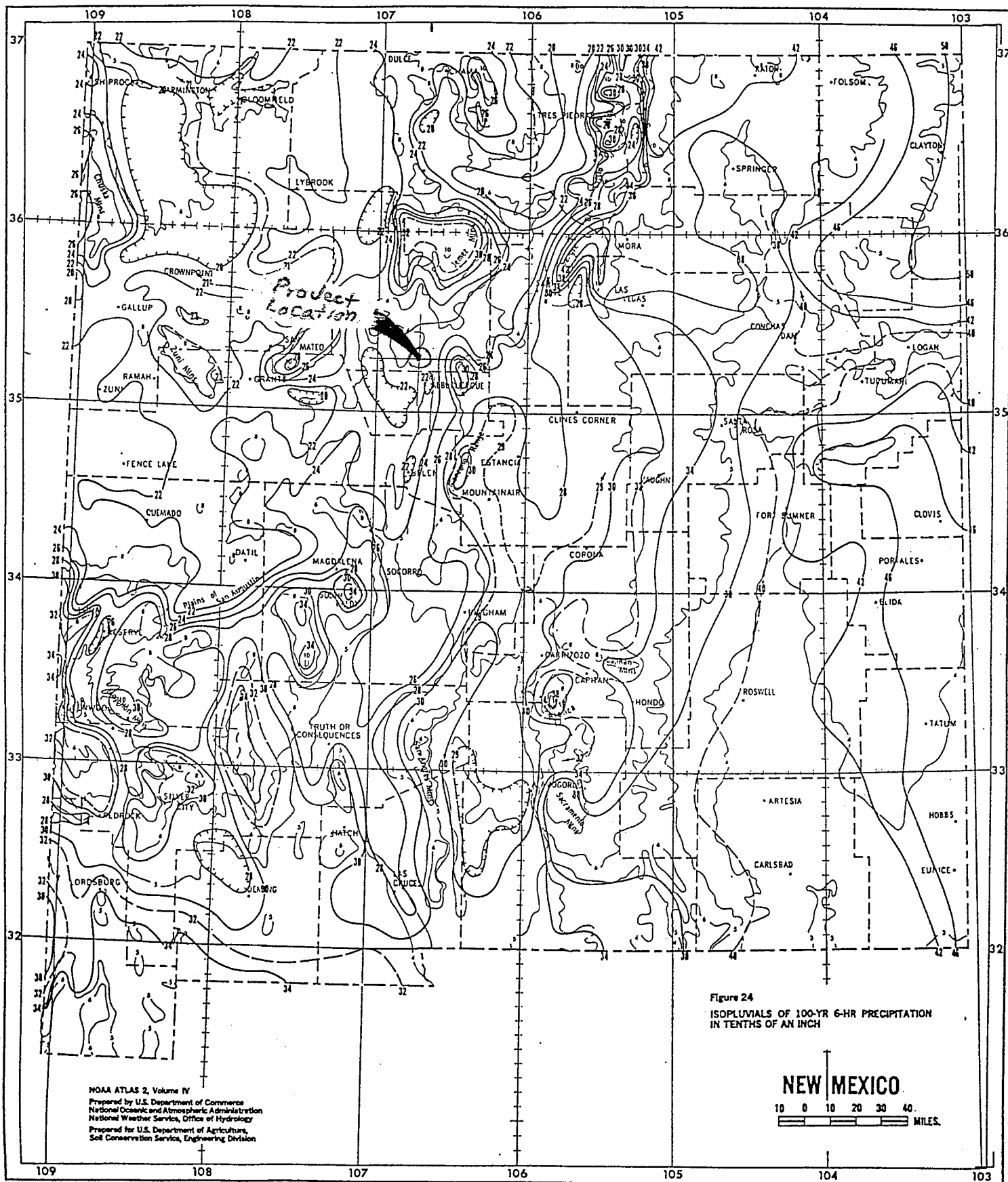
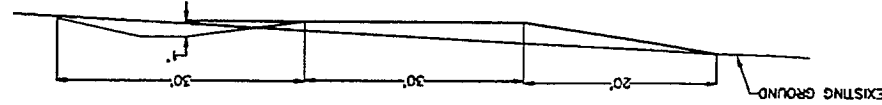


Figure 24
ISOPLUVIALS OF 100-YR 6-HR PRECIPITATION
IN TENTHS OF AN INCH

NEW MEXICO
10 0 10 20 30 40
MILES.

NOAA ATLAS 2, Volume IV
Prepared by U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service, Office of Hydrology
Prepared for U.S. Department of Agriculture,
Soil Conservation Service, Engineering Division





May 11, 1993

Mr. Jerome Fossenier
City Engineer/Public Works Director
City of Rio Rancho
3900 Southern Boulevard S.E.
Rio Rancho, NM 87124

RE: Golf Course Road Mini Storage
Addition and Screening

Dear Jerry,

Submitted herewith is the Drainage Report for the above project. It is proposed that the site is regraded to direct the maximum flow toward Golf Course Road to utilize the recently constructed drainage way and detention ponds constructed with the Golf Course Road Improvement project. The roadside ditch and the ponds were sized to accommodate the Golf Course Road Basin including SAD 3 runoff under fully developed conditions without on-site detention. We request that the City of Rio Rancho's customary on-site detention be waived in this instance since the intent of limiting the peak flow to historical is accomplished by the detention ponds at the County line.

Sincerely,

Monte Bingham
Project Engineer

enclosures

cc: Michael Castillo
w/enclosures

WB/ms

GRADING AND DRAINAGE
APPROVED
5/12/93

City Engineer