#81

community sciences corporation

DRAINAGE REPORT

FOR

GATEWAY NORTH and GATEWAY SOUTH

PREPARED FOR

AMREP

PREPARED BY

COMMUNITY SCIENCES CORPORATION
P. O. BOX 1328
CORRALES, NEW MEXICO 87046

September 1993

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9-22-93

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SURVEYING
LAND PLANNING
CIVIL ENGINEERING
DEVELOPMENT CONSULTANTS

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I. PURPOSE AND SCOPE

AMREP Southwest Inc. is currently planning for the development of Gateway North and Gateway South Subdivisions. The proposed development consists of approximately 28 and 17 acres respectively. The subdivisions will be for office and commercial use.

This report presents an overall Drainage Management and Conceptual Grading Plan for approval by the City of Rio Rancho in order that subsequent subdivision and development may commence.

II. SITE DESCRIPTION AND HISTORY

The Gateway North and South Subdivisions, as shown by Figure 1, Vicinity Map, are located in Rio Rancho adjacent to and west of Highway 528, east of Grande Boulevard and between Sara Road and the Sandoval County line. The two subdivisions are seperated by Haynes Park and two churches on the south side of 19th Avenue.

The legal description of the subdivisions is Revised Tract A and Revised Tract C, Unit 16, Rio Rancho Estates.

Both tracts are undeveloped. However, the tracts were previously graded and the native vegetation has been removed. The native vegetation has been replaced by weeds and some grass. The sites are used for recreational purposes. Both tracts drain from northwest to southeast. A substantial existing earth channel is located along the east boundary of both tracts. The channel conveys flow south to the Black's Arroyo.

Offsite flows do not enter Gateway North. Offsite flows are intercepted by the adjacent streets and conveyed around the site to the earth channel at the southeast corner of the subdivision.

Offsite flows enter Gateway South from the north and at the midpoint of the western boundary from Grande Boulevard and a storm sewer that services a portion of Leonard Street. The offsite flows combine with onsite runoff and migrate to the southeast corner of the subdivision where the water enters the earth channel. The watersheds affecting the subdivisions are shown by Figure 2, Watershed Map.

Planning for the subdivisions is ongoing. Meetings have been conducted with the homeowners, adjacent land owners and other interested parties. The conceptual site plan for each subdivision is shown by Figures 3 and 4. Grande Boulevard will be redesigned to provide a minor residential street for the residential property along the west side and a larger collector type street for the proposed subdivisions. The two streets will be seperated by a landscaped buffer. 19th and 21st Avenues will be improved to a collector type street. Access to the subdivisions will be from Highway 528 and the collector streets bordering the subdivisions. Internal circulation will be established as the subdivisions develop.

At the present time there are several areas that are problem areas during storms. The intersections at 19th Avenue and Grande Boulevard and 19th Avenue and Highway 528 frequently flood. 19th Avenue west of Highway 528 is below the top of the earth channel and water trying to enter the channel floods the street and the intersection at Grande Boulevard. The grades in this area must be modified to better accomodate the flows. Water from Grande Boulevard just south of 19th Avenue is supposed to flow east

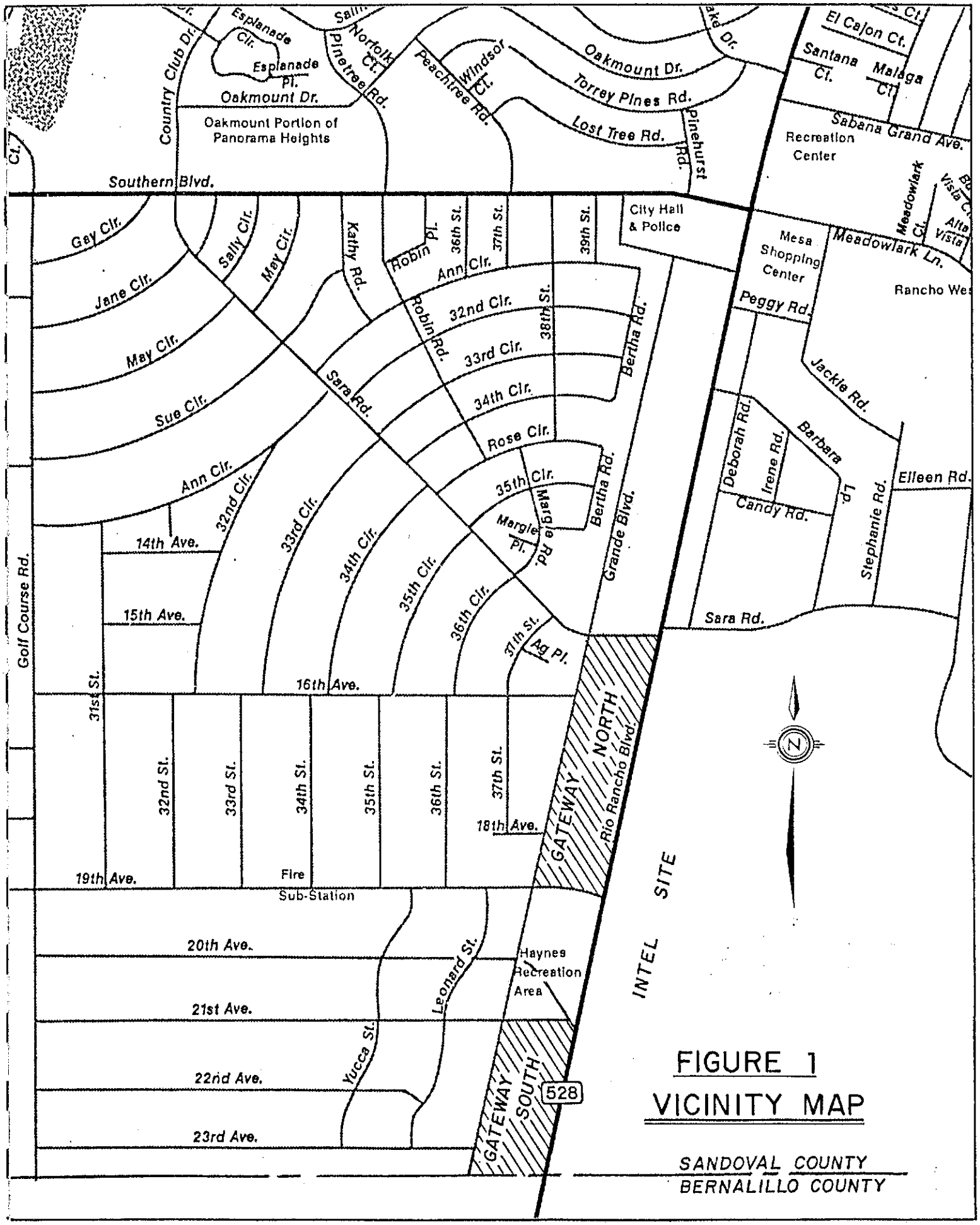


FIGURE 1
VICINITY MAP

SANDOVAL COUNTY
BERNALILLO COUNTY

through Haynes Park to the earth channel. Due to development in the Park, low flows do not exit the street in an appropraite period of time, thereby causing street deteriation and public inconvenience.
At approximately the midpoint of the western boundary of Gateway South is another low point in Grande Boulevard. At the same location is a terminal manhole for a storm drain from Leonard Street. Runoff from the street joins the manhole overflow to migrate to the earth channel.
Each problem area must be addressed during the design of the subdivision.

III. DESIGN CRITERIA

A. Flood Control Regulations

The drainage plan presented in this report has been designed to comply with AMAFCA resolution 80-15, which requires that proposed land development projects be designed such that no flooding of private properties will occur during any storm up to and including the 100-year frequency event. Additionally, this drainage plan has been designed to comply with current "City of Albuquerque Drainage Ordinance" and Chapter 22 of the Development Process Manual (DPM), and subsequently adopted general policies of the City of Albuquerque.

1. 100-year storm

   a. Stormwater flow depth not to exceed the top of curb in any street.

   b. Jump depth to be contained within right-of-way.

2. 10-year storm:

   a. Local street - velocity times depth less than 6.5

   b. Arterial streets:

      i. Flow not to exceed a depth of 0.50
      ii. Velocity times depth less than 6.5
      iii. One driving lane in each direction free of stormwater

B. Engineering Parameters

In accordance with AMAFCA criteria, all hydrological analysis is based on the 100-year frequency, 6-hour duration storm, as represented in Section 22.2, Hydrology, of the "Development Process Manual, Volume 2, Design Criteria for the City of Albuquerque, New Mexico, January 1993".

Ten-year, 6-hour values were also used for subcatchments, in accordance with City drainage policies regarding street flow.
The four rainfalls pertinent to the study are as follows:

	10-Year	100-Year
One-Hour	1.25"	1.87"
Six-Hour	1.47"	2.20"

IV. COMPUTATIONAL PROCEDURES

The analysis approach follows standard engineering practice. Key points of confluence were selected and the associated individual and aggregate contributing basins were subsequently defined.

Hydrological computations were accomplished by means of the March 1992 version of AHYMO Computer Program as developed by AMAFCA. The input parameters and resulting flows for the basins are summarized on Table 1. Summary and detailed AHYMO printouts are contained in Appendix A.

Times of concentration were estimated using the Upland Method and then converted to times to peak (Lg), in accordance with the above referenced Section 22.2 which also establishes the minimum time of concentration as 12 minutes.

Flow characteristics for conveyance swales, channels, and streets were analyzed based on the Manning equation for uniform flow. Streets are assumed to have a 2% cross slope from lip of gutter to crown and a curb and gutter per City of Albuquerque Standard details. Finished grade at the right-of-way is 0.33' above top of curb.

V. OFF-SITE DRAINAGE

The watersheds affecting the subdivisions are shown by Figure 2. Gateway North is affected by Basins 101, 102, 103 and 104. The basins combine and enter Grande Boulevard at 18th Avenue. The offsite basins are essentially fully developed and flows will not increase significantly in the future. The 10 year and 100 year peak runoff rates are 103 cfs and 261 cfs respectively. The runoff flows south in Grande Boulevard to 19th Avenue and combines with runoff from Basin 105. The runoff is conveyed to the east in 19th Avenue to the earth channel where it combines with the runoff from Basin 130. Basin 130 is the Gateway North Subdivision. The rate of runoff at the channel is 166.61 cfs and 394.00 cfs for the 10 year and 100 year events. Frequently 19th Avenue and the intersection at Grande Boulevard flood as a result of high water levels in the earth channel. When the water depth exceeds approximately one foot in the intersection of 19th and Grande, the runoff will flow south in Grande Boulevard and through Haynes Park to the earth channel. Haynes Park contributes 19 cfs and 40 cfs during the 10 and 100-year events.

Gateway South is affected by Basins 120 and 121. Basin 121 is a closed basin along Leonard Street. Runoff collects at a low point and is conveyed by a drainage pipe to a manhole located just east of Grande Boulevard at approximately the midpoint of the subdivision. It appears that the storm drain was to continue east, but the east reach was not constructed. Therefore, the manhole surcharges and overflows. After the funoff has ended, water remains in the manhole and storm drain creating a nuisance. Basin 120 collects in Grande Boulevard and discharges into the subdivision, Basin 132, in the vicinity of the manhole. The flows combine and exit the subdivision into the earth channel at the southeast corner of the site. The 10-year and 100-year flows are 54.56 cfs and 112.40 cfs respectively.

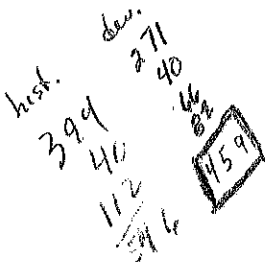
TABLE I

EXISTING DEVELOPMENT CONDITIONS

					LAND TREATMENT				INCREMENTAL		EXISTING TOTAL	
Basin I.D.	Area (Sq.Mi.)	Contr. Basin	Sum Area (Sq.Mi.)	T_c (Min.)	A	B	C	D	Q_{100} (cfs)	Q_{10} (cfs)	Q_{100} (cfs)	Q_{10} (cfs)
101	0.0915	-----	0.0915	15.35	50	10	18	22	113.79	50.92	113.79	50.92
102	0.0700	101	0.1615	15.35	50	10	18	22	86.69	39.13	172.18	69.86
103	0.0421	102	0.2036	12.00	40	10	18	32	69.50	34.83	229.35	98.18
104	0.0547	103	0.2583	16.83	50	10	16	24	65.22	30.17	260.52	103.36
105	0.0646	104	0.3229	15.17	50	10	16	24	81.88	37.82	333.22	134.90
130	0.0438	105	0.3667	12.00	0	0	100	0	80.50	41.99	394.00	✓ 166.61
131	0.0251	-----	0.0251	12.00	0	70	15	15	40.01	18.67	40.01	✓ 18.67
121	0.0224	-----	0.0224	12.00	50	10	16	24	33.01	15.12	33.01	15.12
120	0.0192	121	0.0416	12.00	50	10	16	24	28.30	12.96	61.30	28.07
132	0.0278	120	0.0694	12.00	0	0	100	0	51.10	26.65	112.40	✓ 54.56

FUTURE DEVELOPMENT CONDITIONS

					LAND TREATMENT				INCREMENTAL		FUTURE TOTAL	
Basin I.D.	Area (Sq.Mi.)	Contr. Basin	Sum Area (Sq.Mi.)	T_c (Min.)	A	B	C	D	Q_{100} (cfs)	Q_{10} (cfs)	Q_{100} (cfs)	Q_{10} (cfs)
101	0.0915	-----	0.0915	15.35	50	10	18	22	113.79	50.92	113.79	50.92
102	0.0700	101	0.1615	15.35	50	10	18	22	86.69	39.13	172.18	69.86
103	0.0421	102	0.2036	12.00	40	10	18	32	69.50	34.83	229.35	98.18
104	0.0547	103	0.2583	16.83	50	10	16	24	65.22	30.17	260.52	103.36
130	0.0438	105	0.3667	12.00	0	20	0	80	109.32	69.03	270.79	✓ 64.73
105	0.0646	104	0.3229	15.17	50	10	16	24	81.88	37.82	81.88	✓ 37.82
131	0.0251	-----	0.0251	12.00	0	70	15	15	40.01	18.67	40.01	✓ 18.67
121	0.0224	-----	0.0224	12.00	50	10	16	24	33.01	15.12	33.01	15.12
120	0.0192	121	0.0416	12.00	50	10	16	24	28.30	12.96	61.30	28.07
132	0.0278	120	0.0694	12.00	0	20	0	80	69.39	43.82	66.22	✓ 47.46



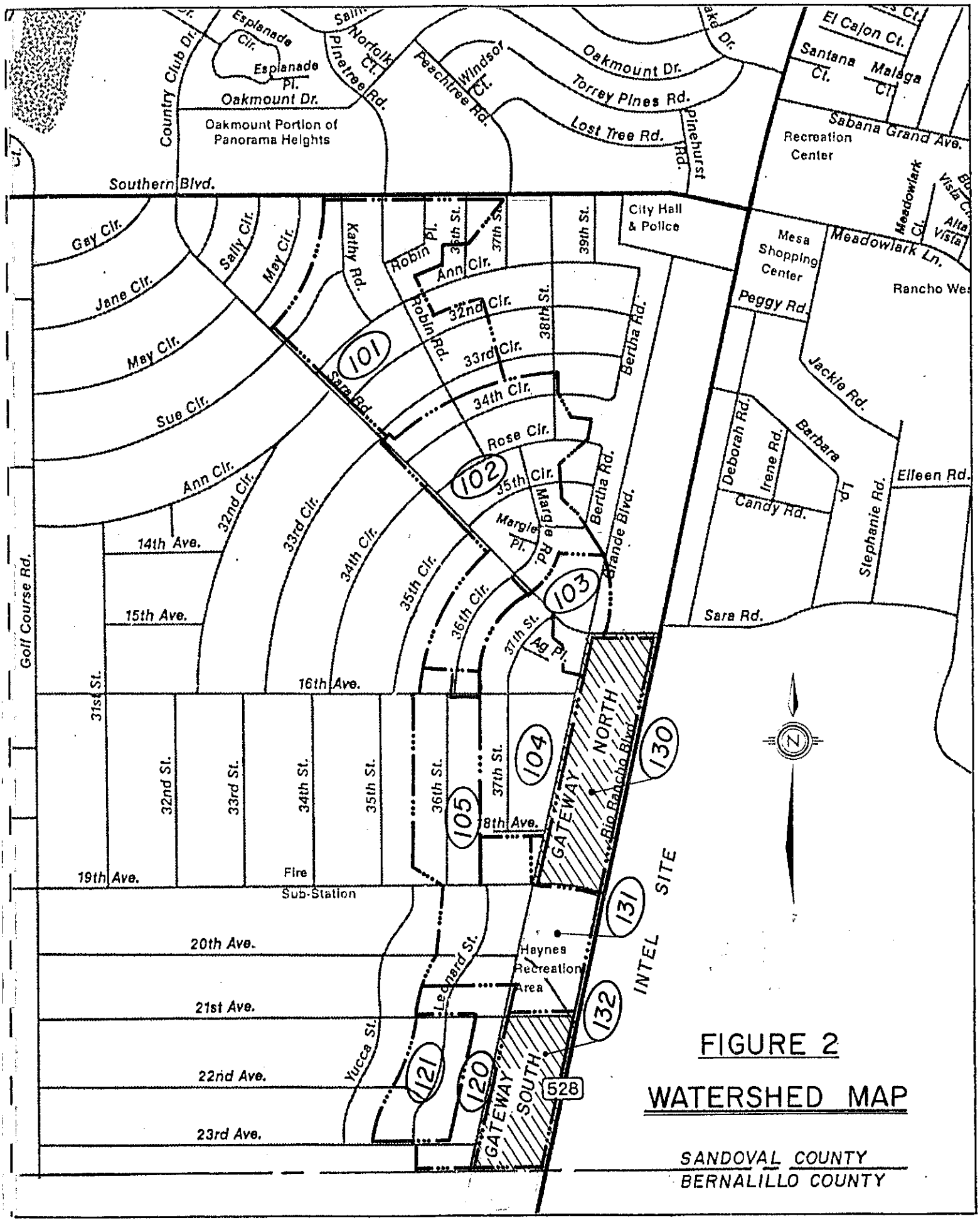


FIGURE 2

WATERSHED MAP

VI. ON-SITE DRAINAGE

The subdivision concept for Gateway North is shown by Figure 3. The exact configuration cannot be determined at this time, but Figure 3 displays a concept that can be changed to accomodate specific needs of purchaseres without significantly altering utility, traffic or storm drainage concepts. Storm water runoff from the subdivision will be routed through traveled ways and easements to the south end of the subdivision, adjacent to 19th Avenue.The off-site flow from Basin 104, 260.52 cfs, enters Grande Boulevard at 18th Avenue. As much of this flow as practical will be conveyed through the subdivision rather than south on Grande Boulevard. Th diverted flow will reduce flooding in the intersection of 19th Avenue and Grande Boulevard. Landscaped detention ponds will be constructed to reduce peak flows from the Gateway North Project to a rate of 0.5 cubic feet per second per acre. A 3.0 foot deep pond with a volume of 1.70 acre feet will reduce the peak developed flow rate of 333.73 cfs. to 270.80 cfs. The pond outlet will be 4-36 inch diameter pipe with an emergency spillway capable of passing the 100-year storm event. The outlets will be directed to the earth channel.

The intersection at 19th Avenue and Grande Boulevard is subject to flooding due to the high flow rates and low slope from the intersection to the earth channel. 19th Avenue will need to be reconfigured vertically west of Grande Boulevard in order to maximize the potential slope to the earth channel. This modification plus diverting flows from 18th Avenue into the subdivision and by allowing excess flows to traverse the Park will help reduce the flooding in the intersection. The intersection will be reconfigured which will also reduce the flooding potential.

While Haynes Park is not a part of this subdivision, the development within the park should be consistant with allowing excess drainage from the intersection at 19th Avenue and Grande Boulevard to flow through the park to the earth channel. At the present time there is a shallow drainage way through the park. A more defined channel would permit the excess flows to traverse the park to the earth channel more easily.

The subdivision concept for Gateway South is shown by Figure 4. Again, the exact configuration cannot be determined at this time. However, the concept shown in Figure 4 can be modified to meet purchasor requirements without harming the drainage concept. Runoff from Basins 121 and 120 will enter the subdivision about midway along the west boundary. Landscaped detention ponds located at the south end of the subdivision will reduce the peak rate of runoff from 130.70 cfs to 66.22 cfs. A 42 inch diameter pipe with a emergency spillway will control the discharge from the ponds. Landscape detention ponds could be constructed at the north end of the subdivision if additional volume is needed or a shifting of drainage from one subdivision to the other is practical. All runoff will be conveyed to the earth channel.

Summary and detailed AHYMO printouts for the 10-year and 100-year pre and post development conditions are shown in Appendix A.

VII. EROSION CONTROL

Control of excessive soil erosion into City streets and drainage improvements during construction will be accomplished by use of temporary lot line, water-trap berms. The berms will be windrowed into place following mass grading operations and left in place until each building is constructed. Figure 5 illustrates the dimensions of the berms. The berms will be located along these boundaries of each lot which are common to City rights-of-way or public easements.

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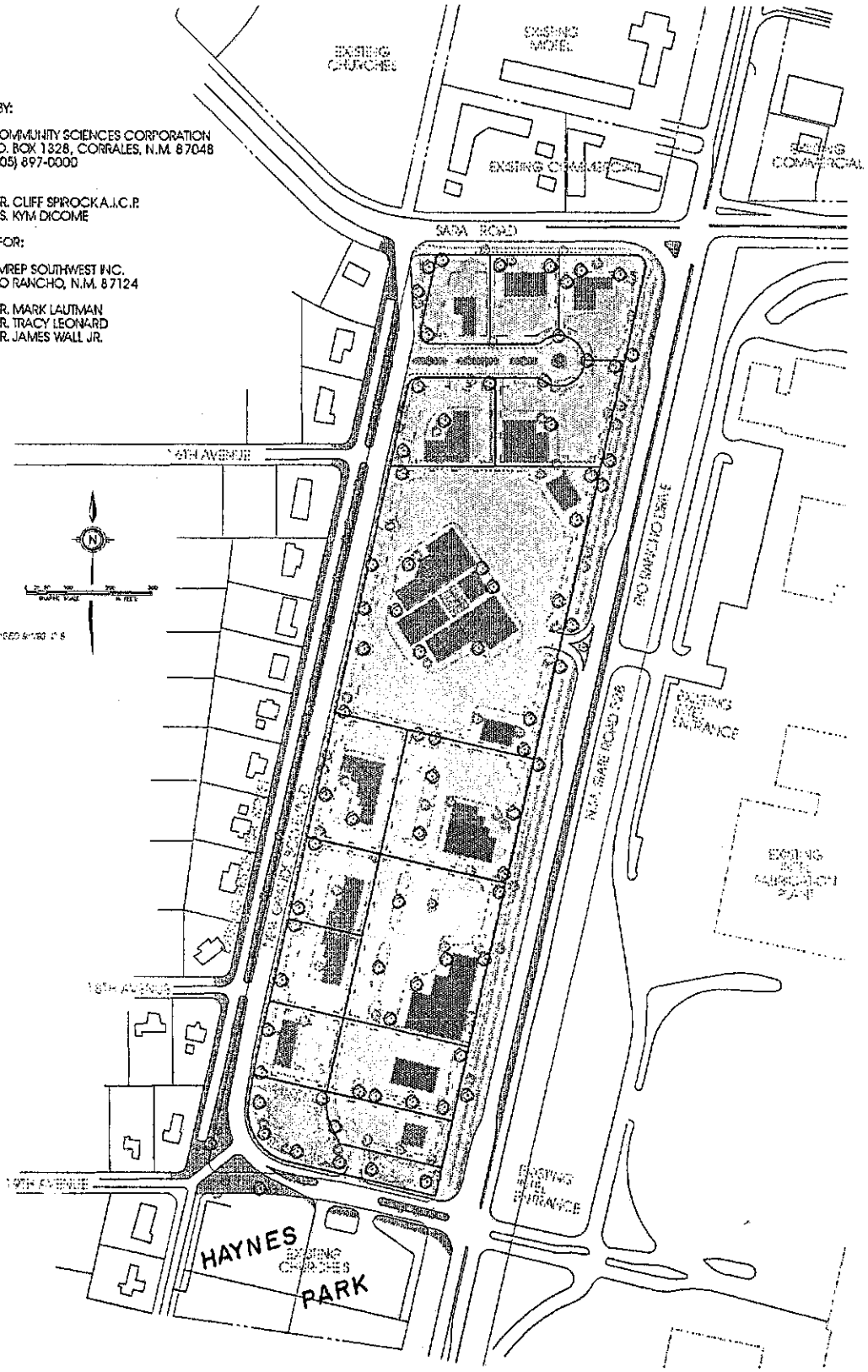

"GATEWAY NORTH"

A SPECIAL USE ZONE FOR
COMMERCIAL C-1, LIMITED C-2 AND
OFFICE LAND USES, SUBJECT TO
THE DEVELOPMENT PLAN

FIGURE 3

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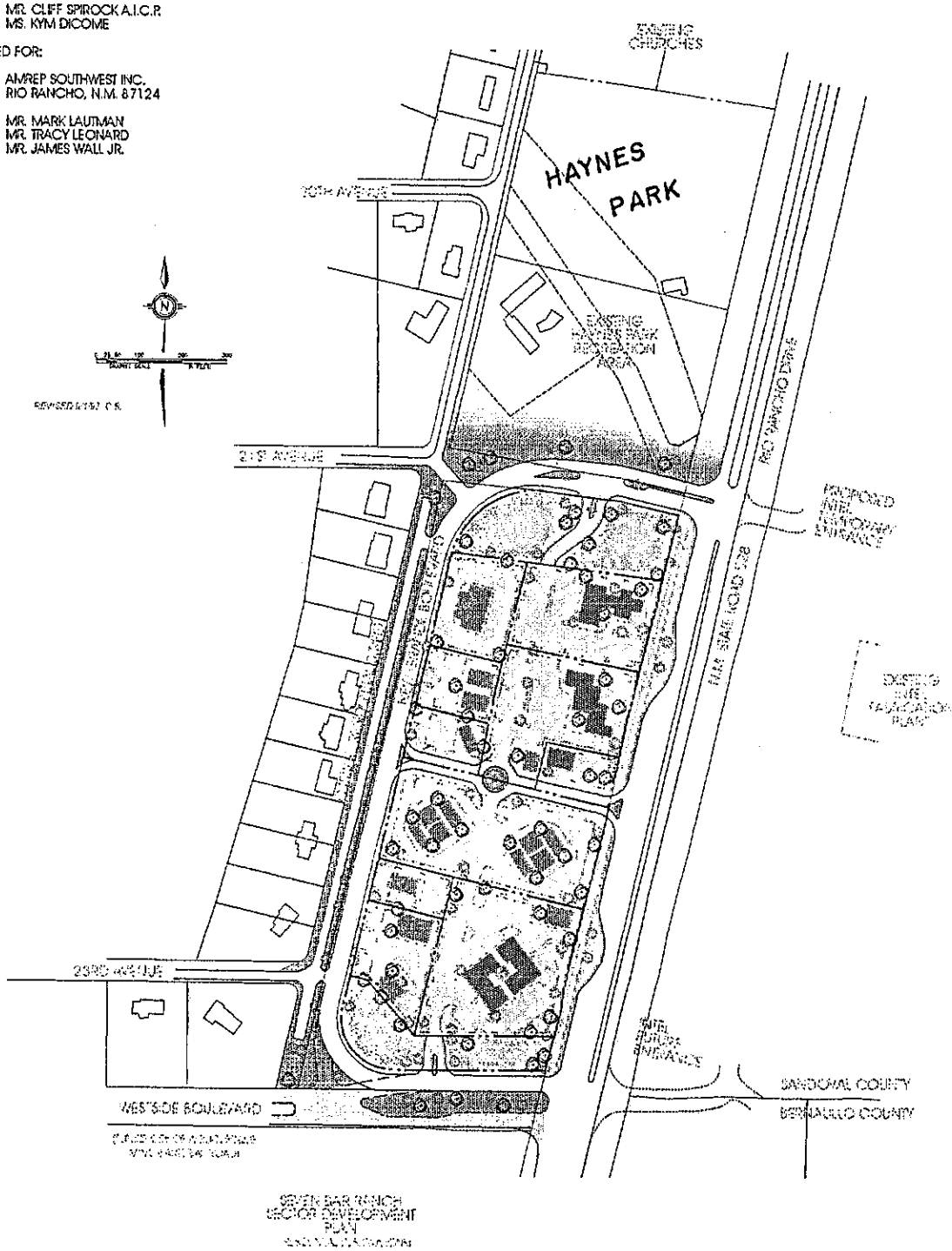
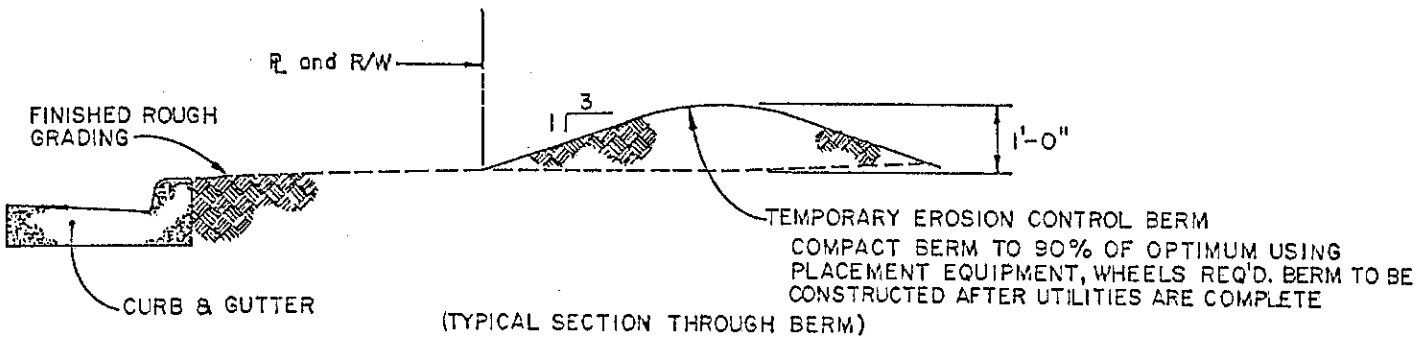


"GATEWAY SOUTH"

A SPECIAL USE ZONE FOR
COMMERCIAL C-1, LIMITED C-2 AND
OFFICE LAND USES, SUBJECT TO
THE DEVELOPMENT PLAN

FIGURE 4



(TYPICAL SECTION THROUGH BERM)

EROSION CONTROL BERM

NTS

FIGURE 5

APPENDIX A

AHYMO

SUMMARY AND DETAILED OUTPUT

10 YEAR PRE-DEVELOPMENT SUMMARY

AHYMO SUMMARY TABLE (AHYMOS92) - AMAFCA VERSION OF HYMO - MARCH, 1992 RUN DATE (MON/DAY/YR) =08/26/1993
INPUT FILE = GWN10PR.DAT USER NO.= J_HUGHES.S92

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	EXISTING 10 YR.CONDITIONS FOR GATEWAY NORTH.									
*S	AUGUST 26, 1993									
RAINFALL TYPE= 1										RAIN6= 1.470
*S BASIN DESIGNATION = BASIN 101										
COMPUTE NM HYD	101.00	-	1	.09150	50.92	1.936	.39669	1.532	.870	PER IMP= 22.00
*S ROUTE BASIN 101 thru 102										
ROUTE	101.00	1	6	.09150	35.81	1.936	.39669	1.632	.611	
*S BASIN DESIGNATION = BASIN 102										
COMPUTE NM HYD	102.00	-	2	.07000	39.13	1.481	.39669	1.532	.873	PER IMP= 22.00
ADD HYD	102.00	6& 2	6	.16150	69.86	3.417	.39668	1.598	.676	
*S BASIN DESIGNATION = BASIN 103										
COMPUTE NM HYD	103.00	-	3	.04210	34.83	1.153	.51352	1.499	1.293	PER IMP= 32.00
ADD HYD	103.00	6& 3	5	.20360	98.18	4.570	.42084	1.565	.753	
*S ROUTE BASINS 101, 102 & 103 THROUGH 104										
ROUTE	103.00	5	6	.20360	78.30	4.570	.42084	1.665	.601	
*S BASIN DESIGNATION = 104										
COMPUTE NM HYD	104.00	-	4	.05470	30.17	1.208	.41401	1.565	.862	PER IMP= 24.00
*S COMBINE HYDROGRAPHS 101, 102, 103 & 104										
ADD HYD	104.00	6& 4	4	.25830	103.36	5.777	.41938	1.632	.625	
*S BASIN DESIGNATION = 105										
COMPUTE NM HYD	105.00	-	5	.06460	37.82	1.426	.41401	1.532	.915	PER IMP= 24.00
*S COMBINE HYDROGRAPHS 104 & 105. TOTAL FLOW AT 19TH/GRANDE.										
ADD HYD	105.00	4& 5	5	.32290	134.90	7.204	.41831	1.598	.653	
*S BASIN DESIGNATION = 130										
COMPUTE NM HYD	130.00	-	1	.04380	41.99	1.020	.43683	1.532	1.498	PER IMP= .00
*S COMBINE HYDROGRAPHS 105 & 130. TOTAL FLOW AT 19TH/528										
ADD HYD	130.00	5& 1	6	.36670	166.61	8.224	.42052	1.565	.710	
*S BASIN DESIGNATION = 131										
COMPUTE NM HYD	131.00	-	1	.02510	18.67	.538	.40216	1.532	1.162	PER IMP= 15.00
*S BASIN DESIGNATION = 121										
COMPUTE NM HYD	121.00	-	2	.02240	15.12	.495	.41401	1.499	1.054	PER IMP= 24.00
*S BASIN DESIGNATION = 120										
COMPUTE NM HYD	120.00	-	3	.01920	12.96	.424	.41401	1.499	1.054	PER IMP= 24.00
*S COMBINE HYDROGRAPHS 120 & 121										
ADD HYD	120.00	2& 3	1	.04160	28.07	.919	.41399	1.499	1.054	
*S BASIN DESIGNATION = 132										
COMPUTE NM HYD	132.00	-	4	.02780	26.65	.648	.43683	1.532	1.498	PER IMP= .00
*S COMBINE HYDROGRAPHS 120, 121 &132. TOTAL FLOW AT 23RD/528										
ADD HYD	132.00	1& 4	2	.06940	54.56	1.566	.42314	1.499	1.228	
FINISH										

10 YEAR PRE-DEVELOPMENT
DETAILED PRINTOUT


```
      AHYMO PROGRAM (AHYMO392) - AMAFCA VERSION OF HYMO - MARCH, 1992
           RUN DATE (MON/DAY/YR) = 08/26/1993
           START TIME (HR:MIN:SEC) = 12:35:55     USER NO.= J_HUGHES.S92
           INPUT FILE = GWN10PR.DAT

   START                 TIME=0.0
   *S       EXISTING 10 YR.CONDITIONS FOR GATEWAY NORTH.
   *S       AUGUST 26, 1993
   *        FILE GWN10PR.DAT
   RAINFALL              TYPE=1 RAIN QUARTER=0.0
                         RAIN ONE=1.25 RAIN SIX=1.47
                         RAIN DAY=1.77 DT=0.0333

                COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
                DT =    .033300 HOURS       END TIME =     5.994000 HOURS
                   .0000   .0011   .0022   .0033   .0045   .0056   .0068
                   .0081   .0093   .0106   .0120   .0133   .0147   .0162
                   .0176   .0192   .0207   .0224   .0240   .0258   .0276
                   .0294   .0313   .0333   .0354   .0376   .0399   .0423
                   .0448   .0475   .0503   .0537   .0574   .0614   .0695
                   .0882   .1170   .1584   .2150   .2895   .3845   .5029
                   .6475   .7863   .8432   .8912   .9337   .9724  1.0080
                  1.0411  1.0720  1.1009  1.1282  1.1539  1.1781  1.2011
                  1.2229  1.2435  1.2631  1.2817  1.2994  1.3162  1.3081
                  1.3117  1.3152  1.3185  1.3217  1.3248  1.3277  1.3305
                  1.3333  1.3359  1.3385  1.3410  1.3434  1.3458  1.3480
                  1.3503  1.3524  1.3546  1.3566  1.3587  1.3606  1.3626
                  1.3645  1.3663  1.3682  1.3700  1.3717  1.3734  1.3751
                  1.3768  1.3784  1.3801  1.3816  1.3832  1.3847  1.3862
                  1.3877  1.3892  1.3907  1.3921  1.3935  1.3949  1.3962
                  1.3976  1.3989  1.4003  1.4016  1.4028  1.4041  1.4054
                  1.4066  1.4078  1.4091  1.4103  1.4115  1.4126  1.4138
                  1.4149  1.4161  1.4172  1.4183  1.4194  1.4205  1.4216
                  1.4227  1.4238  1.4248  1.4259  1.4269  1.4279  1.4289
                  1.4299  1.4309  1.4319  1.4329  1.4339  1.4349  1.4358
                  1.4368  1.4377  1.4387  1.4396  1.4405  1.4414  1.4423
                  1.4432  1.4441  1.4450  1.4459  1.4468  1.4477  1.4485
                  1.4494  1.4502  1.4511  1.4519  1.4528  1.4536  1.4544
                  1.4552  1.4560  1.4568  1.4577  1.4584  1.4592  1.4600
                  1.4608  1.4616  1.4624  1.4631  1.4639  1.4647  1.4654
                  1.4662  1.4669  1.4677  1.4684  1.4691  1.4699

   *S BASIN DESIGNATION = BASIN 101
   COMPUTE NM HYD        ID=1 HYD NO= 101 DA=0.0915 SQ MI
                         PER A=50 PER B=10 PER C=18 PER D=22 TP=0.1705
                         RAIN=-1

      K =   .095125HR    TP =   .170500HR    K/TP RATIO =   .557921     SHAPE CONSTANT, N =  6.896935
      UNIT PEAK =   60.963    CFS   UNIT VOLUME =    .9997      B =   516.35      P60 = 1.2500
      AREA =      .020130 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
      RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300


      K =   .201615HR    TP =   .170500HR    K/TP RATIO =  1.182494     SHAPE CONSTANT, N =  3.001559
```

UNIT PEAK = 118.02 CFS UNIT VOLUME = .9998 B = 281.95 P60 = 1.2500
AREA = .071370 SQ MI IA = .56154 INCHES INF = 1.42231 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 101.00

RUNOFF VOLUME = .39669 INCHES = 1.9358 ACRE-FEET
PEAK DISCHARGE RATE = 50.92 CFS AT 1.532 HOURS BASIN AREA = .0915 SQ. MI.

*S ROUTE BASIN 101 thru 102
COMPUTE RATING CURVE RC=1 VS NO=1 NO SEGS=1 MIN ELEV=10 FT
MAX ELEV=12 FT CH SLP=0.0092 FP
SLP= 0.0092 N=0.021 DIST=16.17 FT
DIST ELEV DIST ELEV DIST ELEV DIST ELEV
0.0 10.67 0.17 10.0 2.17 10.13 16.17 10.41
30.17 10.13 32.17 10.00 32.34 10.67

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
10.00	.0	.0
10.11	.1	.1
10.21	.5	.5
10.32	1.4	2.3
10.42	2.8	6.0
10.53	4.5	13.0
10.63	6.2	22.0
10.74	7.9	32.9
10.84	9.6	45.4
10.95	11.4	59.6
11.05	13.1	75.2
11.16	14.8	92.2
11.26	16.5	110.6
11.37	18.2	130.4
11.47	19.9	151.3
11.58	21.6	173.6
11.68	23.3	197.0
11.79	25.0	221.6
11.89	26.7	247.3
12.00	28.4	274.2

COMPUTE TRAVEL TIME ID=6 REACH NO=1 NO VS=1 L=2650 FT SLP=0.0092

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.105	.087	.08	.7987

.211	.459	.55	.6185
.316	1.377	2.26	.4495
.421	2.849	6.01	.3489
.526	4.546	13.04	.2567
.632	6.246	22.04	.2086
.737	7.948	32.88	.1779
.842	9.650	45.44	.1563
.947	11.352	59.57	.1403
1.053	13.054	75.19	.1278
1.158	14.756	92.23	.1178
1.263	16.458	110.63	.1095
1.368	18.160	130.35	.1026
1.474	19.862	151.34	.0966
1.579	21.565	173.57	.0915
1.684	23.267	197.00	.0869
1.789	24.969	221.60	.0829
1.895	26.671	247.35	.0794
2.000	28.373	274.21	.0762

```
ROUTE              ID=6 HYD NO= 101  INFLOW ID=1
PRINT HYD          ID=6 CODE=1

                              PARTIAL HYDROGRAPH   101.00


    RUNOFF VOLUME =      .39669 INCHES     =       1.9358 ACRE-FEET
    PEAK DISCHARGE RATE =      35.81 CFS  AT   1.632 HOURS   BASIN AREA =    .0915 SQ. MI.



*S BASIN DESIGNATION = BASIN 102
COMPUTE NM HYD     ID=2 HYD NO= 102 DA=0.0700 SQ MI
                   PER A=50 PER B=10 PER C=18 PER D=22 TP=0.1705
                   RAIN=-1

    K =   .093492HR    TP =   .170500HR    K/TP RATIO =    .548342     SHAPE CONSTANT, N =  7.051042
    UNIT PEAK =   47.299    CFS   UNIT VOLUME =    .9998       B =   523.67      P60 = 1.2500
    AREA =      .015400 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033300


    K =   .202030HR    TP =   .170500HR    K/TP RATIO =  1.184927     SHAPE CONSTANT, N =  2.995860
    UNIT PEAK =   90.141    CFS   UNIT VOLUME =    .9997       B =   281.48      P60 = 1.2500
    AREA =      .054600 SQ MI    IA =    .56154 INCHES    INF =   1.42231 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033300

PRINT HYD          ID=2 CODE=1

                              PARTIAL HYDROGRAPH   102.00


    RUNOFF VOLUME =      .39669 INCHES     =       1.4810 ACRE-FEET
    PEAK DISCHARGE RATE =      39.13 CFS  AT   1.532 HOURS   BASIN AREA =    .0700 SQ. MI.
```

```
* COMBINE HYDROGRAPHS FROM 101 & 102
ADD HYD             ID=6  HYD NO=102 ID=6 ID=2
PRINT HYD           ID=6 CODE=1

                                PARTIAL HYDROGRAPH   102.00


    RUNOFF VOLUME =      .39668 INCHES     =       3.4167 ACRE-FEET
    PEAK DISCHARGE RATE =      69.86 CFS  AT   1.598 HOURS   BASIN AREA =   .1615 SQ. MI.



*S BASIN DESIGNATION = BASIN 103
COMPUTE NM HYD      ID=3 HYD NO= 103 DA=0.0421 SQ MI
                    PER A=40 PER B=10 PER C=18 PER D=32 TP=0.1333
                    RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   53.188    CFS   UNIT VOLUME =    .9991       B =   526.28      P60 = 1.2500
    AREA =      .013472 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300


    K =   .154939HR    TP =   .133300HR    K/TP RATIO =  1.162333     SHAPE CONSTANT, N =  3.049904
    UNIT PEAK =   61.394    CFS   UNIT VOLUME =    .9996       B =   285.87      P60 = 1.2500
    AREA =      .028628 SQ MI    IA =    .54853 INCHES    INF =   1.38588 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300

PRINT HYD           ID=3 CODE=1

                                PARTIAL HYDROGRAPH   103.00


    RUNOFF VOLUME =      .51352 INCHES     =       1.1530 ACRE-FEET
    PEAK DISCHARGE RATE =      34.83 CFS  AT   1.499 HOURS   BASIN AREA =   .0421 SQ. MI.



* COMBINE HYDROGRAPHS FROM 102 & 103
ADD HYD             ID=5  HYD NO=103 ID=6 ID=3
PRINT HYD           ID=5 CODE=1

                                PARTIAL HYDROGRAPH   103.00


    RUNOFF VOLUME =      .42084 INCHES     =       4.5697 ACRE-FEET
    PEAK DISCHARGE RATE =      98.18 CFS  AT   1.565 HOURS   BASIN AREA =   .2036 SQ. MI.



*S ROUTE BASINS 101, 102 & 103 THROUGH 104
COMPUTE RATING CURVE RC=1 VS NO=1 NO SEGS=1 MIN ELEV=10 FT
                    MAX ELEV=12 FT CH SLP=0.0095 FP
                    SLP= 0.0095 N=0.021 DIST=16.17 FT
                    DIST  ELEV  DIST  ELEV  DIST  ELEV  DIST  ELEV
```

0.0 10.67 0.17 10.0 2.17 10.13 16.17 10.41
30.17 10.13 32.17 10.0 32.34 10.67

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
10.00	.0	.0
10.11	.1	.1
10.21	.5	.6
10.32	1.4	2.3
10.42	2.8	6.1
10.53	4.5	13.2
10.63	6.2	22.4
10.74	7.9	33.4
10.84	9.6	46.2
10.95	11.4	60.5
11.05	13.1	76.4
11.16	14.8	93.7
11.26	16.5	112.4
11.37	18.2	132.5
11.47	19.9	153.8
11.58	21.6	176.4
11.68	23.3	200.2
11.79	25.0	225.2
11.89	26.7	251.3
12.00	28.4	278.6

COMPUTE TRAVEL TIME ID=6 REACH NO=1 NO VS=1 L=2950 FT SLP=0.0095

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.105	.087	.08	.8750
.211	.459	.55	.6776
.316	1.377	2.29	.4925
.421	2.849	6.11	.3822
.526	4.546	13.25	.2812
.632	6.246	22.40	.2285
.737	7.948	33.42	.1949
.842	9.650	46.18	.1712
.947	11.352	60.53	.1537
1.053	13.054	76.40	.1400
1.158	14.756	93.72	.1290
1.263	16.458	112.42	.1200
1.368	18.160	132.46	.1123
1.474	19.862	153.79	.1058
1.579	21.565	176.38	.1002
1.684	23.267	200.19	.0952
1.789	24.969	225.19	.0909
1.895	26.671	251.35	.0870
2.000	28.373	278.65	.0834

ROUTE ID=6 HYD NO= 103 INFLOW ID=5

```
 PRINT HYD            ID=6 CODE=1

                                   PARTIAL HYDROGRAPH   103.00


     RUNOFF VOLUME =      .42084 INCHES     =       4.5697 ACRE-FEET
     PEAK DISCHARGE RATE =      78.30 CFS  AT   1.665 HOURS   BASIN AREA =   .2036 SQ. MI.



 *S BASIN DESIGNATION = 104
 COMPUTE NM HYD       ID=4 HYD NO= 104 DA=0.0547 SQ MI
                      PER A=50 PER B=10 PER C=16 PER D=24 TP=0.1870
                      RAIN=-1.

     K =   .101915HR    TP =   .187000HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   36.946    CFS   UNIT VOLUME =    .9994       B =   526.28      P60 = 1.2500
     AREA =      .013128 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300


     K =   .223588HR    TP =   .187000HR    K/TP RATIO =  1.195656     SHAPE CONSTANT, N =  2.971085
     UNIT PEAK =   62.126    CFS   UNIT VOLUME =    .9996       B =   279.46      P60 = 1.2500
     AREA =      .041572 SQ MI    IA =    .56711 INCHES    INF =   1.43789 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300

 PRINT HYD            ID=4 CODE=1

                                   PARTIAL HYDROGRAPH   104.00


     RUNOFF VOLUME =      .41401 INCHES     =       1.2078 ACRE-FEET
     PEAK DISCHARGE RATE =      30.17 CFS  AT   1.565 HOURS   BASIN AREA =   .0547 SQ. MI.



 *S COMBINE HYDROGRAPHS 101, 102, 103 & 104
 ADD HYD              ID=4  HYD NO= 104 ID=6 ID=4
 PRINT HYD            ID=4 CODE=1

                                   PARTIAL HYDROGRAPH   104.00


     RUNOFF VOLUME =      .41938 INCHES     =       5.7774 ACRE-FEET
     PEAK DISCHARGE RATE =     103.36 CFS  AT   1.632 HOURS   BASIN AREA =   .2583 SQ. MI.



 *S BASIN DESIGNATION = 105
 COMPUTE NM HYD       ID=5 HYD NO= 105 DA=0.0646 SQ MI
                      PER A=50 PER B=10 PER C=16 PER D=24 TP=0.1685
                      RAIN=-1.

     K =   .091990HR    TP =   .168500HR    K/TP RATIO =   .545936     SHAPE CONSTANT, N =  7.090837
     UNIT PEAK =   48.356    CFS   UNIT VOLUME =    1.000       B =   525.54      P60 = 1.2500
```

```
      AREA =      .015504 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
      RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300


      K =   .201422HR    TP =   .168500HR    K/TP RATIO =  1.195383     SHAPE CONSTANT, N =  2.971704
      UNIT PEAK =   81.440    CFS   UNIT VOLUME =    .9997      B =   279.51      P60 = 1.2500
      AREA =      .049096 SQ MI    IA =    .56711 INCHES    INF =  1.43789 INCHES PER HOUR
      RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300

   PRINT HYD           ID=5 CODE=1

                                PARTIAL HYDROGRAPH   105.00


      RUNOFF VOLUME =      .41401 INCHES     =       1.4264 ACRE-FEET
      PEAK DISCHARGE RATE =      37.82 CFS  AT   1.532 HOURS   BASIN AREA =   .0646 SQ. MI.


   *S COMBINE HYDROGRAPHS 104 & 105. TOTAL FLOW AT 19TH/GRANDE.
   ADD HYD             ID=5  HYD NO= 105 ID=4 ID=5
   PRINT HYD           ID=5 CODE=1

                                PARTIAL HYDROGRAPH   105.00


      RUNOFF VOLUME =      .41831 INCHES     =       7.2038 ACRE-FEET
      PEAK DISCHARGE RATE =     134.90 CFS  AT   1.598 HOURS   BASIN AREA =   .3229 SQ. MI.



   *S BASIN DESIGNATION = 130
   COMPUTE NM HYD      ID=1 HYD NO= 130 DA=0.0438 SQ MI
                       PER A=0 PER B=0 PER C=100 PER D=0 TP=0.1333
                       RAIN=-1.

      K =   .108016HR    TP =   .133300HR    K/TP RATIO =   .810320     SHAPE CONSTANT, N =  4.414309
      UNIT PEAK =   125.49    CFS   UNIT VOLUME =    1.000      B =   381.91      P60 = 1.2500
      AREA =      .043800 SQ MI    IA =    .35000 INCHES    INF =    .83000 INCHES PER HOUR
      RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300

   PRINT HYD           ID=1 CODE=1

                                PARTIAL HYDROGRAPH   130.00


      RUNOFF VOLUME =      .43683 INCHES     =       1.0204 ACRE-FEET
      PEAK DISCHARGE RATE =      41.99 CFS  AT   1.532 HOURS   BASIN AREA =   .0438 SQ. MI.



   *S COMBINE HYDROGRAPHS 105 & 130. TOTAL FLOW AT 19TH/528
   ADD HYD             ID=6  HYD NO= 130 ID=5 ID=1
   PRINT HYD           ID=6 CODE=1
```

PARTIAL HYDROGRAPH 130.00

RUNOFF VOLUME = .42052 INCHES = 8.2242 ACRE-FEET
PEAK DISCHARGE RATE = 166.61 CFS AT 1.565 HOURS BASIN AREA = .3667 SQ. MI.

*S BASIN DESIGNATION = 131
COMPUTE NM HYD ID=1 HYD NO= 131 DA=0.0251 SQ MI
PER A=0 PER B=70 PER C=15 PER D=15 TP=0.1333
RAIN=-1.

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 14.864 CFS UNIT VOLUME = .9986 B = 526.28 P60 = 1.2500
AREA = .003765 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

K = .135921HR TP = .133300HR K/TP RATIO = 1.019665 SHAPE CONSTANT, N = 3.461825
UNIT PEAK = 50.822 CFS UNIT VOLUME = 1.000 B = 317.53 P60 = 1.2500
AREA = .021335 SQ MI IA = .47353 INCHES INF = 1.17588 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 131.00

RUNOFF VOLUME = .40216 INCHES = .5384 ACRE-FEET
PEAK DISCHARGE RATE = 18.67 CFS AT 1.532 HOURS BASIN AREA = .0251 SQ. MI.

*S BASIN DESIGNATION = 121
COMPUTE NM HYD ID=2 HYD NO= 121 DA=0.0224 SQ MI
PER A=50 PER B=10 PER C=16 PER D=24 TP=0.1333
RAIN=-1.

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 21.225 CFS UNIT VOLUME = .9988 B = 526.28 P60 = 1.2500
AREA = .005376 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

K = .159381HR TP = .133300HR K/TP RATIO = 1.195656 SHAPE CONSTANT, N = 2.971085
UNIT PEAK = 35.690 CFS UNIT VOLUME = .9994 B = 279.46 P60 = 1.2500
AREA = .017024 SQ MI IA = .56711 INCHES INF = 1.43789 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 121.00

```
      RUNOFF VOLUME =      .41401 INCHES     =        .4946 ACRE-FEET
      PEAK DISCHARGE RATE =      15.12 CFS  AT   1.499 HOURS   BASIN AREA =   .0224 SQ. MI.



   *S BASIN DESIGNATION = 120
   COMPUTE NM HYD       ID=3 HYD NO= 120 DA=0.0192 SQ MI
                        PER A=50 PER B=10 PER C=16 PER D=24 TP=0.1333
                        RAIN=-1.

      K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
      UNIT PEAK =   18.193    CFS   UNIT VOLUME =    .9987       B =   526.28      P60 = 1.2500
      AREA =      .004608 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
      RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300


      K =   .159381HR    TP =   .133300HR    K/TP RATIO =  1.195656     SHAPE CONSTANT, N =  2.971085
      UNIT PEAK =   30.591    CFS   UNIT VOLUME =    .9993       B =   279.46      P60 = 1.2500
      AREA =      .014592 SQ MI    IA =    .56711 INCHES    INF =   1.43789 INCHES PER HOUR
      RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300

   PRINT HYD            ID=3 CODE=1

                                  PARTIAL HYDROGRAPH   120.00


      RUNOFF VOLUME =      .41401 INCHES     =        .4239 ACRE-FEET
      PEAK DISCHARGE RATE =      12.96 CFS  AT   1.499 HOURS   BASIN AREA =   .0192 SQ. MI.



   *S COMBINE HYDROGRAPHS 120 & 121
   ADD HYD              ID=1  HYD NO= 120 ID=2 ID=3
   PRINT HYD            ID=1 CODE=1

                                  PARTIAL HYDROGRAPH   120.00


      RUNOFF VOLUME =      .41399 INCHES     =        .9185 ACRE-FEET
      PEAK DISCHARGE RATE =      28.07 CFS  AT   1.499 HOURS   BASIN AREA =   .0416 SQ. MI.



   *S BASIN DESIGNATION = 132
   COMPUTE NM HYD       ID=4 HYD NO= 132 DA=0.0278 SQ MI
                        PER A=0 PER B=0 PER C=100 PER D=0 TP=0.1333
                        RAIN=-1.

      K =   .108016HR    TP =   .133300HR    K/TP RATIO =   .810320     SHAPE CONSTANT, N =  4.414309
      UNIT PEAK =   79.648    CFS   UNIT VOLUME =    1.000       B =   381.91      P60 = 1.2500
      AREA =      .027800 SQ MI    IA =    .35000 INCHES    INF =    .83000 INCHES PER HOUR
      RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300

   PRINT HYD            ID=4 CODE=1
```

PARTIAL HYDROGRAPH 132.00

RUNOFF VOLUME = .43683 INCHES = .6477 ACRE-FEET
PEAK DISCHARGE RATE = 26.65 CFS AT 1.532 HOURS BASIN AREA = .0278 SQ. MI.

```
*S COMBINE HYDROGRAPHS 120, 121 &132. TOTAL FLOW AT 23RD/528
ADD HYD             ID=2  HYD NO= 132 ID=1 ID=4
PRINT HYD           ID=2 CODE=1
```

PARTIAL HYDROGRAPH 132.00

RUNOFF VOLUME = .42314 INCHES = 1.5662 ACRE-FEET
PEAK DISCHARGE RATE = 54.56 CFS AT 1.499 HOURS BASIN AREA = .0694 SQ. MI.

```
FINISH
```

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 12:36:06

100 YEAR PRE-DEVELOPMENT SUMMARY

AHYMO SUMMARY TABLE (AHYMO392) - AMAFCA VERSION OF HYMO - MARCH, 1992 RUN DATE (MON/DAY/YR) =08/11/1993
INPUT FILE = GWN100PR.DAT USER NO.= J_HUGHES.892

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	EXISTING 100 YR.CONDITIONS FOR GATEWAY NORTH.									
*S	AUGUST 11, 1993									
RAINFALL	TYPE= 1									RAIN6= 2.200
*S BASIN DESIGNATION = BASIN 101										
COMPUTE NM HYD	101.00	-	1	.09150	113.79	4.262	.87342	1.565	1.943	PER IMP= 22.00
*S ROUTE BASIN 101 thru 102										
ROUTE	101.00	1	6	.09150	93.15	4.262	.87342	1.632	1.591	
*S BASIN DESIGNATION = BASIN 102										
COMPUTE NM HYD	102.00	-	2	.07000	86.69	3.261	.87342	1.565	1.935	PER IMP= 22.00
ADD HYD	102.00	6& 2	6	.16150	172.18	7.523	.87341	1.598	1.666	
*S BASIN DESIGNATION = BASIN 103										
COMPUTE NM HYD	103.00	-	3	.04210	69.50	2.306	1.02694	1.499	2.580	PER IMP= 32.00
ADD HYD	103.00	6& 3	5	.20360	229.35	9.829	.90515	1.565	1.760	
*S ROUTE BASINS 101, 102 & 103 THROUGH 104										
ROUTE	103.00	5	6	.20360	202.04	9.829	.90516	1.632	1.551	
*S BASIN DESIGNATION = 104										
COMPUTE NM HYD	104.00	-	4	.05470	65.22	2.611	.89503	1.565	1.863	PER IMP= 24.00
*S COMBINE HYDROGRAPHS 101, 102, 103 & 104										
ADD HYD	104.00	6& 4	4	.25830	260.52	12.440	.90300	1.632	1.576	
*S BASIN DESIGNATION = 105										
COMPUTE NM HYD	105.00	-	5	.06460	81.88	3.084	.89502	1.532	1.981	PER IMP= 24.00
*S COMBINE HYDROGRAPHS 104 & 105. TOTAL FLOW AT 19TH/GRANDE.										
ADD HYD	105.00	4& 5	5	.32290	333.22	15.523	.90141	1.598	1.612	
*S BASIN DESIGNATION = 130										
COMPUTE NM HYD	130.00	-	1	.04380	80.50	2.323	.99430	1.499	2.872	PER IMP= .00
*S COMBINE HYDROGRAPHS 105 & 130. TOTAL FLOW AT 19TH/528										
ADD HYD	130.00	5& 1	6	.36670	394.00	17.846	.91250	1.598	1.679	
*S BASIN DESIGNATION = 131										
COMPUTE NM HYD	131.00	-	1	.02510	40.01	1.210	.90390	1.499	2.491	PER IMP= 15.00
*S BASIN DESIGNATION = 121										
COMPUTE NM HYD	121.00	-	2	.02240	33.01	1.069	.89503	1.499	2.303	PER IMP= 24.00
*S BASIN DESIGNATION = 120										
COMPUTE NM HYD	120.00	-	3	.01920	28.30	.917	.89503	1.499	2.303	PER IMP= 24.00
*S COMBINE HYDROGRAPHS 120 & 121										
ADD HYD	120.00	2& 3	1	.04160	61.30	1.986	.89501	1.499	2.303	
*S BASIN DESIGNATION = 132										
COMPUTE NM HYD	132.00	-	4	.02780	51.10	1.474	.99430	1.499	2.872	PER IMP= .00
*S COMBINE HYDROGRAPHS 120, 121 &132. TOTAL FLOW AT 23RD/528										
ADD HYD	132.00	1& 4	2	.06940	112.40	3.460	.93478	1.499	2.531	
FINISH										

100 YEAR PRE-DEVELOPMENT
DETAILED PRINTOUT


```
      AHYMO PROGRAM (AHYMO392) - AMAFCA VERSION OF HYMO - MARCH, 1992
           RUN DATE (MON/DAY/YR) = 08/11/1993
           START TIME (HR:MIN:SEC) = 13:18:03     USER NO.= J_HUGHES.S92
           INPUT FILE = GWN100PR.DAT

   START                TIME=0.0
   *S       EXISTING 100 YR.CONDITIONS FOR GATEWAY NORTH.
   *S       AUGUST 11, 1993
   *        FILE GWN100PR.DAT
   RAINFALL             TYPE=1 RAIN QUARTER=0.0
                        RAIN ONE=1.87 RAIN SIX=2.20
                        RAIN DAY=2.66 DT=0.0333

                COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
                DT =    .033300 HOURS       END TIME =     5.994000 HOURS
                   .0000   .0016   .0033   .0050   .0067   .0085   .0103
                   .0121   .0140   .0160   .0180   .0200   .0221   .0243
                   .0265   .0288   .0312   .0336   .0361   .0387   .0414
                   .0442   .0471   .0501   .0533   .0566   .0600   .0636
                   .0674   .0714   .0757   .0808   .0863   .0922   .1044
                   .1323   .1754   .2374   .3221   .4335   .5756   .7527
                   .9690  1.1767  1.2619  1.3336  1.3972  1.4551  1.5084
                  1.5579  1.6041  1.6474  1.6881  1.7266  1.7629  1.7973
                  1.8298  1.8607  1.8900  1.9178  1.9442  1.9515  1.9573
                  1.9627  1.9680  1.9729  1.9777  1.9823  1.9867  1.9909
                  1.9950  1.9990  2.0029  2.0066  2.0102  2.0137  2.0172
                  2.0205  2.0238  2.0269  2.0300  2.0331  2.0360  2.0389
                  2.0418  2.0446  2.0473  2.0500  2.0526  2.0552  2.0578
                  2.0603  2.0627  2.0651  2.0675  2.0698  2.0721  2.0744
                  2.0766  2.0788  2.0810  2.0832  2.0853  2.0873  2.0894
                  2.0914  2.0934  2.0954  2.0974  2.0993  2.1012  2.1031
                  2.1050  2.1068  2.1086  2.1104  2.1122  2.1140  2.1157
                  2.1174  2.1191  2.1208  2.1225  2.1242  2.1258  2.1274
                  2.1290  2.1306  2.1322  2.1338  2.1353  2.1369  2.1384
                  2.1399  2.1414  2.1429  2.1444  2.1459  2.1473  2.1487
                  2.1502  2.1516  2.1530  2.1544  2.1558  2.1571  2.1585
                  2.1599  2.1612  2.1625  2.1639  2.1652  2.1665  2.1678
                  2.1691  2.1703  2.1716  2.1729  2.1741  2.1754  2.1766
                  2.1778  2.1791  2.1803  2.1815  2.1827  2.1839  2.1850
                  2.1862  2.1874  2.1886  2.1897  2.1909  2.1920  2.1931
                  2.1943  2.1954  2.1965  2.1976  2.1987  2.1998

   *S BASIN DESIGNATION = BASIN 101
   COMPUTE NM HYD       ID=1 HYD NO= 101 DA=0.0915 SQ MI
                        PER A=50 PER B=10 PER C=18 PER D=22 TP=0.1705
                        RAIN=-1

       K =   .093552HR    TP =   .170500HR    K/TP RATIO =   .548691     SHAPE CONSTANT, N =  7.045283
       UNIT PEAK =   61.795    CFS   UNIT VOLUME =    .9999       B =   523.40      P60 = 1.8700
       AREA =      .020130 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
       RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300


       K =   .183817HR    TP =   .170500HR    K/TP RATIO =  1.078107     SHAPE CONSTANT, N =  3.276605
```

UNIT PEAK = 127.10 CFS UNIT VOLUME = 1.000 B = 303.65 P60 = 1.8700
AREA = .071370 SQ MI IA = .56154 INCHES INF = 1.42231 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 101.00

RUNOFF VOLUME = .87342 INCHES = 4.2623 ACRE-FEET
PEAK DISCHARGE RATE = 113.79 CFS AT 1.565 HOURS BASIN AREA = .0915 SQ. MI.

*S ROUTE BASIN 101 thru 102
COMPUTE RATING CURVE RC=1 VS NO=1 NO SEGS=1 MIN ELEV=10 FT
MAX ELEV=12 FT CH SLP=0.0092 FP
SLP= 0.0092 N=0.021 DIST=16.17 FT
DIST ELEV DIST ELEV DIST ELEV DIST ELEV
0.0 10.67 0.17 10.0 2.17 10.13 16.17 10.41
30.17 10.13 32.17 10.00 32.34 10.67

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
10.00	.0	.0
10.11	.1	.1
10.21	.5	.5
10.32	1.4	2.3
10.42	2.8	6.0
10.53	4.5	13.0
10.63	6.2	22.0
10.74	7.9	32.9
10.84	9.6	45.4
10.95	11.4	59.6
11.05	13.1	75.2
11.16	14.8	92.2
11.26	16.5	110.6
11.37	18.2	130.4
11.47	19.9	151.3
11.58	21.6	173.6
11.68	23.3	197.0
11.79	25.0	221.6
11.89	26.7	247.3
12.00	28.4	274.2

COMPUTE TRAVEL TIME ID=6 REACH NO=1 NO VS=1 L=2650 FT SLP=0.0092

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.105	.087	.08	.7987

.211	.459	.55	.6185
.316	1.377	2.26	.4495
.421	2.849	6.01	.3489
.526	4.546	13.04	.2567
.632	6.246	22.04	.2086
.737	7.948	32.88	.1779
.842	9.650	45.44	.1563
.947	11.352	59.57	.1403
1.053	13.054	75.19	.1278
1.158	14.756	92.23	.1178
1.263	16.458	110.63	.1095
1.368	18.160	130.35	.1026
1.474	19.862	151.34	.0966
1.579	21.565	173.57	.0915
1.684	23.267	197.00	.0869
1.789	24.969	221.60	.0829
1.895	26.671	247.35	.0794
2.000	28.373	274.21	.0762

```
ROUTE              ID=6 HYD NO= 101  INFLOW ID=1
PRINT HYD          ID=6 CODE=1

                              PARTIAL HYDROGRAPH   101.00


    RUNOFF VOLUME =      .87342 INCHES     =       4.2623 ACRE-FEET
    PEAK DISCHARGE RATE =      93.15 CFS  AT   1.632 HOURS   BASIN AREA =   .0915 SQ. MI.



*S BASIN DESIGNATION = BASIN 102
COMPUTE NM HYD     ID=2 HYD NO= 102 DA=0.0700 SQ MI
                   PER A=50 PER B=10 PER C=18 PER D=22 TP=0.1705
                   RAIN=-1

    K =  .093085HR    TP =  .170500HR    K/TP RATIO =   .545955     SHAPE CONSTANT, N =  7.090506
    UNIT PEAK =  47.467    CFS  UNIT VOLUME =    .9999       B =   525.53      P60 = 1.8700
    AREA =      .015400 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300


    K =  .186130HR    TP =  .170500HR    K/TP RATIO =  1.091669     SHAPE CONSTANT, N =  3.237136
    UNIT PEAK =  96.268    CFS  UNIT VOLUME =    .9999       B =   300.62      P60 = 1.8700
    AREA =      .054600 SQ MI    IA =    .56154 INCHES    INF =   1.42231 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300

PRINT HYD          ID=2 CODE=1

                              PARTIAL HYDROGRAPH   102.00


    RUNOFF VOLUME =      .87342 INCHES     =       3.2607 ACRE-FEET
    PEAK DISCHARGE RATE =      86.69 CFS  AT   1.565 HOURS   BASIN AREA =   .0700 SQ. MI.
```

```
* COMBINE HYDROGRAPHS FROM 101 & 102
ADD HYD             ID=6  HYD NO=102 ID=6 ID=2
PRINT HYD           ID=6 CODE=1

                                PARTIAL HYDROGRAPH   102.00


    RUNOFF VOLUME =      .87341 INCHES     =       7.5229 ACRE-FEET
    PEAK DISCHARGE RATE =     172.18 CFS  AT   1.598 HOURS   BASIN AREA =   .1615 SQ. MI.



*S BASIN DESIGNATION = BASIN 103
COMPUTE NM HYD      ID=3 HYD NO= 103 DA=0.0421 SQ MI
                    PER A=40 PER B=10 PER C=18 PER D=32 TP=0.1333
                    RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   53.188    CFS   UNIT VOLUME =    .9991       B =   526.28      P60 = 1.8700
    AREA =      .013472 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300


    K =   .143572HR    TP =   .133300HR    K/TP RATIO =  1.077057     SHAPE CONSTANT, N =  3.279708
    UNIT PEAK =   65.264    CFS   UNIT VOLUME =    .9999       B =   303.89      P60 = 1.8700
    AREA =      .028628 SQ MI    IA =    .54853 INCHES    INF =   1.38588 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300

PRINT HYD           ID=3 CODE=1

                                PARTIAL HYDROGRAPH   103.00


    RUNOFF VOLUME =     1.02694 INCHES     =       2.3058 ACRE-FEET
    PEAK DISCHARGE RATE =      69.50 CFS  AT   1.499 HOURS   BASIN AREA =   .0421 SQ. MI.



* COMBINE HYDROGRAPHS FROM 102 & 103
ADD HYD             ID=5  HYD NO=103 ID=6 ID=3
PRINT HYD           ID=5 CODE=1

                                PARTIAL HYDROGRAPH   103.00


    RUNOFF VOLUME =      .90515 INCHES     =       9.8287 ACRE-FEET
    PEAK DISCHARGE RATE =     229.35 CFS  AT   1.565 HOURS   BASIN AREA =   .2036 SQ. MI.



*S ROUTE BASINS 101, 102 & 103 THROUGH 104
COMPUTE RATING CURVE RC=1 VS NO=1 NO SEGS=1 MIN ELEV=10 FT
                    MAX ELEV=12 FT CH SLP=0.0095 FP
                    SLP= 0.0095 N=0.021 DIST=16.17 FT
                    DIST  ELEV  DIST  ELEV  DIST  ELEV  DIST  ELEV
```

0.0 10.67 0.17 10.0 2.17 10.13 16.17 10.41
30.17 10.13 32.17 10.0 32.34 10.67

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
10.00	.0	.0
10.11	.1	.1
10.21	.5	.6
10.32	1.4	2.3
10.42	2.8	6.1
10.53	4.5	13.2
10.63	6.2	22.4
10.74	7.9	33.4
10.84	9.6	46.2
10.95	11.4	60.5
11.05	13.1	76.4
11.16	14.8	93.7
11.26	16.5	112.4
11.37	18.2	132.5
11.47	19.9	153.8
11.58	21.6	176.4
11.68	23.3	200.2
11.79	25.0	225.2
11.89	26.7	251.3
12.00	28.4	278.6

COMPUTE TRAVEL TIME ID=6 REACH NO=1 NO VS=1 L=2950 FT SLP=0.0095

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.105	.087	.08	.8750
.211	.459	.55	.6776
.316	1.377	2.29	.4925
.421	2.849	6.11	.3822
.526	4.546	13.25	.2812
.632	6.246	22.40	.2285
.737	7.948	33.42	.1949
.842	9.650	46.18	.1712
.947	11.352	60.53	.1537
1.053	13.054	76.40	.1400
1.158	14.756	93.72	.1290
1.263	16.458	112.42	.1200
1.368	18.160	132.46	.1123
1.474	19.862	153.79	.1058
1.579	21.565	176.38	.1002
1.684	23.267	200.19	.0952
1.789	24.969	225.19	.0909
1.895	26.671	251.35	.0870
2.000	28.373	278.65	.0834

ROUTE ID=6 HYD NO= 103 INFLOW ID=5

```
 PRINT HYD          ID=6 CODE=1

                                PARTIAL HYDROGRAPH   103.00


    RUNOFF VOLUME =      .90516 INCHES     =       9.8287 ACRE-FEET
    PEAK DISCHARGE RATE =     202.04 CFS  AT   1.632 HOURS   BASIN AREA =   .2036 SQ. MI.



 *S BASIN DESIGNATION = 104
 COMPUTE NM HYD     ID=4 HYD NO= 104 DA=0.0547 SQ MI
                    PER A=50 PER B=10 PER C=16 PER D=24 TP=0.1870
                    RAIN=-1.

    K =   .101915HR    TP =   .187000HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   36.946    CFS   UNIT VOLUME =    .9994       B =   526.28      P60 = 1.8700
    AREA =      .013128 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300


    K =   .206514HR    TP =   .187000HR    K/TP RATIO =  1.104353     SHAPE CONSTANT, N =  3.201326
    UNIT PEAK =   66.214    CFS   UNIT VOLUME =    .9998       B =   297.84      P60 = 1.8700
    AREA =      .041572 SQ MI    IA =    .56711 INCHES    INF =   1.43789 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300

 PRINT HYD          ID=4 CODE=1

                                PARTIAL HYDROGRAPH   104.00


    RUNOFF VOLUME =      .89503 INCHES     =       2.6111 ACRE-FEET
    PEAK DISCHARGE RATE =      65.22 CFS  AT   1.565 HOURS   BASIN AREA =   .0547 SQ. MI.


 *S COMBINE HYDROGRAPHS 101, 102, 103 & 104
 ADD HYD            ID=4  HYD NO= 104 ID=6 ID=4
 PRINT HYD          ID=4 CODE=1

                                PARTIAL HYDROGRAPH   104.00


    RUNOFF VOLUME =      .90300 INCHES     =      12.4397 ACRE-FEET
    PEAK DISCHARGE RATE =     260.52 CFS  AT   1.632 HOURS   BASIN AREA =   .2583 SQ. MI.



 *S BASIN DESIGNATION = 105
 COMPUTE NM HYD     ID=5 HYD NO= 105 DA=0.0646 SQ MI
                    PER A=50 PER B=10 PER C=16 PER D=24 TP=0.1685
                    RAIN=-1.

    K =   .091878HR    TP =   .168500HR    K/TP RATIO =   .545267     SHAPE CONSTANT, N =  7.101964
    UNIT PEAK =   48.404    CFS   UNIT VOLUME =    1.000       B =   526.07      P60 = 1.8700
```

```
      AREA =      .015504 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
      RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300


      K =   .185855HR    TP =   .168500HR    K/TP RATIO =  1.102996     SHAPE CONSTANT, N =  3.205106
      UNIT PEAK =   86.869    CFS   UNIT VOLUME =    .9999       B =   298.14      P60 = 1.8700
      AREA =      .049096 SQ MI    IA =    .56711 INCHES    INF =   1.43789 INCHES PER HOUR
      RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300

   PRINT HYD           ID=5 CODE=1

                                  PARTIAL HYDROGRAPH   105.00


      RUNOFF VOLUME =      .89502 INCHES     =       3.0836 ACRE-FEET
      PEAK DISCHARGE RATE =      81.88 CFS  AT   1.532 HOURS   BASIN AREA =   .0646 SQ. MI.



   *S COMBINE HYDROGRAPHS 104 & 105. TOTAL FLOW AT 19TH/GRANDE.
   ADD HYD             ID=5  HYD NO= 105 ID=4 ID=5
   PRINT HYD           ID=5 CODE=1

                                  PARTIAL HYDROGRAPH   105.00


      RUNOFF VOLUME =      .90141 INCHES     =      15.5233 ACRE-FEET
      PEAK DISCHARGE RATE =     333.22 CFS  AT   1.598 HOURS   BASIN AREA =   .3229 SQ. MI.



   *S BASIN DESIGNATION = 130
   COMPUTE NM HYD      ID=1 HYD NO= 130 DA=0.0438 SQ MI
                       PER A=0 PER B=0 PER C=100 PER D=0 TP=0.1333
                       RAIN=-1.

      K =   .105867HR    TP =   .133300HR    K/TP RATIO =   .794199     SHAPE CONSTANT, N =  4.514851
      UNIT PEAK =   127.54    CFS   UNIT VOLUME =    1.000       B =   388.14      P60 = 1.8700
      AREA =      .043800 SQ MI    IA =    .35000 INCHES    INF =    .83000 INCHES PER HOUR
      RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300

   PRINT HYD           ID=1 CODE=1

                                  PARTIAL HYDROGRAPH   130.00


      RUNOFF VOLUME =      .99430 INCHES     =       2.3227 ACRE-FEET
      PEAK DISCHARGE RATE =      80.50 CFS  AT   1.499 HOURS   BASIN AREA =   .0438 SQ. MI.



   *S COMBINE HYDROGRAPHS 105 & 130. TOTAL FLOW AT 19TH/528
   ADD HYD             ID=6  HYD NO= 130 ID=5 ID=1
   PRINT HYD           ID=6 CODE=1
```

PARTIAL HYDROGRAPH 130.00

RUNOFF VOLUME = .91250 INCHES = 17.8460 ACRE-FEET
PEAK DISCHARGE RATE = 394.00 CFS AT 1.598 HOURS BASIN AREA = .3667 SQ. MI.

*S BASIN DESIGNATION = 131
COMPUTE NM HYD ID=1 HYD NO= 131 DA=0.0251 SQ MI
PER A=0 PER B=0 PER C=100 PER D=0 TP=0.1333
RAIN=-1. 70 15 15

K = .105867HR TP = .133300HR K/TP RATIO = .794199 SHAPE CONSTANT, N = 4.514851
UNIT PEAK = 73.086 CFS UNIT VOLUME = 1.000 B = 388.14 P60 = 1.8700
AREA = .025100 SQ MI IA = .35000 INCHES INF = .83000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 131.00

RUNOFF VOLUME = .99430 INCHES = 1.3310 ACRE-FEET
PEAK DISCHARGE RATE = ~~46.14~~ 40.01 CFS AT 1.499 HOURS BASIN AREA = .0251 SQ. MI.

*S BASIN DESIGNATION = 121
COMPUTE NM HYD ID=2 HYD NO= 121 DA=0.0224 SQ MI
PER A=50 PER B=10 PER C=16 PER D=24 TP=0.1333
RAIN=-1.

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 21.225 CFS UNIT VOLUME = .9988 B = 526.28 P60 = 1.8700
AREA = .005376 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

K = .147210HR TP = .133300HR K/TP RATIO = 1.104353 SHAPE CONSTANT, N = 3.201326
UNIT PEAK = 38.038 CFS UNIT VOLUME = .9997 B = 297.84 P60 = 1.8700
AREA = .017024 SQ MI IA = .56711 INCHES INF = 1.43789 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 121.00

RUNOFF VOLUME = .89503 INCHES = 1.0692 ACRE-FEET
PEAK DISCHARGE RATE = 33.01 CFS AT 1.499 HOURS BASIN AREA = .0224 SQ. MI.

*S BASIN DESIGNATION = 120

```
COMPUTE NM HYD       ID=3 HYD NO= 120 DA=0.0192 SQ MI
                     PER A=50 PER B=10 PER C=16 PER D=24 TP=0.1333
                     RAIN=-1.

   K =  .072649HR    TP =  .133300HR    K/TP RATIO =  .545000     SHAPE CONSTANT, N =  7.106420
   UNIT PEAK =  18.193    CFS   UNIT VOLUME =   .9987       B =  526.28      P60 = 1.8700
   AREA =      .004608 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300


   K =  .147210HR    TP =  .133300HR    K/TP RATIO =  1.104353     SHAPE CONSTANT, N =  3.201326
   UNIT PEAK =  32.604    CFS   UNIT VOLUME =   .9996       B =  297.84      P60 = 1.8700
   AREA =      .014592 SQ MI    IA =    .56711 INCHES    INF =   1.43789 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300

PRINT HYD            ID=3 CODE=1

                                  PARTIAL HYDROGRAPH   120.00


   RUNOFF VOLUME =      .89503 INCHES     =       .9165 ACRE-FEET
   PEAK DISCHARGE RATE =      28.30 CFS  AT   1.499 HOURS   BASIN AREA =   .0192 SQ. MI.


*S COMBINE HYDROGRAPHS 120 & 121
ADD HYD              ID=1  HYD NO= 120 ID=2 ID=3
PRINT HYD            ID=1 CODE=1

                                  PARTIAL HYDROGRAPH   120.00


   RUNOFF VOLUME =      .89501 INCHES     =      1.9857 ACRE-FEET
   PEAK DISCHARGE RATE =      61.30 CFS  AT   1.499 HOURS   BASIN AREA =   .0416 SQ. MI.


*S BASIN DESIGNATION = 132
COMPUTE NM HYD       ID=4 HYD NO= 132 DA=0.0278 SQ MI
                     PER A=0 PER B=0 PER C=100 PER D=0 TP=0.1333
                     RAIN=-1.

   K =  .105867HR    TP =  .133300HR    K/TP RATIO =  .794199     SHAPE CONSTANT, N =  4.514851
   UNIT PEAK =  80.948    CFS   UNIT VOLUME =   1.000       B =  388.14      P60 = 1.8700
   AREA =      .027800 SQ MI    IA =    .35000 INCHES    INF =    .83000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300

PRINT HYD            ID=4 CODE=1

                                  PARTIAL HYDROGRAPH   132.00


   RUNOFF VOLUME =      .99430 INCHES     =      1.4742 ACRE-FEET
   PEAK DISCHARGE RATE =      51.10 CFS  AT   1.499 HOURS   BASIN AREA =   .0278 SQ. MI.
```

```
*S COMBINE HYDROGRAPHS 120, 121 &132. TOTAL FLOW AT 23RD/528
ADD HYD            ID=2  HYD NO= 132 ID=1 ID=4
PRINT HYD          ID=2 CODE=1

                                PARTIAL HYDROGRAPH   132.00


    RUNOFF VOLUME =      .93478 INCHES     =       3.4599 ACRE-FEET
    PEAK DISCHARGE RATE =     112.40 CFS  AT   1.499 HOURS   BASIN AREA =   .0694 SQ. MI.


FINISH

    NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 13:18:13
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10 YEAR POST-DEVELOPMENT SUMMARY

AHYMO SUMMARY TABLE (AHYMO392) - AMAFCA VERSION OF HYMO - MARCH, 1992 RUN DATE (MON/DAY/YR) =09/20/1993
INPUT FILE = GWN10PO.DAT USER NO.= J_HUGHES.S92

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	PROPOSED 10 YR.CONDITIONS FOR GATEWAY NORTH.									
*S	SEPTEMBER 20, 1993									
RAINFALL	TYPE= 1									RAIN6= 1.470
*S BASIN DESIGNATION = BASIN 101										
COMPUTE NM HYD	101.00	-	1	.09150	50.92	1.936	.39669	1.532	.870	PER IMP= 22.00
*S ROUTE BASIN 101 thru 102										
ROUTE	101.00	1	6	.09150	35.81	1.936	.39669	1.632	.611	
*S BASIN DESIGNATION = BASIN 102										
COMPUTE NM HYD	102.00	-	2	.07000	39.13	1.481	.39669	1.532	.873	PER IMP= 22.00
ADD HYD	102.00	6& 2	6	.16150	69.86	3.417	.39668	1.598	.676	
*S BASIN DESIGNATION = BASIN 103										
COMPUTE NM HYD	103.00	-	3	.04210	34.83	1.153	.51352	1.499	1.293	PER IMP= 32.00
ADD HYD	103.00	6& 3	5	.20360	98.18	4.570	.42084	1.565	.753	
*S ROUTE BASINS 101, 102 & 103 THROUGH 104										
ROUTE	103.00	5	6	.20360	78.30	4.570	.42084	1.665	.601	
*S BASIN DESIGNATION = 104										
COMPUTE NM HYD	104.00	-	4	.05470	30.17	1.208	.41401	1.565	.862	PER IMP= 24.00
*S COMBINE HYDROGRAPHS 101, 102, 103 & 104										
ADD HYD	104.00	6& 4	4	.25830	103.36	5.777	.41938	1.632	.625	
*S BASIN DESIGNATION = 130										
COMPUTE NM HYD	130.00	-	1	.04380	69.03	2.418	1.03524	1.499	2.463	PER IMP= 80.00
ADD HYD	130.00	4& 1	3	.30210	149.01	8.196	.50867	1.565	.771	
ROUTE RESERVOIR	130.00	1	2	.04380	64.73	2.418	1.03523	1.532	2.309	AC-FT= .191
*S BASIN DESIGNATION = 105										
COMPUTE NM HYD	105.00	-	5	.06460	37.82	1.426	.41401	1.532	.915	PER IMP= 24.00
*S COMBINE HYDROGRAPHS 105 & 130. TOTAL FLOW AT 19TH/528										
ADD HYD	130.00	5& 2	6	.10840	102.55	3.845	.66502	1.532	1.478	
*S BASIN DESIGNATION = 131										
COMPUTE NM HYD	131.00	-	1	.02510	18.67	.538	.40216	1.532	1.162	PER IMP= 15.00
*S BASIN DESIGNATION = 121										
COMPUTE NM HYD	121.00	-	2	.02240	15.12	.495	.41401	1.499	1.054	PER IMP= 24.00
*S BASIN DESIGNATION = 120										
COMPUTE NM HYD	120.00	-	3	.01920	12.96	.424	.41401	1.499	1.054	PER IMP= 24.00
*S COMBINE HYDROGRAPHS 120 & 121										
ADD HYD	120.00	2& 3	1	.04160	28.07	.919	.41399	1.499	1.054	
*S BASIN DESIGNATION = 132										
COMPUTE NM HYD	132.00	-	4	.02780	43.82	1.535	1.03524	1.499	2.463	PER IMP= 80.00
*S COMBINE HYDROGRAPHS 120, 121 &132.										
ADD HYD	132.00	1& 4	2	.06940	71.89	2.453	.66285	1.499	1.619	
ROUTE RESERVOIR	132.00	2	5	.06940	47.46	2.453	.66285	1.598	1.069	AC-FT= .707
*S TOTAL FLOW AT 23RD/528										
FINISH										

10 YEAR POST-DEVELOPMENT
DETAILED PRINTOUT


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      AHYMO PROGRAM (AHYMO392) - AMAFCA VERSION OF HYMO - MARCH, 1992
          RUN DATE (MON/DAY/YR) = 09/20/1993
          START TIME (HR:MIN:SEC) = 11:10:05     USER NO.= J_HUGHES.S92
          INPUT FILE = GWN10PO.DAT

START                 TIME=0.0
*S        PROPOSED 10 YR.CONDITIONS FOR GATEWAY NORTH.
*S        SEPTEMBER 20, 1993
*         FILE GWN10P0.DAT
RAINFALL              TYPE=1 RAIN QUARTER=0.0
                      RAIN ONE=1.25 RAIN SIX=1.47
                      RAIN DAY=1.77 DT=0.0333

               COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
               DT =    .033300 HOURS       END TIME =     5.994000 HOURS
                  .0000   .0011   .0022   .0033   .0045   .0056   .0068
                  .0081   .0093   .0106   .0120   .0133   .0147   .0162
                  .0176   .0192   .0207   .0224   .0240   .0258   .0276
                  .0294   .0313   .0333   .0354   .0376   .0399   .0423
                  .0448   .0475   .0503   .0537   .0574   .0614   .0695
                  .0882   .1170   .1584   .2150   .2895   .3845   .5029
                  .6475   .7863   .8432   .8912   .9337   .9724  1.0080
                 1.0411  1.0720  1.1009  1.1282  1.1539  1.1781  1.2011
                 1.2229  1.2435  1.2631  1.2817  1.2994  1.3042  1.3081
                 1.3117  1.3152  1.3185  1.3217  1.3248  1.3277  1.3305
                 1.3333  1.3359  1.3385  1.3410  1.3434  1.3458  1.3480
                 1.3503  1.3524  1.3546  1.3566  1.3587  1.3606  1.3626
                 1.3645  1.3663  1.3682  1.3700  1.3717  1.3734  1.3751
                 1.3768  1.3784  1.3801  1.3816  1.3832  1.3847  1.3862
                 1.3877  1.3892  1.3907  1.3921  1.3935  1.3949  1.3962
                 1.3976  1.3989  1.4003  1.4016  1.4028  1.4041  1.4054
                 1.4066  1.4078  1.4091  1.4103  1.4115  1.4126  1.4138
                 1.4149  1.4161  1.4172  1.4183  1.4194  1.4205  1.4216
                 1.4227  1.4238  1.4248  1.4259  1.4269  1.4279  1.4289
                 1.4299  1.4309  1.4319  1.4329  1.4339  1.4349  1.4358
                 1.4368  1.4377  1.4387  1.4396  1.4405  1.4414  1.4423
                 1.4432  1.4441  1.4450  1.4459  1.4468  1.4477  1.4485
                 1.4494  1.4502  1.4511  1.4519  1.4528  1.4536  1.4544
                 1.4552  1.4560  1.4568  1.4577  1.4584  1.4592  1.4600
                 1.4608  1.4616  1.4624  1.4631  1.4639  1.4647  1.4654
                 1.4662  1.4669  1.4677  1.4684  1.4691  1.4699

*S BASIN DESIGNATION = BASIN 101
COMPUTE NM HYD        ID=1 HYD NO= 101 DA=0.0915 SQ MI
                      PER A=50 PER B=10 PER C=18 PER D=22 TP=0.1705
                      RAIN=-1

    K =   .095125HR    TP =   .170500HR    K/TP RATIO =   .557921     SHAPE CONSTANT, N =  6.896935
    UNIT PEAK =   60.963    CFS   UNIT VOLUME =    .9997       B =   516.35      P60 = 1.2500
    AREA =      .020130 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300


    K =   .201615HR    TP =   .170500HR    K/TP RATIO =  1.182494     SHAPE CONSTANT, N =  3.001559
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UNIT PEAK = 118.02 CFS UNIT VOLUME = .9998 B = 281.95 P60 = 1.2500
AREA = .071370 SQ MI IA = .56154 INCHES INF = 1.42231 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 101.00

RUNOFF VOLUME = .39669 INCHES = 1.9358 ACRE-FEET
PEAK DISCHARGE RATE = 50.92 CFS AT 1.532 HOURS BASIN AREA = .0915 SQ. MI.

*S ROUTE BASIN 101 thru 102
COMPUTE RATING CURVE RC=1 VS NO=1 NO SEGS=1 MIN ELEV=10 FT
MAX ELEV=12 FT CH SLP=0.0092 FP
SLP= 0.0092 N=0.021 DIST=16.17 FT
DIST ELEV DIST ELEV DIST ELEV DIST ELEV
0.0 10.67 0.17 10.0 2.17 10.13 16.17 10.41
30.17 10.13 32.17 10.00 32.34 10.67

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
10.00	.0	.0
10.11	.1	.1
10.21	.5	.5
10.32	1.4	2.3
10.42	2.8	6.0
10.53	4.5	13.0
10.63	6.2	22.0
10.74	7.9	32.9
10.84	9.6	45.4
10.95	11.4	59.6
11.05	13.1	75.2
11.16	14.8	92.2
11.26	16.5	110.6
11.37	18.2	130.4
11.47	19.9	151.3
11.58	21.6	173.6
11.68	23.3	197.0
11.79	25.0	221.6
11.89	26.7	247.3
12.00	28.4	274.2

COMPUTE TRAVEL TIME ID=6 REACH NO=1 NO VS=1 L=2650 FT SLP=0.0092

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.105	.087	.08	.7987

.211	.459	.55	.6185
.316	1.377	2.26	.4495
.421	2.849	6.01	.3489
.526	4.546	13.04	.2567
.632	6.246	22.04	.2086
.737	7.948	32.88	.1779
.842	9.650	45.44	.1563
.947	11.352	59.57	.1403
1.053	13.054	75.19	.1278
1.158	14.756	92.23	.1178
1.263	16.458	110.63	.1095
1.368	18.160	130.35	.1026
1.474	19.862	151.34	.0966
1.579	21.565	173.57	.0915
1.684	23.267	197.00	.0869
1.789	24.969	221.60	.0829
1.895	26.671	247.35	.0794
2.000	28.373	274.21	.0762

ROUTE ID=6 HYD NO= 101 INFLOW ID=1
PRINT HYD ID=6 CODE=1

PARTIAL HYDROGRAPH 101.00

RUNOFF VOLUME = .39669 INCHES = 1.9358 ACRE-FEET
PEAK DISCHARGE RATE = 35.81 CFS AT 1.632 HOURS BASIN AREA = .0915 SQ. MI.

*S BASIN DESIGNATION = BASIN 102
COMPUTE NM HYD ID=2 HYD NO= 102 DA=0.0700 SQ MI
PER A=50 PER B=10 PER C=18 PER D=22 TP=0.1705
RAIN=-1

K = .093492HR TP = .170500HR K/TP RATIO = .548342 SHAPE CONSTANT, N = 7.051042
UNIT PEAK = 47.299 CFS UNIT VOLUME = .9998 B = 523.67 P60 = 1.2500
AREA = .015400 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

K = .202030HR TP = .170500HR K/TP RATIO = 1.184927 SHAPE CONSTANT, N = 2.995860
UNIT PEAK = 90.141 CFS UNIT VOLUME = .9997 B = 281.48 P60 = 1.2500
AREA = .054600 SQ MI IA = .56154 INCHES INF = 1.42231 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 102.00

RUNOFF VOLUME = .39669 INCHES = 1.4810 ACRE-FEET
PEAK DISCHARGE RATE = 39.13 CFS AT 1.532 HOURS BASIN AREA = .0700 SQ. MI.

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* COMBINE HYDROGRAPHS FROM 101 & 102
ADD HYD             ID=6  HYD NO=102 ID=6 ID=2
PRINT HYD           ID=6 CODE=1

                                PARTIAL HYDROGRAPH   102.00


   RUNOFF VOLUME =      .39668 INCHES     =       3.4167 ACRE-FEET
   PEAK DISCHARGE RATE =      69.86 CFS  AT   1.598 HOURS   BASIN AREA =   .1615 SQ. MI.



*S BASIN DESIGNATION = BASIN 103
COMPUTE NM HYD      ID=3 HYD NO= 103 DA=0.0421 SQ MI
                    PER A=40 PER B=10 PER C=18 PER D=32 TP=0.1333
                    RAIN=-1

   K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
   UNIT PEAK =   53.188    CFS   UNIT VOLUME =    .9991       B =   526.28      P60 = 1.2500
   AREA =      .013472 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300


   K =   .154939HR    TP =   .133300HR    K/TP RATIO =  1.162333     SHAPE CONSTANT, N =  3.049904
   UNIT PEAK =   61.394    CFS   UNIT VOLUME =    .9996       B =   285.87      P60 = 1.2500
   AREA =      .028628 SQ MI    IA =    .54853 INCHES    INF =   1.38588 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300

PRINT HYD           ID=3 CODE=1

                                PARTIAL HYDROGRAPH   103.00


   RUNOFF VOLUME =      .51352 INCHES     =       1.1530 ACRE-FEET
   PEAK DISCHARGE RATE =      34.83 CFS  AT   1.499 HOURS   BASIN AREA =   .0421 SQ. MI.



* COMBINE HYDROGRAPHS FROM 102 & 103
ADD HYD             ID=5  HYD NO=103 ID=6 ID=3
PRINT HYD           ID=5 CODE=1

                                PARTIAL HYDROGRAPH   103.00


   RUNOFF VOLUME =      .42084 INCHES     =       4.5697 ACRE-FEET
   PEAK DISCHARGE RATE =      98.18 CFS  AT   1.565 HOURS   BASIN AREA =   .2036 SQ. MI.



*S ROUTE BASINS 101, 102 & 103 THROUGH 104
COMPUTE RATING CURVE RC=1 VS NO=1 NO SEGS=1 MIN ELEV=10 FT
                    MAX ELEV=12 FT CH SLP=0.0095 FP
                    SLP= 0.0095 N=0.021 DIST=16.17 FT
                    DIST  ELEV  DIST  ELEV  DIST  ELEV  DIST  ELEV
```

0.0 10.67 0.17 10.0 2.17 10.13 16.17 10.41
30.17 10.13 32.17 10.0 32.34 10.67

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
10.00	.0	.0
10.11	.1	.1
10.21	.5	.6
10.32	1.4	2.3
10.42	2.8	6.1
10.53	4.5	13.2
10.63	6.2	22.4
10.74	7.9	33.4
10.84	9.6	46.2
10.95	11.4	60.5
11.05	13.1	76.4
11.16	14.8	93.7
11.26	16.5	112.4
11.37	18.2	132.5
11.47	19.9	153.8
11.58	21.6	176.4
11.68	23.3	200.2
11.79	25.0	225.2
11.89	26.7	251.3
12.00	28.4	278.6

COMPUTE TRAVEL TIME ID=6 REACH NO=1 NO VS=1 L=2950 FT SLP=0.0095

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.105	.087	.08	.8750
.211	.459	.55	.6776
.316	1.377	2.29	.4925
.421	2.849	6.11	.3822
.526	4.546	13.25	.2812
.632	6.246	22.40	.2285
.737	7.948	33.42	.1949
.842	9.650	46.18	.1712
.947	11.352	60.53	.1537
1.053	13.054	76.40	.1400
1.158	14.756	93.72	.1290
1.263	16.458	112.42	.1200
1.368	18.160	132.46	.1123
1.474	19.862	153.79	.1058
1.579	21.565	176.38	.1002
1.684	23.267	200.19	.0952
1.789	24.969	225.19	.0909
1.895	26.671	251.35	.0870
2.000	28.373	278.65	.0834

ROUTE ID=6 HYD NO= 103 INFLOW ID=5

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PRINT HYD          ID=6 CODE=1

                              PARTIAL HYDROGRAPH   103.00


   RUNOFF VOLUME =      .42084 INCHES     =       4.5697 ACRE-FEET
   PEAK DISCHARGE RATE =      78.30 CFS  AT   1.665 HOURS   BASIN AREA =   .2036 SQ. MI.



*S BASIN DESIGNATION = 104
COMPUTE NM HYD     ID=4 HYD NO= 104 DA=0.0547 SQ MI
                   PER A=50 PER B=10 PER C=16 PER D=24 TP=0.1870
                   RAIN=-1.

   K =   .101915HR    TP =   .187000HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
   UNIT PEAK =   36.946    CFS   UNIT VOLUME =    .9994       B =   526.28      P60 = 1.2500
   AREA =      .013128 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300


   K =   .223588HR    TP =   .187000HR    K/TP RATIO =  1.195656     SHAPE CONSTANT, N =  2.971085
   UNIT PEAK =   62.126    CFS   UNIT VOLUME =    .9996       B =   279.46      P60 = 1.2500
   AREA =      .041572 SQ MI    IA =    .56711 INCHES    INF =   1.43789 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300

PRINT HYD          ID=4 CODE=1

                              PARTIAL HYDROGRAPH   104.00


   RUNOFF VOLUME =      .41401 INCHES     =       1.2078 ACRE-FEET
   PEAK DISCHARGE RATE =      30.17 CFS  AT   1.565 HOURS   BASIN AREA =   .0547 SQ. MI.



*S COMBINE HYDROGRAPHS 101, 102, 103 & 104
ADD HYD            ID=4  HYD NO= 104 ID=6 ID=4
PRINT HYD          ID=4 CODE=1

                              PARTIAL HYDROGRAPH   104.00


   RUNOFF VOLUME =      .41938 INCHES     =       5.7774 ACRE-FEET
   PEAK DISCHARGE RATE =     103.36 CFS  AT   1.632 HOURS   BASIN AREA =   .2583 SQ. MI.



*S BASIN DESIGNATION = 130
COMPUTE NM HYD     ID=1 HYD NO= 130 DA=0.0438 SQ MI
                   PER A=0 PER B=20 PER C=0 PER D=80 TP=0.1333
                   RAIN=-1.

   K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
   UNIT PEAK =   138.34    CFS   UNIT VOLUME =    .9993       B =   526.28      P60 = 1.2500
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AREA = .035040 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

K = .141901HR TP = .133300HR K/TP RATIO = 1.064525 SHAPE CONSTANT, N = 3.317383
UNIT PEAK = 20.159 CFS UNIT VOLUME = .9994 B = 306.75 P60 = 1.2500
AREA = .008760 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 130.00

RUNOFF VOLUME = 1.03524 INCHES = 2.4183 ACRE-FEET
PEAK DISCHARGE RATE = 69.03 CFS AT 1.499 HOURS BASIN AREA = .0438 SQ. MI.

* COMBINE HYDROGRAPHS 101,102,104,104 & 130
ADD HYD ID=3 HYD NO=130 ID=4 ID=1
PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 130.00

RUNOFF VOLUME = .50867 INCHES = 8.1957 ACRE-FEET
PEAK DISCHARGE RATE = 149.01 CFS AT 1.565 HOURS BASIN AREA = .3021 SQ. MI.

ROUTE RESERVOIR ID=2 HYD NO=130 INFLOW ID=1 CODE=5

OUTFLOW (CFS)	STORAGE (AC FT)	ELEV(FT)
0.00	0.00	100.0
169.49	0.50	100.50
195.71	1.00	101.00
218.81	1.50	101.50
239.69	2.00	102.00
258.90	2.50	102.50
276.77	3.00	103.00

* * * * * * * * * * * * * * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	100.00	.000	.00
.17	.00	100.00	.000	.00
.33	.00	100.00	.000	.00
.50	.00	100.00	.000	.00
.67	.00	100.00	.000	.00
.83	.00	100.00	.000	.00
1.00	.00	100.00	.000	.00
1.17	.00	100.00	.000	.00
1.33	16.90	100.03	.029	9.99

1.50	69.03	100.18	.176	59.60
1.67	34.91	100.12	.123	41.68
1.83	22.38	100.07	.072	24.34
2.00	16.34	100.05	.052	17.47
2.16	7.38	100.03	.028	9.64
2.33	3.27	100.01	.011	3.80
2.50	1.92	100.01	.006	2.16
2.66	1.19	100.00	.004	1.32
2.83	.76	100.00	.002	.84
3.00	.50	100.00	.002	.55
3.16	.34	100.00	.001	.37
3.33	.25	100.00	.001	.27
3.50	.21	100.00	.001	.22
3.66	.19	100.00	.001	.19
3.83	.17	100.00	.001	.17
4.00	.16	100.00	.000	.17
4.16	.17	100.00	.001	.17
4.33	.19	100.00	.001	.19
4.50	.19	100.00	.001	.19
4.66	.23	100.00	.001	.22
4.83	.25	100.00	.001	.24
5.00	.27	100.00	.001	.26
5.16	.30	100.00	.001	.30
5.33	.33	100.00	.001	.32
5.49	.36	100.00	.001	.35
5.66	.39	100.00	.001	.38
5.83	.43	100.00	.001	.42
5.99	.46	100.00	.001	.45
6.16	.19	100.00	.001	.28
6.33	.05	100.00	.000	.06
6.49	.02	100.00	.000	.03
6.66	.01	100.00	.000	.01
6.83	.01	100.00	.000	.01
6.99	.00	100.00	.000	.00

PEAK DISCHARGE = 64.727 CFS - PEAK OCCURS AT HOUR 1.53
MAXIMUM WATER SURFACE ELEVATION = 100.191
MAXIMUM STORAGE = .1909 AC-FT INCREMENTAL TIME= .033300HRS

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 130.00

RUNOFF VOLUME = 1.03523 INCHES = 2.4183 ACRE-FEET
PEAK DISCHARGE RATE = 64.73 CFS AT 1.532 HOURS BASIN AREA = .0438 SQ. MI.

*S BASIN DESIGNATION = 105
COMPUTE NM HYD ID=5 HYD NO= 105 DA=0.0646 SQ MI
PER A=50 PER B=10 PER C=16 PER D=24 TP=0.1685
RAIN=-1.

K = .091990HR TP = .168500HR K/TP RATIO = .545936 SHAPE CONSTANT, N = 7.090837
UNIT PEAK = 48.356 CFS UNIT VOLUME = 1.000 B = 525.54 P60 = 1.2500

```
      AREA =      .015504 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
      RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300


      K =   .201422HR    TP =   .168500HR    K/TP RATIO =  1.195383     SHAPE CONSTANT, N =  2.971704
      UNIT PEAK =   81.440    CFS   UNIT VOLUME =    .9997      B =   279.51      P60 = 1.2500
      AREA =      .049096 SQ MI    IA =    .56711 INCHES    INF =   1.43789 INCHES PER HOUR
      RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300

   PRINT HYD           ID=5 CODE=1

                                  PARTIAL HYDROGRAPH   105.00


      RUNOFF VOLUME =      .41401 INCHES     =       1.4264 ACRE-FEET
      PEAK DISCHARGE RATE =      37.82 CFS  AT   1.532 HOURS   BASIN AREA =   .0646 SQ. MI.



   *S COMBINE HYDROGRAPHS 105 & 130. TOTAL FLOW AT 19TH/528
   ADD HYD             ID=6  HYD NO= 130 ID=5 ID=2
   PRINT HYD           ID=6 CODE=1

                                  PARTIAL HYDROGRAPH   130.00


      RUNOFF VOLUME =      .66502 INCHES     =       3.8447 ACRE-FEET
      PEAK DISCHARGE RATE =     102.55 CFS  AT   1.532 HOURS   BASIN AREA =   .1084 SQ. MI.



   *S BASIN DESIGNATION = 131
   COMPUTE NM HYD      ID=1 HYD NO= 131 DA=0.0251 SQ MI
                       PER A=0 PER B=70 PER C=15 PER D=15 TP=0.1333
                       RAIN=-1.

      K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
      UNIT PEAK =   14.864    CFS   UNIT VOLUME =    .9986      B =   526.28      P60 = 1.2500
      AREA =      .003765 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
      RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300


      K =   .135921HR    TP =   .133300HR    K/TP RATIO =  1.019665     SHAPE CONSTANT, N =  3.461825
      UNIT PEAK =   50.822    CFS   UNIT VOLUME =    1.000      B =   317.53      P60 = 1.2500
      AREA =      .021335 SQ MI    IA =    .47353 INCHES    INF =   1.17588 INCHES PER HOUR
      RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300

   PRINT HYD           ID=1 CODE=1

                                  PARTIAL HYDROGRAPH   131.00


      RUNOFF VOLUME =      .40216 INCHES     =        .5384 ACRE-FEET
      PEAK DISCHARGE RATE =      18.67 CFS  AT   1.532 HOURS   BASIN AREA =   .0251 SQ. MI.
```

```
*S BASIN DESIGNATION = 121
COMPUTE NM HYD       ID=2 HYD NO= 121 DA=0.0224 SQ MI
                     PER A=50 PER B=10 PER C=16 PER D=24 TP=0.1333
                     RAIN=-1.

    K =  .072649HR    TP =  .133300HR    K/TP RATIO =  .545000     SHAPE CONSTANT, N = 7.106420
    UNIT PEAK =  21.225    CFS   UNIT VOLUME =   .9988      B =  526.28      P60 = 1.2500
    AREA =     .005376 SQ MI    IA =   .10000 INCHES    INF =   .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  .033300


    K =  .159381HR    TP =  .133300HR    K/TP RATIO = 1.195656     SHAPE CONSTANT, N = 2.971085
    UNIT PEAK =  35.690    CFS   UNIT VOLUME =   .9994      B =  279.46      P60 = 1.2500
    AREA =     .017024 SQ MI    IA =   .56711 INCHES    INF =  1.43789 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  .033300

PRINT HYD            ID=2 CODE=1

                                 PARTIAL HYDROGRAPH   121.00


    RUNOFF VOLUME =      .41401 INCHES     =       .4946 ACRE-FEET
    PEAK DISCHARGE RATE =     15.12 CFS  AT   1.499 HOURS   BASIN AREA =   .0224 SQ. MI.



*S BASIN DESIGNATION = 120
COMPUTE NM HYD       ID=3 HYD NO= 120 DA=0.0192 SQ MI
                     PER A=50 PER B=10 PER C=16 PER D=24 TP=0.1333
                     RAIN=-1.

    K =  .072649HR    TP =  .133300HR    K/TP RATIO =  .545000     SHAPE CONSTANT, N = 7.106420
    UNIT PEAK =  18.193    CFS   UNIT VOLUME =   .9987      B =  526.28      P60 = 1.2500
    AREA =     .004608 SQ MI    IA =   .10000 INCHES    INF =   .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  .033300


    K =  .159381HR    TP =  .133300HR    K/TP RATIO = 1.195656     SHAPE CONSTANT, N = 2.971085
    UNIT PEAK =  30.591    CFS   UNIT VOLUME =   .9993      B =  279.46      P60 = 1.2500
    AREA =     .014592 SQ MI    IA =   .56711 INCHES    INF =  1.43789 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  .033300

PRINT HYD            ID=3 CODE=1

                                 PARTIAL HYDROGRAPH   120.00


    RUNOFF VOLUME =      .41401 INCHES     =       .4239 ACRE-FEET
    PEAK DISCHARGE RATE =     12.96 CFS  AT   1.499 HOURS   BASIN AREA =   .0192 SQ. MI.



*S COMBINE HYDROGRAPHS 120 & 121
```

```
ADD HYD             ID=1  HYD NO= 120 ID=2 ID=3
PRINT HYD           ID=1 CODE=1

                                PARTIAL HYDROGRAPH   120.00


    RUNOFF VOLUME =      .41399 INCHES     =        .9185 ACRE-FEET
    PEAK DISCHARGE RATE =      28.07 CFS  AT   1.499 HOURS   BASIN AREA =   .0416 SQ. MI.



*S BASIN DESIGNATION = 132
COMPUTE NM HYD      ID=4 HYD NO= 132 DA=0.0278 SQ MI
                    PER A=0 PER B=20 PER C=0 PER D=80 TP=0.1333
                    RAIN=-1.

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   87.805    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 = 1.2500
    AREA =      .022240 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300


    K =   .141901HR    TP =   .133300HR    K/TP RATIO =  1.064525     SHAPE CONSTANT, N =  3.317383
    UNIT PEAK =   12.795    CFS   UNIT VOLUME =    .9990       B =   306.75      P60 = 1.2500
    AREA =      .005560 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300

PRINT HYD           ID=4 CODE=1

                                PARTIAL HYDROGRAPH   132.00


    RUNOFF VOLUME =     1.03524 INCHES     =       1.5349 ACRE-FEET
    PEAK DISCHARGE RATE =      43.82 CFS  AT   1.499 HOURS   BASIN AREA =   .0278 SQ. MI.



*S COMBINE HYDROGRAPHS 120, 121 &132.
ADD HYD             ID=2  HYD NO= 132 ID=1 ID=4
PRINT HYD           ID=2 CODE=1

                                PARTIAL HYDROGRAPH   132.00


    RUNOFF VOLUME =      .66285 INCHES     =       2.4534 ACRE-FEET
    PEAK DISCHARGE RATE =      71.89 CFS  AT   1.499 HOURS   BASIN AREA =   .0694 SQ. MI.



ROUTE RESERVOIR     ID=5  HYD NO=132  INFLOW ID=2   CODE=5
                    OUTFLOW (CFS)     STORAGE (AC FT)      ELEV(FT)
                     0.00                  0.00             100.0
                     2.51                  0.15             100.50
                    11.77                  0.30             101.00
                    23.55                  0.45             101.50
```

36.67	0.60	102.00
51.80	0.75	102.50
56.54	0.90	103.00
61.28	1.20	103.50
67.52	1.50	104.00

* * * * * * * * * * * * * * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	100.00	.000	.00
.17	.00	100.00	.000	.00
.33	.00	100.00	.000	.00
.50	.00	100.00	.000	.00
.67	.00	100.00	.000	.00
.83	.00	100.00	.000	.00
1.00	.00	100.00	.000	.00
1.17	.00	100.00	.000	.00
1.33	15.54	100.18	.053	.89
1.50	71.89	101.70	.510	28.80
1.67	36.89	102.29	.688	45.58
1.83	22.30	101.82	.547	32.00
2.00	15.79	101.45	.435	22.36
2.16	7.33	101.14	.342	15.09
2.33	3.40	100.84	.251	8.73
2.50	2.04	100.64	.193	5.19
2.66	1.28	100.53	.160	3.12
2.83	.84	100.46	.139	2.32
3.00	.55	100.39	.118	1.98
3.16	.38	100.33	.100	1.67
3.33	.28	100.28	.083	1.39
3.50	.22	100.23	.069	1.16
3.66	.19	100.19	.057	.96
3.83	.17	100.16	.048	.80
4.00	.16	100.13	.040	.67
4.16	.17	100.11	.034	.57
4.33	.18	100.10	.029	.49
4.50	.18	100.08	.025	.42
4.66	.21	100.08	.023	.38
4.83	.23	100.07	.021	.34
5.00	.25	100.06	.019	.32
5.16	.28	100.06	.019	.31
5.33	.30	100.06	.018	.31
5.49	.33	100.06	.018	.31
5.66	.36	100.06	.019	.31
5.83	.39	100.07	.020	.33
5.99	.42	100.07	.021	.34
6.16	.17	100.07	.020	.34
6.33	.05	100.06	.017	.29
6.49	.02	100.05	.014	.24
6.66	.01	100.04	.011	.19
6.83	.00	100.03	.009	.15
6.99	.00	100.02	.007	.12

7.16	.00	100.02	.006	.10
7.33	.00	100.02	.005	.08
7.49	.00	100.01	.004	.06
7.66	.00	100.01	.003	.05
7.83	.00	100.01	.002	.04
7.99	.00	100.01	.002	.03
8.16	.00	100.00	.001	.02
8.33	.00	100.00	.001	.02
8.49	.00	100.00	.001	.02
8.66	.00	100.00	.001	.01
8.82	.00	100.00	.001	.01
8.99	.00	100.00	.000	.01
9.16	.00	100.00	.000	.01
9.32	.00	100.00	.000	.00

PEAK DISCHARGE = 47.459 CFS - PEAK OCCURS AT HOUR 1.60
MAXIMUM WATER SURFACE ELEVATION = 102.357
MAXIMUM STORAGE = .7070 AC-FT INCREMENTAL TIME= .033300HRS

*S TOTAL FLOW AT 23RD/528
PRINT HYD ID=5 CODE=1

PARTIAL HYDROGRAPH 132.00

RUNOFF VOLUME = .66285 INCHES = 2.4534 ACRE-FEET
PEAK DISCHARGE RATE = 47.46 CFS AT 1.598 HOURS BASIN AREA = .0694 SQ. MI.

FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 11:10:17

100 YEAR POST-DEVELOPMENT SUMMARY

AHYMO SUMMARY TABLE (AHYMO392) - AMAFCA VERSION OF HYMO - MARCH, 1992 RUN DATE (MON/DAY/YR) =09/20/1993
INPUT FILE = GWN100PO.DAT USER NO.= J_HUGHES.S92

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
*S	EXISTING 100 YR.CONDITIONS FOR GATEWAY NORTH.										
*S	SEPTEMBER 20, 1993										
RAINFALL	TYPE= 1									RAIN6=	2.200
*S BASIN DESIGNATION = BASIN 101											
COMPUTE NM HYD	101.00	-	1	.09150	113.79	4.262	.87342	1.565	1.943	PER IMP=	22.00
*S ROUTE BASIN 101 thru 102											
ROUTE	101.00	1	6	.09150	93.15	4.262	.87342	1.632	1.591		
*S BASIN DESIGNATION = BASIN 102											
COMPUTE NM HYD	102.00	-	2	.07000	86.69	3.261	.87342	1.565	1.935	PER IMP=	22.00
ADD HYD	102.00	6& 2	6	.16150	172.18	7.523	.87341	1.598	1.666		
*S BASIN DESIGNATION = BASIN 103											
COMPUTE NM HYD	103.00	-	3	.04210	69.50	2.306	1.02694	1.499	2.580	PER IMP=	32.00
ADD HYD	103.00	6& 3	5	.20360	229.35	9.829	.90515	1.565	1.760		
*S ROUTE BASINS 101, 102 & 103 THROUGH 104											
ROUTE	103.00	5	6	.20360	202.04	9.829	.90516	1.632	1.551		
*S BASIN DESIGNATION = 104											
COMPUTE NM HYD	104.00	-	4	.05470	65.22	2.611	.89503	1.565	1.863	PER IMP=	24.00
*S COMBINE HYDROGRAPHS 101, 102, 103 & 104											
ADD HYD	104.00	6& 4	4	.25830	260.52	12.440	.90300	1.632	1.576		
*S BASIN DESIGNATION = 130											
COMPUTE NM HYD	130.00	-	1	.04380	109.32	3.985	1.70584	1.499	3.900	PER IMP=	80.00
ADD HYD	130.00	4& 1	3	.30210	333.73	16.425	1.01940	1.598	1.726		
ROUTE RESERVOIR	130.00	3	2	.30210	270.79	16.425	1.01940	1.732	1.401	AC-FT=	1.700
*S BASIN DESIGNATION = 105											
COMPUTE NM HYD	105.00	-	5	.06460	81.88	3.084	.89502	1.532	1.981	PER IMP=	24.00
*S COMBINE HYDROGRAPHS 105 & 130. TOTAL FLOW AT 19TH/528											
ADD HYD	130.00	5& 2	6	.36670	325.08	19.508	.99749	1.665	1.385		
*S BASIN DESIGNATION = 131											
COMPUTE NM HYD	131.00	-	1	.02510	40.01	1.210	.90390	1.499	2.491	PER IMP=	15.00
*S BASIN DESIGNATION = 121											
COMPUTE NM HYD	121.00	-	2	.02240	33.01	1.069	.89503	1.499	2.303	PER IMP=	24.00
*S BASIN DESIGNATION = 120											
COMPUTE NM HYD	120.00	-	3	.01920	28.30	.917	.89503	1.499	2.303	PER IMP=	24.00
*S COMBINE HYDROGRAPHS 120 & 121											
ADD HYD	120.00	2& 3	1	.04160	61.30	1.986	.89501	1.499	2.303		
*S BASIN DESIGNATION = 132											
COMPUTE NM HYD	132.00	-	4	.02780	69.39	2.529	1.70584	1.499	3.900	PER IMP=	80.00
*S COMBINE HYDROGRAPHS 120, 121 &132.											
ADD HYD	132.00	1& 4	2	.06940	130.70	4.515	1.21981	1.499	2.943		
ROUTE RESERVOIR	132.00	2	5	.06940	66.22	4.515	1.21981	1.665	1.491	AC-FT=	1.438
*S TOTAL FLOW AT 23RD/528											
FINISH											

100 YEAR POST-DEVELOPMENT
DETAILED PRINTOUT


```
      AHYMO PROGRAM (AHYMO392) - AMAFCA VERSION OF HYMO - MARCH, 1992
           RUN DATE (MON/DAY/YR) = 09/20/1993
           START TIME (HR:MIN:SEC) = 11:00:57     USER NO.= J_HUGHES.S92
           INPUT FILE = GWN100PO.DAT

   START                TIME=0.0
   *S       EXISTING 100 YR.CONDITIONS FOR GATEWAY NORTH.
   *S       SEPTEMBER 20, 1993
   *        FILE GWN100PO.DAT
   RAINFALL             TYPE=1 RAIN QUARTER=0.0
                        RAIN ONE=1.87 RAIN SIX=2.20
                        RAIN DAY=2.66 DT=0.0333

                COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
                DT =    .033300 HOURS       END TIME =     5.994000 HOURS
                   .0000   .0016   .0033   .0050   .0067   .0085   .0103
                   .0121   .0140   .0160   .0180   .0200   .0221   .0243
                   .0265   .0288   .0312   .0336   .0361   .0387   .0414
                   .0442   .0471   .0501   .0533   .0566   .0600   .0636
                   .0674   .0714   .0757   .0808   .0863   .0922   .1044
                   .1323   .1754   .2374   .3221   .4335   .5756   .7527
                   .9690  1.1767  1.2619  1.3336  1.3972  1.4551  1.5084
                  1.5579  1.6041  1.6474  1.6881  1.7266  1.7629  1.7973
                  1.8298  1.8607  1.8900  1.9178  1.9442  1.9515  1.9573
                  1.9627  1.9680  1.9729  1.9777  1.9823  1.9867  1.9909
                  1.9950  1.9990  2.0029  2.0066  2.0102  2.0137  2.0172
                  2.0205  2.0238  2.0269  2.0300  2.0331  2.0360  2.0389
                  2.0418  2.0446  2.0473  2.0500  2.0526  2.0552  2.0578
                  2.0603  2.0627  2.0651  2.0675  2.0698  2.0721  2.0744
                  2.0766  2.0788  2.0810  2.0832  2.0853  2.0873  2.0894
                  2.0914  2.0934  2.0954  2.0974  2.0993  2.1012  2.1031
                  2.1050  2.1068  2.1086  2.1104  2.1122  2.1140  2.1157
                  2.1174  2.1191  2.1208  2.1225  2.1242  2.1258  2.1274
                  2.1290  2.1306  2.1322  2.1338  2.1353  2.1369  2.1384
                  2.1399  2.1414  2.1429  2.1444  2.1459  2.1473  2.1487
                  2.1502  2.1516  2.1530  2.1544  2.1558  2.1571  2.1585
                  2.1599  2.1612  2.1625  2.1639  2.1652  2.1665  2.1678
                  2.1691  2.1703  2.1716  2.1729  2.1741  2.1754  2.1766
                  2.1778  2.1791  2.1803  2.1815  2.1827  2.1839  2.1850
                  2.1862  2.1874  2.1886  2.1897  2.1909  2.1920  2.1931
                  2.1943  2.1954  2.1965  2.1976  2.1987  2.1998

   *S BASIN DESIGNATION = BASIN 101
   COMPUTE NM HYD       ID=1 HYD NO= 101 DA=0.0915 SQ MI
                        PER A=50 PER B=10 PER C=18 PER D=22 TP=0.1705
                        RAIN=-1

      K =   .093552HR    TP =   .170500HR    K/TP RATIO =   .548691     SHAPE CONSTANT, N =  7.045283
      UNIT PEAK =   61.795    CFS   UNIT VOLUME =    .9999       B =   523.40      P60 = 1.8700
      AREA =      .020130 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
      RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300


      K =   .183817HR    TP =   .170500HR    K/TP RATIO =  1.078107     SHAPE CONSTANT, N =  3.276605
```

UNIT PEAK = 127.10 CFS UNIT VOLUME = 1.000 B = 303.65 P60 = 1.8700
AREA = .071370 SQ MI IA = .56154 INCHES INF = 1.42231 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 101.00

RUNOFF VOLUME = .87342 INCHES = 4.2623 ACRE-FEET
PEAK DISCHARGE RATE = 113.79 CFS AT 1.565 HOURS BASIN AREA = .0915 SQ. MI.

*S ROUTE BASIN 101 thru 102
COMPUTE RATING CURVE RC=1 VS NO=1 NO SEGS=1 MIN ELEV=10 FT
MAX ELEV=12 FT CH SLP=0.0092 FP
SLP= 0.0092 N=0.021 DIST=16.17 FT
DIST ELEV DIST ELEV DIST ELEV DIST ELEV
0.0 10.67 0.17 10.0 2.17 10.13 16.17 10.41
30.17 10.13 32.17 10.00 32.34 10.67

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
10.00	.0	.0
10.11	.1	.1
10.21	.5	.5
10.32	1.4	2.3
10.42	2.8	6.0
10.53	4.5	13.0
10.63	6.2	22.0
10.74	7.9	32.9
10.84	9.6	45.4
10.95	11.4	59.6
11.05	13.1	75.2
11.16	14.8	92.2
11.26	16.5	110.6
11.37	18.2	130.4
11.47	19.9	151.3
11.58	21.6	173.6
11.68	23.3	197.0
11.79	25.0	221.6
11.89	26.7	247.3
12.00	28.4	274.2

COMPUTE TRAVEL TIME ID=6 REACH NO=1 NO VS=1 L=2650 FT SLP=0.0092

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.105	.087	.08	.7987

.211	.459	.55	.6185
.316	1.377	2.26	.4495
.421	2.849	6.01	.3489
.526	4.546	13.04	.2567
.632	6.246	22.04	.2086
.737	7.948	32.88	.1779
.842	9.650	45.44	.1563
.947	11.352	59.57	.1403
1.053	13.054	75.19	.1278
1.158	14.756	92.23	.1178
1.263	16.458	110.63	.1095
1.368	18.160	130.35	.1026
1.474	19.862	151.34	.0966
1.579	21.565	173.57	.0915
1.684	23.267	197.00	.0869
1.789	24.969	221.60	.0829
1.895	26.671	247.35	.0794
2.000	28.373	274.21	.0762

```
ROUTE              ID=6 HYD NO= 101  INFLOW ID=1
PRINT HYD          ID=6 CODE=1
```

PARTIAL HYDROGRAPH 101.00

RUNOFF VOLUME = .87342 INCHES = 4.2623 ACRE-FEET
PEAK DISCHARGE RATE = 93.15 CFS AT 1.632 HOURS BASIN AREA = .0915 SQ. MI.

```
*S BASIN DESIGNATION = BASIN 102
COMPUTE NM HYD     ID=2 HYD NO= 102 DA=0.0700 SQ MI
                   PER A=50 PER B=10 PER C=18 PER D=22 TP=0.1705
                   RAIN=-1
```

K = .093085HR TP = .170500HR K/TP RATIO = .545955 SHAPE CONSTANT, N = 7.090506
UNIT PEAK = 47.467 CFS UNIT VOLUME = .9999 B = 525.53 P60 = 1.8700
AREA = .015400 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

K = .186130HR TP = .170500HR K/TP RATIO = 1.091669 SHAPE CONSTANT, N = 3.237136
UNIT PEAK = 96.268 CFS UNIT VOLUME = .9999 B = 300.62 P60 = 1.8700
AREA = .054600 SQ MI IA = .56154 INCHES INF = 1.42231 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

```
PRINT HYD          ID=2 CODE=1
```

PARTIAL HYDROGRAPH 102.00

RUNOFF VOLUME = .87342 INCHES = 3.2607 ACRE-FEET
PEAK DISCHARGE RATE = 86.69 CFS AT 1.565 HOURS BASIN AREA = .0700 SQ. MI.

```
* COMBINE HYDROGRAPHS FROM 101 & 102
ADD HYD             ID=6  HYD NO=102 ID=6 ID=2
PRINT HYD           ID=6 CODE=1

                                PARTIAL HYDROGRAPH   102.00


    RUNOFF VOLUME =      .87341 INCHES     =       7.5229 ACRE-FEET
    PEAK DISCHARGE RATE =     172.18 CFS  AT   1.598 HOURS   BASIN AREA =   .1615 SQ. MI.



*S BASIN DESIGNATION = BASIN 103
COMPUTE NM HYD      ID=3 HYD NO= 103 DA=0.0421 SQ MI
                    PER A=40 PER B=10 PER C=18 PER D=32 TP=0.1333
                    RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   53.188    CFS   UNIT VOLUME =    .9991       B =   526.28      P60 = 1.8700
    AREA =      .013472 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300


    K =   .143572HR    TP =   .133300HR    K/TP RATIO =  1.077057     SHAPE CONSTANT, N =  3.279708
    UNIT PEAK =   65.264    CFS   UNIT VOLUME =    .9999       B =   303.89      P60 = 1.8700
    AREA =      .028628 SQ MI    IA =    .54853 INCHES    INF =   1.38588 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300

PRINT HYD           ID=3 CODE=1

                                PARTIAL HYDROGRAPH   103.00


    RUNOFF VOLUME =     1.02694 INCHES     =       2.3058 ACRE-FEET
    PEAK DISCHARGE RATE =      69.50 CFS  AT   1.499 HOURS   BASIN AREA =   .0421 SQ. MI.



* COMBINE HYDROGRAPHS FROM 102 & 103
ADD HYD             ID=5  HYD NO=103 ID=6 ID=3
PRINT HYD           ID=5 CODE=1

                                PARTIAL HYDROGRAPH   103.00


    RUNOFF VOLUME =      .90515 INCHES     =       9.8287 ACRE-FEET
    PEAK DISCHARGE RATE =     229.35 CFS  AT   1.565 HOURS   BASIN AREA =   .2036 SQ. MI.



*S ROUTE BASINS 101, 102 & 103 THROUGH 104
COMPUTE RATING CURVE RC=1 VS NO=1 NO SEGS=1 MIN ELEV=10 FT
                    MAX ELEV=12 FT CH SLP=0.0095 FP
                    SLP= 0.0095 N=0.021 DIST=16.17 FT
                    DIST  ELEV  DIST  ELEV  DIST  ELEV  DIST  ELEV
```

0.0 10.67 0.17 10.0 2.17 10.13 16.17 10.41
30.17 10.13 32.17 10.0 32.34 10.67

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
10.00	.0	.0
10.11	.1	.1
10.21	.5	.6
10.32	1.4	2.3
10.42	2.8	6.1
10.53	4.5	13.2
10.63	6.2	22.4
10.74	7.9	33.4
10.84	9.6	46.2
10.95	11.4	60.5
11.05	13.1	76.4
11.16	14.8	93.7
11.26	16.5	112.4
11.37	18.2	132.5
11.47	19.9	153.8
11.58	21.6	176.4
11.68	23.3	200.2
11.79	25.0	225.2
11.89	26.7	251.3
12.00	28.4	278.6

COMPUTE TRAVEL TIME ID=6 REACH NO=1 NO VS=1 L=2950 FT SLP=0.0095

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.105	.087	.08	.8750
.211	.459	.55	.6776
.316	1.377	2.29	.4925
.421	2.849	6.11	.3822
.526	4.546	13.25	.2812
.632	6.246	22.40	.2285
.737	7.948	33.42	.1949
.842	9.650	46.18	.1712
.947	11.352	60.53	.1537
1.053	13.054	76.40	.1400
1.158	14.756	93.72	.1290
1.263	16.458	112.42	.1200
1.368	18.160	132.46	.1123
1.474	19.862	153.79	.1058
1.579	21.565	176.38	.1002
1.684	23.267	200.19	.0952
1.789	24.969	225.19	.0909
1.895	26.671	251.35	.0870
2.000	28.373	278.65	.0834

ROUTE ID=6 HYD NO= 103 INFLOW ID=5

```
PRINT HYD           ID=6 CODE=1

                                PARTIAL HYDROGRAPH   103.00


    RUNOFF VOLUME =      .90516 INCHES     =       9.8287 ACRE-FEET
    PEAK DISCHARGE RATE =     202.04 CFS  AT   1.632 HOURS   BASIN AREA =   .2036 SQ. MI.



*S BASIN DESIGNATION = 104
COMPUTE NM HYD      ID=4 HYD NO= 104 DA=0.0547 SQ MI
                    PER A=50 PER B=10 PER C=16 PER D=24 TP=0.1870
                    RAIN=-1.

    K =   .101915HR    TP =   .187000HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   36.946    CFS   UNIT VOLUME =    .9994       B =   526.28      P60 = 1.8700
    AREA =      .013128 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300


    K =   .206514HR    TP =   .187000HR    K/TP RATIO =  1.104353     SHAPE CONSTANT, N =  3.201326
    UNIT PEAK =   66.214    CFS   UNIT VOLUME =    .9998       B =   297.84      P60 = 1.8700
    AREA =      .041572 SQ MI    IA =    .56711 INCHES    INF =   1.43789 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300

PRINT HYD           ID=4 CODE=1

                                PARTIAL HYDROGRAPH   104.00


    RUNOFF VOLUME =      .89503 INCHES     =       2.6111 ACRE-FEET
    PEAK DISCHARGE RATE =      65.22 CFS  AT   1.565 HOURS   BASIN AREA =   .0547 SQ. MI.



*S COMBINE HYDROGRAPHS 101, 102, 103 & 104
ADD HYD             ID=4  HYD NO= 104 ID=6 ID=4
PRINT HYD           ID=4 CODE=1

                                PARTIAL HYDROGRAPH   104.00


    RUNOFF VOLUME =      .90300 INCHES     =      12.4397 ACRE-FEET
    PEAK DISCHARGE RATE =     260.52 CFS  AT   1.632 HOURS   BASIN AREA =   .2583 SQ. MI.



*S BASIN DESIGNATION = 130
COMPUTE NM HYD      ID=1 HYD NO= 130 DA=0.0438 SQ MI
                    PER A=0 PER B=20 PER C=0 PER D=80 TP=0.1333
                    RAIN=-1.

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   138.34    CFS   UNIT VOLUME =    .9993       B =   526.28      P60 = 1.8700
```

AREA = .035040 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

K = .130992HR TP = .133300HR K/TP RATIO = .982685 SHAPE CONSTANT, N = 3.593448
UNIT PEAK = 21.495 CFS UNIT VOLUME = .9997 B = 327.09 P60 = 1.8700
AREA = .008760 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 130.00

RUNOFF VOLUME = 1.70584 INCHES = 3.9848 ACRE-FEET
PEAK DISCHARGE RATE = 109.32 CFS AT 1.499 HOURS BASIN AREA = .0438 SQ. MI.

* COMBINE HYDROGRAPHS 101,102,103 104 & 130
ADD HYD ID=3 HYD NO=130 ID=4 ID=1
PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 130.00

RUNOFF VOLUME = 1.01940 INCHES = 16.4245 ACRE-FEET
PEAK DISCHARGE RATE = 333.73 CFS AT 1.598 HOURS BASIN AREA = .3021 SQ. MI.

ROUTE RESERVOIR ID=2 HYD NO=130 INFLOW ID=3 CODE=5

OUTFLOW (CFS)	STORAGE (AC FT)	ELEV(FT)
0.00	0.00	100.0
169.49	0.30	100.50
195.71	0.60	101.00
218.81	0.90	101.50
239.69	1.20	102.00
258.90	1.50	102.50
276.77	1.80	103.00

* * * * * * * * * * * * * * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	100.00	.000	.00
.17	.00	100.00	.000	.00
.33	.00	100.00	.000	.00
.50	.00	100.00	.000	.00
.67	.00	100.00	.000	.00
.83	.00	100.00	.000	.00
1.00	.00	100.00	.000	.00
1.17	.26	100.00	.000	.12
1.33	38.53	100.09	.052	29.66

1.50	258.07	100.73	.440	181.69
1.67	307.79	102.69	1.613	265.61
1.83	196.64	102.34	1.406	252.87
2.00	125.53	100.86	.514	188.20
2.16	75.69	100.24	.145	82.09
2.33	44.70	100.14	.084	47.42
2.50	30.01	100.09	.056	31.45
2.66	21.20	100.07	.039	22.18
2.83	15.73	100.05	.029	16.35
3.00	12.06	100.04	.022	12.46
3.16	9.42	100.03	.017	9.72
3.33	7.62	100.02	.014	7.82
3.50	6.25	100.02	.011	6.41
3.66	5.23	100.02	.009	5.35
3.83	4.41	100.01	.008	4.52
4.00	3.78	100.01	.007	3.85
4.16	3.31	100.01	.006	3.36
4.33	2.93	100.01	.005	2.97
4.50	2.64	100.01	.005	2.68
4.66	2.44	100.01	.004	2.46
4.83	2.28	100.01	.004	2.30
5.00	2.17	100.01	.004	2.18
5.16	2.09	100.01	.004	2.10
5.33	2.04	100.01	.004	2.04
5.49	2.01	100.01	.004	2.01
5.66	1.99	100.01	.004	1.99
5.83	2.00	100.01	.004	2.00
5.99	2.02	100.01	.004	2.02
6.16	1.45	100.00	.003	1.57
6.33	.95	100.00	.002	.99
6.49	.76	100.00	.001	.78
6.66	.62	100.00	.001	.64
6.83	.51	100.00	.001	.53
6.99	.43	100.00	.001	.44
7.16	.36	100.00	.001	.37
7.33	.31	100.00	.001	.31
7.49	.26	100.00	.000	.27
7.66	.22	100.00	.000	.23
7.83	.19	100.00	.000	.19
7.99	.16	100.00	.000	.17
8.16	.14	100.00	.000	.14
8.33	.12	100.00	.000	.12
8.49	.10	100.00	.000	.11
8.66	.09	100.00	.000	.09
8.82	.08	100.00	.000	.08
8.99	.06	100.00	.000	.07
9.16	.06	100.00	.000	.06
9.32	.05	100.00	.000	.05
9.49	.04	100.00	.000	.04
9.66	.03	100.00	.000	.03
9.82	.03	100.00	.000	.03
9.99	.02	100.00	.000	.03
10.16	.02	100.00	.000	.02
10.32	.02	100.00	.000	.02
10.49	.01	100.00	.000	.02

```
      10.66      .01    100.00      .000      .01
      10.82      .01    100.00      .000      .01
      10.99      .01    100.00      .000      .01
      11.16      .01    100.00      .000      .01
      11.32      .01    100.00      .000      .01
      11.49      .01    100.00      .000      .01
      11.66      .00    100.00      .000      .00
   PEAK DISCHARGE =      270.795 CFS - PEAK OCCURS AT HOUR    1.73
   MAXIMUM WATER SURFACE ELEVATION =      102.833
   MAXIMUM STORAGE =       1.6997 AC-FT      INCREMENTAL TIME=     .033300HRS

  PRINT HYD           ID=2 CODE=1

                                PARTIAL HYDROGRAPH   130.00


     RUNOFF VOLUME =     1.01940 INCHES     =      16.4245 ACRE-FEET
     PEAK DISCHARGE RATE =     270.79 CFS  AT   1.732 HOURS   BASIN AREA =   .3021 SQ. MI.



  *S BASIN DESIGNATION = 105
  COMPUTE NM HYD      ID=5 HYD NO= 105 DA=0.0646 SQ MI
                      PER A=50 PER B=10 PER C=16 PER D=24 TP=0.1685
                      RAIN=-1.

     K =   .091878HR    TP =   .168500HR    K/TP RATIO =   .545267     SHAPE CONSTANT, N =  7.101964
     UNIT PEAK =   48.404    CFS   UNIT VOLUME =    1.000       B =   526.07      P60 = 1.8700
     AREA =      .015504 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300


     K =   .185855HR    TP =   .168500HR    K/TP RATIO =  1.102996     SHAPE CONSTANT, N =  3.205106
     UNIT PEAK =   86.869    CFS   UNIT VOLUME =    .9999       B =   298.14      P60 = 1.8700
     AREA =      .049096 SQ MI    IA =    .56711 INCHES    INF =   1.43789 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300

  PRINT HYD           ID=5 CODE=1

                                PARTIAL HYDROGRAPH   105.00


     RUNOFF VOLUME =      .89502 INCHES     =       3.0836 ACRE-FEET
     PEAK DISCHARGE RATE =      81.88 CFS  AT   1.532 HOURS   BASIN AREA =   .0646 SQ. MI.



  *S COMBINE HYDROGRAPHS 105 & 130. TOTAL FLOW AT 19TH/528
  ADD HYD             ID=6  HYD NO= 130 ID=5 ID=2
  PRINT HYD           ID=6 CODE=1

                                PARTIAL HYDROGRAPH   130.00


     RUNOFF VOLUME =      .99749 INCHES     =      19.5081 ACRE-FEET
```

PEAK DISCHARGE RATE = 325.08 CFS AT 1.665 HOURS BASIN AREA = .3667 SQ. MI.

*S BASIN DESIGNATION = 131
COMPUTE NM HYD ID=1 HYD NO= 131 DA=0.0251 SQ MI
PER A=0 PER B=70 PER C=15 PER D=15 TP=0.1333
RAIN=-1.

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 14.864 CFS UNIT VOLUME = .9986 B = 526.28 P60 = 1.8700
AREA = .003765 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

K = .126558HR TP = .133300HR K/TP RATIO = .949423 SHAPE CONSTANT, N = 3.722932
UNIT PEAK = 53.818 CFS UNIT VOLUME = .9999 B = 336.25 P60 = 1.8700
AREA = .021335 SQ MI IA = .47353 INCHES INF = 1.17588 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 131.00

RUNOFF VOLUME = .90390 INCHES = 1.2100 ACRE-FEET
PEAK DISCHARGE RATE = 40.01 CFS AT 1.499 HOURS BASIN AREA = .0251 SQ. MI.

*S BASIN DESIGNATION = 121
COMPUTE NM HYD ID=2 HYD NO= 121 DA=0.0224 SQ MI
PER A=50 PER B=10 PER C=16 PER D=24 TP=0.1333
RAIN=-1.

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 21.225 CFS UNIT VOLUME = .9988 B = 526.28 P60 = 1.8700
AREA = .005376 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

K = .147210HR TP = .133300HR K/TP RATIO = 1.104353 SHAPE CONSTANT, N = 3.201326
UNIT PEAK = 38.038 CFS UNIT VOLUME = .9997 B = 297.84 P60 = 1.8700
AREA = .017024 SQ MI IA = .56711 INCHES INF = 1.43789 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033300

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 121.00

RUNOFF VOLUME = .89503 INCHES = 1.0692 ACRE-FEET
PEAK DISCHARGE RATE = 33.01 CFS AT 1.499 HOURS BASIN AREA = .0224 SQ. MI.

```
*S BASIN DESIGNATION = 120
COMPUTE NM HYD       ID=3 HYD NO= 120 DA=0.0192 SQ MI
                     PER A=50 PER B=10 PER C=16 PER D=24 TP=0.1333
                     RAIN=-1.

    K =  .072649HR   TP =  .133300HR   K/TP RATIO =  .545000    SHAPE CONSTANT, N = 7.106420
    UNIT PEAK =  18.193   CFS  UNIT VOLUME =   .9987     B =  526.28     P60 = 1.8700
    AREA =     .004608 SQ MI   IA =   .10000 INCHES   INF =   .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  .033300


    K =  .147210HR   TP =  .133300HR   K/TP RATIO = 1.104353    SHAPE CONSTANT, N = 3.201326
    UNIT PEAK =  32.604   CFS  UNIT VOLUME =   .9996     B =  297.84     P60 = 1.8700
    AREA =     .014592 SQ MI   IA =   .56711 INCHES   INF =  1.43789 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  .033300

PRINT HYD            ID=3 CODE=1

                                PARTIAL HYDROGRAPH   120.00


    RUNOFF VOLUME =     .89503 INCHES     =       .9165 ACRE-FEET
    PEAK DISCHARGE RATE =     28.30 CFS  AT   1.499 HOURS   BASIN AREA =   .0192 SQ. MI.



*S COMBINE HYDROGRAPHS 120 & 121
ADD HYD              ID=1  HYD NO= 120 ID=2 ID=3
PRINT HYD            ID=1 CODE=1

                                PARTIAL HYDROGRAPH   120.00


    RUNOFF VOLUME =     .89501 INCHES     =      1.9857 ACRE-FEET
    PEAK DISCHARGE RATE =     61.30 CFS  AT   1.499 HOURS   BASIN AREA =   .0416 SQ. MI.



*S BASIN DESIGNATION = 132
COMPUTE NM HYD       ID=4 HYD NO= 132 DA=0.0278 SQ MI
                     PER A=0 PER B=20 PER C=0 PER D=80 TP=0.1333
                     RAIN=-1.

    K =  .072649HR   TP =  .133300HR   K/TP RATIO =  .545000    SHAPE CONSTANT, N = 7.106420
    UNIT PEAK =  87.805   CFS  UNIT VOLUME =   .9992     B =  526.28     P60 = 1.8700
    AREA =     .022240 SQ MI   IA =   .10000 INCHES   INF =   .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  .033300


    K =  .130992HR   TP =  .133300HR   K/TP RATIO =  .982685    SHAPE CONSTANT, N = 3.593448
    UNIT PEAK =  13.643   CFS  UNIT VOLUME =   .9993     B =  327.09     P60 = 1.8700
    AREA =     .005560 SQ MI   IA =   .50000 INCHES   INF =  1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  .033300
```

PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 132.00

RUNOFF VOLUME = 1.70584 INCHES = 2.5292 ACRE-FEET
PEAK DISCHARGE RATE = 69.39 CFS AT 1.499 HOURS BASIN AREA = .0278 SQ. MI.

*S COMBINE HYDROGRAPHS 120, 121 &132.
ADD HYD ID=2 HYD NO= 132 ID=1 ID=4
PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 132.00

RUNOFF VOLUME = 1.21981 INCHES = 4.5149 ACRE-FEET
PEAK DISCHARGE RATE = 130.70 CFS AT 1.499 HOURS BASIN AREA = .0694 SQ. MI.

ROUTE RESERVOIR ID=5 HYD NO=132 INFLOW ID=2 CODE=5

OUTFLOW (CFS)	STORAGE (AC FT)	ELEV(FT)
0.00	0.00	100.0
2.51	0.15	100.50
11.77	0.30	101.00
23.55	0.45	101.50
36.67	0.60	102.00
51.80	0.75	102.50
56.54	0.90	103.00
61.28	1.20	103.50
67.52	1.50	104.00

* * * * * * * * * * * * * * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	100.00	.000	.00
.17	.00	100.00	.000	.00
.33	.00	100.00	.000	.00
.50	.00	100.00	.000	.00
.67	.00	100.00	.000	.00
.83	.00	100.00	.000	.00
1.00	.00	100.00	.000	.00
1.17	.22	100.00	.000	.01
1.33	27.67	100.43	.128	2.13
1.50	130.70	102.92	.876	55.79
1.67	69.11	103.90	1.438	66.22
1.83	38.23	103.58	1.248	62.29
2.00	26.23	102.89	.868	55.52
2.16	12.78	101.79	.537	31.16
2.33	6.42	101.17	.350	15.73

2.50	4.08	100.86	.257	9.13
2.66	2.74	100.68	.203	5.77
2.83	1.93	100.57	.170	3.75
3.00	1.41	100.50	.150	2.53
3.16	1.08	100.45	.135	2.25
3.33	.88	100.40	.119	1.99
3.50	.75	100.35	.104	1.75
3.66	.67	100.31	.092	1.53
3.83	.60	100.27	.080	1.35
4.00	.56	100.24	.071	1.19
4.16	.54	100.21	.063	1.06
4.33	.53	100.19	.057	.95
4.50	.52	100.17	.051	.86
4.66	.52	100.16	.047	.79
4.83	.52	100.15	.044	.73
5.00	.54	100.14	.041	.69
5.16	.55	100.13	.040	.66
5.33	.57	100.13	.038	.64
5.49	.59	100.13	.038	.63
5.66	.60	100.12	.037	.62
5.83	.63	100.12	.037	.62
5.99	.66	100.12	.037	.63
6.16	.26	100.12	.036	.60
6.33	.07	100.10	.030	.51
6.49	.03	100.08	.025	.41
6.66	.02	100.07	.020	.33
6.83	.01	100.05	.016	.27
6.99	.00	100.04	.013	.21
7.16	.00	100.03	.010	.17
7.33	.00	100.03	.008	.13
7.49	.00	100.02	.006	.11
7.66	.00	100.02	.005	.08
7.83	.00	100.01	.004	.07
7.99	.00	100.01	.003	.05
8.16	.00	100.01	.003	.04
8.33	.00	100.01	.002	.03
8.49	.00	100.01	.002	.03
8.66	.00	100.00	.001	.02
8.82	.00	100.00	.001	.02
8.99	.00	100.00	.001	.01
9.16	.00	100.00	.001	.01
9.32	.00	100.00	.001	.01
9.49	.00	100.00	.000	.01
9.66	.00	100.00	.000	.01
9.82	.00	100.00	.000	.00

PEAK DISCHARGE = 66.225 CFS - PEAK OCCURS AT HOUR 1.67
MAXIMUM WATER SURFACE ELEVATION = 103.896
MAXIMUM STORAGE = 1.4377 AC-FT INCREMENTAL TIME= .033300HRS

*S TOTAL FLOW AT 23RD/528
PRINT HYD ID=5 CODE=1

PARTIAL HYDROGRAPH 132.00

RUNOFF VOLUME = 1.21981 INCHES = 4.5149 ACRE-FEET
PEAK DISCHARGE RATE = 66.22 CFS AT 1.665 HOURS BASIN AREA = .0694 SQ. MI.

FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 11:01:09

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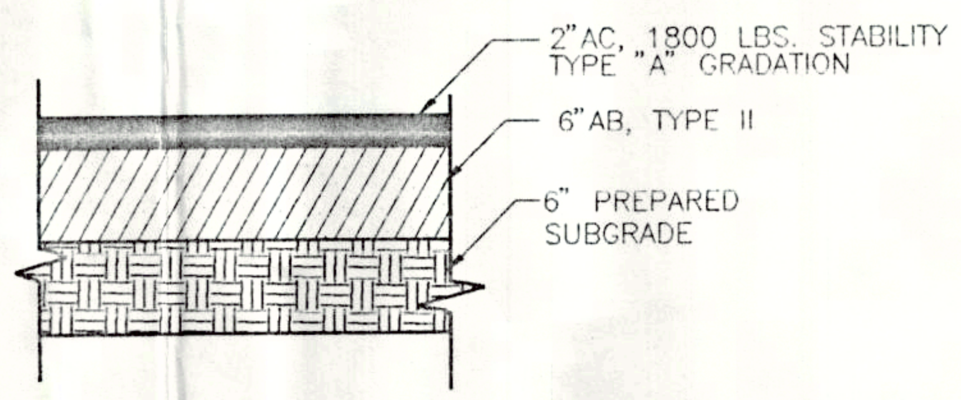
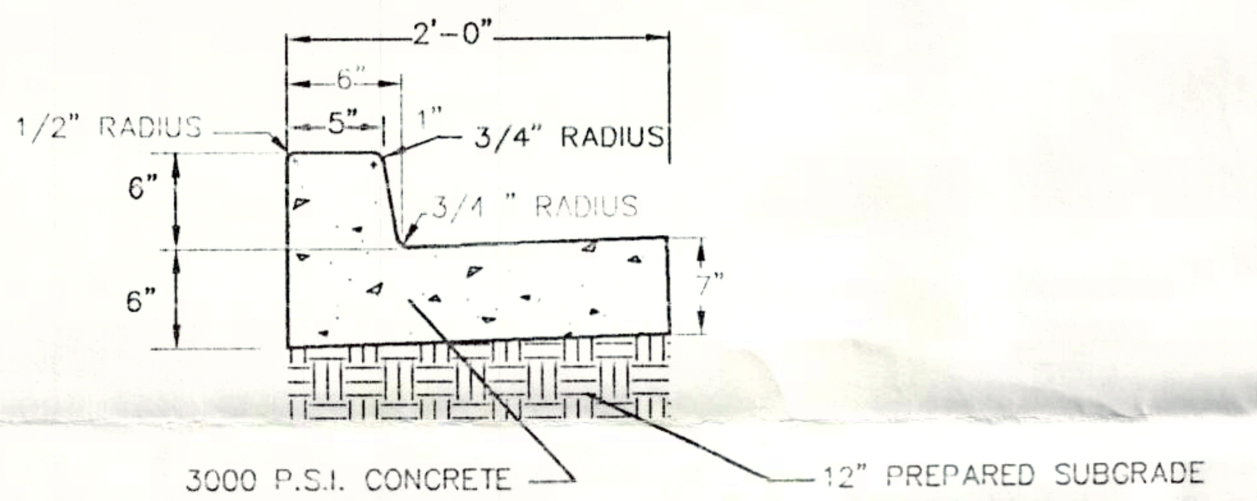
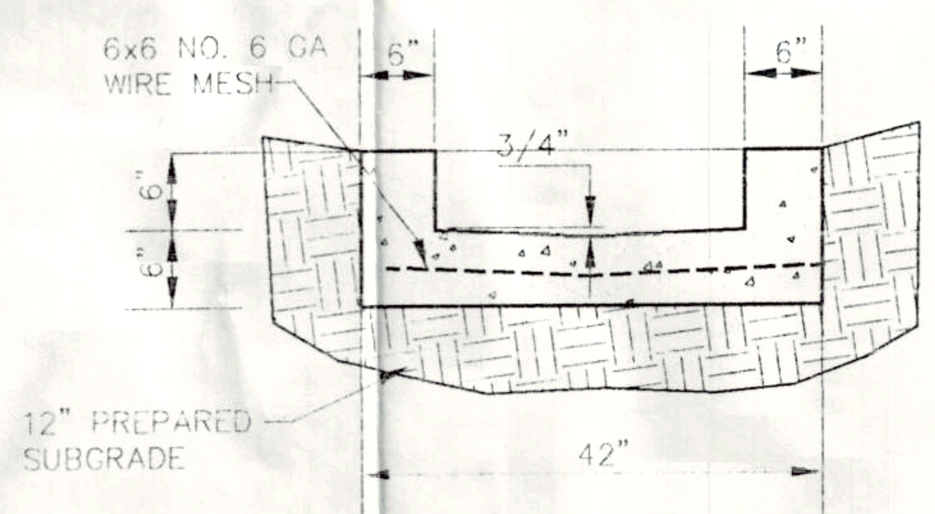


TYPICAL PAVEMENT SECTION
SCALE: 1" = 1'-0"

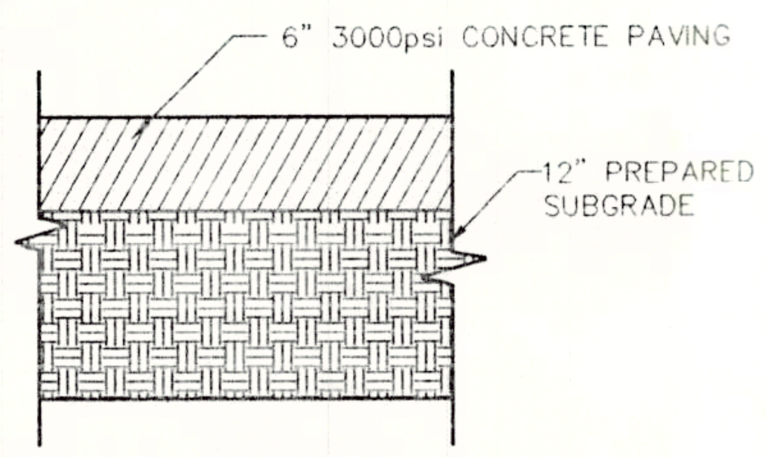


NOTES: DIMENSIONS AT ROUNDED CORNERS ARE MEASUREMENTS TO THE INTERSECTION OF STRAIGHT LINE SEGMENTS.
ALL EXPOSED SURFACES TO BE TROWEL FINISH.

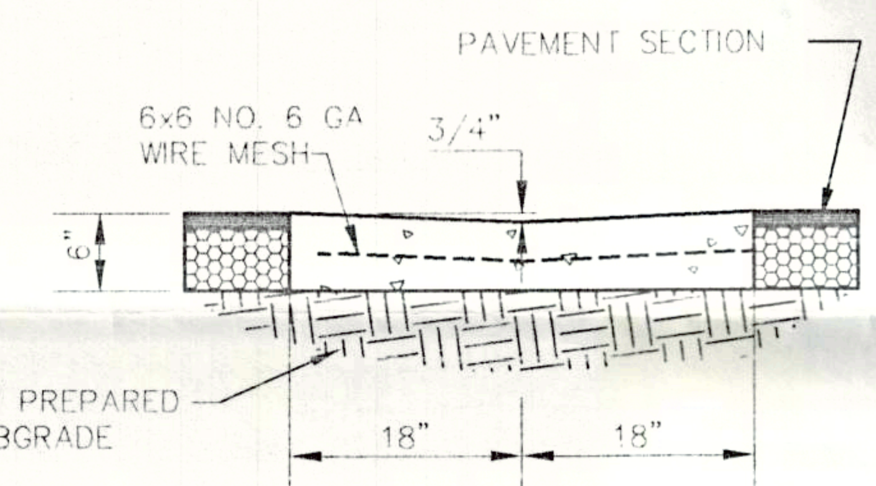
BARRIER CURB AND GUTTER
SCALE: N.T.S.



RUNDOWN SECTION
SCALE: NTS.



CONCRETE PAD SECTION
SCALE: N.T.S.



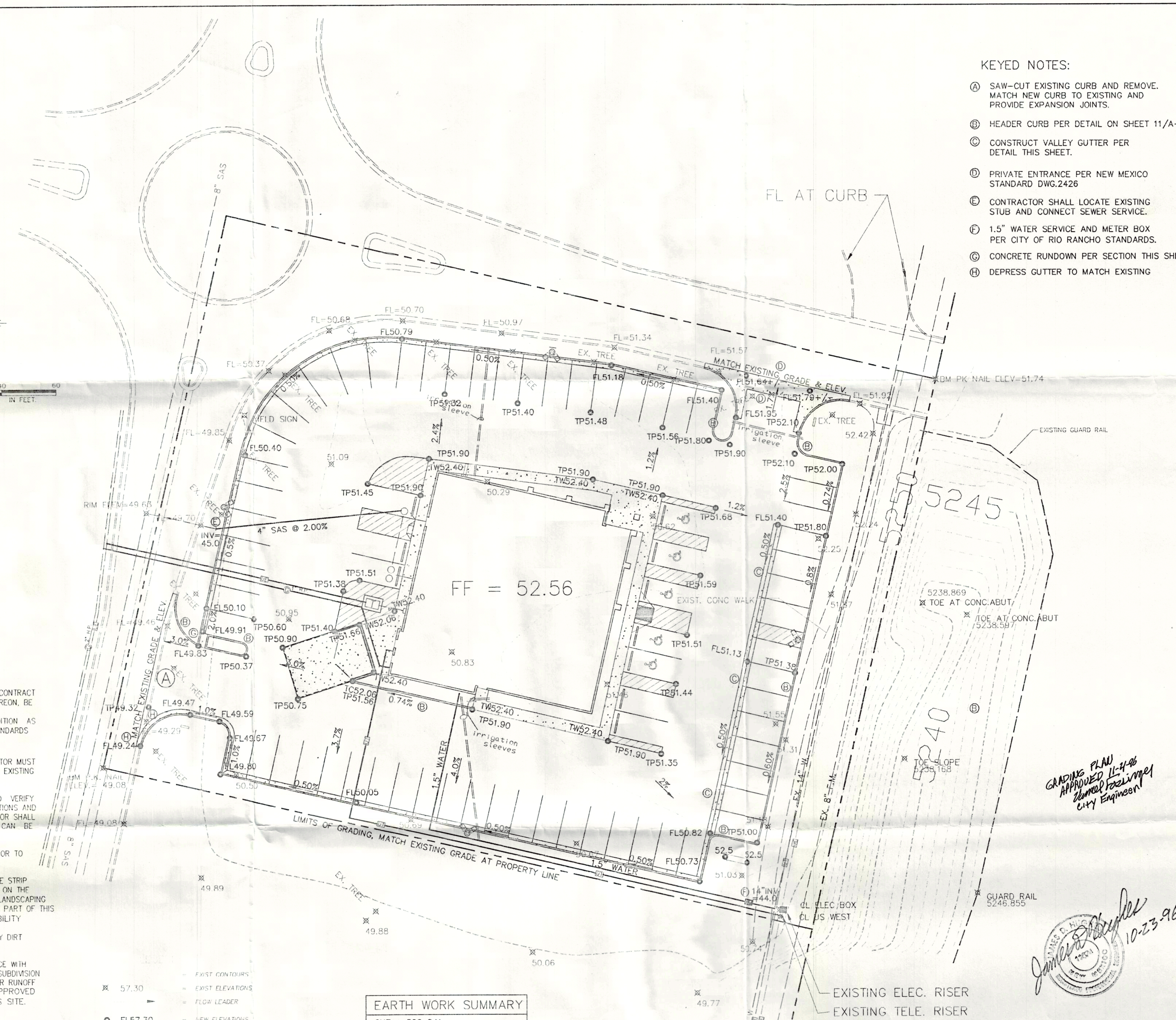
3' VALLEY GUTTER
SCALE: NTS.

WARNING – EXISTING UTILITY LINE LOCATIONS ARE SHOWN IN AN APPROXIMATE MANNER ONLY, AND SUCH LINES MAY EXIST WHERE NONE ARE SHOWN. THE LOCATION OF ANY SUCH EXISTING LINES IS BASED UPON INFORMATION PROVIDED BY THE UTILITY COMPANY, THE OWNER, OR BY OTHERS, AND THE INFORMATION MAY BE INCOMPLETE OR MAY BE OBSOLETE BY THE TIME CONSTRUCTION COMMENCES.

THE CONTRACTOR SHALL:
INFORM HIMSELF OF THE LOCATION OF ANY UTILITY LINE IN OR NEAR THE AREA OF THE WORK IN ADVANCE OF AND DURING EXCAVATION WORK. THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY AND ALL DAMAGE CAUSED BY ITS FAILURE TO LOCATE, IDENTIFY, AND PRESERVE ANY AND ALL EXISTING UTILITIES.

GENERAL NOTES:

1. ALL WORK DETAILED ON THESE PLANS TO BE PERFORMED UNDER CONTRACT SHALL, EXCEPT AS OTHERWISE STATED OR PROVIDED FROM HEREON, BE CONSTRUCTED IN ACCORDANCE WITH THE NEW MEXICO STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 1987 EDITION AS AMENDED IN JUNE 1989, AND WITH THE CITY OF RIO RANCHO STANDARDS AND SPECIFICATIONS.
2. TWO (2) WORKING DAYS PRIOR TO ANY EXCAVATION, CONTRACTOR MUST CONTACT LINE LOCATING SERVICE, (260-1990) FOR LOCATION OF EXISTING UTILITIES.
3. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATIONS OF ALL OBSTRUCTIONS AND EXISTING PAVEMENT. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER OR SURVEYOR SO THAT THE CONFLICT CAN BE RESOLVED WITH MINIMUM AMOUNT OF DELAY.
4. CONTRACTOR SHALL OBTAIN A TOP SOIL DISTURBANCE PERMIT PRIOR TO GRADING.
5. EXISTING TREES ARE TO BE RELOCATED TO WITHIN THE LANDSCAPE STRIP BETWEEN THE EXISTING STREET AND THE PROPOSED PARKING LOT ON THE NORTH AND WEST SIDES OF THIS SITE AS PART OF A SEPERATE LANDSCAPING PLAN (NOT PART OF THIS PROJECT). PROTECTIN OF THE TREES IS PART OF THIS PROJECT AND SHALL BE THE CONTRACTOR'S RESPONSABILITY
6. CONTRACTOR IS RESPONSABLE FOR THE PROMPT REMOVAL OF ANY DIRT TRACKED ONTO THE ADJACENT STREETS FROM THIS SITE.
7. THE DRAINAGE OF THIS SITE AS SHOWN HEREON IS IN ACCORDANCE WITH THE APPROVED GRADING & DRAINAGE PLAN OF GATEWAY NORTH SUBDIVISION WHICH PROVIDED FOR THE MITIGATION OF INCREASED STORM WATER RUNOFF TO SERVE THE DEVELOPMENT OF THIS SITE. REFERENCE THE APPROVED DRAINAGE PLAN FOR DRAINAGE COMPUTATIONS FOR THIS SITE.
8. PARKING LOT STRIPING SHALL BE 4" WIDE WHITE PAINT.
9. THE EXISTING CONTOURS SHOWN ON THIS PLAN WERE GENERATED FROM FIELD SURVEY.
10. AT ALL INTERFACES WITH EXISTING OR PROPOSED CONSTRUCTION, THE CONTRACTOR SHALL "FIELD VERIFY" AND "MATCH EXISTING", OR PROVIDE THESE PLANS TO ADJACENT CONTRACTOR SO THAT THEY MAY "FIELD VERIFY" AND "MATCH EXISTING". IN THE CASE OF A FORSEEABLE PROBLEM THE ENGINEER SHALL BE NOTIFIED.
11. ALL ASPHALT SHALL BE BLUE TOPPED AT INTERVALS OF NOT MORE THAN 25' ON THE NORTH AND EAST SIDE OF THE BUILDING WHERE SLOPES ARE LESS THAN 2.0%.
12. ALL SUBGRADE COMPACTION SHALL BE 95% O.D.D. (MODIFIED)



KEYED NOTES:

(A) SAW-CUT EXISTING CURB AND REMOVE. MATCH NEW CURB TO EXISTING AND PROVIDE EXPANSION JOINTS.
(B) HEADER CURB PER DETAIL ON SHEET 11/A-
(C) CONSTRUCT VALLEY GUTTER PER DETAIL THIS SHEET.
(D) PRIVATE ENTRANCE PER NEW MEXICO STANDARD DWG.2426
(E) CONTRACTOR SHALL LOCATE EXISTING STUB AND CONNECT SEWER SERVICE.
(F) 1.5" WATER SERVICE AND METER BOX PER CITY OF RIO RANCHO STANDARDS.
(G) CONCRETE RUNDOWN PER SECTION THIS SH
(H) DEPRESS GUTTER TO MATCH EXISTING

Symbol	Description
	EXIST CONTOURS
× 57.30	EXIST ELEVATIONS
	FLOW LEADER
○ FL57.30	NEW ELEVATIONS

FL=FLOWLINE, TP=TOP OF PAVEMENT, TW=TOP OF WALK

Symbol	Description
	BARRIER CURB AND GUTTER
	HEADER CURB
	EXISTING CURB AND GUTTER
---2" HP---	GAS LINES
---UE---	UNDERGROUND ELECTRICAL
---UT---	UNDERGROUND TELEPHONE

EARTH WORK SUMMARY

CUT = 590 C.Y.
FILL = 465 C.Y.
EXPORT = 80 C.Y.

MATERIAL FOR SHAPING LANDSCAPE AREA, ASSUMED C/F RATIO 1.1 FOR BALANCE.

NOTE: SEE ARCHITECTURAL DRAWINGS FOR LAYOUT DIMENSIONS

REVISIONS			
NO.	DATE	DESCRIPTION	BY
1			
2			
3			
4			

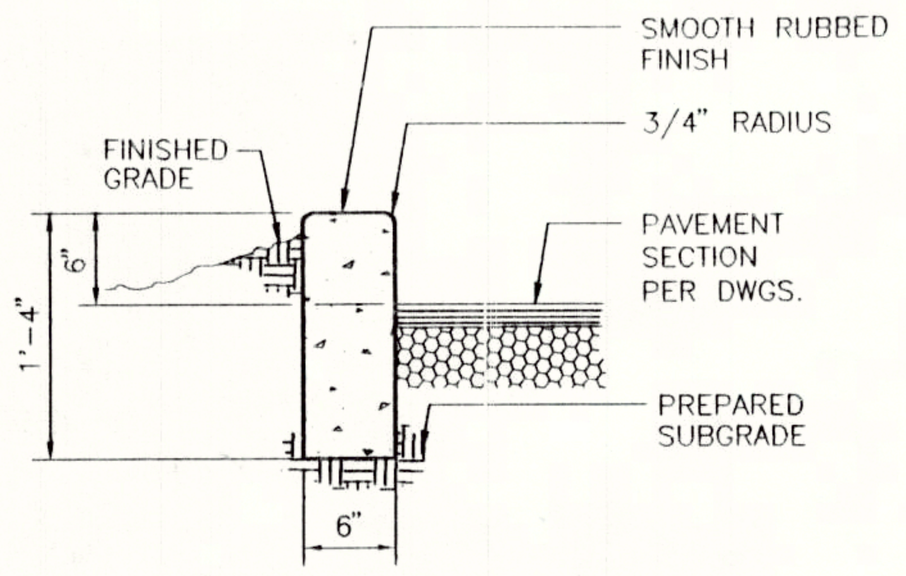
VILLAGE INN, GATEWAY NORTH, TRACT C-
GRADING, PAVING &
WATER / SEWER SERVICE PLAN

DATE:	OCT, 1996
SCALE:	1"=20'
DESIGNED:	J.D.H.
DRAWN:	J.D.H.
JOB NO.:	398-02-40

community sciences corporation
LAND PLANNING ENGINEERING SURVEYING
P.O. Box 1328 Corrales, N.M. 87048

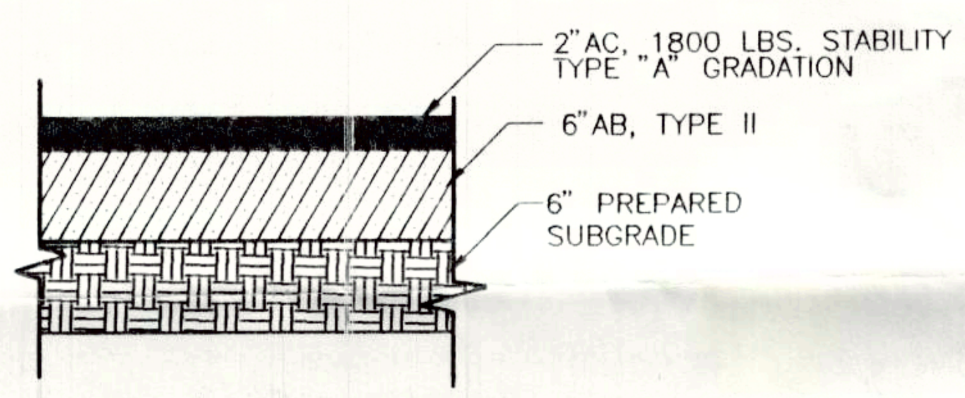
SHEET 1 OF 1

COMMUNITY SCIENCES CORPORATION - CORRALES, NEW MEXICO - (505) 897-0000



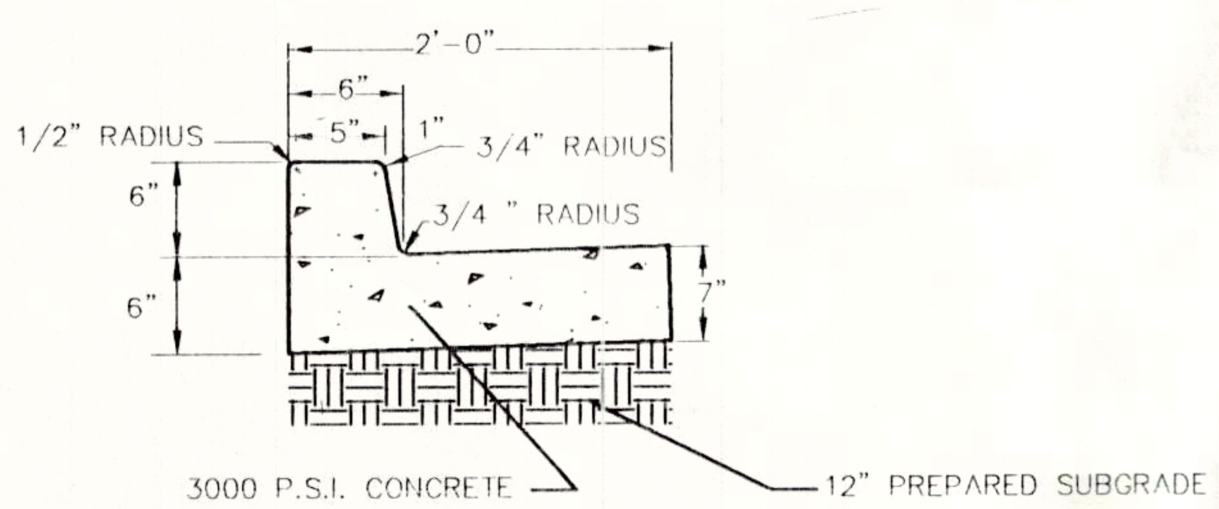
HEADER CURB

SCALE: 1" = 1'-0"



TYPICAL PAVEMENT SECTION

SCALE: 1" = 1'-0"

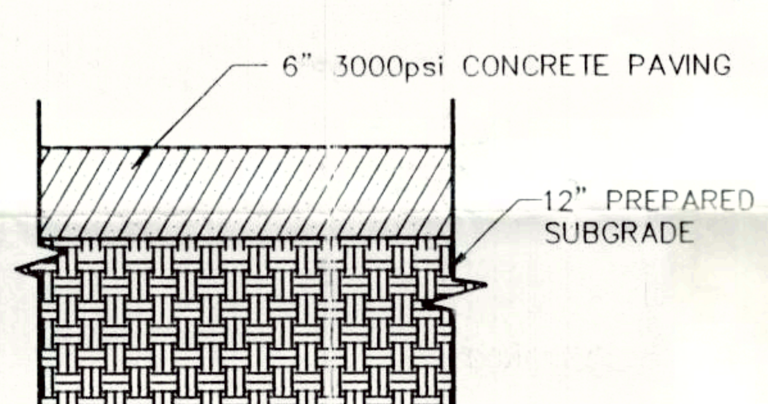


NOTES DIMENSIONS AT ROUNDED CORNERS ARE MEASUREMENTS TO THE INTERSECTION OF STRAIGHT LINE SEGMENTS.

ALL EXPOSED SURFACES TO BE TROWEL FINISH.

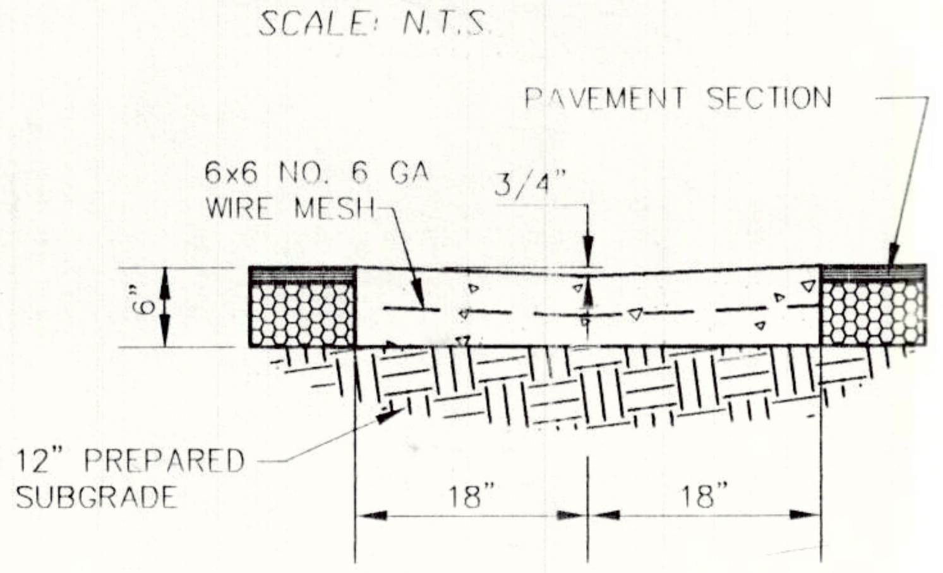
BARRIER CURB AND GUTTER

SCALE: N.T.S.



CONCRETE PAD SECTION

SCALE: N.T.S.



3' VALLEY GUTTER

SCALE: NTS.

GENERAL NOTES:

A) PARKING LOT STRIPING SHALL BE 4" WIDE WHITE PAINT.

B) UTILITIES LOCATOR SERVICE SHALL BE CONTACTED PRIOR TO STARTING EARTHWORK.

C) THE EXISTING CONTOURS SHOWN ON THIS PLAN WERE GENERATED FROM FIELD SURVEY.

D) REFERENCE THE APPROVED DRAINAGE PLAN FOR GATEWAY NORTH SUBDIVISION FOR DRAINAGE COMPUTATIONS FOR THIS SITE.

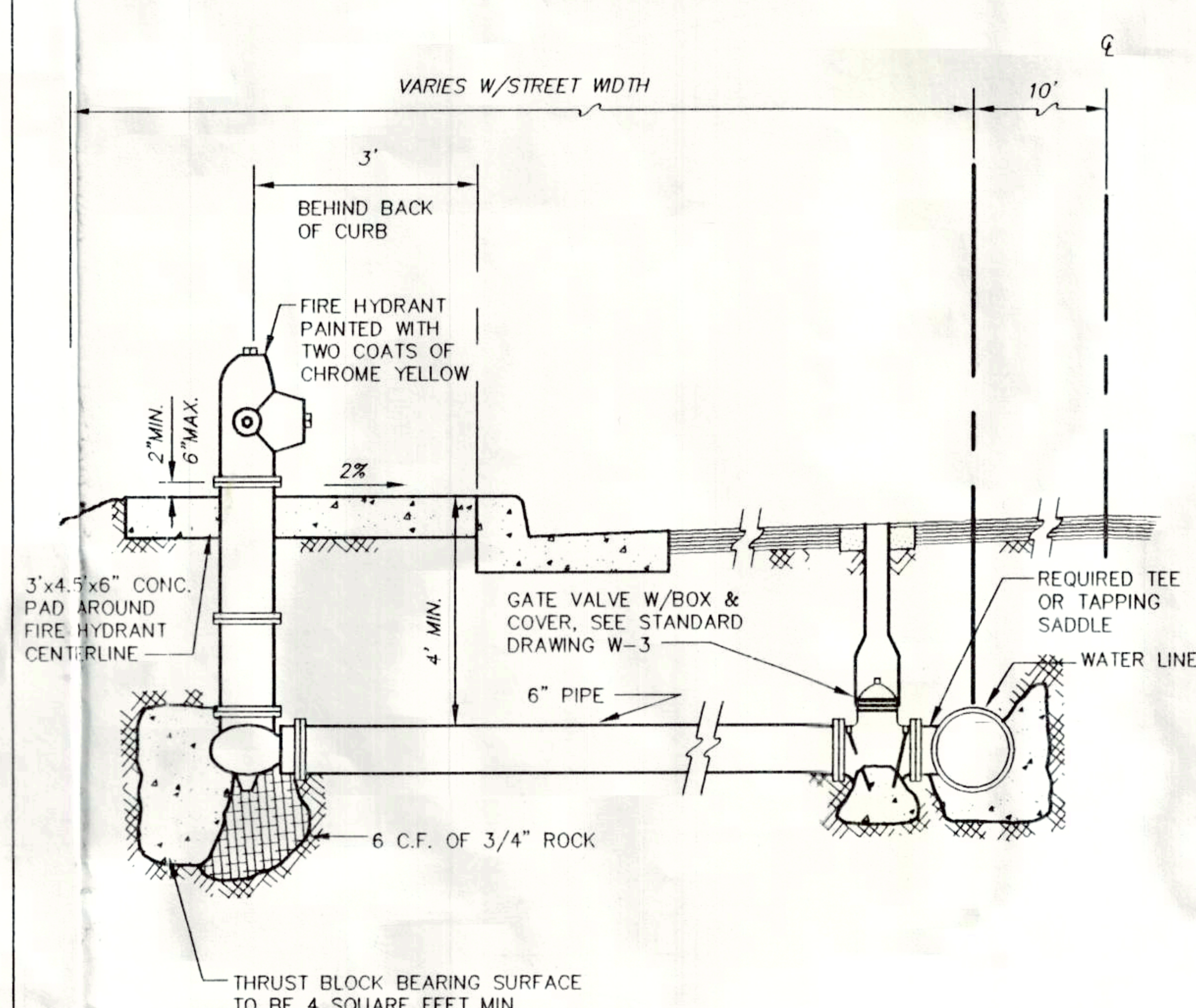
E) AT ALL INTERFACES WITH EXISTING OR PROPOSED CONSTRUCTION, THE CONTRACTOR SHALL "FIELD VERIFY" AND "MATCH EXISTING", OR PROVIDE THESE PLANS TO ADJACENT CONTRACTOR SO THAT THEY MAY "FIELD VERIFY" AND "MATCH EXISTING". IN THE CASE OF A FORSEEABLE PROBLEM THE ENGINEER SHALL BE NOTIFIED.

F) ALL ASPHALT SHALL BE BLUE TOPPED

G) ALL SUBGRADE COMPACTION SHALL BE 95% O.D.D. (MODIFIED)

LEGEND:

— — — —	= EXISTING EASEMENT
- - - - -	= EXIST CONTOURS
FL57.30 ⊗	= EXIST ELEVATIONS
———▶	= FLOW LEADER
X FL57.30	= NEW ELEVATIONS
FL	= FLOW LINE
▭	= BARRIER CURB AND GUTTER
═	= HEADER CURB
≡ ≡ ≡	= EXISTING CURB AND GUTTER



NOTES:

1 FIRE HYDRANTS SHALL HAVE 5 1/4" VALVE OPENING, DRY BARREL, DRY TOP, TRAFFIC MODEL, WITH ONE 4 1/2" PUMPER NOZZLE, TWO 2 1/2" HOSE NOZZLES, NS THREAD, PENTAGON OPERATING NUT (1 1/2" POINT TO FLAT) WITH 1" SIDES, WHICH SHALL OPEN LEFT (COUNTER CLOCKWISE), WITH MECHANICAL JOINT CONNECTION TO 6" SPECIFIED PVC PIPE WITH 4' MIN. COVER.

2 THE FIRE HYDRANT SHALL BE PAINTED WITH TWO COATS OF CHROME YELLOW, AND MEET REQUIREMENTS OF AWWA C502.

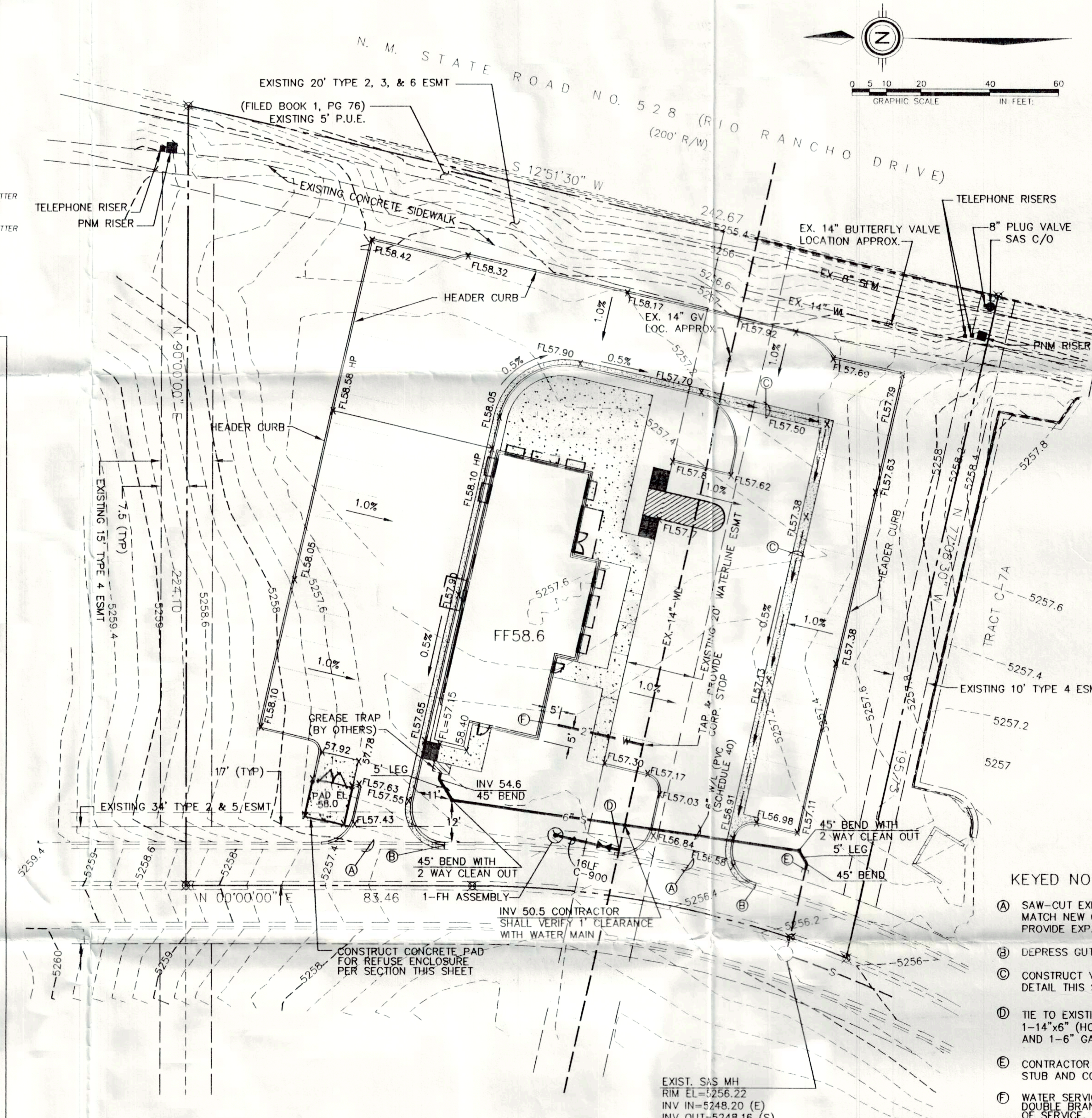
3 APPROVED HYDRANTS INCLUDE KENNEDY GUARDIAN MODEL K - 81, M & H STYLE 129, AND MUELLER SUPER CENTURION 200.

City of Rio Rancho Utilities Department (Water and Wastewater Divisions)

FIRE HYDRANT ASSEMBLY

STANDARD DRAWING W-2

DATE: 1/91 REV. 1/96



KEYED NOTES:

Ⓐ SAW-CUT EXISTING CURB AND REMOVE. MATCH NEW CURB TO EXISTING AND PROVIDE EXPANSION JOINTS.

Ⓑ DEPRESS GUTTER TO MATCH EXISTING.

Ⓒ CONSTRUCT VALLEY GUTTER PER DETAIL THIS SHEET.

Ⓓ TIE TO EXISTING 14" WL WITH 1-14"x6" (HOT TAP COMMERCIAL) AND 1-6" GATE VALVE.

Ⓔ CONTRACTOR SHALL LOCATE EXISTING STUB AND CONNECT SEWER SERVICE.

Ⓕ WATER SERVICES SHALL INCLUDE A DOUBLE BRANCHED EXTENSION AT END OF SERVICE. BRANCHES SHALL BE 1 1/2" AND 1" AND SHALL EACH BE PROVIDED WITH A METER BOX PER CITY STANDARDS.

GATEWAY NORTH
LOT C-6A

EARTH WORK SUMMARY
CUT = 251 CY
FILL = 229 CY (UNADJUSTED)

MATERIAL FOR SHAPING LANDSCAPE AREA, ASSUMED C/F RATIO 1.1 FOR BALANCE.

NOTE: SEE ARCHITECTURAL DRAWINGS FOR LAYOUT DIMENSIONS

Grading & Drainage Plan Approved Vance [illegible] 10-28-96

KENT M. WHITMAN NEW MEXICO 8170 REGISTERED PROFESSIONAL ENGINEER

10/4/96

SCHLOTZSKY'S - GATEWAY NORTH GRADING, PAVING & WATER / SEWER SERVICE PLAN	
DATE: SEPT. 1996	community sciences corporation
SCALE: 1"=20'	LAND PLANNING ENGINEERING SURVEYING
DESIGNED: M.N.S.	P.O. Box 1328 Corrales, N.M. 87048
DRAWN: S.P.S/D.L.W.	SHEET 1 OF 1
JOB NO.: 391-02-036	

REVISIONS: NO. | DATE | DESCRIPTION | BY — 1, 2, 3, 4

39102C1.DWG XREF: N/A