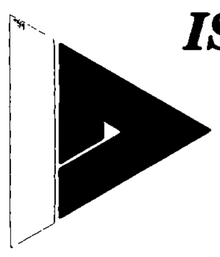

ISAACSON & ARFMAN, P.A.

Consulting Engineering Associates

Albuquerque, NM

DRAINAGE REPORT

FOR

MOUNTAIN VIEW ESTATES SUBDIVISION, UNITS ONE & TWO

A 56 & 58 LOT (TWO PHASE) SINGLE FAMILY RESIDENTIAL SUBDIVISION

ALBUQUERQUE NEW MEXICO
SEPTEMBER 1997

RECEIVED
OCT 01 1997
HYDROLOGY SECTION

Prepared by:

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REGISTERED PROFESSIONAL ENGINEER

09.30.97

Fred C. Arfman, P.E. **Date**

INTRODUCTION

The Mountain View Estates Subdivision was created from two of the planned units of Rolling Hills Subdivision, which were re-zoned for a higher housing density. The community is bordered on the north and west by Rolling Hills (Unit Two and a future phase, respectfully). Arenal Road borders the southern property line and the Amole del Norte Channel borders along the east side. Units One and Two, consisting of 56 and 58 lots respectfully, are being designed and processed simultaneously. Both of these areas have been addressed previously in the Rolling Hills Subdivision Drainage Management Plan. This plan will be re-visited in this report in order to discuss the effects of the higher housing density on the total flows into the Amole del Norte Channel. The following study will also offer the drainage and grading solution for Units One and Two of the Mountain View Estates Subdivision.

I. PROJECT INFORMATION

LEGAL DESCRIPTION: A parcel of land comprising of Parcel A-2-5 and a portion of the unplatted Tract KK-2, Town of Atrisco Grant consisting of 18.14 acres.

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SURVEYOR: Aldrich Land Surveying, Inc.
Attn: Tim Aldrich, NMPLS No. 7719
(505) 884-1990

BENCHMARK: ACS Monument "1-M10" located at the southeast quadrant of Sage Road and Unser Blvd. SW.
Elevation: 5079.88

ZONING: RLT

NUMBER OF EXISTING TRACTS: 2

NUMBER OF PROPOSED LOTS:
Unit One: 56
Unit Two: 58

TOTAL AREA: 18.14 Ac.
790,253 Sq. Ft.

II. SITE CHARACTERISTICS

FLOOD HAZARD: No part of this development is affected nor contributes to a flood hazard area as determined by Panel No. ~~350002-0033~~ 350001 C0337 D of the ~~October 14, 1983~~ 9-20-96 Edition of the F.E.M.A. Maps.

Ao, depth 1' in Arenal Rd right-of-way

EXISTING CONDITIONS: This site is currently undeveloped and mostly undisturbed with native ground cover, typical of the City's west side (Land Treatment B). The site has a slope downward toward the southeast at slopes ranging from 3 to 5 percent. Rolling Hills Unit Two abuts to the north and east. Storm waters generated from the Rolling Hills Unit Two improvements are currently carried by storm

drain and street flow to either the Amole del Norte Channel or an offsite detention pond. Additionally, undeveloped overland flows from the future residential phases to the east cross over the southern portion of Unit One. Arenal Road (28' edge-edge) rural paving within a 86' R.O.W. is adjacent to the south. No flows are accepted from the Arenal Road corridor.

ROLLING HILLS MASTER DRAINAGE PLAN REVISIONS: The Rolling Hills Master Drainage Plan was re-visited to determine the effect a higher housing density would have on the total flows of the remaining undeveloped phases. The percent imperious was calculated for the new RLT zoned areas and found to be slightly higher than what it was under the original zoning (R-1). To model the undeveloped area to the east of Mountain View Estates Units One and Two it was assumed that the remainder of Tract KK-2 would be developed as RLT zoning and Tract A~~AA~~2 would remain zoned as R-1.

The original AHYMO calculations for the subdivision also did not account for the routing of the upper basin flows through the lower basins. Therefore, when the model was re-run to account for the change in percent imperious, it was also modified to address the routing of the flows (see Appendix A: AHYMO CALCULATIONS). The combined effect of the changes made to the model resulted in no

significant change in the maximum flow rates at the two Amole del Norte Channel outfall points.

PROPOSED CONDITIONS:

UNIT ONE: The development of the 56 lots of this phase will require the construction of a storm drain along Old Aspen Road from the westerly phase line to the Amole del Norte Channel. When the future phases to the west are developed the line will be extended to its ultimate length. This system was identified in the previously mentioned Rolling Hills Drainage Management Plan, on file with the City Hydrology Division. A complete hydraulic analysis was calculated for the system using the pipe soffit elevation at the Amole del Norte as the control surface elevation (see Appendix B).

The storm drain has the following hydraulic and hydrological characteristics:

A. West Terminus (Silent Meadows and Old Aspen Road): A battery of Type A inlets have the capacity of accepting 32 cfs into a 30" RCP. These flows will be generated within the future phases to the west (refer to Appendix B).

Interim: Prior to the development of the future phases to the west, the upstream flows from Rolling Hills Units Two and Three will be captured by ponds located at the southern terminus of Quiet Desert Drive and the southern terminus of Rolling Rock Place (see Grading Plan for details). Any overland flows generated from the undeveloped phases will be captured by the catch basins located at Silent Meadows Place and Old Aspen Road.

Ultimate: The fully developed upstream basin will contribute an additional 22 cfs to the storm drain via a battery of Type A inlets to the far west along Old Aspen Road (see the Master Drainage Plan exhibit).

Remaining flows (Q = 9.45 cfs) will be carried by the street at a depth of .33 feet (EGL = .43 ft).

B. Secret Valley Drive and Old Aspen Road: Two Type 'A' inlets will accept 8 cfs of the flow generated along Secret Valley Drive. The storm drain along Old Aspen will increase in size to a 36" diameter capable of conveying 75 cfs at a projected 1.25% slope under gravity (see Flowmaster Worksheet No. 2).

The remaining 31.25 cfs is conveyed by the 32' F.F. street at a flow depth of .46 feet (EGL = 0.71 ft).

C. Old Aspen Drive and Seven Falls Place: Two Type "A" inlets will accept an additional 13 cfs from Old Aspen Road. The storm drain will remain at a 36" diameter RCP and begin to function under pressure conditions. A remaining 45.6 cfs will flow as channelized flow from Old Aspen to the Amole del Norte Channel.

UNIT TWO: Additional Type C inlets will be added at the end of Rockwood Road to pick up the remaining 17 cfs of street flow. The water will be conveyed via the existing storm drain to the Amole del Norte Channel.

CONCLUSIONS & RECOMMENDATIONS

The Drainage Study for Mountain View Estates Subdivision Units One and Two is consistent with the Rolling Hills Drainage Management Plan previously submitted and on file at the Hydrology Division, P.W.D., City of Albuquerque. Rolling Hills Subdivision Units One, Two, and Three are currently under construction and conform to the same DMP. The individual recommendations for Units One and Two are presented below:

Unit One:

1. A portion of the Old Aspen Road storm drain (from Silent Meadows to the Amole del Norte Channel) should be constructed as part of the Unit One improvements.
2. Developer should have a hard lined connection between the storm drain outfall and the Amole del Norte Diversion Channel.
3. An open channel connection to the Amole del Norte shall be constructed from the western terminus of Old Aspen Road.
4. No rear yard ponding shall be allowed in this portion of the development (see Typical Lot Grading Detail).
5. Adjacent lots may share a common lot line drainage swale (see Typical Lot Grading Detail).

Unit Two:

1. Additional catch basins shall be added at the end of Rockwood Road to collect all remaining street flows into the existing storm drain.
2. No rear yard ponding shall be allowed in Unit Two (see Typical Lot Grading Plan).
3. Adjacent lots may share a common lot line drainage swale (see Typical Lot Grading Plan).

APPENDIX A

AHYMO CALCULATIONS

RUN DATE (MON/DAY/YR) = 09/22/1997
START TIME (HR:MIN:SEC) = 16:30:25 USER NO.= ISCARFNM.I01
INPUT FILE = RHMPR2.DAT

**** Mountain View Subdivision Unit 4 &5****
**** September 22, 1996 ****
START RAINFALL BEGINS AT 0.0 HRS
RAINFALL TYPE=1 RAIN QUARTER=0 RAIN ONE=1.87
RAIN SIX=2.20 RAIN DAY=0 DT=0.03333HR

COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
DT = .033330 HOURS END TIME = 5.999400 HOURS

.0000	.0016	.0033	.0050	.0067	.0085	.0103
.0122	.0141	.0160	.0180	.0201	.0222	.0243
.0266	.0289	.0312	.0337	.0362	.0388	.0415
.0443	.0472	.0502	.0534	.0567	.0601	.0637
.0675	.0715	.0758	.0809	.0865	.0924	.1050
.1334	.1771	.2398	.3254	.4379	.5814	.7600
.9780	1.1804	1.2649	1.3363	1.3997	1.4575	1.5106
1.5600	1.6061	1.6493	1.6900	1.7284	1.7646	1.7989
1.8314	1.8623	1.8915	1.9193	1.9456	1.9518	1.9576
1.9630	1.9682	1.9732	1.9780	1.9825	1.9869	1.9912
1.9953	1.9993	2.0031	2.0068	2.0104	2.0140	2.0174
2.0207	2.0240	2.0272	2.0303	2.0333	2.0363	2.0392
2.0420	2.0448	2.0475	2.0502	2.0528	2.0554	2.0580
2.0605	2.0629	2.0653	2.0677	2.0700	2.0723	2.0746
2.0768	2.0790	2.0812	2.0833	2.0855	2.0875	2.0896
2.0916	2.0936	2.0956	2.0976	2.0995	2.1014	2.1033
2.1051	2.1070	2.1088	2.1106	2.1124	2.1141	2.1159
2.1176	2.1193	2.1210	2.1227	2.1244	2.1260	2.1276
2.1292	2.1308	2.1324	2.1340	2.1355	2.1371	2.1386
2.1401	2.1416	2.1431	2.1446	2.1460	2.1475	2.1489
2.1504	2.1518	2.1532	2.1546	2.1560	2.1573	2.1587
2.1600	2.1614	2.1627	2.1640	2.1654	2.1667	2.1680
2.1692	2.1705	2.1718	2.1731	2.1743	2.1756	2.1768
2.1780	2.1792	2.1804	2.1817	2.1829	2.1840	2.1852
2.1864	2.1876	2.1887	2.1899	2.1910	2.1922	2.1933
2.1944	2.1956	2.1967	2.1978	2.1989	2.2000	

*S **BASIN A
COMPUTE NM HYD ID=1 HYD NO=100.00 AREA=0.00517 SQ MI
PER A=0 PER B=37 PER C=13 PER D=50
TP=-0.1333 HR MASSRAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 10.206 CFS UNIT VOLUME = .9982 B = 526.28 P60 = 1.8700
AREA = .002585 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .124459HR TP = .133300HR K/TP RATIO = .933679 SHAPE CONSTANT, N = 3.788292
UNIT PEAK = 6.6089 CFS UNIT VOLUME = .9983 B = 340.80 P60 = 1.8700
AREA = .002585 SQ MI IA = .46100 INCHES INF = 1.14080 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 100.00

RUNOFF VOLUME = 1.35334 INCHES = .3732 ACRE-FEET
PEAK DISCHARGE RATE = 10.94 CFS AT 1.500 HOURS BASIN AREA = .0052 SQ. MI.

*S ** ROUTE BASIN A THROUGH C
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
MIN ELEV=100.00 FT MAX ELEV=100.67 FT
CH SLP=.02 FP SLP=.02 N=.017 DIST=32 FT
DIST ELEV DIST ELEV DIST ELEV
0 100.67 0.1 100.00 16 100.32
31.9 100.00 32.0 100.67

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.04	.06	.05	3.51
100.07	.25	.33	7.03
100.11	.56	.96	10.54
100.14	.99	2.07	14.06
100.18	1.55	3.75	17.57
100.21	2.23	6.10	21.09
100.25	3.04	9.20	24.60
100.28	3.97	13.13	28.12
100.32	5.02	17.98	31.63
100.35	6.14	25.01	31.91
100.39	7.27	33.05	31.92
100.42	8.40	41.95	31.93
100.46	9.52	51.67	31.94
100.49	10.65	62.16	31.95
100.53	11.77	73.40	31.96
100.56	12.90	85.36	31.97
100.60	14.03	98.01	31.98
100.63	15.16	111.33	31.99
100.67	16.28	125.31	32.00

COMPUTE TRAVEL TIME ID=2 REACH NO=1 NO VS=1 L=270 FT
SLP=.046

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.0906
.071	.248	.33	.0571
.106	.558	.96	.0436
.141	.992	2.07	.0360
.176	1.549	3.75	.0310
.212	2.231	6.10	.0274
.247	3.037	9.20	.0248
.282	3.966	13.13	.0227
.317	5.020	17.98	.0209
.353	6.144	25.01	.0184
.388	7.269	33.05	.0165
.423	8.395	41.95	.0150
.458	9.521	51.67	.0138
.494	10.647	62.16	.0128
.529	11.774	73.40	.0120
.564	12.901	85.36	.0113
.599	14.029	98.01	.0107
.635	15.157	111.33	.0102
.670	16.285	125.31	.0097

```
ROUTE                ID=2 HYD NO=100.1 INFLOW ID=1 DT=0.0 HR
PRINT HYD            ID=2 CODE=1

                          PARTIAL HYDROGRAPH   100.10

    RUNOFF VOLUME =     1.35338 INCHES     =        .3732 ACRE-FEET
    PEAK DISCHARGE RATE =      10.79 CFS  AT   1.533 HOURS   BASIN AREA =    .0052 SQ. MI.


*S **BASIN C
COMPUTE NM HYD       ID=3 HYD NO=101.00 AREA=0.00420 SQ MI
                     PER A=0 PER B=37 PER C=13 PER D=50
                     TP=-0.1333 HR   MASSRAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   8.2909    CFS   UNIT VOLUME =    .9981       B =   526.28      P60 = 1.8700
    AREA =      .002100 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .124459HR    TP =   .133300HR    K/TP RATIO =   .933679     SHAPE CONSTANT, N =  3.788292
    UNIT PEAK =   5.3689    CFS   UNIT VOLUME =    .9977       B =   340.80      P60 = 1.8700
    AREA =      .002100 SQ MI    IA =    .46100 INCHES    INF =   1.14080 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=3   CODE=1

                          PARTIAL HYDROGRAPH   101.00
```

RUNOFF VOLUME = 1.35334 INCHES = .3031 ACRE-FEET
PEAK DISCHARGE RATE = 8.89 CFS AT 1.500 HOURS BASIN AREA = .0042 SQ. MI.

```
ADD HYD              ID=4 HYD NO=101.1 ID=2 ID=3
PRINT HYD            ID=4 CODE=5
```

PARTIAL HYDROGRAPH 101.10

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.500	19.2	3.000	.2	4.500	.1	5.999	.1
.167	.0	1.667	10.9	3.166	.2	4.666	.1	6.166	.1
.333	.0	1.833	6.0	3.333	.1	4.833	.1	6.333	.0
.500	.0	2.000	4.0	3.500	.1	4.999	.1	6.499	.0
.667	.0	2.166	2.1	3.666	.1	5.166	.1	6.666	.0
.833	.0	2.333	1.0	3.833	.1	5.333	.1	6.833	.0
1.000	.0	2.500	.6	4.000	.1	5.499	.1		
1.167	.0	2.666	.4	4.166	.1	5.666	.1		
1.333	3.5	2.833	.3	4.333	.1	5.833	.1		

RUNOFF VOLUME = 1.35328 INCHES = .6763 ACRE-FEET
PEAK DISCHARGE RATE = 19.38 CFS AT 1.533 HOURS BASIN AREA = .0094 SQ. MI.

```
*S ** ROUTE BASIN A & C TO WINDSONG ROAD
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                     MIN ELEV=100.00 FT MAX ELEV=100.67 FT
                     CH SLP=.02 FP SLP=.02 N=.017 DIST=32 FT
                     DIST  ELEV  DIST  ELEV  DIST  ELEV
                       0  100.67 0.1  100.00   16   100.32
                     31.9 100.00 32.0 100.67
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.04	.06	.05	3.51
100.07	.25	.33	7.03
100.11	.56	.96	10.54
100.14	.99	2.07	14.06
100.18	1.55	3.75	17.57
100.21	2.23	6.10	21.09
100.25	3.04	9.20	24.60
100.28	3.97	13.13	28.12
100.32	5.02	17.98	31.63
100.35	6.14	25.01	31.91
100.39	7.27	33.05	31.92
100.42	8.40	41.95	31.93
100.46	9.52	51.67	31.94
100.49	10.65	62.16	31.95

```
                                100.53       11.77       73.40       31.96
                                100.56       12.90       85.36       31.97
                                100.60       14.03       98.01       31.98
                                100.63       15.16      111.33       31.99
                                100.67       16.28      125.31       32.00
COMPUTE TRAVEL TIME  ID=5 REACH NO=1 NO VS=1 L=170 FT
                     SLP=.046

                          TRAVEL TIME TABLE
                                       REACH=  1.0

                          WATER        AVERAGE      FLOW         TRAVEL
                          DEPTH        AREA         RATE         TIME
                          FEET         SQ.FT.       CFS          HRS
                             .035          .062          .05        .0570
                             .071          .248          .33        .0359
                             .106          .558          .96        .0274
                             .141          .992         2.07        .0226
                             .176         1.549         3.75        .0195
                             .212         2.231         6.10        .0173
                             .247         3.037         9.20        .0156
                             .282         3.966        13.13        .0143
                             .317         5.020        17.98        .0132
                             .353         6.144        25.01        .0116
                             .388         7.269        33.05        .0104
                             .423         8.395        41.95        .0094
                             .458         9.521        51.67        .0087
                             .494        10.647        62.16        .0081
                             .529        11.774        73.40        .0076
                             .564        12.901        85.36        .0071
                             .599        14.029        98.01        .0068
                             .635        15.157       111.33        .0064
                             .670        16.285       125.31        .0061
ROUTE                ID=5 HYD NO=101.2 INFLOW ID=4 DT=0.0 HR
PRINT HYD            ID=5 CODE=1

                                  PARTIAL HYDROGRAPH   101.20


    RUNOFF VOLUME =     1.35334 INCHES     =        .6763 ACRE-FEET
    PEAK DISCHARGE RATE =      19.63 CFS  AT   1.533 HOURS   BASIN AREA =    .0094 SQ. MI.


*S **BASIN E
COMPUTE NM HYD       ID=6 HYD NO=102.00 AREA=0.00356 SQ MI
                     PER A=0 PER B=37 PER C=13 PER D=50
                     TP=-0.1333 HR   MASSRAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   7.0275    CFS   UNIT VOLUME =    .9978       B =   526.28      P60 = 1.8700
    AREA =      .001780 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
```

K = .124459HR TP = .133300HR K/TP RATIO = .933679 SHAPE CONSTANT, N = 3.788292
UNIT PEAK = 4.5508 CFS UNIT VOLUME = .9972 B = 340.80 P60 = 1.8700
AREA = .001780 SQ MI IA = .46100 INCHES INF = 1.14080 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=6 CODE=5

PARTIAL HYDROGRAPH 102.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.333	1.6	2.666	.1	4.000	.0	5.333	.0
.167	.0	1.500	7.5	2.833	.1	4.166	.0	5.499	.0
.333	.0	1.667	3.9	3.000	.1	4.333	.0	5.666	.0
.500	.0	1.833	2.2	3.166	.1	4.500	.0	5.833	.0
.667	.0	2.000	1.5	3.333	.0	4.666	.0	5.999	.0
.833	.0	2.166	.7	3.500	.0	4.833	.0	6.166	.0
1.000	.0	2.333	.3	3.666	.0	4.999	.0	6.333	.0
1.167	.0	2.500	.2	3.833	.0	5.166	.0	6.499	.0

RUNOFF VOLUME = 1.35334 INCHES = .2570 ACRE-FEET
PEAK DISCHARGE RATE = 7.54 CFS AT 1.500 HOURS BASIN AREA = .0036 SQ. MI.

ADD HYD ID=7 HYD NO=102.1 ID=5 ID=6

PRINT HYD ID=7 CODE=1

PARTIAL HYDROGRAPH 102.10

RUNOFF VOLUME = 1.35328 INCHES = .9332 ACRE-FEET
PEAK DISCHARGE RATE = 26.91 CFS AT 1.533 HOURS BASIN AREA = .0129 SQ. MI.

*S ** ROUTE BASINS A,C & E TO AUTUMN CANYON ROAD
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
MIN ELEV=100.00 FT MAX ELEV=100.67 FT
CH SLP=.02 FP SLP=.02 N=.017 DIST=32 FT
DIST ELEV DIST ELEV DIST ELEV
0 100.67 0.1 100.00 16 100.32
31.9 100.00 32.0 100.67

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.04	.06	.05	3.51
100.07	.25	.33	7.03
100.11	.56	.96	10.54
100.14	.99	2.07	14.06
100.18	1.55	3.75	17.57

100.21	2.23	6.10	21.09
100.25	3.04	9.20	24.60
100.28	3.97	13.13	28.12
100.32	5.02	17.98	31.63
100.35	6.14	25.01	31.91
100.39	7.27	33.05	31.92
100.42	8.40	41.95	31.93
100.46	9.52	51.67	31.94
100.49	10.65	62.16	31.95
100.53	11.77	73.40	31.96
100.56	12.90	85.36	31.97
100.60	14.03	98.01	31.98
100.63	15.16	111.33	31.99
100.67	16.28	125.31	32.00

COMPUTE TRAVEL TIME ID=8 REACH NO=1 NO VS=1 L=240 FT
SLP=.046

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.0805
.071	.248	.33	.0507
.106	.558	.96	.0387
.141	.992	2.07	.0320
.176	1.549	3.75	.0275
.212	2.231	6.10	.0244
.247	3.037	9.20	.0220
.282	3.966	13.13	.0201
.317	5.020	17.98	.0186
.353	6.144	25.01	.0164
.388	7.269	33.05	.0147
.423	8.395	41.95	.0133
.458	9.521	51.67	.0123
.494	10.647	62.16	.0114
.529	11.774	73.40	.0107
.564	12.901	85.36	.0101
.599	14.029	98.01	.0095
.635	15.157	111.33	.0091
.670	16.285	125.31	.0087

ROUTE ID=8 HYD NO=102.2 INFLOW ID=7 DT=0.0 HR
PRINT HYD ID=8 CODE=1

PARTIAL HYDROGRAPH 102.20

RUNOFF VOLUME = 1.35332 INCHES = .9332 ACRE-FEET
PEAK DISCHARGE RATE = 27.23 CFS AT 1.533 HOURS BASIN AREA = .0129 SQ. MI.

```
*S **BASIN G
COMPUTE NM HYD       ID=9 HYD NO=103.00 AREA=0.00291 SQ MI
                     PER A=0 PER B=37 PER C=13 PER D=50
                     TP=-0.1333 HR   MASSRAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   5.7444    CFS   UNIT VOLUME =    .9973       B =   526.28      P60 = 1.8700
    AREA =      .001455 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .124459HR    TP =   .133300HR    K/TP RATIO =   .933679     SHAPE CONSTANT, N =  3.788292
    UNIT PEAK =   3.7199    CFS   UNIT VOLUME =    .9966       B =   340.80      P60 = 1.8700
    AREA =      .001455 SQ MI    IA =    .46100 INCHES    INF =   1.14080 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=9   CODE=1

                                PARTIAL HYDROGRAPH   103.00


    RUNOFF VOLUME =     1.35334 INCHES      =         .2100 ACRE-FEET
    PEAK DISCHARGE RATE =       6.16 CFS  AT   1.500 HOURS   BASIN AREA =   .0029 SQ. MI.
```

```
ADD HYD              ID=10 HYD NO=103.1 ID=8 ID=9
*S ** ROUTE BASINS A,C,E & G TO AP2
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                     MIN ELEV=100.00 FT MAX ELEV=100.67 FT
                     CH SLP=.02 FP SLP=.02 N=.017 DIST=32 FT
                     DIST  ELEV  DIST  ELEV  DIST  ELEV
                       0  100.67 0.1  100.00   16   100.32
                     31.9 100.00 32.0 100.67
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.04	.06	.05	3.51
100.07	.25	.33	7.03
100.11	.56	.96	10.54
100.14	.99	2.07	14.06
100.18	1.55	3.75	17.57
100.21	2.23	6.10	21.09
100.25	3.04	9.20	24.60
100.28	3.97	13.13	28.12
100.32	5.02	17.98	31.63
100.35	6.14	25.01	31.91
100.39	7.27	33.05	31.92
100.42	8.40	41.95	31.93
100.46	9.52	51.67	31.94
100.49	10.65	62.16	31.95

100.53	11.77	73.40	31.96
100.56	12.90	85.36	31.97
100.60	14.03	98.01	31.98
100.63	15.16	111.33	31.99
100.67	16.28	125.31	32.00

COMPUTE TRAVEL TIME ID=11 REACH NO=1 NO VS=1 L=250 FT
SLP=.0149

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.0839
.071	.248	.33	.0528
.106	.558	.96	.0403
.141	.992	2.07	.0333
.176	1.549	3.75	.0287
.212	2.231	6.10	.0254
.247	3.037	9.20	.0229
.282	3.966	13.13	.0210
.317	5.020	17.98	.0194
.353	6.144	25.01	.0171
.388	7.269	33.05	.0153
.423	8.395	41.95	.0139
.458	9.521	51.67	.0128
.494	10.647	62.16	.0119
.529	11.774	73.40	.0111
.564	12.901	85.36	.0105
.599	14.029	98.01	.0099
.635	15.157	111.33	.0095
.670	16.285	125.31	.0090

ROUTE ID=11 HYD NO=103.2 INFLOW ID=10 DT=0.0 HR
PRINT HYD ID=11 CODE=1

PARTIAL HYDROGRAPH 103.20

RUNOFF VOLUME = 1.35330 INCHES = 1.1433 ACRE-FEET
PEAK DISCHARGE RATE = 33.31 CFS AT 1.533 HOURS BASIN AREA = .0158 SQ. MI.

*S **BASIN F
COMPUTE NM HYD ID=12 HYD NO=104.00 AREA=0.00356 SQ MI
PER A=0 PER B=37 PER C=13 PER D=50
TP=-0.1333 HR MASSRAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 7.0275 CFS UNIT VOLUME = .9978 B = 526.28 P60 = 1.8700
AREA = .001780 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

```
    K =    .124459HR     TP =    .133300HR     K/TP RATIO =    .933679      SHAPE CONSTANT, N =  3.788292
    UNIT PEAK =    4.5508     CFS    UNIT VOLUME =     .9972        B =    340.80       P60 = 1.8700
    AREA =       .001780 SQ MI     IA =     .46100 INCHES     INF =   1.14080 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD            ID=12   CODE=1

                                PARTIAL HYDROGRAPH   104.00


    RUNOFF VOLUME =      1.35334 INCHES      =         .2570 ACRE-FEET
    PEAK DISCHARGE RATE =        7.54 CFS  AT    1.500 HOURS   BASIN AREA =    .0036 SQ. MI.


ADD HYD              ID=13 HYD NO=104.1 ID=11 ID=12
*S TOTAL FLOW @ AP2
PRINT HYD            ID=13 CODE=5

                                PARTIAL HYDROGRAPH   104.10

     TIME      FLOW          TIME      FLOW          TIME      FLOW          TIME      FLOW          TIME      FLOW
      HRS       CFS           HRS       CFS           HRS       CFS           HRS       CFS           HRS       CFS
     .000        .0         1.500      37.2         3.000        .5         4.500        .2         5.999        .2
     .167        .0         1.667      24.5         3.166        .3         4.666        .2         6.166        .2
     .333        .0         1.833      13.4         3.333        .3         4.833        .2         6.333        .1
     .500        .0         2.000       8.8         3.500        .2         4.999        .2         6.499        .0
     .667        .0         2.166       5.1         3.666        .2         5.166        .2         6.666        .0
     .833        .0         2.333       2.4         3.833        .2         5.333        .2         6.833        .0
    1.000        .0         2.500       1.4         4.000        .2         5.499        .2         6.999        .0
    1.167        .0         2.666        .9         4.166        .2         5.666        .2         7.166        .0
    1.333       4.5         2.833        .6         4.333        .2         5.833        .2

    RUNOFF VOLUME =      1.35327 INCHES      =        1.4002 ACRE-FEET
    PEAK DISCHARGE RATE =       40.59 CFS  AT    1.533 HOURS   BASIN AREA =    .0194 SQ. MI.


*S ****************************************************************************
*S ****************************************************************************
*S **BASIN B
COMPUTE NM HYD       ID=14 HYD NO=200.00 AREA=0.00291 SQ MI
                     PER A=0 PER B=37 PER C=13 PER D=50
                     TP=-0.1333 HR   MASSRAIN=-1

    K =    .072649HR     TP =    .133300HR     K/TP RATIO =    .545000      SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =    5.7444     CFS    UNIT VOLUME =     .9973        B =    526.28       P60 = 1.8700
    AREA =       .001455 SQ MI     IA =     .10000 INCHES     INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330
```

```
    K =    .124459HR     TP =    .133300HR     K/TP RATIO =    .933679      SHAPE CONSTANT, N =  3.788292
    UNIT PEAK =    3.7199     CFS   UNIT VOLUME =     .9966        B =    340.80       P60 = 1.8700
    AREA =       .001455 SQ MI     IA =     .46100 INCHES     INF =   1.14080 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD           ID=14   CODE=1

                                  PARTIAL HYDROGRAPH   200.00


    RUNOFF VOLUME =     1.35334 INCHES     =         .2100 ACRE-FEET
    PEAK DISCHARGE RATE =       6.16 CFS  AT   1.500 HOURS   BASIN AREA =    .0029 SQ. MI.


*S ** ROUTE BASIN B THROUGH BASIN D TO AP1
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                     MIN ELEV=100.00 FT MAX ELEV=100.67 FT
                     CH SLP=.02 FP SLP=.02 N=.017 DIST=28 FT
                     DIST  ELEV  DIST  ELEV  DIST  ELEV
                       0  100.67 0.1  100.00   14   100.28
                     27.9 100.00 28.0 100.67

                                  RATING CURVE VALLEY SECTION  1.0
                                     WATER        FLOW         FLOW         TOP
                                    SURFACE       AREA         RATE        WIDTH
                                     ELEV         SQ FT        CFS          FT
                                    100.00          .00          .00          .00
                                    100.04          .06          .05         3.51
                                    100.07          .25          .33         7.02
                                    100.11          .56          .96        10.53
                                    100.14          .99         2.07        14.05
                                    100.18         1.55         3.75        17.56
                                    100.21         2.23         6.09        21.07
                                    100.25         3.03         9.19        24.58
                                    100.28         3.96        13.18        27.88
                                    100.32         4.95        19.05        27.89
                                    100.35         5.93        25.73        27.91
                                    100.39         6.91        33.18        27.92
                                    100.42         7.90        41.35        27.93
                                    100.46         8.88        50.21        27.94
                                    100.49         9.87        59.73        27.95
                                    100.53        10.85        69.89        27.96
                                    100.56        11.84        80.66        27.97
                                    100.60        12.83        92.01        27.98
                                    100.63        13.81       103.94        27.99
                                    100.67        14.80       116.42        28.00
COMPUTE TRAVEL TIME  ID=15 REACH NO=1 NO VS=1 L=640 FT
                     SLP=.0388

                              TRAVEL TIME TABLE
                                              REACH=  1.0
```

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.2148
.071	.248	.33	.1353
.106	.557	.96	.1032
.141	.991	2.07	.0852
.176	1.548	3.75	.0734
.212	2.229	6.09	.0650
.247	3.034	9.19	.0587
.282	3.962	13.18	.0534
.317	4.946	19.05	.0462
.353	5.930	25.73	.0410
.388	6.914	33.18	.0370
.423	7.898	41.35	.0340
.458	8.883	50.21	.0315
.494	9.869	59.73	.0294
.529	10.854	69.89	.0276
.564	11.841	80.66	.0261
.599	12.827	92.01	.0248
.635	13.814	103.94	.0236
.670	14.801	116.42	.0226

```
ROUTE                ID=15 HYD NO=200.1 INFLOW ID=14 DT=0.0 HR
PRINT HYD            ID=15 CODE=1

                              PARTIAL HYDROGRAPH   200.10

    RUNOFF VOLUME =      1.35342 INCHES     =         .2100 ACRE-FEET
    PEAK DISCHARGE RATE =       5.43 CFS  AT    1.567 HOURS   BASIN AREA =    .0029 SQ. MI.


*S **BASIN D
COMPUTE NM HYD       ID=16 HYD NO=201.00 AREA=0.00259 SQ MI
                     PER A=0 PER B=37 PER C=13 PER D=50
                     TP=-0.1333 HR   MASSRAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   5.1127    CFS   UNIT VOLUME =     .9973       B =   526.28      P60 = 1.8700
    AREA =       .001295 SQ MI    IA =     .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =    .124459HR    TP =    .133300HR    K/TP RATIO =    .933679     SHAPE CONSTANT, N =  3.788292
    UNIT PEAK =   3.3108    CFS   UNIT VOLUME =     .9962       B =   340.80      P60 = 1.8700
    AREA =       .001295 SQ MI    IA =     .46100 INCHES    INF =   1.14080 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=16   CODE=1

                              PARTIAL HYDROGRAPH   201.00
```

RUNOFF VOLUME = 1.35334 INCHES = .1869 ACRE-FEET
PEAK DISCHARGE RATE = 5.49 CFS AT 1.500 HOURS BASIN AREA = .0026 SQ. MI.

```
*S **TOTAL FLOW AT AP1 (BASIN B + D)
ADD HYD              ID=17 HYD NO=201.1 ID=15 ID=16
PRINT HYD            ID=17 CODE=5
```

PARTIAL HYDROGRAPH 201.10

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.500	10.1	3.000	.1	4.500	.0	5.999	.1
.167	.0	1.667	6.9	3.166	.1	4.666	.0	6.166	.0
.333	.0	1.833	3.8	3.333	.1	4.833	.0	6.333	.0
.500	.0	2.000	2.5	3.500	.1	4.999	.0	6.499	.0
.667	.0	2.166	1.4	3.666	.1	5.166	.0	6.666	.0
.833	.0	2.333	.7	3.833	.1	5.333	.0	6.833	.0
1.000	.0	2.500	.4	4.000	.0	5.499	.0	6.999	.0
1.167	.0	2.666	.3	4.166	.0	5.666	.1		
1.333	1.6	2.833	.2	4.333	.0	5.833	.1		

RUNOFF VOLUME = 1.35325 INCHES = .3969 ACRE-FEET
PEAK DISCHARGE RATE = 10.62 CFS AT 1.533 HOURS BASIN AREA = .0055 SQ. MI.

```
*S **OFFSITE BASIN TO THE NORTH (COMMERCIAL)
COMPUTE NM HYD       ID=18 HYD NO=202.00 AREA=0.0075 SQ MI
                     PER A=0 PER B=10 PER C=0 PER D=90
                     TP=-0.1333 HR   MASSRAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   26.649    CFS   UNIT VOLUME =    .9989       B =   526.28      P60 = 1.8700
    AREA =      .006750 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .130992HR    TP =   .133300HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
    UNIT PEAK =   1.8403    CFS   UNIT VOLUME =    .9932       B =   327.09      P60 = 1.8700
    AREA =      .000750 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=18   CODE=1
```

PARTIAL HYDROGRAPH 202.00

RUNOFF VOLUME = 1.83567 INCHES = .7343 ACRE-FEET
PEAK DISCHARGE RATE = 19.86 CFS AT 1.500 HOURS BASIN AREA = .0075 SQ. MI.

*S ** ROUTE OFFSITE FLOWS THROUGH BASIN 2B
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
MIN ELEV=100.00 FT MAX ELEV=100.67 FT
CH SLP=.02 FP SLP=.02 N=.017 DIST=28 FT
DIST ELEV DIST ELEV DIST ELEV
0 100.67 0.1 100.00 14 100.28
27.9 100.00 28.0 100.67

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.04	.06	.05	3.51
100.07	.25	.33	7.02
100.11	.56	.96	10.53
100.14	.99	2.07	14.05
100.18	1.55	3.75	17.56
100.21	2.23	6.09	21.07
100.25	3.03	9.19	24.58
100.28	3.96	13.18	27.88
100.32	4.95	19.05	27.89
100.35	5.93	25.73	27.91
100.39	6.91	33.18	27.92
100.42	7.90	41.35	27.93
100.46	8.88	50.21	27.94
100.49	9.87	59.73	27.95
100.53	10.85	69.89	27.96
100.56	11.84	80.66	27.97
100.60	12.83	92.01	27.98
100.63	13.81	103.94	27.99
100.67	14.80	116.42	28.00

COMPUTE TRAVEL TIME ID=19 REACH NO=1 NO VS=1 L=480 FT
SLP=.03

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.1611
.071	.248	.33	.1015
.106	.557	.96	.0774
.141	.991	2.07	.0639
.176	1.548	3.75	.0551
.212	2.229	6.09	.0488
.247	3.034	9.19	.0440
.282	3.962	13.18	.0401
.317	4.946	19.05	.0346
.353	5.930	25.73	.0307
.388	6.914	33.18	.0278
.423	7.898	41.35	.0255
.458	8.883	50.21	.0236

.494	9.869	59.73	.0220
.529	10.854	69.89	.0207
.564	11.841	80.66	.0196
.599	12.827	92.01	.0186
.635	13.814	103.94	.0177
.670	14.801	116.42	.0170

```
ROUTE                ID=19 HYD NO=202.1 INFLOW ID=18 DT=0.0 HR
PRINT HYD            ID=19 CODE=1
```

PARTIAL HYDROGRAPH 202.10

RUNOFF VOLUME = 1.83570 INCHES = .7343 ACRE-FEET
PEAK DISCHARGE RATE = 19.45 CFS AT 1.533 HOURS BASIN AREA = .0075 SQ. MI.

```
*S **BASIN 2B
COMPUTE NM HYD       ID=20 HYD NO=203.00 AREA=0.0142 SQ MI
                     PER A=0 PER B=37 PER C=13 PER D=50
                     TP=-0.1333 HR   MASSRAIN=-1
```

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 28.031 CFS UNIT VOLUME = .9990 B = 526.28 P60 = 1.8700
AREA = .007100 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .124459HR TP = .133300HR K/TP RATIO = .933679 SHAPE CONSTANT, N = 3.788292
UNIT PEAK = 18.152 CFS UNIT VOLUME = .9995 B = 340.80 P60 = 1.8700
AREA = .007100 SQ MI IA = .46100 INCHES INF = 1.14080 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

```
PRINT HYD            ID=20   CODE=1
```

PARTIAL HYDROGRAPH 203.00

RUNOFF VOLUME = 1.35334 INCHES = 1.0249 ACRE-FEET
PEAK DISCHARGE RATE = 30.02 CFS AT 1.500 HOURS BASIN AREA = .0142 SQ. MI.

```
*S **TOTAL FLOW AT AP3 (OFFSITE FLOWS + BASIN 2B)
ADD HYD              ID=1 HYD NO=203.1 ID=19 ID=20
PRINT HYD            ID=1 CODE=5
```

PARTIAL HYDROGRAPH 203.10

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.500	48.4	3.000	.5	4.500	.2	5.999	.3
.167	.0	1.667	27.1	3.166	.4	4.666	.2	6.166	.2
.333	.0	1.833	15.7	3.333	.3	4.833	.2	6.333	.1

.500	.0	2.000	11.0	3.500	.3	4.999	.2	6.499	.0
.667	.0	2.166	5.7	3.666	.3	5.166	.2	6.666	.0
.833	.0	2.333	2.7	3.833	.2	5.333	.2	6.833	.0
1.000	.0	2.500	1.6	4.000	.2	5.499	.2	6.999	.0
1.167	.1	2.666	1.1	4.166	.2	5.666	.3	7.166	.0
1.333	9.9	2.833	.8	4.333	.2	5.833	.3		

RUNOFF VOLUME = 1.52002 INCHES = 1.7592 ACRE-FEET
PEAK DISCHARGE RATE = 48.45 CFS AT 1.533 HOURS BASIN AREA = .0217 SQ. MI.

```
*S **TOTAL FLOW AT BASIN 2F (AP1 + AP3)
ADD HYD             ID=2 HYD NO=204.0 ID=1 ID=17
PRINT HYD           ID=2 CODE=1
```

PARTIAL HYDROGRAPH 204.00

RUNOFF VOLUME = 1.48630 INCHES = 2.1561 ACRE-FEET
PEAK DISCHARGE RATE = 59.08 CFS AT 1.533 HOURS BASIN AREA = .0272 SQ. MI.

```
*S ** ROUTE BASINS AP1 & AP3 THROUGH BASIN 2F
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
MIN ELEV=100.00 FT MAX ELEV=100.67 FT
CH SLP=.02 FP SLP=.02 N=.017 DIST=32 FT
DIST  ELEV  DIST  ELEV  DIST  ELEV
  0  100.67 0.1  100.00   16   100.32
31.9 100.00 32.0 100.67
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.04	.06	.05	3.51
100.07	.25	.33	7.03
100.11	.56	.96	10.54
100.14	.99	2.07	14.06
100.18	1.55	3.75	17.57
100.21	2.23	6.10	21.09
100.25	3.04	9.20	24.60
100.28	3.97	13.13	28.12
100.32	5.02	17.98	31.63
100.35	6.14	25.01	31.91
100.39	7.27	33.05	31.92
100.42	8.40	41.95	31.93
100.46	9.52	51.67	31.94
100.49	10.65	62.16	31.95
100.53	11.77	73.40	31.96
100.56	12.90	85.36	31.97
100.60	14.03	98.01	31.98

```
                                    100.63        15.16       111.33        31.99
                                    100.67        16.28       125.31        32.00
COMPUTE TRAVEL TIME  ID=3 REACH NO=1 NO VS=1 L=370 FT
                     SLP=.0222

                          TRAVEL TIME TABLE
                                        REACH=  1.0

                          WATER         AVERAGE       FLOW          TRAVEL
                          DEPTH         AREA          RATE          TIME
                          FEET          SQ.FT.        CFS           HRS
                             .035          .062           .05         .1242
                             .071          .248           .33         .0782
                             .106          .558           .96         .0597
                             .141          .992          2.07         .0493
                             .176         1.549          3.75         .0425
                             .212         2.231          6.10         .0376
                             .247         3.037          9.20         .0339
                             .282         3.966         13.13         .0310
                             .317         5.020         17.98         .0287
                             .353         6.144         25.01         .0253
                             .388         7.269         33.05         .0226
                             .423         8.395         41.95         .0206
                             .458         9.521         51.67         .0189
                             .494        10.647         62.16         .0176
                             .529        11.774         73.40         .0165
                             .564        12.901         85.36         .0155
                             .599        14.029         98.01         .0147
                             .635        15.157        111.33         .0140
                             .670        16.285        125.31         .0134
ROUTE                ID=3 HYD NO=204.1 INFLOW ID=2 DT=0.0 HR
PRINT HYD            ID=3 CODE=1

                                  PARTIAL HYDROGRAPH   204.10


    RUNOFF VOLUME =     1.48632 INCHES     =       2.1561 ACRE-FEET
    PEAK DISCHARGE RATE =      59.95 CFS  AT   1.533 HOURS   BASIN AREA =    .0272 SQ. MI.


*S **BASIN 2F
COMPUTE NM HYD       ID=4 HYD NO=205.00 AREA=0.0036 SQ MI
                     PER A=0 PER B=37 PER C=13 PER D=50
                     TP=-0.1333 HR   MASSRAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   7.1065    CFS   UNIT VOLUME =    .9978       B =   526.28      P60 = 1.8700
    AREA =      .001800 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
```

```
    K =    .124459HR     TP =    .133300HR     K/TP RATIO =    .933679      SHAPE CONSTANT, N =  3.788292
    UNIT PEAK =    4.6019     CFS   UNIT VOLUME =     .9975        B =    340.80       P60 = 1.8700
    AREA =       .001800 SQ MI     IA =     .46100 INCHES     INF =   1.14080 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD           ID=4   CODE=1

                                    PARTIAL HYDROGRAPH   205.00


    RUNOFF VOLUME =      1.35334 INCHES      =         .2598 ACRE-FEET
    PEAK DISCHARGE RATE =        7.62 CFS  AT    1.500 HOURS   BASIN AREA =    .0036 SQ. MI.


ADD HYD             ID=5 HYD NO=205.1 ID=4 ID=3
PRINT HYD           ID=5 CODE=1

                                    PARTIAL HYDROGRAPH   205.10


    RUNOFF VOLUME =      1.47075 INCHES      =        2.4159 ACRE-FEET
    PEAK DISCHARGE RATE =       67.31 CFS  AT    1.533 HOURS   BASIN AREA =    .0308 SQ. MI.


*S ADD FLOW FROM AP2
ADD HYD             ID=6 HYD NO=205.2 ID=13 ID=5
PRINT HYD           ID=6 CODE=1

                                    PARTIAL HYDROGRAPH   205.20


    RUNOFF VOLUME =      1.42535 INCHES      =        3.8161 ACRE-FEET
    PEAK DISCHARGE RATE =      107.90 CFS  AT    1.533 HOURS   BASIN AREA =    .0502 SQ. MI.


*S ** ROUTE BASINS AP1, AP2 & AP3 THROUGH BASIN 2I
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                    MIN ELEV=100.00 FT MAX ELEV=100.67 FT
                    CH SLP=.02 FP SLP=.02 N=.017 DIST=32 FT
                    DIST  ELEV  DIST  ELEV  DIST  ELEV
                      0  100.67 0.1  100.00   16   100.32
                    31.9 100.00 32.0 100.67

                                RATING CURVE VALLEY SECTION  1.0
                                  WATER       FLOW        FLOW        TOP
                                 SURFACE      AREA        RATE       WIDTH
                                  ELEV        SQ FT       CFS         FT
                                 100.00         .00         .00         .00
                                 100.04         .06         .05        3.51
                                 100.07         .25         .33        7.03
                                 100.11         .56         .96       10.54
```

100.14	.99	2.07	14.06
100.18	1.55	3.75	17.57
100.21	2.23	6.10	21.09
100.25	3.04	9.20	24.60
100.28	3.97	13.13	28.12
100.32	5.02	17.98	31.63
100.35	6.14	25.01	31.91
100.39	7.27	33.05	31.92
100.42	8.40	41.95	31.93
100.46	9.52	51.67	31.94
100.49	10.65	62.16	31.95
100.53	11.77	73.40	31.96
100.56	12.90	85.36	31.97
100.60	14.03	98.01	31.98
100.63	15.16	111.33	31.99
100.67	16.28	125.31	32.00

COMPUTE TRAVEL TIME ID=7 REACH NO=1 NO VS=1 L=490 FT
SLP=.0338

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.1644
.071	.248	.33	.1036
.106	.558	.96	.0790
.141	.992	2.07	.0653
.176	1.549	3.75	.0562
.212	2.231	6.10	.0498
.247	3.037	9.20	.0449
.282	3.966	13.13	.0411
.317	5.020	17.98	.0380
.353	6.144	25.01	.0334
.388	7.269	33.05	.0299
.423	8.395	41.95	.0272
.458	9.521	51.67	.0251
.494	10.647	62.16	.0233
.529	11.774	73.40	.0218
.564	12.901	85.36	.0206
.599	14.029	98.01	.0195
.635	15.157	111.33	.0185
.670	16.285	125.31	.0177

ROUTE ID=7 HYD NO=205.3 INFLOW ID=6 DT=0.0 HR
PRINT HYD ID=7 CODE=1

PARTIAL HYDROGRAPH 205.30

RUNOFF VOLUME = 1.42536 INCHES = 3.8161 ACRE-FEET
PEAK DISCHARGE RATE = 107.46 CFS AT 1.533 HOURS BASIN AREA = .0502 SQ. MI.

```
*S **BASIN 2I
COMPUTE NM HYD       ID=8 HYD NO=206.00 AREA=0.0055 SQ MI
                     PER A=0 PER B=31 PER C=10 PER D=59
                     TP=-0.1333 HR   MASSRAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   12.811    CFS   UNIT VOLUME =    .9985       B =   526.28      P60 = 1.8700
    AREA =      .003245 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .124864HR    TP =   .133300HR    K/TP RATIO =   .936713     SHAPE CONSTANT, N =  3.775485
    UNIT PEAK =   5.7502    CFS   UNIT VOLUME =    .9978       B =   339.91      P60 = 1.8700
    AREA =      .002255 SQ MI    IA =    .46341 INCHES    INF =   1.14756 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=8   CODE=1

                                  PARTIAL HYDROGRAPH   206.00


    RUNOFF VOLUME =     1.46152 INCHES     =         .4287 ACRE-FEET
    PEAK DISCHARGE RATE =      12.29 CFS  AT   1.500 HOURS   BASIN AREA =   .0055 SQ. MI.


ADD HYD              ID=9 HYD NO=206.1 ID=7 ID=8
PRINT HYD            ID=9 CODE=1

                                  PARTIAL HYDROGRAPH   206.10


    RUNOFF VOLUME =     1.42892 INCHES     =        4.2448 ACRE-FEET
    PEAK DISCHARGE RATE =     119.29 CFS  AT   1.533 HOURS   BASIN AREA =   .0557 SQ. MI.


*S **ROUTE BASIN AP1,AP2,AP3 & BASIN 2I TO AMOLE CHANNEL
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                     MIN ELEV=100.00 FT MAX ELEV=100.67 FT
                     CH SLP=.02 FP SLP=.02 N=.017 DIST=32 FT
                     DIST  ELEV  DIST  ELEV  DIST  ELEV
                       0  100.67 0.1  100.00   16   100.32
                     31.9 100.00 32.0 100.67

                                  RATING CURVE VALLEY SECTION  1.0
                                      WATER       FLOW        FLOW        TOP
                                     SURFACE      AREA        RATE       WIDTH
                                      ELEV        SQ FT       CFS         FT
                                     100.00         .00         .00         .00
                                     100.04         .06         .05        3.51
                                     100.07         .25         .33        7.03
                                     100.11         .56         .96       10.54
                                     100.14         .99        2.07       14.06
```

100.18	1.55	3.75	17.57
100.21	2.23	6.10	21.09
100.25	3.04	9.20	24.60
100.28	3.97	13.13	28.12
100.32	5.02	17.98	31.63
100.35	6.14	25.01	31.91
100.39	7.27	33.05	31.92
100.42	8.40	41.95	31.93
100.46	9.52	51.67	31.94
100.49	10.65	62.16	31.95
100.53	11.77	73.40	31.96
100.56	12.90	85.36	31.97
100.60	14.03	98.01	31.98
100.63	15.16	111.33	31.99
100.67	16.28	125.31	32.00

COMPUTE TRAVEL TIME ID=10 REACH NO=1 NO VS=1 L=240 FT
SLP=.0338

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.0805
.071	.248	.33	.0507
.106	.558	.96	.0387
.141	.992	2.07	.0320
.176	1.549	3.75	.0275
.212	2.231	6.10	.0244
.247	3.037	9.20	.0220
.282	3.966	13.13	.0201
.317	5.020	17.98	.0186
.353	6.144	25.01	.0164
.388	7.269	33.05	.0147
.423	8.395	41.95	.0133
.458	9.521	51.67	.0123
.494	10.647	62.16	.0114
.529	11.774	73.40	.0107
.564	12.901	85.36	.0101
.599	14.029	98.01	.0095
.635	15.157	111.33	.0091
.670	16.285	125.31	.0087

ROUTE ID=10 HYD NO=206.2 INFLOW ID=9 DT=0.0 HR
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 206.20

RUNOFF VOLUME = 1.42893 INCHES = 4.2448 ACRE-FEET
PEAK DISCHARGE RATE = 119.04 CFS AT 1.533 HOURS BASIN AREA = .0557 SQ. MI.

```
*S **BASIN 2J
COMPUTE NM HYD       ID=11 HYD NO=207.00 AREA=0.0029 SQ MI
                     PER A=0 PER B=31 PER C=10 PER D=59
                     TP=-0.1333 HR   MASSRAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =    6.7551    CFS   UNIT VOLUME =     .9976       B =   526.28      P60 = 1.8700
    AREA =       .001711 SQ MI    IA =     .10000 INCHES    INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330


    K =    .124864HR    TP =    .133300HR    K/TP RATIO =    .936713     SHAPE CONSTANT, N =  3.775485
    UNIT PEAK =    3.0319    CFS   UNIT VOLUME =     .9958       B =   339.91      P60 = 1.8700
    AREA =       .001189 SQ MI    IA =     .46341 INCHES    INF =   1.14756 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD            ID=11   CODE=1

                                PARTIAL HYDROGRAPH   207.00


    RUNOFF VOLUME =     1.46152 INCHES      =         .2260 ACRE-FEET
    PEAK DISCHARGE RATE =       6.49 CFS  AT    1.500 HOURS   BASIN AREA =    .0029 SQ. MI.
```

```
ADD HYD              ID=12 HYD NO=207.1 ID=11 ID=10
*S TOTAL FLOW @ AP4 (ENTRANCE TO AMOLE DEL NORTE CHANNEL)
PRINT HYD            ID=12 CODE=5

                                PARTIAL HYDROGRAPH   207.10

     TIME      FLOW          TIME      FLOW          TIME      FLOW          TIME      FLOW          TIME      FLOW
      HRS       CFS           HRS       CFS           HRS       CFS           HRS       CFS           HRS       CFS
     .000        .0         1.667      80.3         3.333       1.0         4.999        .5         6.666        .1
     .167        .0         1.833      44.4         3.500        .8         5.166        .5         6.833        .1
     .333        .0         2.000      29.8         3.666        .7         5.333        .6         6.999        .0
     .500        .0         2.166      18.8         3.833        .6         5.499        .6         7.166        .0
     .667        .0         2.333       9.0         4.000        .6         5.666        .6         7.333        .0
     .833        .0         2.500       5.2         4.166        .6         5.833        .6         7.499        .0
    1.000        .0         2.666       3.4         4.333        .5         5.999        .6         7.666        .0
    1.167        .0         2.833       2.4         4.500        .5         6.166        .6         7.833        .0
    1.333       8.6         3.000       1.7         4.666        .5         6.333        .4
    1.500     110.8         3.166       1.3         4.833        .5         6.499        .2

    RUNOFF VOLUME =     1.43053 INCHES      =        4.4708 ACRE-FEET
    PEAK DISCHARGE RATE =     125.29 CFS  AT    1.533 HOURS   BASIN AREA =    .0586 SQ. MI.


*S ***************************************************************************
*S ***************************************************************************
**FUTURE PHASES****
*S **BASIN 2A1
```

```
COMPUTE NM HYD       ID=13 HYD NO=300.00 AREA=0.0087 SQ MI
                     PER A=0 PER B=37 PER C=13 PER D=50
                     TP=-0.1333 HR   MASSRAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   17.174    CFS   UNIT VOLUME =    .9988       B =   526.28      P60 = 1.8700
    AREA =      .004350 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .124459HR    TP =   .133300HR    K/TP RATIO =   .933679     SHAPE CONSTANT, N =  3.788292
    UNIT PEAK =   11.121    CFS   UNIT VOLUME =    .9990       B =   340.80      P60 = 1.8700
    AREA =      .004350 SQ MI    IA =    .46100 INCHES    INF =   1.14080 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=13   CODE=1

                                    HYDROGRAPH FROM AREA   300.00


    RUNOFF VOLUME =     1.35334 INCHES     =        .6279 ACRE-FEET
    PEAK DISCHARGE RATE =      18.40 CFS  AT   1.500 HOURS   BASIN AREA =   .0087 SQ. MI.


*S **ROUTE BASIN 2A1 TO AP5 (32' F-F STREET)
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                     MIN ELEV=100.00 FT MAX ELEV=100.67 FT
                     CH SLP=.02 FP SLP=.02 N=.017 DIST=32 FT
                     DIST  ELEV  DIST  ELEV  DIST  ELEV
                       0  100.67 0.1  100.00   16   100.32
                     31.9 100.00 32.0 100.67

                              RATING CURVE VALLEY SECTION  1.0
                                WATER        FLOW        FLOW        TOP
                              SURFACE        AREA        RATE       WIDTH
                                ELEV        SQ FT        CFS         FT
                              100.00          .00         .00         .00
                              100.04          .06         .05        3.51
                              100.07          .25         .33        7.03
                              100.11          .56         .96       10.54
                              100.14          .99        2.07       14.06
                              100.18         1.55        3.75       17.57
                              100.21         2.23        6.10       21.09
                              100.25         3.04        9.20       24.60
                              100.28         3.97       13.13       28.12
                              100.32         5.02       17.98       31.63
                              100.35         6.14       25.01       31.91
                              100.39         7.27       33.05       31.92
                              100.42         8.40       41.95       31.93
                              100.46         9.52       51.67       31.94
                              100.49        10.65       62.16       31.95
                              100.53        11.77       73.40       31.96
                              100.56        12.90       85.36       31.97
```

100.60	14.03	98.01	31.98
100.63	15.16	111.33	31.99
100.67	16.28	125.31	32.00

COMPUTE TRAVEL TIME ID=14 REACH NO=1 NO VS=1 L=620 FT
SLP=.0312

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.2081
.071	.248	.33	.1311
.106	.558	.96	.1000
.141	.992	2.07	.0826
.176	1.549	3.75	.0712
.212	2.231	6.10	.0630
.247	3.037	9.20	.0569
.282	3.966	13.13	.0520
.317	5.020	17.98	.0481
.353	6.144	25.01	.0423
.388	7.269	33.05	.0379
.423	8.395	41.95	.0345
.458	9.521	51.67	.0317
.494	10.647	62.16	.0295
.529	11.774	73.40	.0276
.564	12.901	85.36	.0260
.599	14.029	98.01	.0247
.635	15.157	111.33	.0234
.670	16.285	125.31	.0224

ROUTE ID=14 HYD NO=300.1 INFLOW ID=13 DT=0.0 HR
PRINT HYD ID=14 CODE=1

HYDROGRAPH FROM AREA 300.10

RUNOFF VOLUME = 1.35337 INCHES = .6280 ACRE-FEET
PEAK DISCHARGE RATE = 17.05 CFS AT 1.533 HOURS BASIN AREA = .0087 SQ. MI.

*S **BASIN 2A2
COMPUTE NM HYD ID=15 HYD NO=301.00 AREA=0.0055 SQ MI
PER A=0 PER B=31 PER C=10 PER D=59
TP=-0.1333 HR MASSRAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 12.811 CFS UNIT VOLUME = .9985 B = 526.28 P60 = 1.8700
AREA = .003245 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

```
    K =   .124864HR    TP =   .133300HR    K/TP RATIO =   .936713     SHAPE CONSTANT, N =  3.775485
    UNIT PEAK =   5.7502    CFS   UNIT VOLUME =    .9978       B =   339.91      P60 = 1.8700
    AREA =      .002255 SQ MI    IA =    .46341 INCHES    INF =   1.14756 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=15   CODE=1

                                    HYDROGRAPH FROM AREA   301.00


    RUNOFF VOLUME =     1.46152 INCHES     =        .4287 ACRE-FEET
    PEAK DISCHARGE RATE =      12.29 CFS  AT   1.500 HOURS   BASIN AREA =   .0055 SQ. MI.


*S ** ADD BASIN 2A1 & 2A2 TO FIND FLOW AT AP5
ADD HYD             ID=16 HYD NO=302.00 ID=14 ID=15
PRINT HYD           ID=16 CODE=5

                                    HYDROGRAPH FROM AREA   302.00

     TIME      FLOW          TIME      FLOW          TIME      FLOW          TIME      FLOW          TIME      FLOW
      HRS       CFS           HRS       CFS           HRS       CFS           HRS       CFS           HRS       CFS
     .000        .0         1.500      27.6         3.000        .3         4.500        .1         5.999        .2
     .167        .0         1.667      18.0         3.166        .3         4.666        .1         6.166        .1
     .333        .0         1.833       9.9         3.333        .2         4.833        .1         6.333        .0
     .500        .0         2.000       6.6         3.500        .2         4.999        .1         6.499        .0
     .667        .0         2.166       3.6         3.666        .2         5.166        .1         6.666        .0
     .833        .0         2.333       1.7         3.833        .1         5.333        .1         6.833        .0
    1.000        .0         2.500       1.1         4.000        .1         5.499        .1         6.999        .0
    1.167        .0         2.666        .7         4.166        .1         5.666        .1         7.166        .0
    1.333       4.7         2.833        .5         4.333        .1         5.833        .1

    RUNOFF VOLUME =     1.39521 INCHES     =       1.0566 ACRE-FEET
    PEAK DISCHARGE RATE =      28.89 CFS  AT   1.533 HOURS   BASIN AREA =   .0142 SQ. MI.


*S **BASIN 2C1
COMPUTE NM HYD      ID=17 HYD NO=303.00 AREA=0.0046 SQ MI
                    PER A=0 PER B=37 PER C=13 PER D=50
                    TP=-0.1333 HR   MASSRAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   9.0805    CFS   UNIT VOLUME =    .9981       B =   526.28      P60 = 1.8700
    AREA =      .002300 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .124459HR    TP =   .133300HR    K/TP RATIO =   .933679     SHAPE CONSTANT, N =  3.788292
    UNIT PEAK =   5.8803    CFS   UNIT VOLUME =    .9979       B =   340.80      P60 = 1.8700
    AREA =      .002300 SQ MI    IA =    .46100 INCHES    INF =   1.14080 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
```

PRINT HYD ID=17 CODE=1

HYDROGRAPH FROM AREA 303.00

RUNOFF VOLUME = 1.35334 INCHES = .3320 ACRE-FEET
PEAK DISCHARGE RATE = 9.74 CFS AT 1.500 HOURS BASIN AREA = .0046 SQ. MI.

*S **ROUTE BASIN 2C1 TO OLD ASPEN RD (28' F-F STREET)
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
MIN ELEV=100.00 FT MAX ELEV=100.67 FT
CH SLP=.02 FP SLP=.02 N=.017 DIST=28 FT
DIST ELEV DIST ELEV DIST ELEV
0 100.67 0.1 100.00 14 100.28
27.9 100.00 28.0 100.67

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.04	.06	.05	3.51
100.07	.25	.33	7.02
100.11	.56	.96	10.53
100.14	.99	2.07	14.05
100.18	1.55	3.75	17.56
100.21	2.23	6.09	21.07
100.25	3.03	9.19	24.58
100.28	3.96	13.18	27.88
100.32	4.95	19.05	27.89
100.35	5.93	25.73	27.91
100.39	6.91	33.18	27.92
100.42	7.90	41.35	27.93
100.46	8.88	50.21	27.94
100.49	9.87	59.73	27.95
100.53	10.85	69.89	27.96
100.56	11.84	80.66	27.97
100.60	12.83	92.01	27.98
100.63	13.81	103.94	27.99
100.67	14.80	116.42	28.00

COMPUTE TRAVEL TIME ID=18 REACH NO=1 NO VS=1 L=350 FT
SLP=.0375

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.1174
.071	.248	.33	.0740
.106	.557	.96	.0565

.141	.991	2.07	.0466
.176	1.548	3.75	.0402
.212	2.229	6.09	.0356
.247	3.034	9.19	.0321
.282	3.962	13.18	.0292
.317	4.946	19.05	.0252
.353	5.930	25.73	.0224
.388	6.914	33.18	.0203
.423	7.898	41.35	.0186
.458	8.883	50.21	.0172
.494	9.869	59.73	.0161
.529	10.854	69.89	.0151
.564	11.841	80.66	.0143
.599	12.827	92.01	.0136
.635	13.814	103.94	.0129
.670	14.801	116.42	.0124

```
ROUTE                ID=18 HYD NO=303.1 INFLOW ID=17 DT=0.0 HR
PRINT HYD            ID=18 CODE=1

                                  HYDROGRAPH FROM AREA   303.10


    RUNOFF VOLUME =     1.35339 INCHES     =        .3320 ACRE-FEET
    PEAK DISCHARGE RATE =       9.49 CFS  AT   1.533 HOURS   BASIN AREA =    .0046 SQ. MI.


*S ** BASIN 2C2
COMPUTE NM HYD       ID=19 HYD NO=303.20 AREA=0.0035 SQ MI
                     PER A=0 PER B=31 PER C=10 PER D=59
                     TP=-0.1333 HR   MASSRAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   8.1527    CFS   UNIT VOLUME =    .9981       B =   526.28      P60 = 1.8700
    AREA =      .002065 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .124864HR    TP =   .133300HR    K/TP RATIO =   .936713     SHAPE CONSTANT, N =  3.775485
    UNIT PEAK =   3.6592    CFS   UNIT VOLUME =    .9965       B =   339.91      P60 = 1.8700
    AREA =      .001435 SQ MI    IA =    .46341 INCHES    INF =   1.14756 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=19   CODE=1

                                  HYDROGRAPH FROM AREA   303.20


    RUNOFF VOLUME =     1.46152 INCHES     =        .2728 ACRE-FEET
    PEAK DISCHARGE RATE =       7.83 CFS  AT   1.500 HOURS   BASIN AREA =    .0035 SQ. MI.
```

```
*S **ADD BASIN 2C1 & 2C2
ADD HYD              ID=20 HYD NO=303.3 ID=19 ID=18
PRINT HYD            ID=20 CODE=1

                                    HYDROGRAPH FROM AREA   303.30

    RUNOFF VOLUME =     1.40002 INCHES     =        .6048 ACRE-FEET
    PEAK DISCHARGE RATE =      17.03 CFS  AT   1.533 HOURS   BASIN AREA =    .0081 SQ. MI.


*S **ADD BASINS 2A & 2C
ADD HYD              ID=1 HYD NO=304.00 ID=20 ID=16
PRINT HYD            ID=1 CODE=1

                                    HYDROGRAPH FROM AREA   304.00

    RUNOFF VOLUME =     1.39696 INCHES     =       1.6614 ACRE-FEET
    PEAK DISCHARGE RATE =      45.91 CFS  AT   1.533 HOURS   BASIN AREA =    .0223 SQ. MI.


*S **ROUTE BASINS 2A & 2C TO AP6 (32' F-F STREET)
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                     MIN ELEV=100.00 FT MAX ELEV=100.67 FT
                     CH SLP=.02 FP SLP=.02 N=.017 DIST=32 FT
                     DIST  ELEV  DIST  ELEV  DIST  ELEV
                       0  100.67 0.1  100.00   16   100.32
                     31.9 100.00 32.0 100.67

                              RATING CURVE VALLEY SECTION  1.0
                                 WATER       FLOW        FLOW        TOP
                                SURFACE      AREA        RATE       WIDTH
                                 ELEV        SQ FT       CFS        FT
                                100.00         .00         .00         .00
                                100.04         .06         .05        3.51
                                100.07         .25         .33        7.03
                                100.11         .56         .96       10.54
                                100.14         .99        2.07       14.06
                                100.18        1.55        3.75       17.57
                                100.21        2.23        6.10       21.09
                                100.25        3.04        9.20       24.60
                                100.28        3.97       13.13       28.12
                                100.32        5.02       17.98       31.63
                                100.35        6.14       25.01       31.91
                                100.39        7.27       33.05       31.92
                                100.42        8.40       41.95       31.93
                                100.46        9.52       51.67       31.94
                                100.49       10.65       62.16       31.95
                                100.53       11.77       73.40       31.96
                                100.56       12.90       85.36       31.97
                                100.60       14.03       98.01       31.98
```

```
                                    100.63        15.16       111.33        31.99
                                    100.67        16.28       125.31        32.00
COMPUTE TRAVEL TIME  ID=3 REACH NO=1 NO VS=1 L=480 FT
                     SLP=.013

                          TRAVEL TIME TABLE
                                        REACH=  1.0

                          WATER         AVERAGE       FLOW          TRAVEL
                          DEPTH         AREA          RATE          TIME
                          FEET          SQ.FT.        CFS           HRS
                             .035          .062           .05         .1611
                             .071          .248           .33         .1015
                             .106          .558           .96         .0774
                             .141          .992          2.07         .0639
                             .176         1.549          3.75         .0551
                             .212         2.231          6.10         .0488
                             .247         3.037          9.20         .0440
                             .282         3.966         13.13         .0403
                             .317         5.020         17.98         .0372
                             .353         6.144         25.01         .0328
                             .388         7.269         33.05         .0293
                             .423         8.395         41.95         .0267
                             .458         9.521         51.67         .0246
                             .494        10.647         62.16         .0228
                             .529        11.774         73.40         .0214
                             .564        12.901         85.36         .0202
                             .599        14.029         98.01         .0191
                             .635        15.157        111.33         .0182
                             .670        16.285        125.31         .0173
ROUTE                ID=3 HYD NO=304.1 INFLOW ID=1 DT=0.0 HR
PRINT HYD            ID=3 CODE=1

                                    HYDROGRAPH FROM AREA   304.10


    RUNOFF VOLUME =     1.39698 INCHES     =       1.6615 ACRE-FEET
    PEAK DISCHARGE RATE =      45.68 CFS  AT   1.533 HOURS   BASIN AREA =    .0223 SQ. MI.


*S **BASIN 2D
COMPUTE NM HYD       ID=4 HYD NO=305.00 AREA=0.0058 SQ MI
                     PER A=0 PER B=31 PER C=10 PER D=59
                     TP=-0.1333 HR   MASSRAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   13.510    CFS   UNIT VOLUME =    .9985       B =   526.28      P60 = 1.8700
    AREA =      .003422 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
```

K = .124864HR TP = .133300HR K/TP RATIO = .936713 SHAPE CONSTANT, N = 3.775485
UNIT PEAK = 6.0639 CFS UNIT VOLUME = .9981 B = 339.91 P60 = 1.8700
AREA = .002378 SQ MI IA = .46341 INCHES INF = 1.14756 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=4 CODE=1

HYDROGRAPH FROM AREA 305.00

RUNOFF VOLUME = 1.46152 INCHES = .4521 ACRE-FEET
PEAK DISCHARGE RATE = 12.96 CFS AT 1.500 HOURS BASIN AREA = .0058 SQ. MI.

*S **ROUTE BASIN 2D TO AP6 (32' F-F STREET)
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
MIN ELEV=100.00 FT MAX ELEV=100.67 FT
CH SLP=.02 FP SLP=.02 N=.017 DIST=32 FT
DIST ELEV DIST ELEV DIST ELEV
0 100.67 0.1 100.00 16 100.32
31.9 100.00 32.0 100.67

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.04	.06	.05	3.51
100.07	.25	.33	7.03
100.11	.56	.96	10.54
100.14	.99	2.07	14.06
100.18	1.55	3.75	17.57
100.21	2.23	6.10	21.09
100.25	3.04	9.20	24.60
100.28	3.97	13.13	28.12
100.32	5.02	17.98	31.63
100.35	6.14	25.01	31.91
100.39	7.27	33.05	31.92
100.42	8.40	41.95	31.93
100.46	9.52	51.67	31.94
100.49	10.65	62.16	31.95
100.53	11.77	73.40	31.96
100.56	12.90	85.36	31.97
100.60	14.03	98.01	31.98
100.63	15.16	111.33	31.99
100.67	16.28	125.31	32.00

COMPUTE TRAVEL TIME ID=5 REACH NO=1 NO VS=1 L=210 FT
SLP=.013

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.0705
.071	.248	.33	.0444
.106	.558	.96	.0339
.141	.992	2.07	.0280
.176	1.549	3.75	.0241
.212	2.231	6.10	.0213
.247	3.037	9.20	.0193
.282	3.966	13.13	.0176
.317	5.020	17.98	.0163
.353	6.144	25.01	.0143
.388	7.269	33.05	.0128
.423	8.395	41.95	.0117
.458	9.521	51.67	.0107
.494	10.647	62.16	.0100
.529	11.774	73.40	.0094
.564	12.901	85.36	.0088
.599	14.029	98.01	.0083
.635	15.157	111.33	.0079
.670	16.285	125.31	.0076

```
ROUTE                ID=5 HYD NO=305.1 INFLOW ID=4 DT=0.0 HR
PRINT HYD            ID=5 CODE=1
```

HYDROGRAPH FROM AREA 305.10

RUNOFF VOLUME = 1.46156 INCHES = .4521 ACRE-FEET
PEAK DISCHARGE RATE = 12.82 CFS AT 1.533 HOURS BASIN AREA = .0058 SQ. MI.

```
*S **ADD BASINS 2A, 2C & 2D TOGETHER
ADD HYD              ID=6 HYD NO=306.00 ID=5 ID=3
PRINT HYD            ID=6 CODE=1
```

HYDROGRAPH FROM AREA 306.00

RUNOFF VOLUME = 1.41028 INCHES = 2.1135 ACRE-FEET
PEAK DISCHARGE RATE = 58.50 CFS AT 1.533 HOURS BASIN AREA = .0281 SQ. MI.

```
*S **BASIN 2E
COMPUTE NM HYD       ID=7 HYD NO=307.00 AREA=0.0023 SQ MI
                     PER A=0 PER B=31 PER C=10 PER D=59
                     TP=-0.1333 HR   MASSRAIN=-1
```

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 5.3575 CFS UNIT VOLUME = .9973 B = 526.28 P60 = 1.8700
AREA = .001357 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

```
    K =   .124864HR    TP =   .133300HR    K/TP RATIO =   .936713     SHAPE CONSTANT, N =  3.775485
    UNIT PEAK =   2.4046    CFS   UNIT VOLUME =    .9944       B =   339.91      P60 = 1.8700
    AREA =      .000943 SQ MI    IA =    .46341 INCHES    INF =   1.14756 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=7   CODE=1

                                    HYDROGRAPH FROM AREA   307.00


    RUNOFF VOLUME =     1.46152 INCHES     =        .1793 ACRE-FEET
    PEAK DISCHARGE RATE =       5.15 CFS  AT   1.500 HOURS   BASIN AREA =   .0023 SQ. MI.


ADD HYD             ID=8 HYD NO=306.10 ID=7 ID=6
*S **TOTAL FLOW @ AP6
PRINT HYD           ID=8 CODE=5

                                    HYDROGRAPH FROM AREA   306.10

     TIME      FLOW          TIME      FLOW          TIME      FLOW          TIME      FLOW          TIME      FLOW
      HRS       CFS           HRS       CFS           HRS       CFS           HRS       CFS           HRS       CFS
     .000        .0         1.667      40.0         3.333        .5         4.999        .3         6.666        .0
     .167        .0         1.833      22.3         3.500        .4         5.166        .3         6.833        .0
     .333        .0         2.000      14.9         3.666        .3         5.333        .3         6.999        .0
     .500        .0         2.166       8.6         3.833        .3         5.499        .3         7.166        .0
     .667        .0         2.333       4.1         4.000        .3         5.666        .3         7.333        .0
     .833        .0         2.500       2.5         4.166        .3         5.833        .3         7.499        .0
    1.000        .0         2.666       1.6         4.333        .3         5.999        .3
    1.167        .0         2.833       1.1         4.500        .3         6.166        .3
    1.333       7.9         3.000        .8         4.666        .3         6.333        .1
    1.500      58.6         3.166        .6         4.833        .3         6.499        .1

    RUNOFF VOLUME =     1.41415 INCHES     =       2.2928 ACRE-FEET
    PEAK DISCHARGE RATE =      63.45 CFS  AT   1.533 HOURS   BASIN AREA =   .0304 SQ. MI.


*S **BASIN 2G
COMPUTE NM HYD      ID=9 HYD NO=307.10 AREA=0.0061 SQ MI
                    PER A=0 PER B=31 PER C=10 PER D=59
                    TP=-0.1333 HR   MASSRAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   14.209    CFS   UNIT VOLUME =    .9985       B =   526.28      P60 = 1.8700
    AREA =      .003599 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .124864HR    TP =   .133300HR    K/TP RATIO =   .936713     SHAPE CONSTANT, N =  3.775485
    UNIT PEAK =   6.3775    CFS   UNIT VOLUME =    .9981       B =   339.91      P60 = 1.8700
    AREA =      .002501 SQ MI    IA =    .46341 INCHES    INF =   1.14756 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
```

```
PRINT HYD            ID=9   CODE=1

                                    HYDROGRAPH FROM AREA   307.10

     RUNOFF VOLUME =      1.46152 INCHES      =         .4755 ACRE-FEET
     PEAK DISCHARGE RATE =       13.63 CFS  AT   1.500 HOURS   BASIN AREA =    .0061 SQ. MI.


*S **ADD 2G TO AP6
ADD HYD              ID=10 HYD NO=306.2 ID=9 ID=8
PRINT HYD            ID=10 CODE=1

                                    HYDROGRAPH FROM AREA   306.20

     RUNOFF VOLUME =      1.42206 INCHES      =        2.7683 ACRE-FEET
     PEAK DISCHARGE RATE =       76.58 CFS  AT   1.533 HOURS   BASIN AREA =    .0365 SQ. MI.


*S **ROUTE BASIN 2G & AP6 TO AP7 (32' F-F STREET)
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                     MIN ELEV=100.00 FT MAX ELEV=100.67 FT
                     CH SLP=.02 FP SLP=.02 N=.017 DIST=32 FT
DIST  ELEV  DIST  ELEV  DIST  ELEV
  0  100.67 0.1  100.00   16   100.32
31.9 100.00 32.0 100.67

                RATING CURVE VALLEY SECTION  1.0
     WATER          FLOW          FLOW          TOP
   SURFACE          AREA          RATE         WIDTH
     ELEV          SQ FT           CFS          FT
   100.00            .00           .00           .00
   100.04            .06           .05          3.51
   100.07            .25           .33          7.03
   100.11            .56           .96         10.54
   100.14            .99          2.07         14.06
   100.18           1.55          3.75         17.57
   100.21           2.23          6.10         21.09
   100.25           3.04          9.20         24.60
   100.28           3.97         13.13         28.12
   100.32           5.02         17.98         31.63
   100.35           6.14         25.01         31.91
   100.39           7.27         33.05         31.92
   100.42           8.40         41.95         31.93
   100.46           9.52         51.67         31.94
   100.49          10.65         62.16         31.95
   100.53          11.77         73.40         31.96
   100.56          12.90         85.36         31.97
   100.60          14.03         98.01         31.98
   100.63          15.16        111.33         31.99
   100.67          16.28        125.31         32.00
```

COMPUTE TRAVEL TIME ID=11 REACH NO=1 NO VS=1 L=320 FT
SLP=.013

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.1074
.071	.248	.33	.0676
.106	.558	.96	.0516
.141	.992	2.07	.0426
.176	1.549	3.75	.0367
.212	2.231	6.10	.0325
.247	3.037	9.20	.0293
.282	3.966	13.13	.0268
.317	5.020	17.98	.0248
.353	6.144	25.01	.0218
.388	7.269	33.05	.0196
.423	8.395	41.95	.0178
.458	9.521	51.67	.0164
.494	10.647	62.16	.0152
.529	11.774	73.40	.0143
.564	12.901	85.36	.0134
.599	14.029	98.01	.0127
.635	15.157	111.33	.0121
.670	16.285	125.31	.0116

ROUTE ID=11 HYD NO=306.3 INFLOW ID=10 DT=0.0 HR
PRINT HYD ID=11 CODE=1

HYDROGRAPH FROM AREA 306.30

RUNOFF VOLUME = 1.42207 INCHES = 2.7683 ACRE-FEET
PEAK DISCHARGE RATE = 76.80 CFS AT 1.533 HOURS BASIN AREA = .0365 SQ. MI.

*S **BASIN 2H1
COMPUTE NM HYD ID=12 HYD NO=308.00 AREA=0.0047 SQ MI
PER A=0 PER B=37 PER C=13 PER D=50
TP=-0.1333 HR MASSRAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 9.2779 CFS UNIT VOLUME = .9981 B = 526.28 P60 = 1.8700
AREA = .002350 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .124459HR TP = .133300HR K/TP RATIO = .933679 SHAPE CONSTANT, N = 3.788292
UNIT PEAK = 6.0081 CFS UNIT VOLUME = .9981 B = 340.80 P60 = 1.8700
AREA = .002350 SQ MI IA = .46100 INCHES INF = 1.14080 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=12 CODE=1

HYDROGRAPH FROM AREA 308.00

RUNOFF VOLUME = 1.35334 INCHES = .3392 ACRE-FEET
PEAK DISCHARGE RATE = 9.95 CFS AT 1.500 HOURS BASIN AREA = .0047 SQ. MI.

*S **ROUTE BASIN 2H1 TO AP7 (32' F-F STREET)
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
MIN ELEV=100.00 FT MAX ELEV=100.67 FT
CH SLP=.02 FP SLP=.02 N=.017 DIST=32 FT
DIST ELEV DIST ELEV DIST ELEV
0 100.67 0.1 100.00 16 100.32
31.9 100.00 32.0 100.67

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.04	.06	.05	3.51
100.07	.25	.33	7.03
100.11	.56	.96	10.54
100.14	.99	2.07	14.06
100.18	1.55	3.75	17.57
100.21	2.23	6.10	21.09
100.25	3.04	9.20	24.60
100.28	3.97	13.13	28.12
100.32	5.02	17.98	31.63
100.35	6.14	25.01	31.91
100.39	7.27	33.05	31.92
100.42	8.40	41.95	31.93
100.46	9.52	51.67	31.94
100.49	10.65	62.16	31.95
100.53	11.77	73.40	31.96
100.56	12.90	85.36	31.97
100.60	14.03	98.01	31.98
100.63	15.16	111.33	31.99
100.67	16.28	125.31	32.00

COMPUTE TRAVEL TIME ID=13 REACH NO=1 NO VS=1 L=250 FT
SLP=.0125

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.0839
.071	.248	.33	.0528
.106	.558	.96	.0403

.141	.992	2.07	.0333
.176	1.549	3.75	.0287
.212	2.231	6.10	.0254
.247	3.037	9.20	.0229
.282	3.966	13.13	.0210
.317	5.020	17.98	.0194
.353	6.144	25.01	.0171
.388	7.269	33.05	.0153
.423	8.395	41.95	.0139
.458	9.521	51.67	.0128
.494	10.647	62.16	.0119
.529	11.774	73.40	.0111
.564	12.901	85.36	.0105
.599	14.029	98.01	.0099
.635	15.157	111.33	.0095
.670	16.285	125.31	.0090

```
ROUTE                ID=13 HYD NO=308.1 INFLOW ID=12 DT=0.0 HR
PRINT HYD            ID=13 CODE=1

                                    HYDROGRAPH FROM AREA   308.10

    RUNOFF VOLUME =      1.35339 INCHES      =         .3392 ACRE-FEET
    PEAK DISCHARGE RATE =        9.83 CFS  AT    1.533 HOURS   BASIN AREA =    .0047 SQ. MI.

*S **BASIN 2H2
COMPUTE NM HYD       ID=14 HYD NO=308.2 AREA=0.0022 SQ MI
                     PER A=0 PER B=31 PER C=10 PER D=59
                     TP=-0.1333 HR   MASSRAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   5.1246    CFS   UNIT VOLUME =    .9973       B =   526.28      P60 = 1.8700
    AREA =      .001298 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .124864HR    TP =   .133300HR    K/TP RATIO =   .936713     SHAPE CONSTANT, N =  3.775485
    UNIT PEAK =   2.3001    CFS   UNIT VOLUME =    .9944       B =   339.91      P60 = 1.8700
    AREA =      .000902 SQ MI    IA =    .46341 INCHES    INF =   1.14756 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=14   CODE=1

                                    HYDROGRAPH FROM AREA   308.20

    RUNOFF VOLUME =      1.46152 INCHES      =         .1715 ACRE-FEET
    PEAK DISCHARGE RATE =        4.93 CFS  AT    1.500 HOURS   BASIN AREA =    .0022 SQ. MI.
```

```
*S **ADD BASIN 2H1 & 2H2
ADD HYD              ID=15 HYD NO=308.2 ID=13 ID=14
PRINT HYD            ID=15 CODE=1

                                    HYDROGRAPH FROM AREA   308.20

    RUNOFF VOLUME =      1.38776 INCHES      =         .5107 ACRE-FEET
    PEAK DISCHARGE RATE =       14.57 CFS  AT   1.533 HOURS   BASIN AREA =    .0069 SQ. MI.


*S **ADD BASINS 2H, 2G & AP6 FLOWS
ADD HYD              ID=16 HYD NO=306.4 ID=11 ID=15
*S **BASIN 2L1
COMPUTE NM HYD       ID=17 HYD NO=309.00 AREA=0.0018 SQ MI
                     PER A=0 PER B=31 PER C=10 PER D=59
                     TP=-0.1333 HR   MASSRAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   4.1928    CFS   UNIT VOLUME =     .9965       B =   526.28       P60 = 1.8700
    AREA =       .001062 SQ MI    IA =     .10000 INCHES    INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330
    K =    .124864HR    TP =    .133300HR    K/TP RATIO =    .936713     SHAPE CONSTANT, N =  3.775485
    UNIT PEAK =   1.8819    CFS   UNIT VOLUME =     .9932       B =   339.91       P60 = 1.8700
    AREA =       .000738 SQ MI    IA =     .46341 INCHES    INF =    1.14756 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD            ID=17   CODE=1

                                    HYDROGRAPH FROM AREA   309.00

    RUNOFF VOLUME =      1.46152 INCHES      =         .1403 ACRE-FEET
    PEAK DISCHARGE RATE =        4.03 CFS  AT   1.500 HOURS   BASIN AREA =    .0018 SQ. MI.


ADD HYD              ID=18 HYD NO=306.5 ID=16 ID=17
*S TOTAL FLOW @ AP7
PRINT HYD            ID=18 CODE=5

                                    HYDROGRAPH FROM AREA   306.50

     TIME     FLOW          TIME     FLOW          TIME     FLOW          TIME     FLOW          TIME     FLOW
      HRS      CFS           HRS      CFS           HRS      CFS           HRS      CFS           HRS      CFS
     .000       .0         1.667     59.5         3.333       .7         4.999       .4         6.666       .1
     .167       .0         1.833     33.0         3.500       .6         5.166       .4         6.833       .0
     .333       .0         2.000     22.2         3.666       .5         5.333       .4         6.999       .0
     .500       .0         2.166     13.1         3.833       .5         5.499       .4         7.166       .0
     .667       .0         2.333      6.1         4.000       .4         5.666       .5         7.333       .0
     .833       .0         2.500      3.7         4.166       .4         5.833       .5         7.499       .0
```

1.000	.0	2.666	2.4	4.333	.4	5.999	.5	7.666	.0
1.167	.0	2.833	1.6	4.500	.4	6.166	.4		
1.333	11.2	3.000	1.2	4.666	.4	6.333	.2		
1.500	87.7	3.166	.9	4.833	.4	6.499	.1		

RUNOFF VOLUME = 1.41839 INCHES = 3.4192 ACRE-FEET
PEAK DISCHARGE RATE = 95.25 CFS AT 1.533 HOURS BASIN AREA = .0452 SQ. MI.

*S **ROUTE AP7 TO AP8 (32' F-F STREET)
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
MIN ELEV=100.00 FT MAX ELEV=100.67 FT
CH SLP=.02 FP SLP=.02 N=.017 DIST=32 FT
DIST ELEV DIST ELEV DIST ELEV
0 100.67 0.1 100.00 16 100.32
31.9 100.00 32.0 100.67

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.04	.06	.05	3.51
100.07	.25	.33	7.03
100.11	.56	.96	10.54
100.14	.99	2.07	14.06
100.18	1.55	3.75	17.57
100.21	2.23	6.10	21.09
100.25	3.04	9.20	24.60
100.28	3.97	13.13	28.12
100.32	5.02	17.98	31.63
100.35	6.14	25.01	31.91
100.39	7.27	33.05	31.92
100.42	8.40	41.95	31.93
100.46	9.52	51.67	31.94
100.49	10.65	62.16	31.95
100.53	11.77	73.40	31.96
100.56	12.90	85.36	31.97
100.60	14.03	98.01	31.98
100.63	15.16	111.33	31.99
100.67	16.28	125.31	32.00

COMPUTE TRAVEL TIME ID=19 REACH NO=1 NO VS=1 L=360 FT
SLP=.018

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.1208
.071	.248	.33	.0761
.106	.558	.96	.0581

.141	.992	2.07	.0479
.176	1.549	3.75	.0413
.212	2.231	6.10	.0366
.247	3.037	9.20	.0330
.282	3.966	13.13	.0302
.317	5.020	17.98	.0279
.353	6.144	25.01	.0246
.388	7.269	33.05	.0220
.423	8.395	41.95	.0200
.458	9.521	51.67	.0184
.494	10.647	62.16	.0171
.529	11.774	73.40	.0160
.564	12.901	85.36	.0151
.599	14.029	98.01	.0143
.635	15.157	111.33	.0136
.670	16.285	125.31	.0130

```
ROUTE                ID=19 HYD NO=306.6 INFLOW ID=18 DT=0.0 HR
PRINT HYD            ID=19 CODE=1

                                HYDROGRAPH FROM AREA   306.60

    RUNOFF VOLUME =     1.41840 INCHES     =       3.4193 ACRE-FEET
    PEAK DISCHARGE RATE =      94.88 CFS  AT   1.533 HOURS   BASIN AREA =   .0452 SQ. MI.

*S **BASIN 2K
COMPUTE NM HYD       ID=20 HYD NO=310.00 AREA=0.010 SQ MI
                     PER A=0 PER B=31 PER C=10 PER D=59
                     TP=-0.1333 HR   MASSRAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   23.294    CFS   UNIT VOLUME =    .9989       B =   526.28      P60 = 1.8700
    AREA =      .005900 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .124864HR    TP =   .133300HR    K/TP RATIO =   .936713     SHAPE CONSTANT, N =  3.775485
    UNIT PEAK =   10.455    CFS   UNIT VOLUME =    .9990       B =   339.91      P60 = 1.8700
    AREA =      .004100 SQ MI    IA =    .46341 INCHES    INF =   1.14756 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=20   CODE=1

                                HYDROGRAPH FROM AREA   310.00

    RUNOFF VOLUME =     1.46152 INCHES     =        .7795 ACRE-FEET
    PEAK DISCHARGE RATE =      22.34 CFS  AT   1.500 HOURS   BASIN AREA =   .0100 SQ. MI.
```

```
ADD HYD              ID=1 HYD NO=306.7 ID=19 ID=20
PRINT HYD            ID=1 CODE=1
```

HYDROGRAPH FROM AREA 306.70

RUNOFF VOLUME = 1.42619 INCHES = 4.1987 ACRE-FEET
PEAK DISCHARGE RATE = 116.38 CFS AT 1.533 HOURS BASIN AREA = .0552 SQ. MI.

```
*S **BASIN 2L
COMPUTE NM HYD       ID=2 HYD NO=309.1 AREA=0.0024 SQ MI
                     PER A=0 PER B=31 PER C=10 PER D=59
                     TP=-0.1333 HR   MASSRAIN=-1
```

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 5.5904 CFS UNIT VOLUME = .9973 B = 526.28 P60 = 1.8700
AREA = .001416 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .124864HR TP = .133300HR K/TP RATIO = .936713 SHAPE CONSTANT, N = 3.775485
UNIT PEAK = 2.5092 CFS UNIT VOLUME = .9949 B = 339.91 P60 = 1.8700
AREA = .000984 SQ MI IA = .46341 INCHES INF = 1.14756 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

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

HYDROGRAPH FROM AREA 309.10

RUNOFF VOLUME = 1.46152 INCHES = .1871 ACRE-FEET
PEAK DISCHARGE RATE = 5.37 CFS AT 1.500 HOURS BASIN AREA = .0024 SQ. MI.

```
ADD HYD              ID=3 HYD NO=306.8 ID=1 ID=2
*S TOTAL FLOW @ AP8 (ENTRANCE TO AMOLE DEL NORTE CHANNEL)
PRINT HYD            ID=3 CODE=5
```

HYDROGRAPH FROM AREA 306.80

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.667	76.7	3.333	.9	4.999	.5	6.666	.1
.167	.0	1.833	42.6	3.500	.8	5.166	.5	6.833	.1
.333	.0	2.000	28.7	3.666	.7	5.333	.6	6.999	.0
.500	.0	2.166	17.2	3.833	.6	5.499	.6	7.166	.0
.667	.0	2.333	8.2	4.000	.6	5.666	.6	7.333	.0
.833	.0	2.500	4.9	4.166	.5	5.833	.6	7.499	.0
1.000	.0	2.666	3.2	4.333	.5	5.999	.6	7.666	.0
1.167	.1	2.833	2.1	4.500	.5	6.166	.5	7.833	.0
1.333	13.3	3.000	1.5	4.666	.5	6.333	.3		

1.500	111.1	3.166	1.2	4.833	.5	6.499	.2

RUNOFF VOLUME = 1.42766 INCHES = 4.3858 ACRE-FEET
PEAK DISCHARGE RATE = 121.56 CFS AT 1.533 HOURS BASIN AREA = .0576 SQ. MI.

FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 16:30:28

APPENDIX B

- PRESSURE CALCULATIONS
- FLOWMASTER SHEETS

Total # of Lots = 114
Total Acres = 18.19
Du/Ac = 6.28 per DPM calculate percent D

45 x 110 Lots

Total Area = 6075 ft²
House = 1800 ft²
Drivepad/Sdwk/C&G/Paving = 1523 ft² ∴ % D = 55%

40 x 100 Lots

Total Area = 5000 ft²
House = 1700 ft²
Drivipad/Sdwk/C&G)Paving = 1920 ft² % D = 62.4%

∴ use D = 59%
B = 31%
C = 10%

ISAACSON & ARFMAN, P.A.

SUBJECT % Impervious for Zone RLT JOB NO. 944
BY MC DATE 9/26/97 SHEET NO. ___ OF ___

Q @ AP5 = 28.89 cfs

$Q_{1/2}$ street = 14.45 cfs
S = 1.3%
per DPM plate 22.3 D-1 D = .41 ft
per DPM plate 22.3 D-5 Q_{inlet} = 5.5 cfs (use 4 Type A inlets)

∴ pass through flow 28.89 - 22 = 6.89 cfs

Q @ AP6 = 63.5 cfs - 22 cfs = 41.5 cfs

$Q_{1/2}$ Street = 20.75 cfs D = .51 ft (per DPM plate 22.3 D-1)
S = 1.3%
per DPM plate 22.3 D-5 Q_{inlet} = 8 cfs (use 4 Type A inlets)

∴ pass through flow 41.5 - 32 = 9.5 cfs

Q from Basin 2H = 14.5 cfs

$Q_{1/2}$ = 7.25 cfs

S = 1.25%

$Q_{1/2}$ @ d=.67 = $87.41(.0125)^{.5}(6.32)(.43)^{.67}$ = 35.11 cfs
$Q_{1/2}$ @ d=.33 = $87.41(.0125)^{.5}(1.59)(.11)^{.67}$ = 3.56 cfs
d ≈ .37 ft

Per Dpm plate 22.3 D-5 Q_{inlet} = 4 cfs (use 2 Type A inlet @ Secret Valley)

∴ pass through 14.5 - 8 = 6.5 cfs

Q @ AP7 = 95.25 - 64 = 31.25 cfs

$Q_{1/2}$ street = 15.6 cfs D = .51 ft (per DPM plate 22.3 D-1)
S = .5%
per DPM plate 22.3 D-5 Q_{inlet} = 6.5 cfs (use 2 Type A inlets)

∴ pass through 31.25 - 13 = 18.25 cfs

Old Aspen Rd Storm Drain

From Amole del Norte to MH #4

D = 3ft
S = .87%
E = 102.5
E_2 = 100.81
P_1 = ?
P_2 = 3.0 ft

Q = 75 cfs
V = 10.61 ft/sec
A = 7.07 ft^2
L = 215
Σ = .001

* Use Moody Diagram to find friction factor

$$N_{RE} = \frac{DV}{\nu} = \frac{10.61(3)}{1.21 \times 10^{-5}} = 2.63 \times 10^4 \quad \therefore f \approx .018$$

$$h_L = f\left(\frac{L}{D}\right)\left(V^2/2g\right) = 2.26 \text{ ft}$$

* find headloss from bend (30° Bend)

$$K_b = .25\sqrt{\Phi/90} = .14$$

$$h_b = .14\left(10.61^2/64.4\right) = .25 \text{ ft}$$

$$E_1 + P_1 + V_1^2/2g^{\,0} = E_2 + P_2 + V_2^2/2g^{\,0} + h_L + h_b$$

$$P_1 = 100.81 + 3 + .25 + 2.26 - 102.5 = 3.81 \text{ A}$$

HGL = 102.5 + 3.81 = 106.31 < 107.11 ✓ dr

From MH4 to MH3

Try D = 2.5
S = 1.25%
E_1 = 107.13
E_2 = 103
P_1 = ?
P_2 = 3.31

Q = 62 cfs
V = 12.63 ft/sec
A = 4.91
L = 330 ft

MH4 to MH3 (cont')

* Use Moody Diagram to find f

$N_{RE} = 12.63(2.5)/1.21\times10^{-5} = 2.61\times10^{6}$ $\quad f \approx .018$

$h_L = .018(330/2.5)(12.63^2/64.4) = 5.89$ ft

$P_1 = 3.31 + 103 + 5.89 - 107.13 = 5.07$ ft

$\underline{HGL} = 107.13 + 5.07 = \underline{112.2} < 112.40$ ✓OK

from MH3 to MH2

$D = 2.5$ ft
$S = 1.25\%$
$E = 111.44$
$E_2 = 107.63$
$P_1 = ?$
$P_2 = 5.07$

$Q = 54$ cfs
$V = 10.99$ ft/sec
$A = 4.91$ ft^2
$L = 305$ ft

* find f (use Moody Diagram)

$N_{RE} = 2.27\times10^{6}$ $\quad f \approx .018$

$h_L = .018(305/2.5)(10.99^2/64.4) = 4.12$ ft

$P_1 = 107.63 + 5.07 + 4.12 - 111.44 = 5.38$ ft

$\underline{HGL} = 111.44 + 5.38 = 116.82 > 115.99$ TOO HIGH!

→ ∴ Upsize pipe from MH4 to MH3 to 36" ϕ RCP. Will function under gravity (see Flowmaster) So use soffit of incoming pipe as control elevation (104.73).

$P_2 = 2.5$ ft

∴ $P_1 = 107.3 + 2.5 + 4.12 - 111.44 = 2.81$

$\underline{HGL}$: $2.81 + 111.44 = \underline{114.25} < 115.99$ ✓OK

MH2 to MH1 (future)

Try $D = 1.5$ ft
$S = 1.259_0$
$P_1 = ?$
$P_2 = 1.81$
$E_1 = 118.07$
$E_2 = 112.44$

$L = 450$ ft
$Q = 22$ cfs
$V = 12.45$ ft/sec
$A = 1.77 ft^2$

* find f (use Moody Diagram)

$N_{RE} = 1.54 \times 10^6$ $\therefore$ $f \approx .019$

$h_L = .019 (450/1.5)(12.45^2/64.9) = 13.72$

$P_1 = 112.44 + 13.72 + 1.81 - 118.07 = 9.9$ ft

$HGL = 118.07 + 9.9 = 127.97$ ' 77 | 22.54

→ * use a 24" ϕ RCP under Gravity flow (see Flowmaster)

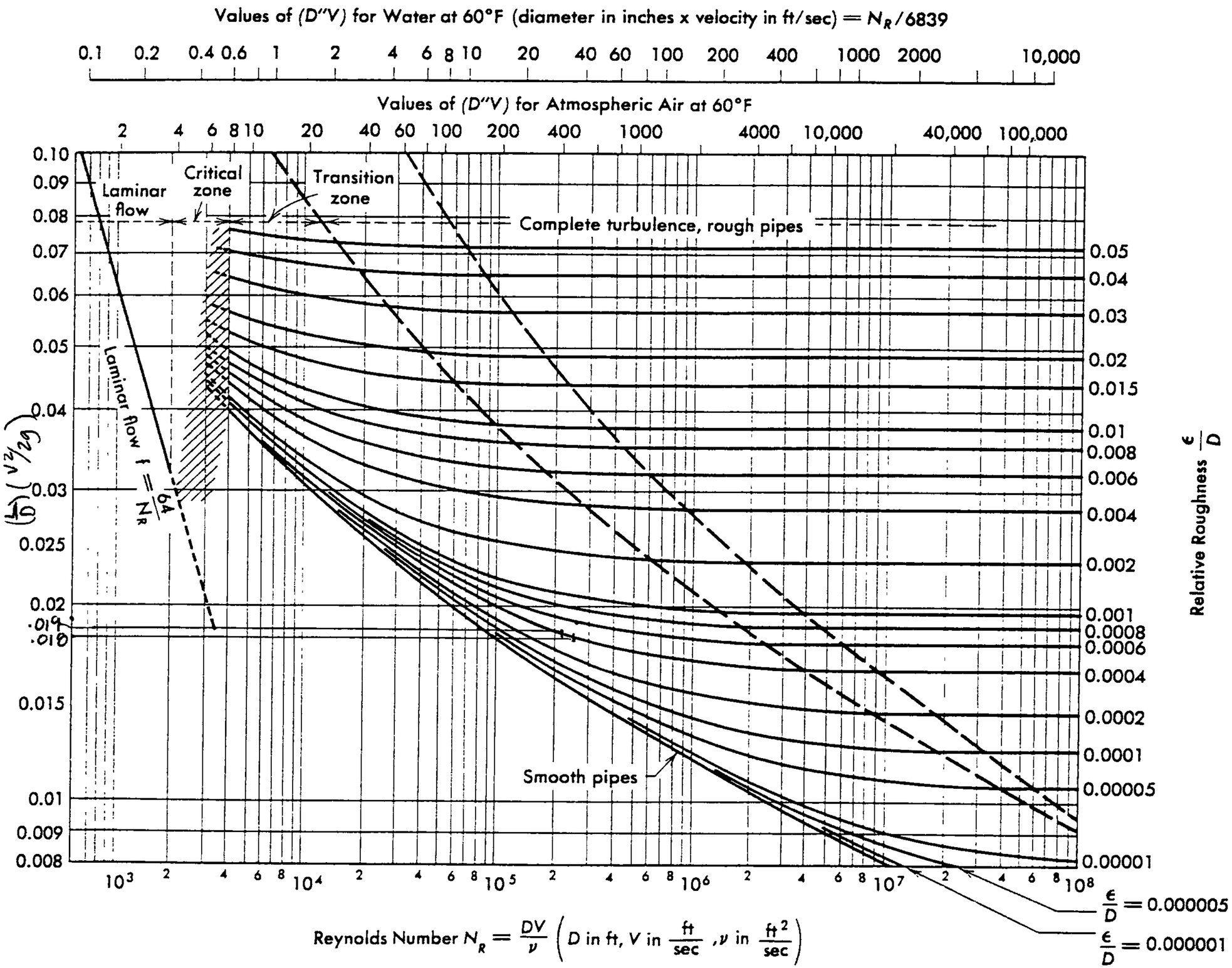


Fig. 3–3. Friction factor for pipes.

36" Diameter RCP from MH3 to MH4
Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\rhmvesd.fm2
Worksheet	36" RCP @ s= 1.25%
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Input Data		
Mannings Coefficient	0.013	
Channel Slope	1.25	%
Depth	36.0	in
Diameter	36.00	in

Results		
Discharge	74.57	cfs
Flow Area	7.07	ft^2
Wetted Perimeter	9.42	ft
Top Width	0.00	ft
Critical Depth	2.71	ft
Percent Full	100.00	
Critical Slope	0.010959	ft/ft
Velocity	10.55	ft/s
Velocity Head	1.73	ft
Specific Energy	FULL	ft
Froude Number	FULL	
Maximum Discharge	80.21	cfs
Full Flow Capacity	74.57	cfs
Full Flow Slope	0.012500	ft/ft

24" Diameter RCP from MH1 to MH2(future)
Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\rhmvesd.fm2
Worksheet	24" RCP from MH1 to MH2
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	1.25	%
Diameter	24.00	in
Discharge	22.00	cfs

Results		
Depth	17.3	in
Flow Area	2.43	ft^2
Wetted Perimeter	4.06	ft
Top Width	1.79	ft
Critical Depth	1.68	ft
Percent Full	72.12	
Critical Slope	0.009114	ft/ft
Velocity	9.07	ft/s
Velocity Head	1.28	ft
Specific Energy	2.72	ft
Froude Number	1.37	
Maximum Discharge	27.21	cfs
Full Flow Capacity	25.29	cfs
Full Flow Slope	0.009458	ft/ft
Flow is supercritical.		

CITY OF
Albuquerque

March 17, 1998

Greg Krenik, P.E.
Mark Goodwin & Associates
P.O. Box 90606
Albuquerque, NM 87199

RE: MOUNTAIN VIEW ESTATES UNITS 3 & 4 (M10-D7B). DRAINAGE REPORT FOR PRELIMINARY PLAT APPROVAL. ENGINEER'S STAMP DATED MARCH 5, 1998.

Dear Mr. Krenik:

Based on the information provided on your March 6, 1998 submittal, City Hydrology has the following comments:

1. Show a typical lot layout detail. Also show a typical side yard section.

2. I there an existing storm drain east of your proposed storm drain in Old Aspen Place? I can't tell where the line is due to the size of your Unit Boundary Line.

3. The Unit 3 infrastructure list refers to 18-inch RCP in Old Aspen Place, from Lot 63 to Fox Hill Place. Isn't Lot 63 at Fox Hill Place?

4. It seems that the 18-inch RCP from lot 65 to Lot 63 should be entered on your infrastructure list two times since it is on both sides of the street.

5. Why are you installing the entire storm drain with Unit 3?

If I can be of further assistance, please feel free to contact me at 924-3984.

Sincerely,

Lisa Ann Manwill, P.E.
Hydrology

c: Andrew Garcia
File

DRAINAGE INFORMATION SHEET

PROJECT TITLE: Mountain View Estates Units 3 & 4 ZONE ATLAS/DRNG,FILE#: M - 10/D7B

DRB #: _____ EPC #: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: Lands of Albuquerque South, Unit 2, Track A2 & Unplotted Lands, Remainder of Track KK

CITY ADDRESS: _____

ENGINEERING FIRM: Mark Goodwin & Associates, PA CONTACT: Gregory J. Krenik

ADDRESS: P.O. Box 90606, Albuquerque, NM 87199 PHONE: 828-2200

OWNER: Longford Homes CONTACT: Scott Rowe

ADDRESS: 7301 Jefferson NE, Suite G, Albuquerque, NM 87109 PHONE: 761-9911

ARCHITECT: N/A CONTACT: _____

ADDRESS: _____ PHONE: _____

SURVEYOR: Aldrich Land Surverying CONTACT: Tim Aldrich

ADDRESS: P.O. Box 30701, Albuquerque, NM 87190-0701 PHONE: 884-1990

CONTRACTOR: N/A CONTACT: _____

ADDRESS: _____ PHONE: _____

TYPE OF SUBMITTAL:

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

PRE-DESIGN MEETING:

- ____ YES
- ____ NO
- ____ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

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

DATE SUBMITTED: 3-2-98

BY: _____
Gregory J. Krenik, PE

RECEIVED
MAR 04 1998
HYDROLOGY SECTION

D.R.B. Case No. _____
D.R.C. Project No. _____
Date Submitted _____
Prelim. Plat Approved _____
Prelim. Plat Expires _____

Figure 12

EXHIBIT "A"
To Subdivision Improvements Agreement
DEVELOPMENT REVIEW BOARD (DRB) REQUIRED INFRASTRUCTURE LISTING
for Mountain View Estates Units 3&4

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

Size	Type Improvement	Location	From	To
		UNIT 3		
32' FF	Res Pvmt Std C&G (both sides) * 4' Sdwk (both sides)	Quiet Desert Dr	Old Aspen Pl	Lot 46, Blk H
32' FF	Res Pvmt Mount C&G(both sides) * 4' Sdwk (both sides)	Quiet Desert Dr	Lot 47, Blk H	Lot 56, Blk H
28' FF	Res Pvmt Std C&G (E side) * 4' Sdwk (E side)	Fox Hill Pl	Old Aspen Pl	Lot 34, Blk L
28' FF	Res Pvmt Std C&G (W side) * 4' Sdwk (W side)	Fox Hill Pl	Old Aspen Pl	Lot 59, Blk L
28' FF	Res Pvmt Mount C&G (E side) * 4' Sdwk (E side)	Fox Hill Pl	Lot 35, Blk L	Lot 48, Blk L
28' FF	Res Pvmt Mount C&G (W side) * 4' Sdwk (W side)	Fox Hill Pl	Lot 58, Blk L	Lot 48, Blk L
32' FF	Res Pvmt Std C&G (both sides) * 4' Sdwk (both sides)	Fox Hill Pl	Arenal Rd	Old Aspen Pl

RECEIVED
MAR 04 1998
HYDROLOGY SECTION

D.R.B. Case No. _____
D.R.C. Project No. _____
Date Submitted _____
Prelim. Plat Approved _____
Prelim. Plat Expires _____

Size	Type Improvement	Location	From	To
24' FE	Res Pvmt (N side) Std C&G (N side) * 4' Sdwk (N side)	Old Aspen Pl	Fox Hill Pl	Unit I phase line
6"	PVC Waterline	Quiet Desert Dr	Old Aspen Pl	Lot 56, Blk H
6"	PVC Waterline	Fox Hill Pl	Old Aspen Pl	Lot 48, Blk L
8"	PVC Waterline	Old Aspen Pl	Fox Hill Pl	Unit I phase line
8"	SAS	Quiet Desert Dr	Lot 56, Blk H	Old Aspen Pl
8"	SAS	Fox Hill Pl	Lot 48, Blk L	Old Aspen Pl
8"	SAS	Old Aspen Pl	Fox Hill Pl	Unit I phase line
24"	RCP	Old Aspen Pl	Fox Hill Pl	Unit I phase line
18"	RCP	Old Aspen Pl	Lot 63, Blk L	Fox Hill Pl

UNIT 4

unit Lot 63 + Fox Hill about the 2nd place?

Size	Type Improvement	Location	From	To
32' FF	Res Pvmt Mount C&G (both sides) * 4' Sdwk (both sides)	Rolling Rock Pl	Lot 47, Blk A	Lot 48, Blk A
32' FF	Res Pvmt Std C&G(both sides) * 4' Sdwk (both sides)	Rolling Rock Pl	Lot 49, Blk A	Old Aspen Pl
32' FF	Res Pvmt Std C&G (both sides) * 4' Sdwk (both sides)	Old Aspen Pl	Rolling Rock Pl	Lot 8, Blk I
8' FE	Res Pvmt (S side) Std C&G (S side) * 4' Sdwk (S side)	Old Aspen Pl	Lot 9, Blk I	Secret Valley Dr
—	Std C&G (W side) 4' Sdwk (W side)	Secret Valley Dr	Old Aspen Pl	Arenal Rd
8"	PVC Waterline	Rolling Rock Pl	Lot 48, Blk A	Old Aspen Pl
8"	PVC Waterline	~~Old Aspen Pl~~	Rolling Rock Pl	Fox Hill Pl should not this be on unit #3
18"	RCP	Old Aspen Pl	Lot 65, Blk L	Lot 63, Blk L
18"	RCP	Old Aspen Pl	Lot 9, Blk I	Lot 11, Blk I
~~24"~~	~~RCP~~	"	~~Lot 65, Blk L~~	~~Lot 8, Blk I~~

D.R.B. Case No. _____
D.R.C. Project No. _____
Date Submitted _____
Prelim. Plat Approved _____
Prelim. Plat Expires _____

Size	Type Improvement	Location	From	To
		UNIT 4 — Off-site		
25' FF	Art Pvmt (N side) Std C&G (N side) Ext C&G (N side) 6' Sdwk (N side)	Arenal Rd	Unser Blvd	Secret Valley Rd
25' FF	Art Pvmt (E side) Std C&G (E side) Ext C&G (E side) 10' Bike Path (E side)	Unser Blvd	Arenal Rd	Lot 48, Blk I
___	Signalization Improvements	NW corner of Unser Blvd & Arenal intersection		

* Item to be deferred.

Stormdrain to include manholes, inlets, riprap and outfall.

Engineer's Certification for Grading and Drainage per DPM including Perimeter Walls as shown on the Grading Plan for Release of SIA and Financial Guarantees. Financial Guarantee is not required for this item.

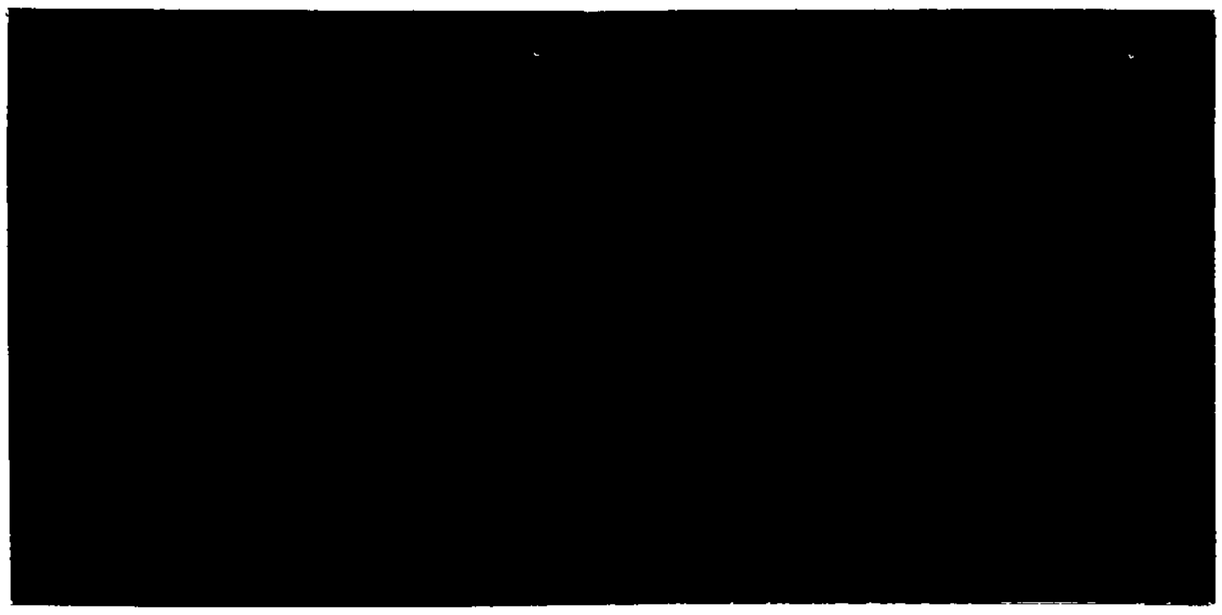
Water infrastructure to include valves, fittings, valveboxes and fire hydrants.

Sanitary sewer to include manholes and service connections.

Street lights per DPM.

Prepared By: _____
Print Name: Gregory J. Krenik, PE
Firm: Mark Goodwin & Associates, PA

* * * *

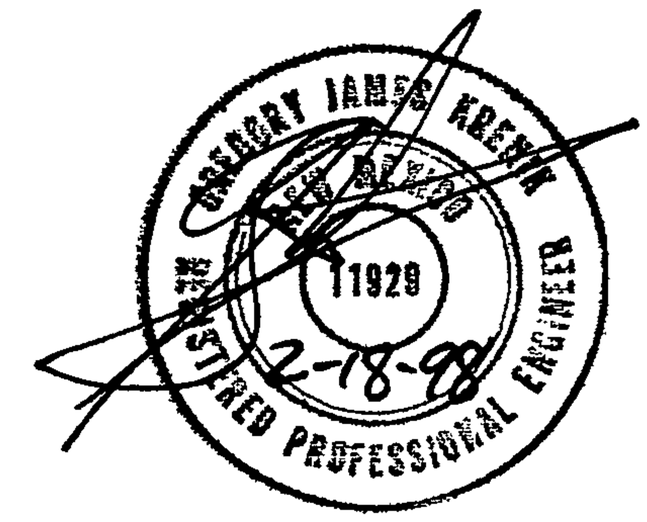


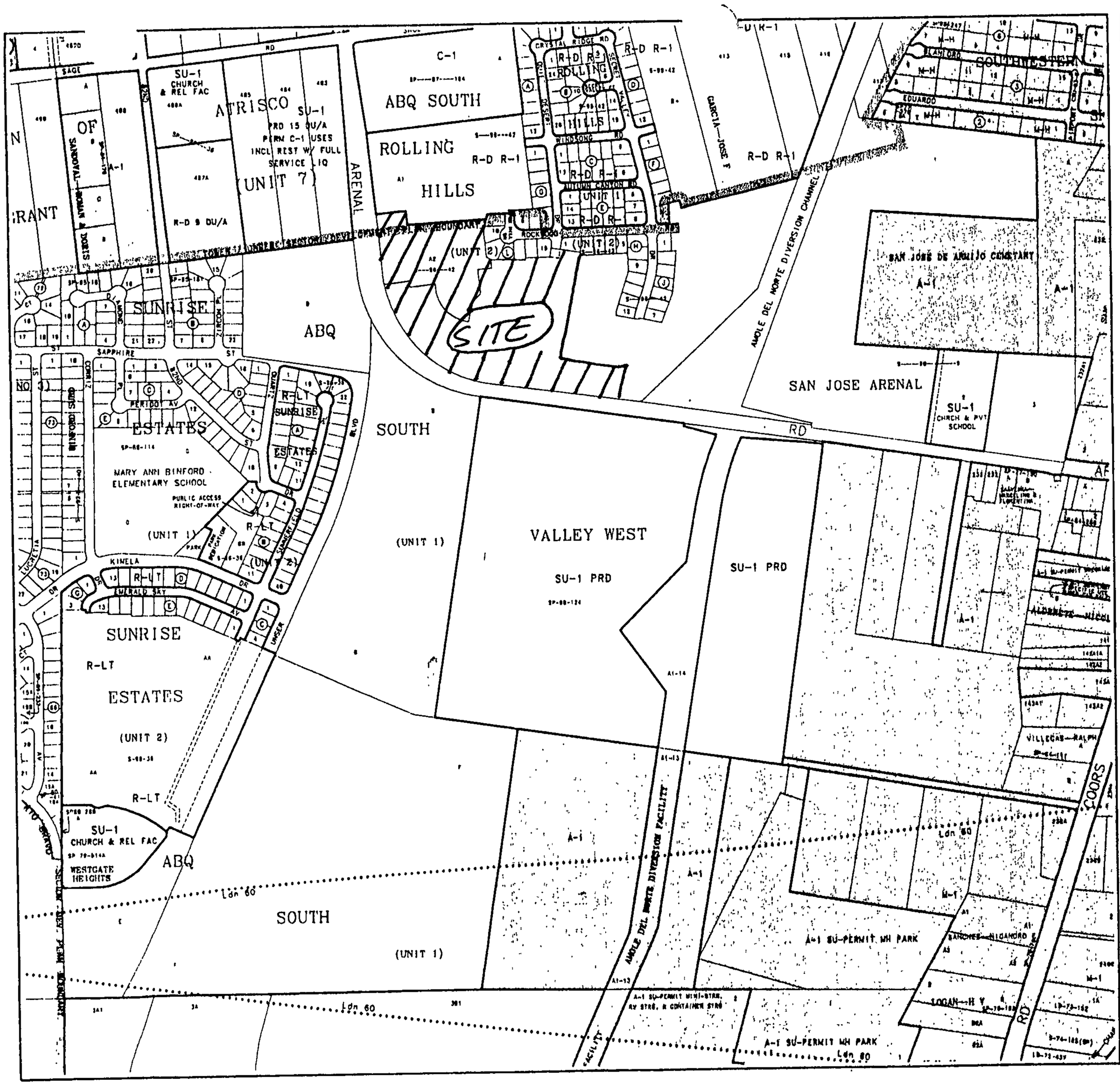
DRAINAGE CALCULATIONS

FOR

MOUNTAIN VIEW ESTATES

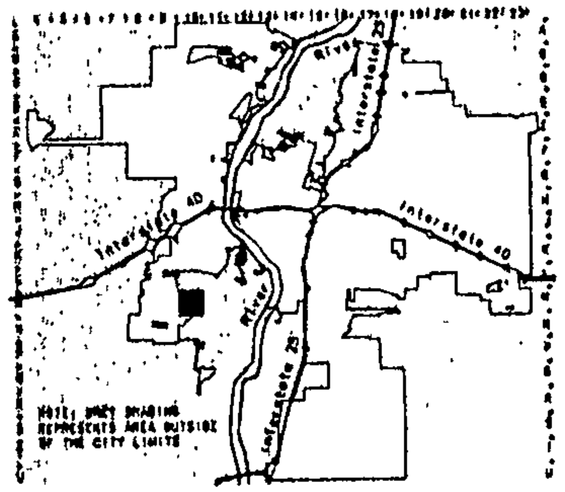
UNITS 3 & 4





GRAPHIC SCALE IN FEET

250 0 500 1000



CITY OF Albuquerque

Albuquerque Geographic Information System

PLANNING DEPARTMENT

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Map Amended through February 21, 1997

LEGAL DESCRIPTION

TION

R2E

SEC 34

UNIFORM PROPERTY CODE

1-010-056

M-10-Z

D. Mark Goodwin & Associates, P.A.
Consulting Engineers and Surveyors

PROJECT Mountain View Units 3 & 4
SUBJECT Drainage Calcs
BY GSK DATE 1-19-98
CHECKED _____ DATE _____
SHEET 1 OF ____

- SITE IS PART OF THE DRAINAGE MASTERPLAN FOR THE ROLLING HILLS SUBDIVISION - UNIT ONE & FUTURE PHASES PREPARED BY ISAACSON & ARFMAN, P.A. STAMPED BY THE CITY JAN. 10, 1996.
- SITE DOES NOT LIE IN A 100 YEAR FLOOD ZONE.
- SITE RECEIVES OFFSITE FLOW FROM 12 LOTS OF UNIT 3 OF THE ROLLING HILLS SUBDIVISION. THESE FLOWS ENTER OUR SITE FROM THE NORTH AND ARE MAINTAINED IN THE PAVEMENT OF ROLLING ROCK PLACE.
- DIRECT DISCHARGE WILL BE ALLOWED PER THE MOUNTAIN VIEW ESTATES SUBDIVISION, UNITS ONE & TWO DRAINAGE REPORT PREPARED BY ISAACSON & ARFMAN, P.A. DATED 9-30-97. EXHIBIT "A"

- TOTAL SITE = 17.1473 AC = 0.026793 S.M.

ROW = 3.4540 AC 2.7632 AC "D" 0.6908 AC "B"

PADS = 4.6901 AC TYPE "D"

DRIVE PADS = 1.0285 AC TYPE "D"

YARDS = 7.9747 AC TYPE "B"

TOTAL "D" = 8.4818 AC 49.46%
"B" = 8.6655 AC 50.54%

- AREA OF UNIT 3 (OFFSITE)

= 2.4621 AC = 0.003847 S.M.

ROW = 0.4591 AC 0.3673 AC TYPE "D" 0.0918 AC TYPE "B"
PADS = 0.7438 AC TYPE "D"
DRIVE PADS = 0.1102 AC TYPE "D"
YARDS = 1.1490 AC TYPE "B"

TOTAL "D" = 1.2213 AC 49.60%
"B" = 1.2408 AC 50.40%

$P_1 = 1.92$ in

$P_6 = 2.25$ in

$P_{24} = 2.67$ in

D. Mark Goodwin & Associates, P.A.
Consulting Engineers and Surveyors

PROJECT Mountain View Units 3 & 4
SUBJECT Drainage Calcs
BY GSK DATE 2-11-98
CHECKED _____ DATE _____
SHEET 2 OF ____

FROM THE AHYMO OUTPUT SHEETS 6-11

$Q_{OFFSITE} = 8.11$ CFS

$Q_{MTNVW} = 56.36$ CFS

$$Q \text{ PER LOT IN MTN VW} = \frac{56.36}{112} = 0.5032 \text{ CFS}$$

- Q AT INTERSECTION OF OLD ASPEN PL AND
  $44 \times 0.5032 + 8.11 = 30.25$ CFS (WEST SIDE) BASIN 2A Per Master PLAN
- Q AT INTERSECTION OF OLD ASPEN PL AND FOX HILL
  $35 \times 0.5032 = 17.61$ CFS (NORTH SIDE) BASIN 2C Per Master PLAN
- Q AT INTERSECTION OF OLD ASPEN PL AND QUIET DESERT DR
  $25 \times 0.5032 = 12.58$ CFS (NORTH SIDE) BASIN 2D Per Master PLAN

BASIN	THIS PLAN	ISAACSON & AFMAN MASTER PLAN
AP5	30.25 CFS	28.89 CFS
2C	17.61 CFS	17.03 CFS
2D	12.58 CFS	12.96 CFS
2E	4.03 CFS	5.15 CFS
AP6	64.47 CFS	63.45 CFS

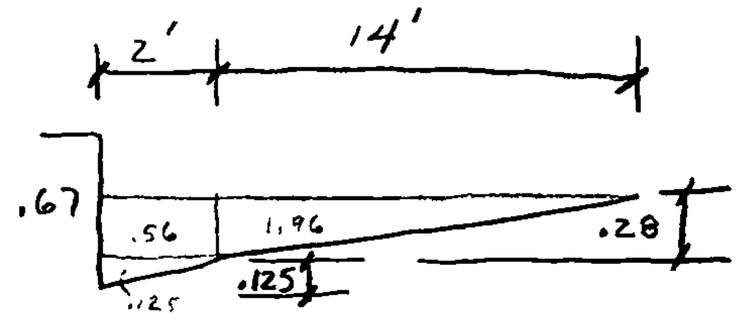
OUR PLAN GENERATES 1.02 CFS ADDITIONAL OVER THE MASTER PLAN AND THIS REPORT WILL SHOW THE DESIGNED STORM DRAIN SYSTEM CAN HANDLE THE ADDITIONAL FLOW.

- FIND CAPACITY OF STREETS
  - OLD ASPEN PL AT FOX HILL

$S = 2.3\%$ $n = 0.017$

$d = 0.45$
$WP = 32.90$
$A = 6.73$
$V = 4.602$ F/S
$Q = 30.97$ CFS $\approx$ 30.25 CFS OK

$d + \frac{V^2}{2g} = 0.78 < 0.87$ OK

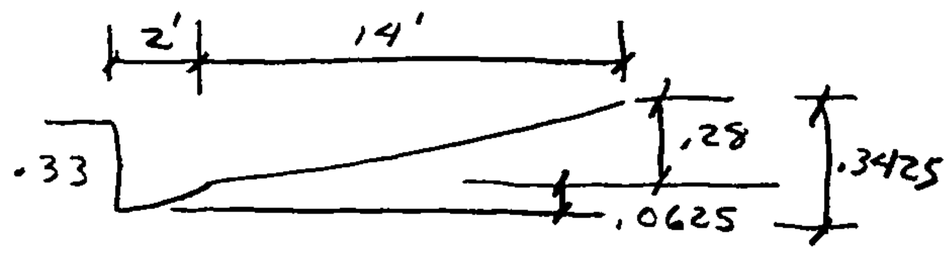


D. Mark Goodwin & Associates, P.A.
Consulting Engineers and Surveyors

PROJECT Mountain View Units 3 & 4
SUBJECT DRAINAGE CALCS
BY GSK DATE 2-11-98
CHECKED _____ DATE _____
SHEET 3 OF ____

- FIND LIMITS OF MOUNTABLE CURB

$S = 4\%$ $\quad n = 0.017$



$d = 0.25$
$WP = 11.625$
$A = 1.3164$
$V_{1/2} = 4.0919$ F/S

$d + \frac{V^2}{2g} = 0.51 < 0.53$ OK

$Q_{1/2} = 5.3866$ CFS

TOTAL Q = 10.77 CFS

#LOTS = $10.77 / 0.5032 = 21$ LOTS

- AT OLD ASPEN PL ADD 2 DBL "A" INLETS ONE ON EACH SIDE.

$d = .45$

FROM NOMO SHEET 12

Q GRATE = 8.2 CFS

Q PAST INLETS
$= 30.25 - 2(8.2) = 13.85$ CFS

- FIND NEW d $\quad S = 2.3\%$

$d = 0.36$
$WP = 14.11$
$A = 1.976$
$V_{1/2} = 3.57$ F/S
$Q_{1/2} = 7.06$ CFS $\approx 13.85/2 = 6.925$ CFS OK

ADD SINGLE "C" INLET ON EACH SIDE

FROM NOMO SHEET 13

Q GRATE = 4.4 CFS

Q PAST INLETS
$13.85 - 2(4.4) = 5.05$ CFS

ADD THIS FLOW TO FLOW FROM FOX HILL

17.61 + 5.05 = 22.66 CFS MOVES EAST THROUGH THE INTERSECTION.

- AT OLD ASPEN PL JUST WEST OF SILENT MEADOWS PL

$Q = 22.66 + 12.58 + 4.03$
$= 39.27$ CFS

FIND d $S = 1.3\%$ $n = 0.017$

$d = 0.53$
$WP = 33.06$
$A = 9.29$
$V = 4.276$ F/S
$Q = 39.72$ CFS $\approx$ 39.27 CFS OK

$d + \frac{v^2}{2g} = 0.81 < 0.87$ OK

- ADD ONE DBL "A" ON EACH SIDE OF ROAD.

$d = 0.53$
FROM NOMO SHEET 12
$Q_{grate} = 8.6$ CFS

Q PAST INLETS

$39.27 - 2(8.6) = 22.07$ CFS

- FIND NEW d

$d = 0.445$
$wp = 32.89$
$A = 6.57$
$V = 3.406$ F/S
$Q = 22.375$ CFS $\approx$ 22.07 CFS OK

$d + \frac{v^2}{2g} = 0.63 < 0.87$ OK

USE A DBL "C" ON EACH SIDE OF THE ROAD

FROM NOMO SHEET 12

$Q_{grate} = 5.9$ CFS

Q PAST INLETS
$= 22.07 - 2(5.9)$
$= 10.27$ CFS

THESE FLOWS VERY CLOSELY MATCH THE MOUNTAIN VIEW ESTATES SUBDIVISION UNITS ONE & TWO REPORT.

LOCATION	FLOW IN SD THIS REPORT	FLOW IN SD I & A REPORT
OLD ASPEN & FOX HILL	25.2 CFS	22 CFS
OLD ASPEN & SILENT MEADOWS PL	29 CFS	32 CFS
	54.2 CFS	54 CFS

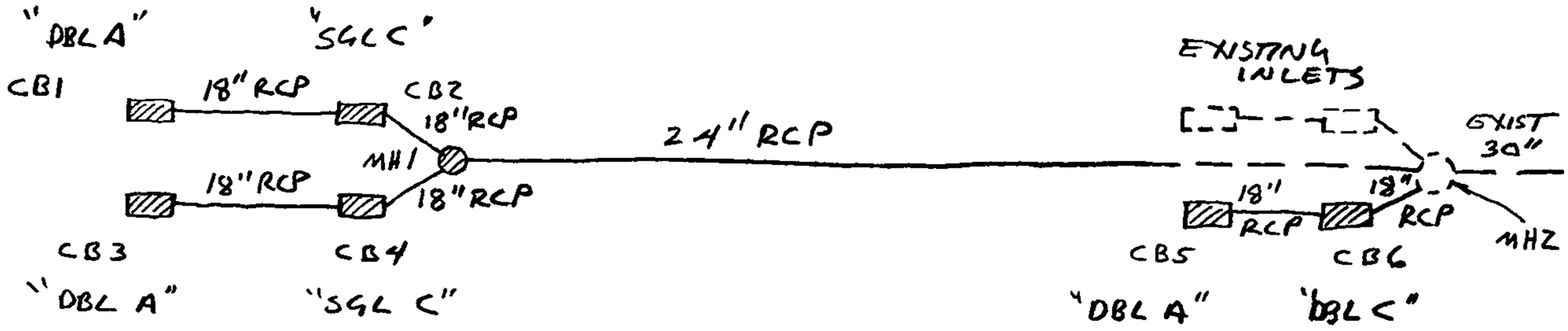
D. Mark Goodwin & Associates, P.A.
Consulting Engineers and Surveyors

PROJECT Mountain View Units 3 & 4
SUBJECT Drainage Calcs
BY GSK DATE 2-11-98
CHECKED _____ DATE _____
SHEET 5 OF ____

- SIZE STORM DRAIN

FROM NOMO SHEET 14

24" RCP @ 1.3% carries 26 cfs
18" RCP @ 2.0% carries 15 cfs



STRUCTURE	RIM/GRATE	INV
CB1	28.09	24.59
CB2	23.90	20.40
CB3	28.16	24.66
CB4	23.96	20.46
CB5	17.23	13.73
CB6	16.19	12.69
MH1	22.92	19.40/18.90
MH2	16.45	12.69/ 12.45 11.95

```
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***** HYDROGRAPH FOR MOUNTAIN VIEW OFFSITE - ROLLING HILLS UNIT 3
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                        RAIN ONE=1.92 IN RAIN SIX=2.25 IN
                        RAIN DAY=2.67 IN DT=0.03333 HR
COMPUTE NM HYD          ID=1 HYD NO=101.1 AREA=0.003847 SQ MI
                        PER A=0 B=50.4 C=0 D=49.6
                        TP=0.1333 HR MASS RAINFALL=-1
PRINT HYD               ID=1 CODE=1
FINISH
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          INPUT FILE = MTNVWOFF.DAT

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                         RAIN ONE=1.92 IN RAIN SIX=2.25 IN
                         RAIN DAY=2.67 IN DT=0.03333 HR

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                    DT =     .033330 HOURS        END TIME =     5.999400 HOURS
                       .0000   .0016   .0032   .0049   .0066   .0083   .0100
                       .0119   .0137   .0156   .0176   .0196   .0216   .0237
                       .0259   .0281   .0305   .0328   .0353   .0378   .0405
                       .0432   .0460   .0490   .0521   .0553   .0587   .0622
                       .0659   .0698   .0740   .0793   .0849   .0910   .1040
                       .1332   .1780   .2424   .3303   .4458   .5931   .7765
                      1.0004  1.2081  1.2949  1.3682  1.4333  1.4926  1.5472
                      1.5979  1.6452  1.6896  1.7313  1.7707  1.8080  1.8432
                      1.8766  1.9082  1.9383  1.9668  1.9938  2.0001  2.0060
                      2.0115  2.0168  2.0218  2.0266  2.0313  2.0357  2.0400
                      2.0442  2.0482  2.0521  2.0558  2.0595  2.0631  2.0665
                      2.0699  2.0732  2.0764  2.0795  2.0826  2.0856  2.0885
                      2.0914  2.0942  2.0969  2.0996  2.1023  2.1049  2.1075
                      2.1100  2.1124  2.1149  2.1173  2.1196  2.1219  2.1242
                      2.1265  2.1287  2.1309  2.1330  2.1351  2.1372  2.1393
                      2.1413  2.1433  2.1453  2.1473  2.1492  2.1512  2.1530
                      2.1549  2.1568  2.1586  2.1604  2.1622  2.1640  2.1657
                      2.1675  2.1692  2.1709  2.1725  2.1742  2.1759  2.1775
                      2.1791  2.1807  2.1823  2.1839  2.1854  2.1870  2.1885
                      2.1900  2.1915  2.1930  2.1945  2.1960  2.1974  2.1989
                      2.2003  2.2017  2.2031  2.2045  2.2059  2.2073  2.2086
                      2.2100  2.2113  2.2127  2.2140  2.2153  2.2166  2.2179
                      2.2192  2.2205  2.2218  2.2230  2.2243  2.2255  2.2268
                      2.2280  2.2292  2.2304  2.2316  2.2328  2.2340  2.2352
                      2.2364  2.2376  2.2387  2.2399  2.2410  2.2422  2.2433
                      2.2444  2.2456  2.2467  2.2478  2.2489  2.2500

COMPUTE NM HYD           ID=1 HYD NO=101.1 AREA=0.003847 SQ MI
                         PER A=0 B=50.4 C=0 D=49.6
                         TP=0.1333 HR MASS RAINFALL=-1

     K =    .072649HR     TP =    .133300HR     K/TP RATIO =    .545000      SHAPE CONSTANT, N =
     UNIT PEAK =    7.5333     CFS    UNIT VOLUME =     .9978        B =    526.28       P60 = 1.92
     AREA =         .001908 SQ MI     IA =     .10000 INCHES     INF =     .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330


     K =    .131002HR     TP =    .133300HR     K/TP RATIO =    .982760      SHAPE CONSTANT, N =
     UNIT PEAK =    4.7573     CFS    UNIT VOLUME =     .9975        B =    327.07       P60 = 1.92
     AREA =         .001939 SQ MI     IA =     .50000 INCHES     INF =    1.25000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD                ID=1 CODE=1

                                        PARTIAL HYDROGRAPH    101.10
```

RUNOFF VOLUME = 1.35507 INCHES = .2780 ACRE-FEET
PEAK DISCHARGE RATE = 8.11 CFS AT 1.500 HOURS BASIN AREA = .0038 SQ. MI.

FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 10:15:05

```
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***** HYDROGRAPH FOR MOUNTAIN VIEW UNITS 3 & 4
RAINFALL                TYPE=1 RAIN QUARTER=0.0 IN
                        RAIN ONE=1.92 IN RAIN SIX=2.25 IN
                        RAIN DAY=2.67 IN DT=0.03333 HR
COMPUTE NM HYD          ID=1 HYD NO=101.1 AREA=0.026793 SQ MI
                        PER A=0 B=50.54 C=0 D=49.46
                        TP=0.1333 HR MASS RAINFALL=-1
PRINT HYD               ID=1 CODE=1
FINISH
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                         RAIN ONE=1.92 IN RAIN SIX=2.25 IN
                         RAIN DAY=2.67 IN DT=0.03333 HR

                    COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 H
                    DT =     .033330 HOURS        END TIME =      5.999400 HOURS
                       .0000   .0016   .0032   .0049   .0066   .0083   .0100
                       .0119   .0137   .0156   .0176   .0196   .0216   .0237
                       .0259   .0281   .0305   .0328   .0353   .0378   .0405
                       .0432   .0460   .0490   .0521   .0553   .0587   .0622
                       .0659   .0698   .0740   .0793   .0849   .0910   .1040
                       .1332   .1780   .2424   .3303   .4458   .5931   .7765
                      1.0004  1.2081  1.2949  1.3682  1.4333  1.4926  1.5472
                      1.5979  1.6452  1.6896  1.7313  1.7707  1.8080  1.8432
                      1.8766  1.9082  1.9383  1.9668  1.9938  2.0001  2.0060
                      2.0115  2.0168  2.0218  2.0266  2.0313  2.0357  2.0400
                      2.0442  2.0482  2.0521  2.0558  2.0595  2.0631  2.0665
                      2.0699  2.0732  2.0764  2.0795  2.0826  2.0856  2.0885
                      2.0914  2.0942  2.0969  2.0996  2.1023  2.1049  2.1075
                      2.1100  2.1124  2.1149  2.1173  2.1196  2.1219  2.1242
                      2.1265  2.1287  2.1309  2.1330  2.1351  2.1372  2.1393
                      2.1413  2.1433  2.1453  2.1473  2.1492  2.1512  2.1530
                      2.1549  2.1568  2.1586  2.1604  2.1622  2.1640  2.1657
                      2.1675  2.1692  2.1709  2.1725  2.1742  2.1759  2.1775
                      2.1791  2.1807  2.1823  2.1839  2.1854  2.1870  2.1885
                      2.1900  2.1915  2.1930  2.1945  2.1960  2.1974  2.1989
                      2.2003  2.2017  2.2031  2.2045  2.2059  2.2073  2.2086
                      2.2100  2.2113  2.2127  2.2140  2.2153  2.2166  2.2179
                      2.2192  2.2205  2.2218  2.2230  2.2243  2.2255  2.2268
                      2.2280  2.2292  2.2304  2.2316  2.2328  2.2340  2.2352
                      2.2364  2.2376  2.2387  2.2399  2.2410  2.2422  2.2433
                      2.2444  2.2456  2.2467  2.2478  2.2489  2.2500

COMPUTE NM HYD           ID=1 HYD NO=101.1 AREA=0.026793 SQ MI
                         PER A=0 B=50.54 C=0 D=49.46
                         TP=0.1333 HR MASS RAINFALL=-1

     K =    .072649HR     TP =    .133300HR     K/TP RATIO =    .545000      SHAPE CONSTANT, N =
     UNIT PEAK =    52.319     CFS    UNIT VOLUME =     .9992        B =    526.28       P60 = 1.92
     AREA =         .013252 SQ MI     IA =     .10000 INCHES     INF =     .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330


     K =    .131002HR     TP =    .133300HR     K/TP RATIO =    .982760      SHAPE CONSTANT, N =
     UNIT PEAK =    33.225     CFS    UNIT VOLUME =     .9999        B =    327.07       P60 = 1.92
     AREA =         .013541 SQ MI     IA =     .50000 INCHES     INF =    1.25000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD                ID=1 CODE=1

                                        PARTIAL HYDROGRAPH    101.10
```

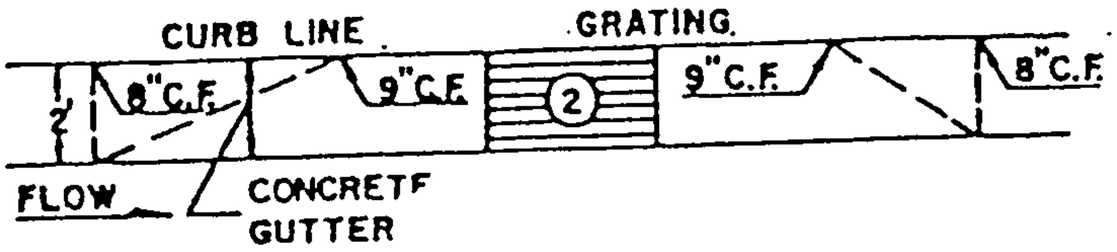
RUNOFF VOLUME = 1.35323 INCHES = 1.9337 ACRE-FEET
PEAK DISCHARGE RATE = 56.36 CFS AT 1.500 HOURS BASIN AREA = .0268 SQ. MI.

FINISH

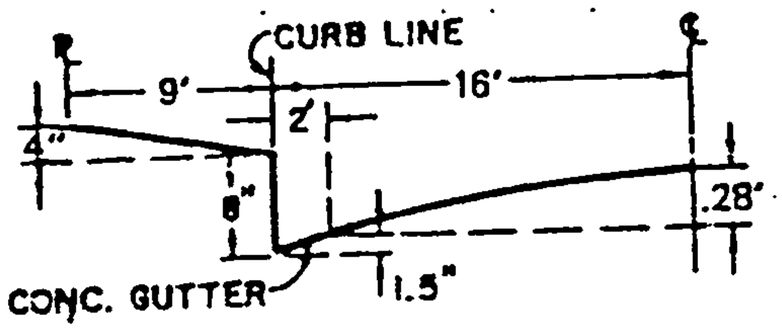
NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 10:44:10

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

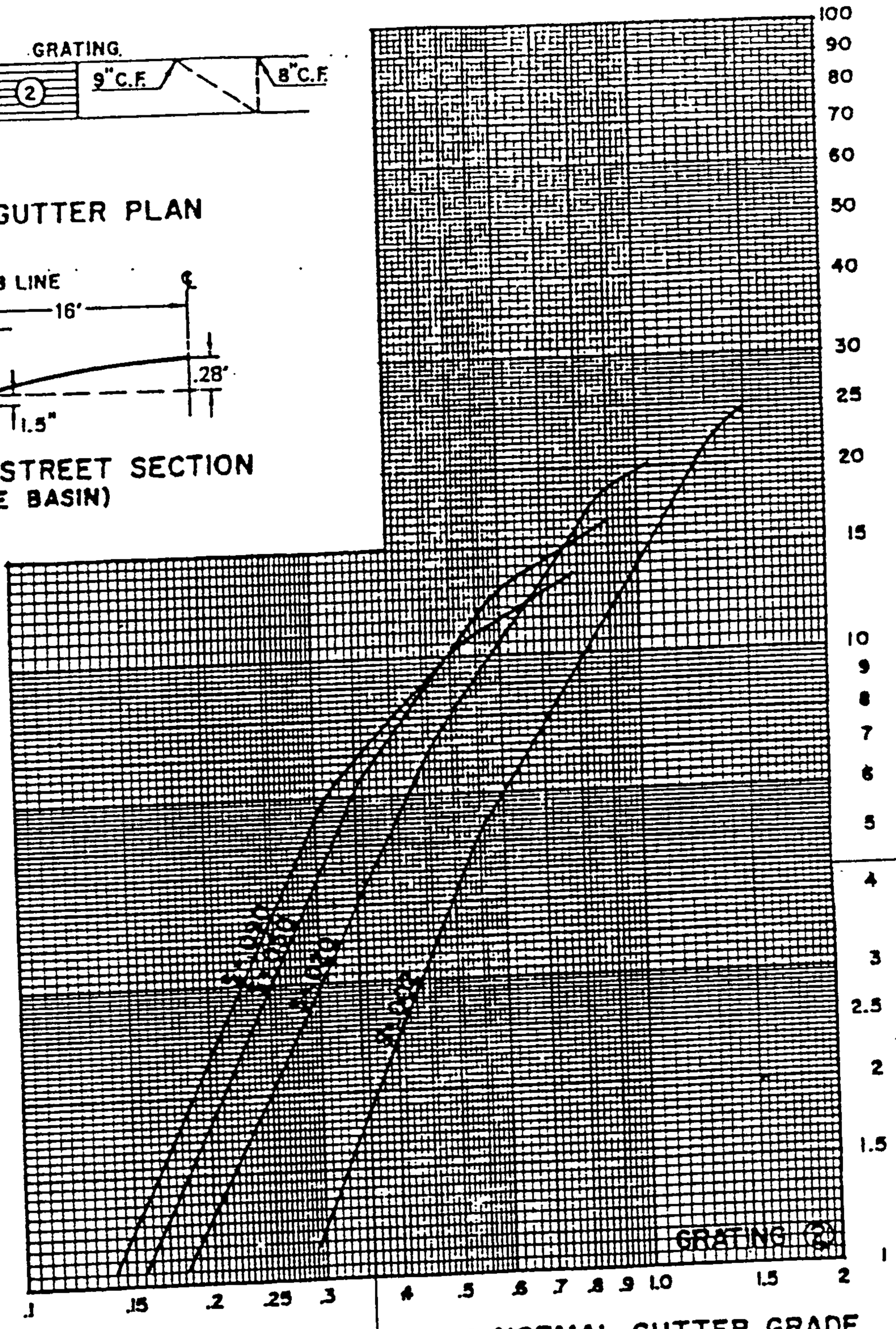
13



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



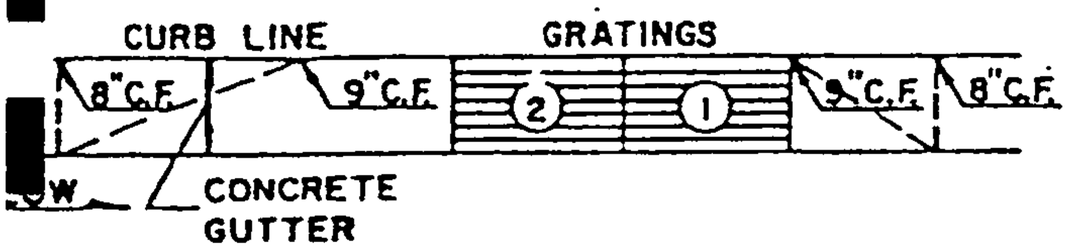
74 0.36

REV. 3-83

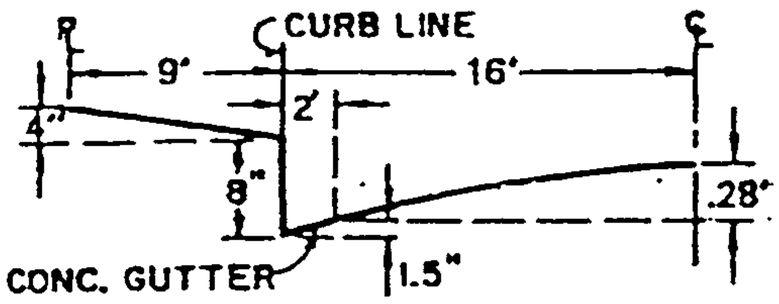
PLATE 22.3 D-5.

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

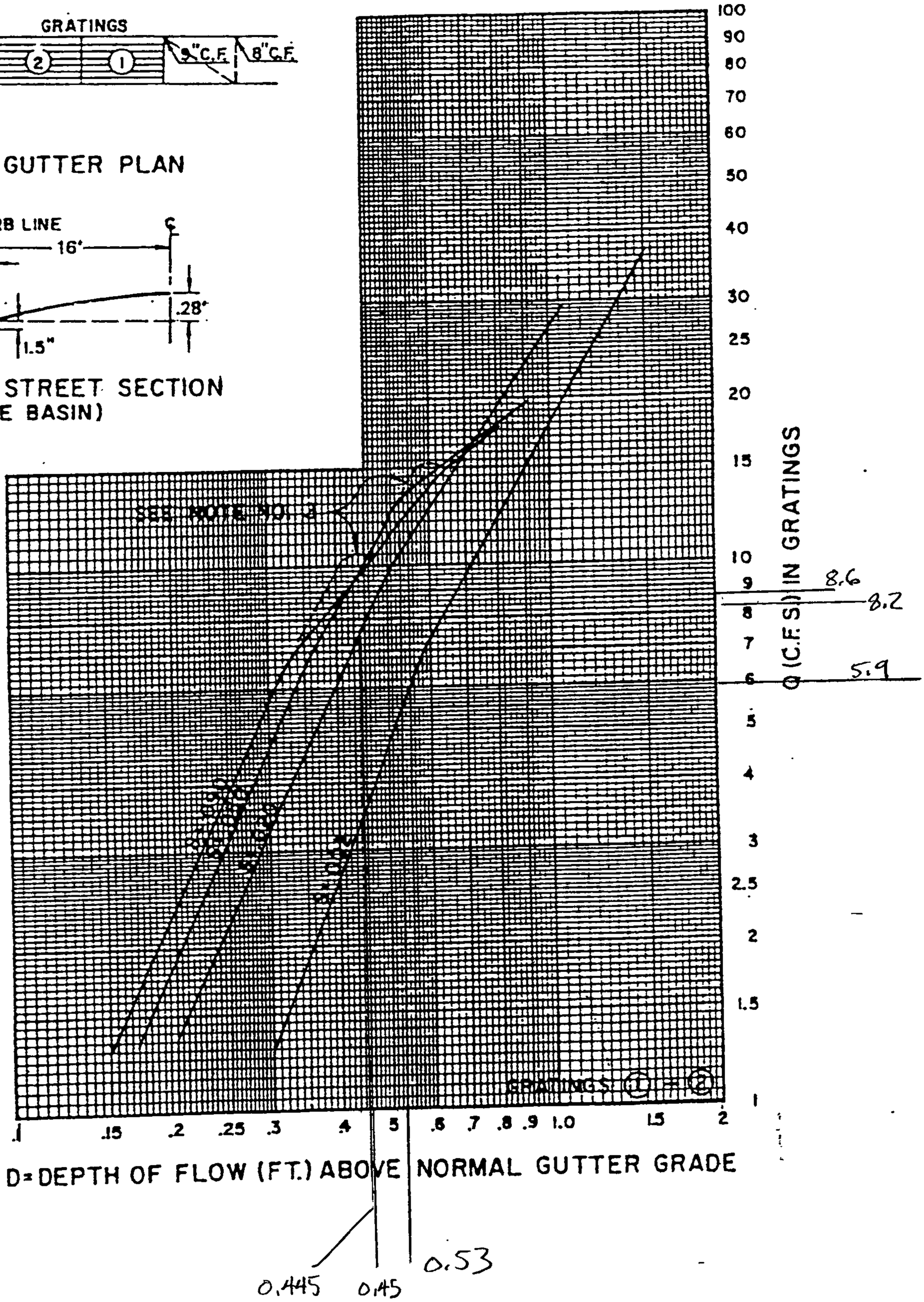
12



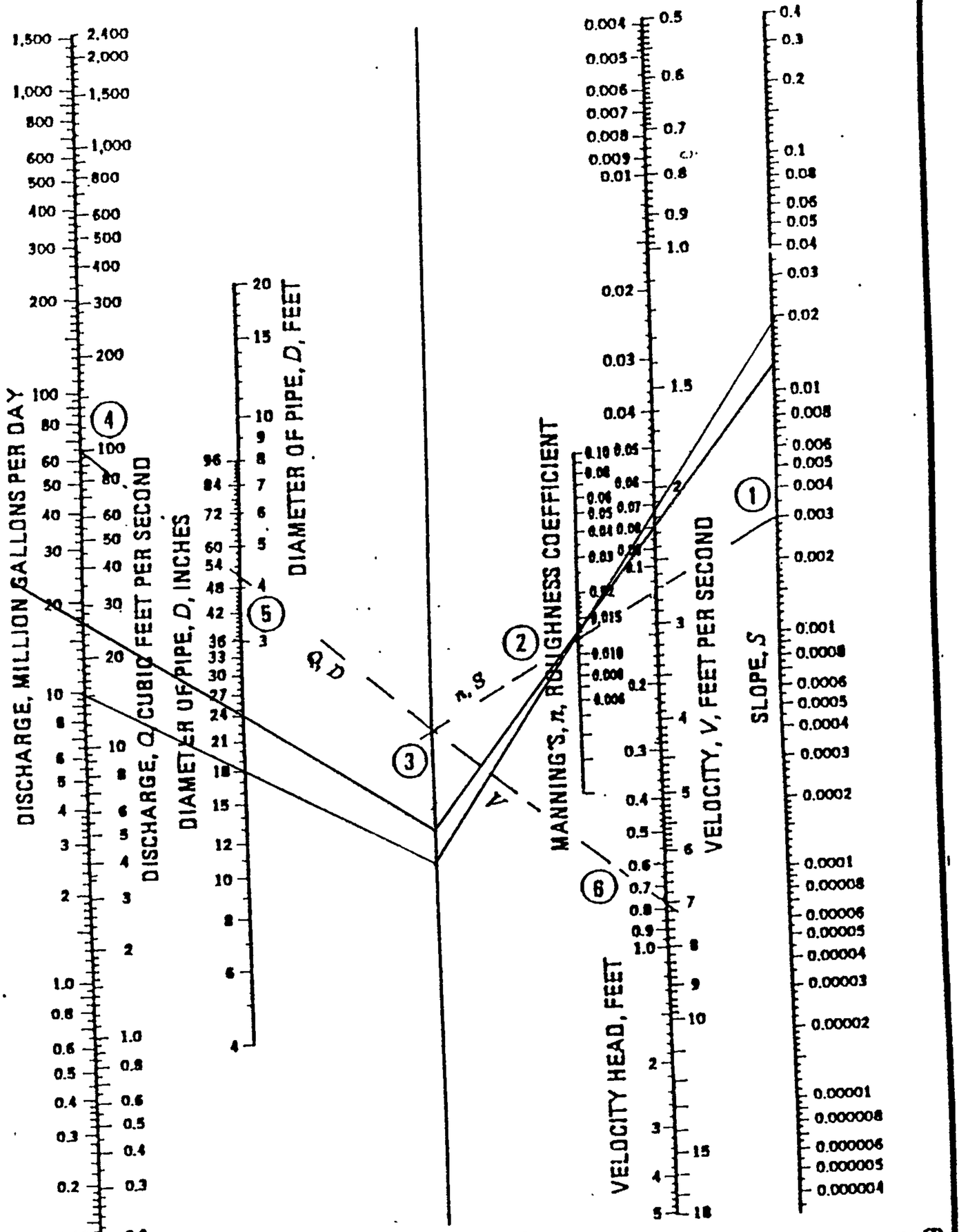
GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



Reference: American Concrete Pipe Association (1980).



B) Circular Pipe Solution

APPENDIX A

DRAINAGE REPORT

FOR

MOUNTAIN VIEW ESTATES SUBDIVISION, UNITS ONE & TWO

A 56 & 58 LOT (TWO PHASE) SINGLE FAMILY RESIDENTIAL SUBDIVISION

ALBUQUERQUE NEW MEXICO
SEPTEMBER 1997

RECEIVED
OCT 01 1997
HYDROLOGY SECTION

Prepared by:

ISAACSON & ARFMAN, P.A.
128 Monroe Street, NE
Albuquerque, NM 87108
(505) 268-8828

FRED C. ARFMAN
STATE OF NEW MEXICO
7328
REGISTERED PROFESSIONAL ENGINEER

09.30.97

Fred C. Arfman, P.E. **Date**

INTRODUCTION

The Mountain View Estates Subdivision was created from two of the planned units of Rolling Hills Subdivision, which were re-zoned for a higher housing density. The community is bordered on the north and west by Rolling Hills (Unit Two and a future phase, respectfully). Arenal Road borders the southern property line and the Amole del Norte Channel borders along the east side. Units One and Two, consisting of 56 and 58 lots respectfully, are being designed and processed simultaneously. Both of these areas have been addressed previously in the Rolling Hills Subdivision Drainage Management Plan. This plan will be re-visited in this report in order to discuss the effects of the higher housing density on the total flows into the Amole del Norte Channel. The following study will also offer the drainage and grading solution for Units One and Two of the Mountain View Estates Subdivision.

I. PROJECT INFORMATION

LEGAL DESCRIPTION: A parcel of land comprising of Parcel A-2-5 and a portion of the unplatted Tract KK-2, Town of Atrisco Grant consisting of 18.14 acres.

ENGINEER: Isaacson & Arfman, P.A.
128 Monroe Street NE
Albuquerque, NM 87108
Attn: Fred C. Arfman, P.E.
(505) 268-8828

SURVEYOR: Aldrich Land Surveying, Inc.
Attn: Tim Aldrich, NMPLS No. 7719
(505) 884-1990

BENCHMARK: ACS Monument "1-M10" located at the southeast quadrant of Sage Road and Unser Blvd. SW.
Elevation: 5079.88

ZONING: RLT

NUMBER OF EXISTING TRACTS: 2

NUMBER OF PROPOSED LOTS:
Unit One: 56
Unit Two: 58

TOTAL AREA: 18.14 Ac.
790,253 Sq. Ft.

II. SITE CHARACTERISTICS

FLOOD HAZARD: No part of this development is affected nor contributes to a flood hazard area as determined by Panel No. ~~350002-0033~~ 35001 C0337 D of the ~~October 14, 1983~~ 9-20-96 Edition of the F.E.M.A. Maps.

Ao, depth 1' in Arenal Rd right-of-way

EXISTING CONDITIONS: This site is currently undeveloped and mostly undisturbed with native ground cover, typical of the City's west side (Land Treatment B). The site has a slope downward toward the southeast at slopes ranging from 3 to 5 percent. Rolling Hills Unit Two abuts to the north and east. Storm waters generated from the Rolling Hills Unit Two improvements are currently carried by storm

drain and street flow to either the Amole del Norte Channel or an offsite detention pond. Additionally, undeveloped overland flows from the future residential phases to the east cross over the southern portion of Unit One. Arenal Road (28' edge-edge) rural paving within a 86' R.O.W. is adjacent to the south. No flows are accepted from the Arenal Road corridor.

ROLLING HILLS MASTER DRAINAGE PLAN REVISIONS: The Rolling Hills Master Drainage Plan was re-visited to determine the effect a higher housing density would have on the total flows of the remaining undeveloped phases. The percent imperious was calculated for the new RLT zoned areas and found to be slightly higher than what it was under the original zoning (R-1). To model the undeveloped area to the ~~east~~ west of Mountain View Estates Units One and Two it was assumed that the remainder of Tract KK-2 would be developed as RLT zoning and Tract A~~A~~2 would remain zoned as R-1.

The original AHYMO calculations for the subdivision also did not account for the routing of the upper basin flows through the lower basins. Therefore, when the model was re-run to account for the change in percent imperious, it was also modified to address the routing of the flows (see Appendix A: AHYMO CALCULATIONS). The combined effect of the changes made to the model resulted in no

significant change in the maximum flow rates at the two Amole del Norte Channel outfall points.

PROPOSED CONDITIONS:

UNIT ONE: The development of the 56 lots of this phase will require the construction of a storm drain along Old Aspen Road from the westerly phase line to the Amole del Norte Channel. When the future phases to the west are developed the line will be extended to its ultimate length. This system was identified in the previously mentioned Rolling Hills Drainage Management Plan, on file with the City Hydrology Division. A complete hydraulic analysis was calculated for the system using the pipe soffit elevation at the Amole del Norte as the control surface elevation (see Appendix B).

The storm drain has the following hydraulic and hydrological characteristics:

A. West Terminus (Silent Meadows and Old Aspen Road): A battery of Type A inlets have the capacity of accepting 32 cfs into a 30" RCP. These flows will be generated within the future phases to the west (refer to Appendix B).

Interim: Prior to the development of the future phases to the west, the upstream flows from Rolling Hills Units Two and Three will be captured by ponds located at the southern terminus of Quiet Desert Drive and the southern terminus of Rolling Rock Place (see Grading Plan for details). Any overland flows generated from the undeveloped phases will be captured by the catch basins located at Silent Meadows Place and Old Aspen Road.

Ultimate: The fully developed upstream basin will contribute an additional 22 cfs to the storm drain via a battery of Type A inlets to the far west along Old Aspen Road (see the Master Drainage Plan exhibit).

Remaining flows (Q = 9.45 cfs) will be carried by the street at a depth of .33 feet (EGL = .43 ft).

B. Secret Valley Drive and Old Aspen Road: Two Type 'A' inlets will accept 8 cfs of the flow generated along Secret Valley Drive. The storm drain along Old Aspen will increase in size to a 36" diameter capable of conveying 75 cfs at a projected 1.25% slope under gravity (see Flowmaster Worksheet No. 2).

The remaining 31.25 cfs is conveyed by the 32' F.F. street at a flow depth of .46 feet (EGL = 0.71 ft).

C. Old Aspen Drive and Seven Falls Place: Two Type "A" inlets will accept an additional 13 cfs from Old Aspen Road. The storm drain will remain at a 36" diameter RCP and begin to function under pressure conditions. A remaining 45.6 cfs will flow as channelized flow from Old Aspen to the Amole del Norte Channel.

UNIT TWO: Additional Type C inlets will be added at the end of Rockwood Road to pick up the remaining 17 cfs of street flow. The water will be conveyed via the existing storm drain to the Amole del Norte Channel.

CONCLUSIONS & RECOMMENDATIONS

The Drainage Study for Mountain View Estates Subdivision Units One and Two is consistent with the Rolling Hills Drainage Management Plan previously submitted and on file at the Hydrology Division, P.W.D., City of Albuquerque. Rolling Hills Subdivision Units One, Two, and Three are currently under construction and conform to the same DMP. The individual recommendations for Units One and Two are presented below:

Unit One:

1. A portion of the Old Aspen Road storm drain (from Silent Meadows to the Amole del Norte Channel) should be constructed as part of the Unit One improvements.
2. Developer should have a hard lined connection between the storm drain outfall and the Amole del Norte Diversion Channel.
3. An open channel connection to the Amole del Norte shall be constructed from the western terminus of Old Aspen Road.
4. No rear yard ponding shall be allowed in this portion of the development (see Typical Lot Grading Detail).
5. Adjacent lots may share a common lot line drainage swale (see Typical Lot Grading Detail).

Unit Two:

1. Additional catch basins shall be added at the end of Rockwood Road to collect all remaining street flows into the existing storm drain.
2. No rear yard ponding shall be allowed in Unit Two (see Typical Lot Grading Plan).
3. Adjacent lots may share a common lot line drainage swale (see Typical Lot Grading Plan).

APPENDIX A

AHYMO CALCULATIONS

RUN DATE (MON/DAY/YR) = 09/22/1997
START TIME (HR:MIN:SEC) = 16:30:25 USER NO.= ISCARFNM.I01
INPUT FILE = RHMPR2.DAT

**** Mountain View Subdivision Unit 4 &5****
**** September 22, 1996 ****
START RAINFALL BEGINS AT 0.0 HRS
RAINFALL TYPE=1 RAIN QUARTER=0 RAIN ONE=1.87
RAIN SIX=2.20 RAIN DAY=0 DT=0.03333HR

COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
DT = .033330 HOURS END TIME = 5.999400 HOURS

.0000	.0016	.0033	.0050	.0067	.0085	.0103
.0122	.0141	.0160	.0180	.0201	.0222	.0243
.0266	.0289	.0312	.0337	.0362	.0388	.0415
.0443	.0472	.0502	.0534	.0567	.0601	.0637
.0675	.0715	.0758	.0809	.0865	.0924	.1050
.1334	.1771	.2398	.3254	.4379	.5814	.7600
.9780	1.1804	1.2649	1.3363	1.3997	1.4575	1.5106
1.5600	1.6061	1.6493	1.6900	1.7284	1.7646	1.7989
1.8314	1.8623	1.8915	1.9193	1.9456	1.9518	1.9576
1.9630	1.9682	1.9732	1.9780	1.9825	1.9869	1.9912
1.9953	1.9993	2.0031	2.0068	2.0104	2.0140	2.0174
2.0207	2.0240	2.0272	2.0303	2.0333	2.0363	2.0392
2.0420	2.0448	2.0475	2.0502	2.0528	2.0554	2.0580
2.0605	2.0629	2.0653	2.0677	2.0700	2.0723	2.0746
2.0768	2.0790	2.0812	2.0833	2.0855	2.0875	2.0896
2.0916	2.0936	2.0956	2.0976	2.0995	2.1014	2.1033
2.1051	2.1070	2.1088	2.1106	2.1124	2.1141	2.1159
2.1176	2.1193	2.1210	2.1227	2.1244	2.1260	2.1276
2.1292	2.1308	2.1324	2.1340	2.1355	2.1371	2.1386
2.1401	2.1416	2.1431	2.1446	2.1460	2.1475	2.1489
2.1504	2.1518	2.1532	2.1546	2.1560	2.1573	2.1587
2.1600	2.1614	2.1627	2.1640	2.1654	2.1667	2.1680
2.1692	2.1705	2.1718	2.1731	2.1743	2.1756	2.1768
2.1780	2.1792	2.1804	2.1817	2.1829	2.1840	2.1852
2.1864	2.1876	2.1887	2.1899	2.1910	2.1922	2.1933
2.1944	2.1956	2.1967	2.1978	2.1989	2.2000	

*S **BASIN A
COMPUTE NM HYD ID=1 HYD NO=100.00 AREA=0.00517 SQ MI
PER A=0 PER B=37 PER C=13 PER D=50
TP=-0.1333 HR MASSRAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 10.206 CFS UNIT VOLUME = .9982 B = 526.28 P60 = 1.8700
AREA = .002585 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .124459HR TP = .133300HR K/TP RATIO = .933679 SHAPE CONSTANT, N = 3.788292
UNIT PEAK = 6.6089 CFS UNIT VOLUME = .9983 B = 340.80 P60 = 1.8700
AREA = .002585 SQ MI IA = .46100 INCHES INF = 1.14080 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 100.00

RUNOFF VOLUME = 1.35334 INCHES = .3732 ACRE-FEET
PEAK DISCHARGE RATE = 10.94 CFS AT 1.500 HOURS BASIN AREA = .0052 SQ. MI.

*S ** ROUTE BASIN A THROUGH C
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
MIN ELEV=100.00 FT MAX ELEV=100.67 FT
CH SLP=.02 FP SLP=.02 N=.017 DIST=32 FT
DIST ELEV DIST ELEV DIST ELEV
0 100.67 0.1 100.00 16 100.32
31.9 100.00 32.0 100.67

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.04	.06	.05	3.51
100.07	.25	.33	7.03
100.11	.56	.96	10.54
100.14	.99	2.07	14.06
100.18	1.55	3.75	17.57
100.21	2.23	6.10	21.09
100.25	3.04	9.20	24.60
100.28	3.97	13.13	28.12
100.32	5.02	17.98	31.63
100.35	6.14	25.01	31.91
100.39	7.27	33.05	31.92
100.42	8.40	41.95	31.93
100.46	9.52	51.67	31.94
100.49	10.65	62.16	31.95
100.53	11.77	73.40	31.96
100.56	12.90	85.36	31.97
100.60	14.03	98.01	31.98
100.63	15.16	111.33	31.99
100.67	16.28	125.31	32.00

COMPUTE TRAVEL TIME ID=2 REACH NO=1 NO VS=1 L=270 FT
SLP=.046

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.0906
.071	.248	.33	.0571
.106	.558	.96	.0436
.141	.992	2.07	.0360
.176	1.549	3.75	.0310
.212	2.231	6.10	.0274
.247	3.037	9.20	.0248
.282	3.966	13.13	.0227
.317	5.020	17.98	.0209
.353	6.144	25.01	.0184
.388	7.269	33.05	.0165
.423	8.395	41.95	.0150
.458	9.521	51.67	.0138
.494	10.647	62.16	.0128
.529	11.774	73.40	.0120
.564	12.901	85.36	.0113
.599	14.029	98.01	.0107
.635	15.157	111.33	.0102
.670	16.285	125.31	.0097

```
ROUTE                ID=2 HYD NO=100.1 INFLOW ID=1 DT=0.0 HR
PRINT HYD            ID=2 CODE=1

                          PARTIAL HYDROGRAPH   100.10

    RUNOFF VOLUME =      1.35338 INCHES      =         .3732 ACRE-FEET
    PEAK DISCHARGE RATE =      10.79 CFS  AT   1.533 HOURS   BASIN AREA =    .0052 SQ. MI.


*S **BASIN C
COMPUTE NM HYD       ID=3 HYD NO=101.00 AREA=0.00420 SQ MI
                     PER A=0 PER B=37 PER C=13 PER D=50
                     TP=-0.1333 HR   MASSRAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   8.2909    CFS   UNIT VOLUME =     .9981       B =   526.28      P60 = 1.8700
    AREA =       .002100 SQ MI    IA =     .10000 INCHES    INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330


    K =    .124459HR    TP =    .133300HR    K/TP RATIO =    .933679     SHAPE CONSTANT, N =  3.788292
    UNIT PEAK =   5.3689    CFS   UNIT VOLUME =     .9977       B =   340.80      P60 = 1.8700
    AREA =       .002100 SQ MI    IA =     .46100 INCHES    INF =    1.14080 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD            ID=3   CODE=1

                          PARTIAL HYDROGRAPH   101.00
```

RUNOFF VOLUME = 1.35334 INCHES = .3031 ACRE-FEET
PEAK DISCHARGE RATE = 8.89 CFS AT 1.500 HOURS BASIN AREA = .0042 SQ. MI.

ADD HYD ID=4 HYD NO=101.1 ID=2 ID=3
PRINT HYD ID=4 CODE=5

PARTIAL HYDROGRAPH 101.10

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.500	19.2	3.000	.2	4.500	.1	5.999	.1
.167	.0	1.667	10.9	3.166	.2	4.666	.1	6.166	.1
.333	.0	1.833	6.0	3.333	.1	4.833	.1	6.333	.0
.500	.0	2.000	4.0	3.500	.1	4.999	.1	6.499	.0
.667	.0	2.166	2.1	3.666	.1	5.166	.1	6.666	.0
.833	.0	2.333	1.0	3.833	.1	5.333	.1	6.833	.0
1.000	.0	2.500	.6	4.000	.1	5.499	.1		
1.167	.0	2.666	.4	4.166	.1	5.666	.1		
1.333	3.5	2.833	.3	4.333	.1	5.833	.1		

RUNOFF VOLUME = 1.35328 INCHES = .6763 ACRE-FEET
PEAK DISCHARGE RATE = 19.38 CFS AT 1.533 HOURS BASIN AREA = .0094 SQ. MI.

*S ** ROUTE BASIN A & C TO WINDSONG ROAD
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
MIN ELEV=100.00 FT MAX ELEV=100.67 FT
CH SLP=.02 FP SLP=.02 N=.017 DIST=32 FT
DIST ELEV DIST ELEV DIST ELEV
0 100.67 0.1 100.00 16 100.32
31.9 100.00 32.0 100.67

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.04	.06	.05	3.51
100.07	.25	.33	7.03
100.11	.56	.96	10.54
100.14	.99	2.07	14.06
100.18	1.55	3.75	17.57
100.21	2.23	6.10	21.09
100.25	3.04	9.20	24.60
100.28	3.97	13.13	28.12
100.32	5.02	17.98	31.63
100.35	6.14	25.01	31.91
100.39	7.27	33.05	31.92
100.42	8.40	41.95	31.93
100.46	9.52	51.67	31.94
100.49	10.65	62.16	31.95

100.53	11.77	73.40	31.96
100.56	12.90	85.36	31.97
100.60	14.03	98.01	31.98
100.63	15.16	111.33	31.99
100.67	16.28	125.31	32.00

COMPUTE TRAVEL TIME ID=5 REACH NO=1 NO VS=1 L=170 FT
SLP=.046

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.0570
.071	.248	.33	.0359
.106	.558	.96	.0274
.141	.992	2.07	.0226
.176	1.549	3.75	.0195
.212	2.231	6.10	.0173
.247	3.037	9.20	.0156
.282	3.966	13.13	.0143
.317	5.020	17.98	.0132
.353	6.144	25.01	.0116
.388	7.269	33.05	.0104
.423	8.395	41.95	.0094
.458	9.521	51.67	.0087
.494	10.647	62.16	.0081
.529	11.774	73.40	.0076
.564	12.901	85.36	.0071
.599	14.029	98.01	.0068
.635	15.157	111.33	.0064
.670	16.285	125.31	.0061

ROUTE ID=5 HYD NO=101.2 INFLOW ID=4 DT=0.0 HR
PRINT HYD ID=5 CODE=1

PARTIAL HYDROGRAPH 101.20

RUNOFF VOLUME = 1.35334 INCHES = .6763 ACRE-FEET
PEAK DISCHARGE RATE = 19.63 CFS AT 1.533 HOURS BASIN AREA = .0094 SQ. MI.

*S **BASIN E
COMPUTE NM HYD ID=6 HYD NO=102.00 AREA=0.00356 SQ MI
PER A=0 PER B=37 PER C=13 PER D=50
TP=-0.1333 HR MASSRAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 7.0275 CFS UNIT VOLUME = .9978 B = 526.28 P60 = 1.8700
AREA = .001780 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .124459HR TP = .133300HR K/TP RATIO = .933679 SHAPE CONSTANT, N = 3.788292
UNIT PEAK = 4.5508 CFS UNIT VOLUME = .9972 B = 340.80 P60 = 1.8700
AREA = .001780 SQ MI IA = .46100 INCHES INF = 1.14080 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=6 CODE=5

PARTIAL HYDROGRAPH 102.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.333	1.6	2.666	.1	4.000	.0	5.333	.0
.167	.0	1.500	7.5	2.833	.1	4.166	.0	5.499	.0
.333	.0	1.667	3.9	3.000	.1	4.333	.0	5.666	.0
.500	.0	1.833	2.2	3.166	.1	4.500	.0	5.833	.0
.667	.0	2.000	1.5	3.333	.0	4.666	.0	5.999	.0
.833	.0	2.166	.7	3.500	.0	4.833	.0	6.166	.0
1.000	.0	2.333	.3	3.666	.0	4.999	.0	6.333	.0
1.167	.0	2.500	.2	3.833	.0	5.166	.0	6.499	.0

RUNOFF VOLUME = 1.35334 INCHES = .2570 ACRE-FEET
PEAK DISCHARGE RATE = 7.54 CFS AT 1.500 HOURS BASIN AREA = .0036 SQ. MI.

ADD HYD ID=7 HYD NO=102.1 ID=5 ID=6
PRINT HYD ID=7 CODE=1

PARTIAL HYDROGRAPH 102.10

RUNOFF VOLUME = 1.35328 INCHES = .9332 ACRE-FEET
PEAK DISCHARGE RATE = 26.91 CFS AT 1.533 HOURS BASIN AREA = .0129 SQ. MI.

*S ** ROUTE BASINS A,C & E TO AUTUMN CANYON ROAD
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
MIN ELEV=100.00 FT MAX ELEV=100.67 FT
CH SLP=.02 FP SLP=.02 N=.017 DIST=32 FT
DIST ELEV DIST ELEV DIST ELEV
0 100.67 0.1 100.00 16 100.32
31.9 100.00 32.0 100.67

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.04	.06	.05	3.51
100.07	.25	.33	7.03
100.11	.56	.96	10.54
100.14	.99	2.07	14.06
100.18	1.55	3.75	17.57

100.21	2.23	6.10	21.09
100.25	3.04	9.20	24.60
100.28	3.97	13.13	28.12
100.32	5.02	17.98	31.63
100.35	6.14	25.01	31.91
100.39	7.27	33.05	31.92
100.42	8.40	41.95	31.93
100.46	9.52	51.67	31.94
100.49	10.65	62.16	31.95
100.53	11.77	73.40	31.96
100.56	12.90	85.36	31.97
100.60	14.03	98.01	31.98
100.63	15.16	111.33	31.99
100.67	16.28	125.31	32.00

COMPUTE TRAVEL TIME ID=8 REACH NO=1 NO VS=1 L=240 FT
SLP=.046

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.0805
.071	.248	.33	.0507
.106	.558	.96	.0387
.141	.992	2.07	.0320
.176	1.549	3.75	.0275
.212	2.231	6.10	.0244
.247	3.037	9.20	.0220
.282	3.966	13.13	.0201
.317	5.020	17.98	.0186
.353	6.144	25.01	.0164
.388	7.269	33.05	.0147
.423	8.395	41.95	.0133
.458	9.521	51.67	.0123
.494	10.647	62.16	.0114
.529	11.774	73.40	.0107
.564	12.901	85.36	.0101
.599	14.029	98.01	.0095
.635	15.157	111.33	.0091
.670	16.285	125.31	.0087

ROUTE ID=8 HYD NO=102.2 INFLOW ID=7 DT=0.0 HR
PRINT HYD ID=8 CODE=1

PARTIAL HYDROGRAPH 102.20

RUNOFF VOLUME = 1.35332 INCHES = .9332 ACRE-FEET
PEAK DISCHARGE RATE = 27.23 CFS AT 1.533 HOURS BASIN AREA = .0129 SQ. MI.

```
*S **BASIN G
COMPUTE NM HYD       ID=9 HYD NO=103.00 AREA=0.00291 SQ MI
                     PER A=0 PER B=37 PER C=13 PER D=50
                     TP=-0.1333 HR   MASSRAIN=-1

     K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   5.7444    CFS   UNIT VOLUME =    .9973       B =   526.28      P60 = 1.8700
     AREA =      .001455 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


     K =   .124459HR    TP =   .133300HR    K/TP RATIO =   .933679     SHAPE CONSTANT, N =  3.788292
     UNIT PEAK =   3.7199    CFS   UNIT VOLUME =    .9966       B =   340.80      P60 = 1.8700
     AREA =      .001455 SQ MI    IA =    .46100 INCHES    INF =   1.14080 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=9   CODE=1

                                PARTIAL HYDROGRAPH   103.00


     RUNOFF VOLUME =     1.35334 INCHES      =         .2100 ACRE-FEET
     PEAK DISCHARGE RATE =       6.16 CFS  AT   1.500 HOURS   BASIN AREA =   .0029 SQ. MI.


ADD HYD              ID=10 HYD NO=103.1 ID=8 ID=9
*S ** ROUTE BASINS A,C,E & G TO AP2
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                     MIN ELEV=100.00 FT MAX ELEV=100.67 FT
                     CH SLP=.02 FP SLP=.02 N=.017 DIST=32 FT
                     DIST  ELEV  DIST  ELEV  DIST  ELEV
                       0  100.67 0.1  100.00   16   100.32
                     31.9 100.00 32.0 100.67

                              RATING CURVE VALLEY SECTION  1.0
                                WATER        FLOW        FLOW        TOP
                              SURFACE        AREA        RATE       WIDTH
                               ELEV          SQ FT       CFS         FT
                              100.00          .00          .00         .00
                              100.04          .06          .05        3.51
                              100.07          .25          .33        7.03
                              100.11          .56          .96       10.54
                              100.14          .99         2.07       14.06
                              100.18         1.55         3.75       17.57
                              100.21         2.23         6.10       21.09
                              100.25         3.04         9.20       24.60
                              100.28         3.97        13.13       28.12
                              100.32         5.02        17.98       31.63
                              100.35         6.14        25.01       31.91
                              100.39         7.27        33.05       31.92
                              100.42         8.40        41.95       31.93
                              100.46         9.52        51.67       31.94
                              100.49        10.65        62.16       31.95
```

100.53	11.77	73.40	31.96
100.56	12.90	85.36	31.97
100.60	14.03	98.01	31.98
100.63	15.16	111.33	31.99
100.67	16.28	125.31	32.00

COMPUTE TRAVEL TIME ID=11 REACH NO=1 NO VS=1 L=250 FT
SLP=.0149

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.0839
.071	.248	.33	.0528
.106	.558	.96	.0403
.141	.992	2.07	.0333
.176	1.549	3.75	.0287
.212	2.231	6.10	.0254
.247	3.037	9.20	.0229
.282	3.966	13.13	.0210
.317	5.020	17.98	.0194
.353	6.144	25.01	.0171
.388	7.269	33.05	.0153
.423	8.395	41.95	.0139
.458	9.521	51.67	.0128
.494	10.647	62.16	.0119
.529	11.774	73.40	.0111
.564	12.901	85.36	.0105
.599	14.029	98.01	.0099
.635	15.157	111.33	.0095
.670	16.285	125.31	.0090

ROUTE ID=11 HYD NO=103.2 INFLOW ID=10 DT=0.0 HR
PRINT HYD ID=11 CODE=1

PARTIAL HYDROGRAPH 103.20

RUNOFF VOLUME = 1.35330 INCHES = 1.1433 ACRE-FEET
PEAK DISCHARGE RATE = 33.31 CFS AT 1.533 HOURS BASIN AREA = .0158 SQ. MI.

*S **BASIN F
COMPUTE NM HYD ID=12 HYD NO=104.00 AREA=0.00356 SQ MI
PER A=0 PER B=37 PER C=13 PER D=50
TP=-0.1333 HR MASSRAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 7.0275 CFS UNIT VOLUME = .9978 B = 526.28 P60 = 1.8700
AREA = .001780 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

```
    K =   .124459HR    TP =   .133300HR    K/TP RATIO =   .933679     SHAPE CONSTANT, N =  3.788292
    UNIT PEAK =   4.5508    CFS   UNIT VOLUME =    .9972       B =   340.80      P60 = 1.8700
    AREA =      .001780 SQ MI    IA =    .46100 INCHES    INF =   1.14080 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=12   CODE=1

                                PARTIAL HYDROGRAPH   104.00

    RUNOFF VOLUME =     1.35334 INCHES      =        .2570 ACRE-FEET
    PEAK DISCHARGE RATE =       7.54 CFS  AT   1.500 HOURS   BASIN AREA =   .0036 SQ. MI.


ADD HYD             ID=13 HYD NO=104.1 ID=11 ID=12
*S TOTAL FLOW @ AP2
PRINT HYD           ID=13 CODE=5

                                PARTIAL HYDROGRAPH   104.10

     TIME     FLOW        TIME     FLOW        TIME     FLOW        TIME     FLOW        TIME     FLOW
      HRS      CFS         HRS      CFS         HRS      CFS         HRS      CFS         HRS      CFS
     .000       .0       1.500     37.2       3.000       .5      4.500       .2      5.999       .2
     .167       .0       1.667     24.5       3.166       .3      4.666       .2      6.166       .2
     .333       .0       1.833     13.4       3.333       .3      4.833       .2      6.333       .1
     .500       .0       2.000      8.8       3.500       .2      4.999       .2      6.499       .0
     .667       .0       2.166      5.1       3.666       .2      5.166       .2      6.666       .0
     .833       .0       2.333      2.4       3.833       .2      5.333       .2      6.833       .0
    1.000       .0       2.500      1.4       4.000       .2      5.499       .2      6.999       .0
    1.167       .0       2.666       .9       4.166       .2      5.666       .2      7.166       .0
    1.333       4.5      2.833       .6       4.333       .2      5.833       .2

    RUNOFF VOLUME =     1.35327 INCHES      =       1.4002 ACRE-FEET
    PEAK DISCHARGE RATE =      40.59 CFS  AT   1.533 HOURS   BASIN AREA =   .0194 SQ. MI.


*S **********************************************************************
*S **********************************************************************
*S **BASIN B
COMPUTE NM HYD      ID=14 HYD NO=200.00 AREA=0.00291 SQ MI
                    PER A=0 PER B=37 PER C=13 PER D=50
                    TP=-0.1333 HR   MASSRAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   5.7444    CFS   UNIT VOLUME =    .9973       B =   526.28      P60 = 1.8700
    AREA =      .001455 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
```

K = .124459HR TP = .133300HR K/TP RATIO = .933679 SHAPE CONSTANT, N = 3.788292
UNIT PEAK = 3.7199 CFS UNIT VOLUME = .9966 B = 340.80 P60 = 1.8700
AREA = .001455 SQ MI IA = .46100 INCHES INF = 1.14080 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=14 CODE=1

PARTIAL HYDROGRAPH 200.00

RUNOFF VOLUME = 1.35334 INCHES = .2100 ACRE-FEET
PEAK DISCHARGE RATE = 6.16 CFS AT 1.500 HOURS BASIN AREA = .0029 SQ. MI.

*S ** ROUTE BASIN B THROUGH BASIN D TO AP1
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
MIN ELEV=100.00 FT MAX ELEV=100.67 FT
CH SLP=.02 FP SLP=.02 N=.017 DIST=28 FT
DIST ELEV DIST ELEV DIST ELEV
0 100.67 0.1 100.00 14 100.28
27.9 100.00 28.0 100.67

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.04	.06	.05	3.51
100.07	.25	.33	7.02
100.11	.56	.96	10.53
100.14	.99	2.07	14.05
100.18	1.55	3.75	17.56
100.21	2.23	6.09	21.07
100.25	3.03	9.19	24.58
100.28	3.96	13.18	27.88
100.32	4.95	19.05	27.89
100.35	5.93	25.73	27.91
100.39	6.91	33.18	27.92
100.42	7.90	41.35	27.93
100.46	8.88	50.21	27.94
100.49	9.87	59.73	27.95
100.53	10.85	69.89	27.96
100.56	11.84	80.66	27.97
100.60	12.83	92.01	27.98
100.63	13.81	103.94	27.99
100.67	14.80	116.42	28.00

COMPUTE TRAVEL TIME ID=15 REACH NO=1 NO VS=1 L=640 FT
SLP=.0388

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.2148
.071	.248	.33	.1353
.106	.557	.96	.1032
.141	.991	2.07	.0852
.176	1.548	3.75	.0734
.212	2.229	6.09	.0650
.247	3.034	9.19	.0587
.282	3.962	13.18	.0534
.317	4.946	19.05	.0462
.353	5.930	25.73	.0410
.388	6.914	33.18	.0370
.423	7.898	41.35	.0340
.458	8.883	50.21	.0315
.494	9.869	59.73	.0294
.529	10.854	69.89	.0276
.564	11.841	80.66	.0261
.599	12.827	92.01	.0248
.635	13.814	103.94	.0236
.670	14.801	116.42	.0226

ROUTE ID=15 HYD NO=200.1 INFLOW ID=14 DT=0.0 HR
PRINT HYD ID=15 CODE=1

PARTIAL HYDROGRAPH 200.10

RUNOFF VOLUME = 1.35342 INCHES = .2100 ACRE-FEET
PEAK DISCHARGE RATE = 5.43 CFS AT 1.567 HOURS BASIN AREA = .0029 SQ. MI.

*S **BASIN D
COMPUTE NM HYD ID=16 HYD NO=201.00 AREA=0.00259 SQ MI
PER A=0 PER B=37 PER C=13 PER D=50
TP=-0.1333 HR MASSRAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 5.1127 CFS UNIT VOLUME = .9973 B = 526.28 P60 = 1.8700
AREA = .001295 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .124459HR TP = .133300HR K/TP RATIO = .933679 SHAPE CONSTANT, N = 3.788292
UNIT PEAK = 3.3108 CFS UNIT VOLUME = .9962 B = 340.80 P60 = 1.8700
AREA = .001295 SQ MI IA = .46100 INCHES INF = 1.14080 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=16 CODE=1

PARTIAL HYDROGRAPH 201.00

RUNOFF VOLUME = 1.35334 INCHES = .1869 ACRE-FEET
PEAK DISCHARGE RATE = 5.49 CFS AT 1.500 HOURS BASIN AREA = .0026 SQ. MI.

*S **TOTAL FLOW AT AP1 (BASIN B + D)
ADD HYD ID=17 HYD NO=201.1 ID=15 ID=16
PRINT HYD ID=17 CODE=5

PARTIAL HYDROGRAPH 201.10

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.500	10.1	3.000	.1	4.500	.0	5.999	.1
.167	.0	1.667	6.9	3.166	.1	4.666	.0	6.166	.0
.333	.0	1.833	3.8	3.333	.1	4.833	.0	6.333	.0
.500	.0	2.000	2.5	3.500	.1	4.999	.0	6.499	.0
.667	.0	2.166	1.4	3.666	.1	5.166	.0	6.666	.0
.833	.0	2.333	.7	3.833	.1	5.333	.0	6.833	.0
1.000	.0	2.500	.4	4.000	.0	5.499	.0	6.999	.0
1.167	.0	2.666	.3	4.166	.0	5.666	.1		
1.333	1.6	2.833	.2	4.333	.0	5.833	.1		

RUNOFF VOLUME = 1.35325 INCHES = .3969 ACRE-FEET
PEAK DISCHARGE RATE = 10.62 CFS AT 1.533 HOURS BASIN AREA = .0055 SQ. MI.

*S **OFFSITE BASIN TO THE NORTH (COMMERCIAL)
COMPUTE NM HYD ID=18 HYD NO=202.00 AREA=0.0075 SQ MI
PER A=0 PER B=10 PER C=0 PER D=90
TP=-0.1333 HR MASSRAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 26.649 CFS UNIT VOLUME = .9989 B = 526.28 P60 = 1.8700
AREA = .006750 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .130992HR TP = .133300HR K/TP RATIO = .982685 SHAPE CONSTANT, N = 3.593448
UNIT PEAK = 1.8403 CFS UNIT VOLUME = .9932 B = 327.09 P60 = 1.8700
AREA = .000750 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=18 CODE=1

PARTIAL HYDROGRAPH 202.00

RUNOFF VOLUME = 1.83567 INCHES = .7343 ACRE-FEET
PEAK DISCHARGE RATE = 19.86 CFS AT 1.500 HOURS BASIN AREA = .0075 SQ. MI.

*S ** ROUTE OFFSITE FLOWS THROUGH BASIN 2B
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
MIN ELEV=100.00 FT MAX ELEV=100.67 FT
CH SLP=.02 FP SLP=.02 N=.017 DIST=28 FT
DIST ELEV DIST ELEV DIST ELEV
0 100.67 0.1 100.00 14 100.28
27.9 100.00 28.0 100.67

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.04	.06	.05	3.51
100.07	.25	.33	7.02
100.11	.56	.96	10.53
100.14	.99	2.07	14.05
100.18	1.55	3.75	17.56
100.21	2.23	6.09	21.07
100.25	3.03	9.19	24.58
100.28	3.96	13.18	27.88
100.32	4.95	19.05	27.89
100.35	5.93	25.73	27.91
100.39	6.91	33.18	27.92
100.42	7.90	41.35	27.93
100.46	8.88	50.21	27.94
100.49	9.87	59.73	27.95
100.53	10.85	69.89	27.96
100.56	11.84	80.66	27.97
100.60	12.83	92.01	27.98
100.63	13.81	103.94	27.99
100.67	14.80	116.42	28.00

COMPUTE TRAVEL TIME ID=19 REACH NO=1 NO VS=1 L=480 FT
SLP=.03

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.1611
.071	.248	.33	.1015
.106	.557	.96	.0774
.141	.991	2.07	.0639
.176	1.548	3.75	.0551
.212	2.229	6.09	.0488
.247	3.034	9.19	.0440
.282	3.962	13.18	.0401
.317	4.946	19.05	.0346
.353	5.930	25.73	.0307
.388	6.914	33.18	.0278
.423	7.898	41.35	.0255
.458	8.883	50.21	.0236

.494	9.869	59.73	.0220
.529	10.854	69.89	.0207
.564	11.841	80.66	.0196
.599	12.827	92.01	.0186
.635	13.814	103.94	.0177
.670	14.801	116.42	.0170

```
ROUTE                ID=19 HYD NO=202.1 INFLOW ID=18 DT=0.0 HR
PRINT HYD            ID=19 CODE=1
```

PARTIAL HYDROGRAPH 202.10

RUNOFF VOLUME = 1.83570 INCHES = .7343 ACRE-FEET
PEAK DISCHARGE RATE = 19.45 CFS AT 1.533 HOURS BASIN AREA = .0075 SQ. MI.

```
*S **BASIN 2B
COMPUTE NM HYD       ID=20 HYD NO=203.00 AREA=0.0142 SQ MI
                     PER A=0 PER B=37 PER C=13 PER D=50
                     TP=-0.1333 HR   MASSRAIN=-1
```

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 28.031 CFS UNIT VOLUME = .9990 B = 526.28 P60 = 1.8700
AREA = .007100 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .124459HR TP = .133300HR K/TP RATIO = .933679 SHAPE CONSTANT, N = 3.788292
UNIT PEAK = 18.152 CFS UNIT VOLUME = .9995 B = 340.80 P60 = 1.8700
AREA = .007100 SQ MI IA = .46100 INCHES INF = 1.14080 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

```
PRINT HYD            ID=20   CODE=1
```

PARTIAL HYDROGRAPH 203.00

RUNOFF VOLUME = 1.35334 INCHES = 1.0249 ACRE-FEET
PEAK DISCHARGE RATE = 30.02 CFS AT 1.500 HOURS BASIN AREA = .0142 SQ. MI.

```
*S **TOTAL FLOW AT AP3 (OFFSITE FLOWS + BASIN 2B)
ADD HYD              ID=1 HYD NO=203.1 ID=19 ID=20
PRINT HYD            ID=1 CODE=5
```

PARTIAL HYDROGRAPH 203.10

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.500	48.4	3.000	.5	4.500	.2	5.999	.3
.167	.0	1.667	27.1	3.166	.4	4.666	.2	6.166	.2
.333	.0	1.833	15.7	3.333	.3	4.833	.2	6.333	.1

.500	.0	2.000	11.0	3.500	.3	4.999	.2	6.499	.0
.667	.0	2.166	5.7	3.666	.3	5.166	.2	6.666	.0
.833	.0	2.333	2.7	3.833	.2	5.333	.2	6.833	.0
1.000	.0	2.500	1.6	4.000	.2	5.499	.2	6.999	.0
1.167	.1	2.666	1.1	4.166	.2	5.666	.3	7.166	.0
1.333	9.9	2.833	.8	4.333	.2	5.833	.3		

RUNOFF VOLUME = 1.52002 INCHES = 1.7592 ACRE-FEET
PEAK DISCHARGE RATE = 48.45 CFS AT 1.533 HOURS BASIN AREA = .0217 SQ. MI.

```
*S **TOTAL FLOW AT BASIN 2F (AP1 + AP3)
ADD HYD              ID=2 HYD NO=204.0 ID=1 ID=17
PRINT HYD            ID=2 CODE=1
```

PARTIAL HYDROGRAPH 204.00

RUNOFF VOLUME = 1.48630 INCHES = 2.1561 ACRE-FEET
PEAK DISCHARGE RATE = 59.08 CFS AT 1.533 HOURS BASIN AREA = .0272 SQ. MI.

```
*S ** ROUTE BASINS AP1 & AP3 THROUGH BASIN 2F
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                     MIN ELEV=100.00 FT MAX ELEV=100.67 FT
                     CH SLP=.02 FP SLP=.02 N=.017 DIST=32 FT
                     DIST  ELEV  DIST  ELEV  DIST  ELEV
                       0  100.67 0.1  100.00   16   100.32
                     31.9 100.00 32.0 100.67
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.04	.06	.05	3.51
100.07	.25	.33	7.03
100.11	.56	.96	10.54
100.14	.99	2.07	14.06
100.18	1.55	3.75	17.57
100.21	2.23	6.10	21.09
100.25	3.04	9.20	24.60
100.28	3.97	13.13	28.12
100.32	5.02	17.98	31.63
100.35	6.14	25.01	31.91
100.39	7.27	33.05	31.92
100.42	8.40	41.95	31.93
100.46	9.52	51.67	31.94
100.49	10.65	62.16	31.95
100.53	11.77	73.40	31.96
100.56	12.90	85.36	31.97
100.60	14.03	98.01	31.98

100.63	15.16	111.33	31.99
100.67	16.28	125.31	32.00

COMPUTE TRAVEL TIME ID=3 REACH NO=1 NO VS=1 L=370 FT
SLP=.0222

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.1242
.071	.248	.33	.0782
.106	.558	.96	.0597
.141	.992	2.07	.0493
.176	1.549	3.75	.0425
.212	2.231	6.10	.0376
.247	3.037	9.20	.0339
.282	3.966	13.13	.0310
.317	5.020	17.98	.0287
.353	6.144	25.01	.0253
.388	7.269	33.05	.0226
.423	8.395	41.95	.0206
.458	9.521	51.67	.0189
.494	10.647	62.16	.0176
.529	11.774	73.40	.0165
.564	12.901	85.36	.0155
.599	14.029	98.01	.0147
.635	15.157	111.33	.0140
.670	16.285	125.31	.0134

ROUTE ID=3 HYD NO=204.1 INFLOW ID=2 DT=0.0 HR
PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 204.10

RUNOFF VOLUME = 1.48632 INCHES = 2.1561 ACRE-FEET
PEAK DISCHARGE RATE = 59.95 CFS AT 1.533 HOURS BASIN AREA = .0272 SQ. MI.

*S **BASIN 2F
COMPUTE NM HYD ID=4 HYD NO=205.00 AREA=0.0036 SQ MI
PER A=0 PER B=37 PER C=13 PER D=50
TP=-0.1333 HR MASSRAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 7.1065 CFS UNIT VOLUME = .9978 B = 526.28 P60 = 1.8700
AREA = .001800 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

```
    K =    .124459HR     TP =    .133300HR     K/TP RATIO =    .933679      SHAPE CONSTANT, N =  3.788292
    UNIT PEAK =    4.6019     CFS   UNIT VOLUME =     .9975        B =    340.80       P60 = 1.8700
    AREA =       .001800 SQ MI     IA =     .46100 INCHES     INF =   1.14080 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD             ID=4   CODE=1

                                   PARTIAL HYDROGRAPH   205.00

    RUNOFF VOLUME =      1.35334 INCHES      =         .2598 ACRE-FEET
    PEAK DISCHARGE RATE =        7.62 CFS  AT    1.500 HOURS   BASIN AREA =    .0036 SQ. MI.


ADD HYD               ID=5 HYD NO=205.1 ID=4 ID=3
PRINT HYD             ID=5 CODE=1

                                   PARTIAL HYDROGRAPH   205.10

    RUNOFF VOLUME =      1.47075 INCHES      =        2.4159 ACRE-FEET
    PEAK DISCHARGE RATE =       67.31 CFS  AT    1.533 HOURS   BASIN AREA =    .0308 SQ. MI.


*S ADD FLOW FROM AP2
ADD HYD               ID=6 HYD NO=205.2 ID=13 ID=5
PRINT HYD             ID=6 CODE=1

                                   PARTIAL HYDROGRAPH   205.20

    RUNOFF VOLUME =      1.42535 INCHES      =        3.8161 ACRE-FEET
    PEAK DISCHARGE RATE =      107.90 CFS  AT    1.533 HOURS   BASIN AREA =    .0502 SQ. MI.


*S ** ROUTE BASINS AP1, AP2 & AP3 THROUGH BASIN 2I
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                     MIN ELEV=100.00 FT MAX ELEV=100.67 FT
                     CH SLP=.02 FP SLP=.02 N=.017 DIST=32 FT
                     DIST  ELEV  DIST  ELEV  DIST  ELEV
                       0  100.67 0.1  100.00   16   100.32
                     31.9 100.00 32.0 100.67

                                   RATING CURVE VALLEY SECTION  1.0
                                      WATER       FLOW        FLOW        TOP
                                    SURFACE       AREA        RATE       WIDTH
                                     ELEV         SQ FT       CFS        FT
                                    100.00          .00         .00         .00
                                    100.04          .06         .05        3.51
                                    100.07          .25         .33        7.03
                                    100.11          .56         .96       10.54
```

100.14	.99	2.07	14.06
100.18	1.55	3.75	17.57
100.21	2.23	6.10	21.09
100.25	3.04	9.20	24.60
100.28	3.97	13.13	28.12
100.32	5.02	17.98	31.63
100.35	6.14	25.01	31.91
100.39	7.27	33.05	31.92
100.42	8.40	41.95	31.93
100.46	9.52	51.67	31.94
100.49	10.65	62.16	31.95
100.53	11.77	73.40	31.96
100.56	12.90	85.36	31.97
100.60	14.03	98.01	31.98
100.63	15.16	111.33	31.99
100.67	16.28	125.31	32.00

COMPUTE TRAVEL TIME ID=7 REACH NO=1 NO VS=1 L=490 FT
SLP=.0338

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.1644
.071	.248	.33	.1036
.106	.558	.96	.0790
.141	.992	2.07	.0653
.176	1.549	3.75	.0562
.212	2.231	6.10	.0498
.247	3.037	9.20	.0449
.282	3.966	13.13	.0411
.317	5.020	17.98	.0380
.353	6.144	25.01	.0334
.388	7.269	33.05	.0299
.423	8.395	41.95	.0272
.458	9.521	51.67	.0251
.494	10.647	62.16	.0233
.529	11.774	73.40	.0218
.564	12.901	85.36	.0206
.599	14.029	98.01	.0195
.635	15.157	111.33	.0185
.670	16.285	125.31	.0177

ROUTE ID=7 HYD NO=205.3 INFLOW ID=6 DT=0.0 HR
PRINT HYD ID=7 CODE=1

PARTIAL HYDROGRAPH 205.30

RUNOFF VOLUME = 1.42536 INCHES = 3.8161 ACRE-FEET
PEAK DISCHARGE RATE = 107.46 CFS AT 1.533 HOURS BASIN AREA = .0502 SQ. MI.

```
*S **BASIN 2I
COMPUTE NM HYD       ID=8 HYD NO=206.00 AREA=0.0055 SQ MI
                     PER A=0 PER B=31 PER C=10 PER D=59
                     TP=-0.1333 HR   MASSRAIN=-1

     K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   12.811    CFS   UNIT VOLUME =    .9985       B =   526.28      P60 = 1.8700
     AREA =      .003245 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


     K =   .124864HR    TP =   .133300HR    K/TP RATIO =   .936713     SHAPE CONSTANT, N =  3.775485
     UNIT PEAK =   5.7502    CFS   UNIT VOLUME =    .9978       B =   339.91      P60 = 1.8700
     AREA =      .002255 SQ MI    IA =    .46341 INCHES    INF =   1.14756 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=8   CODE=1

                                  PARTIAL HYDROGRAPH   206.00


     RUNOFF VOLUME =     1.46152 INCHES      =         .4287 ACRE-FEET
     PEAK DISCHARGE RATE =      12.29 CFS  AT   1.500 HOURS   BASIN AREA =   .0055 SQ. MI.
```

```
ADD HYD              ID=9 HYD NO=206.1 ID=7 ID=8
PRINT HYD            ID=9 CODE=1

                                  PARTIAL HYDROGRAPH   206.10


     RUNOFF VOLUME =     1.42892 INCHES      =        4.2448 ACRE-FEET
     PEAK DISCHARGE RATE =     119.29 CFS  AT   1.533 HOURS   BASIN AREA =   .0557 SQ. MI.
```

```
*S **ROUTE BASIN AP1,AP2,AP3 & BASIN 2I TO AMOLE CHANNEL
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                     MIN ELEV=100.00 FT MAX ELEV=100.67 FT
                     CH SLP=.02 FP SLP=.02 N=.017 DIST=32 FT
                     DIST  ELEV  DIST  ELEV  DIST  ELEV
                       0  100.67 0.1  100.00   16   100.32
                     31.9 100.00 32.0 100.67

                                RATING CURVE VALLEY SECTION  1.0
                                   WATER        FLOW        FLOW        TOP
                                  SURFACE       AREA        RATE       WIDTH
                                   ELEV         SQ FT       CFS         FT
                                  100.00          .00         .00         .00
                                  100.04          .06         .05        3.51
                                  100.07          .25         .33        7.03
                                  100.11          .56         .96       10.54
                                  100.14          .99        2.07       14.06
```

100.18	1.55	3.75	17.57
100.21	2.23	6.10	21.09
100.25	3.04	9.20	24.60
100.28	3.97	13.13	28.12
100.32	5.02	17.98	31.63
100.35	6.14	25.01	31.91
100.39	7.27	33.05	31.92
100.42	8.40	41.95	31.93
100.46	9.52	51.67	31.94
100.49	10.65	62.16	31.95
100.53	11.77	73.40	31.96
100.56	12.90	85.36	31.97
100.60	14.03	98.01	31.98
100.63	15.16	111.33	31.99
100.67	16.28	125.31	32.00

COMPUTE TRAVEL TIME ID=10 REACH NO=1 NO VS=1 L=240 FT
SLP=.0338

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.0805
.071	.248	.33	.0507
.106	.558	.96	.0387
.141	.992	2.07	.0320
.176	1.549	3.75	.0275
.212	2.231	6.10	.0244
.247	3.037	9.20	.0220
.282	3.966	13.13	.0201
.317	5.020	17.98	.0186
.353	6.144	25.01	.0164
.388	7.269	33.05	.0147
.423	8.395	41.95	.0133
.458	9.521	51.67	.0123
.494	10.647	62.16	.0114
.529	11.774	73.40	.0107
.564	12.901	85.36	.0101
.599	14.029	98.01	.0095
.635	15.157	111.33	.0091
.670	16.285	125.31	.0087

ROUTE ID=10 HYD NO=206.2 INFLOW ID=9 DT=0.0 HR
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 206.20

RUNOFF VOLUME = 1.42893 INCHES = 4.2448 ACRE-FEET
PEAK DISCHARGE RATE = 119.04 CFS AT 1.533 HOURS BASIN AREA = .0557 SQ. MI.

```
*S **BASIN 2J
COMPUTE NM HYD       ID=11 HYD NO=207.00 AREA=0.0029 SQ MI
                     PER A=0 PER B=31 PER C=10 PER D=59
                     TP=-0.1333 HR   MASSRAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   6.7551    CFS   UNIT VOLUME =    .9976       B =   526.28      P60 = 1.8700
    AREA =      .001711 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .124864HR    TP =   .133300HR    K/TP RATIO =   .936713     SHAPE CONSTANT, N =  3.775485
    UNIT PEAK =   3.0319    CFS   UNIT VOLUME =    .9958       B =   339.91      P60 = 1.8700
    AREA =      .001189 SQ MI    IA =    .46341 INCHES    INF =   1.14756 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=11   CODE=1

                                PARTIAL HYDROGRAPH   207.00


    RUNOFF VOLUME =     1.46152 INCHES      =         .2260 ACRE-FEET
    PEAK DISCHARGE RATE =       6.49 CFS  AT   1.500 HOURS   BASIN AREA =   .0029 SQ. MI.
```

```
ADD HYD              ID=12 HYD NO=207.1 ID=11 ID=10
*S TOTAL FLOW @ AP4 (ENTRANCE TO AMOLE DEL NORTE CHANNEL)
PRINT HYD            ID=12 CODE=5

                                PARTIAL HYDROGRAPH   207.10

     TIME      FLOW          TIME      FLOW          TIME      FLOW          TIME      FLOW          TIME      FLOW
      HRS       CFS           HRS       CFS           HRS       CFS           HRS       CFS           HRS       CFS
     .000        .0          1.667      80.3         3.333       1.0         4.999        .5         6.666        .1
     .167        .0          1.833      44.4         3.500        .8         5.166        .5         6.833        .1
     .333        .0          2.000      29.8         3.666        .7         5.333        .6         6.999        .0
     .500        .0          2.166      18.8         3.833        .6         5.499        .6         7.166        .0
     .667        .0          2.333       9.0         4.000        .6         5.666        .6         7.333        .0
     .833        .0          2.500       5.2         4.166        .6         5.833        .6         7.499        .0
    1.000        .0          2.666       3.4         4.333        .5         5.999        .6         7.666        .0
    1.167        .0          2.833       2.4         4.500        .5         6.166        .6         7.833        .0
    1.333       8.6          3.000       1.7         4.666        .5         6.333        .4
    1.500     110.8          3.166       1.3         4.833        .5         6.499        .2

    RUNOFF VOLUME =     1.43053 INCHES      =       4.4708 ACRE-FEET
    PEAK DISCHARGE RATE =     125.29 CFS  AT   1.533 HOURS   BASIN AREA =   .0586 SQ. MI.


*S ***************************************************************************
*S ***************************************************************************
**FUTURE PHASES****
*S **BASIN 2A1
```

```
COMPUTE NM HYD       ID=13 HYD NO=300.00 AREA=0.0087 SQ MI
                     PER A=0 PER B=37 PER C=13 PER D=50
                     TP=-0.1333 HR   MASSRAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   17.174    CFS   UNIT VOLUME =    .9988       B =   526.28      P60 = 1.8700
    AREA =      .004350 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .124459HR    TP =   .133300HR    K/TP RATIO =   .933679     SHAPE CONSTANT, N =  3.788292
    UNIT PEAK =   11.121    CFS   UNIT VOLUME =    .9990       B =   340.80      P60 = 1.8700
    AREA =      .004350 SQ MI    IA =    .46100 INCHES    INF =   1.14080 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=13   CODE=1

                                    HYDROGRAPH FROM AREA   300.00


    RUNOFF VOLUME =     1.35334 INCHES      =        .6279 ACRE-FEET
    PEAK DISCHARGE RATE =      18.40 CFS  AT   1.500 HOURS   BASIN AREA =   .0087 SQ. MI.
```

```
*S **ROUTE BASIN 2A1 TO AP5 (32' F-F STREET)
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                     MIN ELEV=100.00 FT MAX ELEV=100.67 FT
                     CH SLP=.02 FP SLP=.02 N=.017 DIST=32 FT
                     DIST  ELEV  DIST  ELEV  DIST  ELEV
                       0  100.67 0.1  100.00   16   100.32
                     31.9 100.00 32.0 100.67
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.04	.06	.05	3.51
100.07	.25	.33	7.03
100.11	.56	.96	10.54
100.14	.99	2.07	14.06
100.18	1.55	3.75	17.57
100.21	2.23	6.10	21.09
100.25	3.04	9.20	24.60
100.28	3.97	13.13	28.12
100.32	5.02	17.98	31.63
100.35	6.14	25.01	31.91
100.39	7.27	33.05	31.92
100.42	8.40	41.95	31.93
100.46	9.52	51.67	31.94
100.49	10.65	62.16	31.95
100.53	11.77	73.40	31.96
100.56	12.90	85.36	31.97

100.60	14.03	98.01	31.98
100.63	15.16	111.33	31.99
100.67	16.28	125.31	32.00

COMPUTE TRAVEL TIME ID=14 REACH NO=1 NO VS=1 L=620 FT
SLP=.0312

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.2081
.071	.248	.33	.1311
.106	.558	.96	.1000
.141	.992	2.07	.0826
.176	1.549	3.75	.0712
.212	2.231	6.10	.0630
.247	3.037	9.20	.0569
.282	3.966	13.13	.0520
.317	5.020	17.98	.0481
.353	6.144	25.01	.0423
.388	7.269	33.05	.0379
.423	8.395	41.95	.0345
.458	9.521	51.67	.0317
.494	10.647	62.16	.0295
.529	11.774	73.40	.0276
.564	12.901	85.36	.0260
.599	14.029	98.01	.0247
.635	15.157	111.33	.0234
.670	16.285	125.31	.0224

ROUTE ID=14 HYD NO=300.1 INFLOW ID=13 DT=0.0 HR
PRINT HYD ID=14 CODE=1

HYDROGRAPH FROM AREA 300.10

RUNOFF VOLUME = 1.35337 INCHES = .6280 ACRE-FEET
PEAK DISCHARGE RATE = 17.05 CFS AT 1.533 HOURS BASIN AREA = .0087 SQ. MI.

*S **BASIN 2A2
COMPUTE NM HYD ID=15 HYD NO=301.00 AREA=0.0055 SQ MI
PER A=0 PER B=31 PER C=10 PER D=59
TP=-0.1333 HR MASSRAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 12.811 CFS UNIT VOLUME = .9985 B = 526.28 P60 = 1.8700
AREA = .003245 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .124864HR TP = .133300HR K/TP RATIO = .936713 SHAPE CONSTANT, N = 3.775485
UNIT PEAK = 5.7502 CFS UNIT VOLUME = .9978 B = 339.91 P60 = 1.8700
AREA = .002255 SQ MI IA = .46341 INCHES INF = 1.14756 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=15 CODE=1

HYDROGRAPH FROM AREA 301.00

RUNOFF VOLUME = 1.46152 INCHES = .4287 ACRE-FEET
PEAK DISCHARGE RATE = 12.29 CFS AT 1.500 HOURS BASIN AREA = .0055 SQ. MI.

*S ** ADD BASIN 2A1 & 2A2 TO FIND FLOW AT AP5
ADD HYD ID=16 HYD NO=302.00 ID=14 ID=15
PRINT HYD ID=16 CODE=5

HYDROGRAPH FROM AREA 302.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.500	27.6	3.000	.3	4.500	.1	5.999	.2
.167	.0	1.667	18.0	3.166	.3	4.666	.1	6.166	.1
.333	.0	1.833	9.9	3.333	.2	4.833	.1	6.333	.0
.500	.0	2.000	6.6	3.500	.2	4.999	.1	6.499	.0
.667	.0	2.166	3.6	3.666	.2	5.166	.1	6.666	.0
.833	.0	2.333	1.7	3.833	.1	5.333	.1	6.833	.0
1.000	.0	2.500	1.1	4.000	.1	5.499	.1	6.999	.0
1.167	.0	2.666	.7	4.166	.1	5.666	.1	7.166	.0
1.333	4.7	2.833	.5	4.333	.1	5.833	.1		

RUNOFF VOLUME = 1.39521 INCHES = 1.0566 ACRE-FEET
PEAK DISCHARGE RATE = 28.89 CFS AT 1.533 HOURS BASIN AREA = .0142 SQ. MI.

*S **BASIN 2C1
COMPUTE NM HYD ID=17 HYD NO=303.00 AREA=0.0046 SQ MI
PER A=0 PER B=37 PER C=13 PER D=50
TP=-0.1333 HR MASSRAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 9.0805 CFS UNIT VOLUME = .9981 B = 526.28 P60 = 1.8700
AREA = .002300 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .124459HR TP = .133300HR K/TP RATIO = .933679 SHAPE CONSTANT, N = 3.788292
UNIT PEAK = 5.8803 CFS UNIT VOLUME = .9979 B = 340.80 P60 = 1.8700
AREA = .002300 SQ MI IA = .46100 INCHES INF = 1.14080 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=17 CODE=1

HYDROGRAPH FROM AREA 303.00

RUNOFF VOLUME = 1.35334 INCHES = .3320 ACRE-FEET
PEAK DISCHARGE RATE = 9.74 CFS AT 1.500 HOURS BASIN AREA = .0046 SQ. MI.

*S **ROUTE BASIN 2C1 TO OLD ASPEN RD (28' F-F STREET)
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
MIN ELEV=100.00 FT MAX ELEV=100.67 FT
CH SLP=.02 FP SLP=.02 N=.017 DIST=28 FT
DIST ELEV DIST ELEV DIST ELEV
0 100.67 0.1 100.00 14 100.28
27.9 100.00 28.0 100.67

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.04	.06	.05	3.51
100.07	.25	.33	7.02
100.11	.56	.96	10.53
100.14	.99	2.07	14.05
100.18	1.55	3.75	17.56
100.21	2.23	6.09	21.07
100.25	3.03	9.19	24.58
100.28	3.96	13.18	27.88
100.32	4.95	19.05	27.89
100.35	5.93	25.73	27.91
100.39	6.91	33.18	27.92
100.42	7.90	41.35	27.93
100.46	8.88	50.21	27.94
100.49	9.87	59.73	27.95
100.53	10.85	69.89	27.96
100.56	11.84	80.66	27.97
100.60	12.83	92.01	27.98
100.63	13.81	103.94	27.99
100.67	14.80	116.42	28.00

COMPUTE TRAVEL TIME ID=18 REACH NO=1 NO VS=1 L=350 FT
SLP=.0375

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.1174
.071	.248	.33	.0740
[illegible]	[illegible] .5[illegible]	[illegible] .9[illegible]	[illegible]65

.141	.991	2.07	.0466
.176	1.548	3.75	.0402
.212	2.229	6.09	.0356
.247	3.034	9.19	.0321
.282	3.962	13.18	.0292
.317	4.946	19.05	.0252
.353	5.930	25.73	.0224
.388	6.914	33.18	.0203
.423	7.898	41.35	.0186
.458	8.883	50.21	.0172
.494	9.869	59.73	.0161
.529	10.854	69.89	.0151
.564	11.841	80.66	.0143
.599	12.827	92.01	.0136
.635	13.814	103.94	.0129
.670	14.801	116.42	.0124

```
ROUTE                ID=18 HYD NO=303.1 INFLOW ID=17 DT=0.0 HR
PRINT HYD            ID=18 CODE=1
```

HYDROGRAPH FROM AREA 303.10

RUNOFF VOLUME = 1.35339 INCHES = .3320 ACRE-FEET
PEAK DISCHARGE RATE = 9.49 CFS AT 1.533 HOURS BASIN AREA = .0046 SQ. MI.

```
*S ** BASIN 2C2
COMPUTE NM HYD       ID=19 HYD NO=303.20 AREA=0.0035 SQ MI
                     PER A=0 PER B=31 PER C=10 PER D=59
                     TP=-0.1333 HR   MASSRAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   8.1527    CFS   UNIT VOLUME =    .9981       B =   526.28      P60 = 1.8700
    AREA =      .002065 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .124864HR    TP =   .133300HR    K/TP RATIO =   .936713     SHAPE CONSTANT, N =  3.775485
    UNIT PEAK =   3.6592    CFS   UNIT VOLUME =    .9965       B =   339.91      P60 = 1.8700
    AREA =      .001435 SQ MI    IA =    .46341 INCHES    INF =   1.14756 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=19   CODE=1
```

HYDROGRAPH FROM AREA 303.20

RUNOFF VOLUME = 1.46152 INCHES = .2728 ACRE-FEET
PEAK DISCHARGE RATE = 7.83 CFS AT 1.500 HOURS BASIN AREA = .0035 SQ. MI.

```
*S **ADD BASIN 2C1 & 2C2
ADD HYD              ID=20 HYD NO=303.3 ID=19 ID=18
PRINT HYD            ID=20 CODE=1
```

HYDROGRAPH FROM AREA 303.30

RUNOFF VOLUME = 1.40002 INCHES = .6048 ACRE-FEET
PEAK DISCHARGE RATE = 17.03 CFS AT 1.533 HOURS BASIN AREA = .0081 SQ. MI.

```
*S **ADD BASINS 2A & 2C
ADD HYD              ID=1 HYD NO=304.00 ID=20 ID=16
PRINT HYD            ID=1 CODE=1
```

HYDROGRAPH FROM AREA 304.00

RUNOFF VOLUME = 1.39696 INCHES = 1.6614 ACRE-FEET
PEAK DISCHARGE RATE = 45.91 CFS AT 1.533 HOURS BASIN AREA = .0223 SQ. MI.

```
*S **ROUTE BASINS 2A & 2C TO AP6 (32' F-F STREET)
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                     MIN ELEV=100.00 FT MAX ELEV=100.67 FT
                     CH SLP=.02 FP SLP=.02 N=.017 DIST=32 FT
                     DIST  ELEV  DIST  ELEV  DIST  ELEV
                       0  100.67 0.1  100.00   16   100.32
                     31.9 100.00 32.0 100.67
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.04	.06	.05	3.51
100.07	.25	.33	7.03
100.11	.56	.96	10.54
100.14	.99	2.07	14.06
100.18	1.55	3.75	17.57
100.21	2.23	6.10	21.09
100.25	3.04	9.20	24.60
100.28	3.97	13.13	28.12
100.32	5.02	17.98	31.63
100.35	6.14	25.01	31.91
100.39	7.27	33.05	31.92
100.42	8.40	41.95	31.93
100.46	9.52	51.67	31.94
100.49	10.65	62.16	31.95
100.53	11.77	73.40	31.96
100.56	12.90	85.36	31.97
1[redacted]0	14[redacted]	[redacted]8.0[redacted]	[redacted].98

```
                                    100.63        15.16       111.33        31.99
                                    100.67        16.28       125.31        32.00
COMPUTE TRAVEL TIME  ID=3 REACH NO=1 NO VS=1 L=480 FT
                     SLP=.013

                          TRAVEL TIME TABLE
                                        REACH=  1.0

                     WATER          AVERAGE        FLOW          TRAVEL
                     DEPTH          AREA           RATE          TIME
                     FEET           SQ.FT.         CFS           HRS
                        .035            .062            .05         .1611
                        .071            .248            .33         .1015
                        .106            .558            .96         .0774
                        .141            .992           2.07         .0639
                        .176           1.549           3.75         .0551
                        .212           2.231           6.10         .0488
                        .247           3.037           9.20         .0440
                        .282           3.966          13.13         .0403
                        .317           5.020          17.98         .0372
                        .353           6.144          25.01         .0328
                        .388           7.269          33.05         .0293
                        .423           8.395          41.95         .0267
                        .458           9.521          51.67         .0246
                        .494          10.647          62.16         .0228
                        .529          11.774          73.40         .0214
                        .564          12.901          85.36         .0202
                        .599          14.029          98.01         .0191
                        .635          15.157         111.33         .0182
                        .670          16.285         125.31         .0173
ROUTE                ID=3 HYD NO=304.1 INFLOW ID=1 DT=0.0 HR
PRINT HYD            ID=3 CODE=1

                                  HYDROGRAPH FROM AREA   304.10


    RUNOFF VOLUME =      1.39698 INCHES      =       1.6615 ACRE-FEET
    PEAK DISCHARGE RATE =       45.68 CFS  AT   1.533 HOURS   BASIN AREA =    .0223 SQ. MI.


*S **BASIN 2D
COMPUTE NM HYD       ID=4 HYD NO=305.00 AREA=0.0058 SQ MI
                     PER A=0 PER B=31 PER C=10 PER D=59
                     TP=-0.1333 HR   MASSRAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   13.510    CFS   UNIT VOLUME =    .9985       B =   526.28      P60 = 1.8700
    AREA =       .003422 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330
```

K = .124864HR TP = .133300HR K/TP RATIO = .936713 SHAPE CONSTANT, N = 3.775485
UNIT PEAK = 6.0639 CFS UNIT VOLUME = .9981 B = 339.91 P60 = 1.8700
AREA = .002378 SQ MI IA = .46341 INCHES INF = 1.14756 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=4 CODE=1

HYDROGRAPH FROM AREA 305.00

RUNOFF VOLUME = 1.46152 INCHES = .4521 ACRE-FEET
PEAK DISCHARGE RATE = 12.96 CFS AT 1.500 HOURS BASIN AREA = .0058 SQ. MI.

*S **ROUTE BASIN 2D TO AP6 (32' F-F STREET)
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
MIN ELEV=100.00 FT MAX ELEV=100.67 FT
CH SLP=.02 FP SLP=.02 N=.017 DIST=32 FT
DIST ELEV DIST ELEV DIST ELEV
0 100.67 0.1 100.00 16 100.32
31.9 100.00 32.0 100.67

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.04	.06	.05	3.51
100.07	.25	.33	7.03
100.11	.56	.96	10.54
100.14	.99	2.07	14.06
100.18	1.55	3.75	17.57
100.21	2.23	6.10	21.09
100.25	3.04	9.20	24.60
100.28	3.97	13.13	28.12
100.32	5.02	17.98	31.63
100.35	6.14	25.01	31.91
100.39	7.27	33.05	31.92
100.42	8.40	41.95	31.93
100.46	9.52	51.67	31.94
100.49	10.65	62.16	31.95
100.53	11.77	73.40	31.96
100.56	12.90	85.36	31.97
100.60	14.03	98.01	31.98
100.63	15.16	111.33	31.99
100.67	16.28	125.31	32.00

COMPUTE TRAVEL TIME ID=5 REACH NO=1 NO VS=1 L=210 FT
SLP=.013

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.0705
.071	.248	.33	.0444
.106	.558	.96	.0339
.141	.992	2.07	.0280
.176	1.549	3.75	.0241
.212	2.231	6.10	.0213
.247	3.037	9.20	.0193
.282	3.966	13.13	.0176
.317	5.020	17.98	.0163
.353	6.144	25.01	.0143
.388	7.269	33.05	.0128
.423	8.395	41.95	.0117
.458	9.521	51.67	.0107
.494	10.647	62.16	.0100
.529	11.774	73.40	.0094
.564	12.901	85.36	.0088
.599	14.029	98.01	.0083
.635	15.157	111.33	.0079
.670	16.285	125.31	.0076

```
ROUTE                ID=5 HYD NO=305.1 INFLOW ID=4 DT=0.0 HR
PRINT HYD            ID=5 CODE=1
```

HYDROGRAPH FROM AREA 305.10

RUNOFF VOLUME = 1.46156 INCHES = .4521 ACRE-FEET
PEAK DISCHARGE RATE = 12.82 CFS AT 1.533 HOURS BASIN AREA = .0058 SQ. MI.

```
*S **ADD BASINS 2A, 2C & 2D TOGETHER
ADD HYD              ID=6 HYD NO=306.00 ID=5 ID=3
PRINT HYD            ID=6 CODE=1
```

HYDROGRAPH FROM AREA 306.00

RUNOFF VOLUME = 1.41028 INCHES = 2.1135 ACRE-FEET
PEAK DISCHARGE RATE = 58.50 CFS AT 1.533 HOURS BASIN AREA = .0281 SQ. MI.

```
*S **BASIN 2E
COMPUTE NM HYD       ID=7 HYD NO=307.00 AREA=0.0023 SQ MI
                     PER A=0 PER B=31 PER C=10 PER D=59
                     TP=-0.1333 HR   MASSRAIN=-1
```

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 5.3575 CFS UNIT VOLUME = .9973 B = 526.28 P60 = 1.8700
AREA = .001357 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RU[redacted] CO[redacted]ED [redacted]NIT[redacted] AB[redacted]CTI[redacted]/INFI[redacted]ATI[redacted] [redacted]UMBER METHOD[redacted] DT[redacted] .[redacted]

```
    K =    .124864HR     TP =    .133300HR     K/TP RATIO =    .936713     SHAPE CONSTANT, N =  3.775485
    UNIT PEAK =    2.4046     CFS    UNIT VOLUME =     .9944        B =   339.91       P60 = 1.8700
    AREA =       .000943 SQ MI     IA =     .46341 INCHES     INF =   1.14756 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD            ID=7   CODE=1
```

HYDROGRAPH FROM AREA 307.00

```
    RUNOFF VOLUME =      1.46152 INCHES      =         .1793 ACRE-FEET
    PEAK DISCHARGE RATE =        5.15 CFS  AT    1.500 HOURS   BASIN AREA =    .0023 SQ. MI.


ADD HYD              ID=8 HYD NO=306.10 ID=7 ID=6
*S **TOTAL FLOW @ AP6
PRINT HYD            ID=8 CODE=5
```

HYDROGRAPH FROM AREA 306.10

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.667	40.0	3.333	.5	4.999	.3	6.666	.0
.167	.0	1.833	22.3	3.500	.4	5.166	.3	6.833	.0
.333	.0	2.000	14.9	3.666	.3	5.333	.3	6.999	.0
.500	.0	2.166	8.6	3.833	.3	5.499	.3	7.166	.0
.667	.0	2.333	4.1	4.000	.3	5.666	.3	7.333	.0
.833	.0	2.500	2.5	4.166	.3	5.833	.3	7.499	.0
1.000	.0	2.666	1.6	4.333	.3	5.999	.3		
1.167	.0	2.833	1.1	4.500	.3	6.166	.3		
1.333	7.9	3.000	.8	4.666	.3	6.333	.1		
1.500	58.6	3.166	.6	4.833	.3	6.499	.1		

```
    RUNOFF VOLUME =      1.41415 INCHES      =        2.2928 ACRE-FEET
    PEAK DISCHARGE RATE =       63.45 CFS  AT    1.533 HOURS   BASIN AREA =    .0304 SQ. MI.


*S **BASIN 2G
COMPUTE NM HYD       ID=9 HYD NO=307.10 AREA=0.0061 SQ MI
                     PER A=0 PER B=31 PER C=10 PER D=59
                     TP=-0.1333 HR   MASSRAIN=-1

    K =    .072649HR     TP =    .133300HR     K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =    14.209     CFS    UNIT VOLUME =     .9985        B =   526.28       P60 = 1.8700
    AREA =       .003599 SQ MI     IA =     .10000 INCHES     INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330


    K =    .124864HR     TP =    .133300HR     K/TP RATIO =    .936713     SHAPE CONSTANT, N =  3.775485
    UNIT PEAK =    6.3775     CFS    UNIT VOLUME =     .9981        B =   339.91       P60 = 1.8700
    AREA =       .002501 SQ MI     IA =     .46341 INCHES     INF =   1.14756 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330
```

PRINT HYD ID=9 CODE=1

HYDROGRAPH FROM AREA 307.10

RUNOFF VOLUME = 1.46152 INCHES = .4755 ACRE-FEET
PEAK DISCHARGE RATE = 13.63 CFS AT 1.500 HOURS BASIN AREA = .0061 SQ. MI.

*S **ADD 2G TO AP6
ADD HYD ID=10 HYD NO=306.2 ID=9 ID=8
PRINT HYD ID=10 CODE=1

HYDROGRAPH FROM AREA 306.20

RUNOFF VOLUME = 1.42206 INCHES = 2.7683 ACRE-FEET
PEAK DISCHARGE RATE = 76.58 CFS AT 1.533 HOURS BASIN AREA = .0365 SQ. MI.

*S **ROUTE BASIN 2G & AP6 TO AP7 (32' F-F STREET)
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
MIN ELEV=100.00 FT MAX ELEV=100.67 FT
CH SLP=.02 FP SLP=.02 N=.017 DIST=32 FT

DIST	ELEV	DIST	ELEV	DIST	ELEV
0	100.67	0.1	100.00	16	100.32
31.9	100.00	32.0	100.67		

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.04	.06	.05	3.51
100.07	.25	.33	7.03
100.11	.56	.96	10.54
100.14	.99	2.07	14.06
100.18	1.55	3.75	17.57
100.21	2.23	6.10	21.09
100.25	3.04	9.20	24.60
100.28	3.97	13.13	28.12
100.32	5.02	17.98	31.63
100.35	6.14	25.01	31.91
100.39	7.27	33.05	31.92
100.42	8.40	41.95	31.93
100.46	9.52	51.67	31.94
100.49	10.65	62.16	31.95
100.53	11.77	73.40	31.96
100.56	12.90	85.36	31.97
100.60	14.03	98.01	31.98
100.63	15.16	111.33	31.99
1[redacted]7	16[redacted]	[redacted]25.[redacted]	[redacted].00[redacted]

COMPUTE TRAVEL TIME ID=11 REACH NO=1 NO VS=1 L=320 FT
SLP=.013

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.1074
.071	.248	.33	.0676
.106	.558	.96	.0516
.141	.992	2.07	.0426
.176	1.549	3.75	.0367
.212	2.231	6.10	.0325
.247	3.037	9.20	.0293
.282	3.966	13.13	.0268
.317	5.020	17.98	.0248
.353	6.144	25.01	.0218
.388	7.269	33.05	.0196
.423	8.395	41.95	.0178
.458	9.521	51.67	.0164
.494	10.647	62.16	.0152
.529	11.774	73.40	.0143
.564	12.901	85.36	.0134
.599	14.029	98.01	.0127
.635	15.157	111.33	.0121
.670	16.285	125.31	.0116

ROUTE ID=11 HYD NO=306.3 INFLOW ID=10 DT=0.0 HR
PRINT HYD ID=11 CODE=1

HYDROGRAPH FROM AREA 306.30

RUNOFF VOLUME = 1.42207 INCHES = 2.7683 ACRE-FEET
PEAK DISCHARGE RATE = 76.80 CFS AT 1.533 HOURS BASIN AREA = .0365 SQ. MI.

*S **BASIN 2H1
COMPUTE NM HYD ID=12 HYD NO=308.00 AREA=0.0047 SQ MI
PER A=0 PER B=37 PER C=13 PER D=50
TP=-0.1333 HR MASSRAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 9.2779 CFS UNIT VOLUME = .9981 B = 526.28 P60 = 1.8700
AREA = .002350 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .124459HR TP = .133300HR K/TP RATIO = .933679 SHAPE CONSTANT, N = 3.788292
UNIT PEAK = 6.0081 CFS UNIT VOLUME = .9981 B = 340.80 P60 = 1.8700
AREA = .002350 SQ MI IA = .46100 INCHES INF = 1.14080 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=12 CODE=1

HYDROGRAPH FROM AREA 308.00

RUNOFF VOLUME = 1.35334 INCHES = .3392 ACRE-FEET
PEAK DISCHARGE RATE = 9.95 CFS AT 1.500 HOURS BASIN AREA = .0047 SQ. MI.

*S **ROUTE BASIN 2H1 TO AP7 (32' F-F STREET)
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
MIN ELEV=100.00 FT MAX ELEV=100.67 FT
CH SLP=.02 FP SLP=.02 N=.017 DIST=32 FT
DIST ELEV DIST ELEV DIST ELEV
0 100.67 0.1 100.00 16 100.32
31.9 100.00 32.0 100.67

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.04	.06	.05	3.51
100.07	.25	.33	7.03
100.11	.56	.96	10.54
100.14	.99	2.07	14.06
100.18	1.55	3.75	17.57
100.21	2.23	6.10	21.09
100.25	3.04	9.20	24.60
100.28	3.97	13.13	28.12
100.32	5.02	17.98	31.63
100.35	6.14	25.01	31.91
100.39	7.27	33.05	31.92
100.42	8.40	41.95	31.93
100.46	9.52	51.67	31.94
100.49	10.65	62.16	31.95
100.53	11.77	73.40	31.96
100.56	12.90	85.36	31.97
100.60	14.03	98.01	31.98
100.63	15.16	111.33	31.99
100.67	16.28	125.31	32.00

COMPUTE TRAVEL TIME ID=13 REACH NO=1 NO VS=1 L=250 FT
SLP=.0125

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.0839
.071	.248	.33	.0528
.106	.558	.96	.0403

.141	.992	2.07	.0333
.176	1.549	3.75	.0287
.212	2.231	6.10	.0254
.247	3.037	9.20	.0229
.282	3.966	13.13	.0210
.317	5.020	17.98	.0194
.353	6.144	25.01	.0171
.388	7.269	33.05	.0153
.423	8.395	41.95	.0139
.458	9.521	51.67	.0128
.494	10.647	62.16	.0119
.529	11.774	73.40	.0111
.564	12.901	85.36	.0105
.599	14.029	98.01	.0099
.635	15.157	111.33	.0095
.670	16.285	125.31	.0090

```
ROUTE                ID=13 HYD NO=308.1 INFLOW ID=12 DT=0.0 HR
PRINT HYD            ID=13 CODE=1

                                  HYDROGRAPH FROM AREA    308.10

    RUNOFF VOLUME =      1.35339 INCHES      =         .3392 ACRE-FEET
    PEAK DISCHARGE RATE =        9.83 CFS  AT    1.533 HOURS   BASIN AREA =    .0047 SQ. MI.

*S **BASIN 2H2
COMPUTE NM HYD       ID=14 HYD NO=308.2 AREA=0.0022 SQ MI
                     PER A=0 PER B=31 PER C=10 PER D=59
                     TP=-0.1333 HR   MASSRAIN=-1

    K =    .072649HR     TP =    .133300HR     K/TP RATIO =    .545000      SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   5.1246     CFS   UNIT VOLUME =     .9973        B =   526.28       P60 = 1.8700
    AREA =       .001298 SQ MI     IA =     .10000 INCHES     INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330


    K =    .124864HR     TP =    .133300HR     K/TP RATIO =    .936713      SHAPE CONSTANT, N =  3.775485
    UNIT PEAK =   2.3001     CFS   UNIT VOLUME =     .9944        B =   339.91       P60 = 1.8700
    AREA =       .000902 SQ MI     IA =     .46341 INCHES     INF =   1.14756 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD            ID=14   CODE=1

                                  HYDROGRAPH FROM AREA    308.20

    RUNOFF VOLUME =      1.46152 INCHES      =         .1715 ACRE-FEET
    PEAK DISCHARGE RATE =        4.93 CFS  AT    1.500 HOURS   BASIN AREA =    .0022 SQ. MI.
```

```
*S **ADD BASIN 2H1 & 2H2
ADD HYD              ID=15 HYD NO=308.2 ID=13 ID=14
PRINT HYD            ID=15 CODE=1

                                        HYDROGRAPH FROM AREA   308.20


    RUNOFF VOLUME =      1.38776 INCHES      =         .5107 ACRE-FEET
    PEAK DISCHARGE RATE =       14.57 CFS  AT   1.533 HOURS   BASIN AREA =    .0069 SQ. MI.



*S **ADD BASINS 2H, 2G & AP6 FLOWS
ADD HYD              ID=16 HYD NO=306.4 ID=11 ID=15
*S **BASIN 2L1
COMPUTE NM HYD       ID=17 HYD NO=309.00 AREA=0.0018 SQ MI
                     PER A=0 PER B=31 PER C=10 PER D=59
                     TP=-0.1333 HR   MASSRAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   4.1928    CFS   UNIT VOLUME =     .9965       B =    526.28      P60 = 1.8700
    AREA =       .001062 SQ MI    IA =     .10000 INCHES    INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

    K =    .124864HR    TP =    .133300HR    K/TP RATIO =    .936713     SHAPE CONSTANT, N =  3.775485
    UNIT PEAK =   1.8819    CFS   UNIT VOLUME =     .9932       B =    339.91      P60 = 1.8700
    AREA =       .000738 SQ MI    IA =     .46341 INCHES    INF =    1.14756 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD            ID=17   CODE=1

                                        HYDROGRAPH FROM AREA   309.00


    RUNOFF VOLUME =      1.46152 INCHES      =         .1403 ACRE-FEET
    PEAK DISCHARGE RATE =        4.03 CFS  AT   1.500 HOURS   BASIN AREA =    .0018 SQ. MI.



ADD HYD              ID=18 HYD NO=306.5 ID=16 ID=17
*S TOTAL FLOW @ AP7
PRINT HYD            ID=18 CODE=5

                                        HYDROGRAPH FROM AREA   306.50

     TIME      FLOW          TIME      FLOW          TIME      FLOW          TIME      FLOW          TIME      FLOW
      HRS       CFS           HRS       CFS           HRS       CFS           HRS       CFS           HRS       CFS
     .000        .0         1.667      59.5         3.333        .7         4.999        .4         6.666        .1
     .167        .0         1.833      33.0         3.500        .6         5.166        .4         6.833        .0
     .333        .0         2.000      22.2         3.666        .5         5.333        .4         6.999        .0
     .500        .0         2.166      13.1         3.833        .5         5.499        .4         7.166        .0
     .667        .0         2.333       6.1         4.000        .4         5.666        .5         7.333        .0
     .833        .0         2.500       3.7         4.166        .4         5.833        .5         7.499        .0
```

1.000	.0	2.666	2.4	4.333	.4	5.999	.5	7.666	.0								
1.167	.0	2.833	1.6	4.500	.4	6.166	.4										
1.333	11.2	3.000	1.2	4.666	.4	6.333	.2										
1.500	87.7	3.166	.9	4.833	.4	6.499	.1										

RUNOFF VOLUME = 1.41839 INCHES = 3.4192 ACRE-FEET
PEAK DISCHARGE RATE = 95.25 CFS AT 1.533 HOURS BASIN AREA = .0452 SQ. MI.

*S **ROUTE AP7 TO AP8 (32' F-F STREET)
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
MIN ELEV=100.00 FT MAX ELEV=100.67 FT
CH SLP=.02 FP SLP=.02 N=.017 DIST=32 FT
DIST ELEV DIST ELEV DIST ELEV
0 100.67 0.1 100.00 16 100.32
31.9 100.00 32.0 100.67

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.04	.06	.05	3.51
100.07	.25	.33	7.03
100.11	.56	.96	10.54
100.14	.99	2.07	14.06
100.18	1.55	3.75	17.57
100.21	2.23	6.10	21.09
100.25	3.04	9.20	24.60
100.28	3.97	13.13	28.12
100.32	5.02	17.98	31.63
100.35	6.14	25.01	31.91
100.39	7.27	33.05	31.92
100.42	8.40	41.95	31.93
100.46	9.52	51.67	31.94
100.49	10.65	62.16	31.95
100.53	11.77	73.40	31.96
100.56	12.90	85.36	31.97
100.60	14.03	98.01	31.98
100.63	15.16	111.33	31.99
100.67	16.28	125.31	32.00

COMPUTE TRAVEL TIME ID=19 REACH NO=1 NO VS=1 L=360 FT
SLP=.018

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.062	.05	.1208
.071	.248	.33	.0761
.106	.558	.96	.0581

.141	.992	2.07	.0479
.176	1.549	3.75	.0413
.212	2.231	6.10	.0366
.247	3.037	9.20	.0330
.282	3.966	13.13	.0302
.317	5.020	17.98	.0279
.353	6.144	25.01	.0246
.388	7.269	33.05	.0220
.423	8.395	41.95	.0200
.458	9.521	51.67	.0184
.494	10.647	62.16	.0171
.529	11.774	73.40	.0160
.564	12.901	85.36	.0151
.599	14.029	98.01	.0143
.635	15.157	111.33	.0136
.670	16.285	125.31	.0130

```
ROUTE              ID=19 HYD NO=306.6 INFLOW ID=18 DT=0.0 HR
PRINT HYD          ID=19 CODE=1

                                HYDROGRAPH FROM AREA   306.60

    RUNOFF VOLUME =     1.41840 INCHES     =        3.4193 ACRE-FEET
    PEAK DISCHARGE RATE =      94.88 CFS  AT    1.533 HOURS   BASIN AREA =    .0452 SQ. MI.

*S **BASIN 2K
COMPUTE NM HYD     ID=20 HYD NO=310.00 AREA=0.010 SQ MI
                   PER A=0 PER B=31 PER C=10 PER D=59
                   TP=-0.1333 HR   MASSRAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   23.294    CFS   UNIT VOLUME =    .9989       B =   526.28      P60 = 1.8700
    AREA =      .005900 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .124864HR    TP =   .133300HR    K/TP RATIO =   .936713     SHAPE CONSTANT, N =  3.775485
    UNIT PEAK =   10.455    CFS   UNIT VOLUME =    .9990       B =   339.91      P60 = 1.8700
    AREA =      .004100 SQ MI    IA =    .46341 INCHES    INF =   1.14756 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD          ID=20   CODE=1

                                HYDROGRAPH FROM AREA   310.00

    RUNOFF VOLUME =     1.46152 INCHES     =         .7795 ACRE-FEET
    PEAK DISCHARGE RATE =      22.34 CFS  AT    1.500 HOURS   BASIN AREA =    .0100 SQ. MI.
```

```
ADD HYD              ID=1 HYD NO=306.7 ID=19 ID=20
PRINT HYD            ID=1 CODE=1
```

HYDROGRAPH FROM AREA 306.70

RUNOFF VOLUME = 1.42619 INCHES = 4.1987 ACRE-FEET
PEAK DISCHARGE RATE = 116.38 CFS AT 1.533 HOURS BASIN AREA = .0552 SQ. MI.

```
*S **BASIN 2L
COMPUTE NM HYD       ID=2 HYD NO=309.1 AREA=0.0024 SQ MI
                     PER A=0 PER B=31 PER C=10 PER D=59
                     TP=-0.1333 HR   MASSRAIN=-1
```

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 5.5904 CFS UNIT VOLUME = .9973 B = 526.28 P60 = 1.8700
AREA = .001416 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .124864HR TP = .133300HR K/TP RATIO = .936713 SHAPE CONSTANT, N = 3.775485
UNIT PEAK = 2.5092 CFS UNIT VOLUME = .9949 B = 339.91 P60 = 1.8700
AREA = .000984 SQ MI IA = .46341 INCHES INF = 1.14756 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

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

HYDROGRAPH FROM AREA 309.10

RUNOFF VOLUME = 1.46152 INCHES = .1871 ACRE-FEET
PEAK DISCHARGE RATE = 5.37 CFS AT 1.500 HOURS BASIN AREA = .0024 SQ. MI.

```
ADD HYD              ID=3 HYD NO=306.8 ID=1 ID=2
*S TOTAL FLOW @ AP8 (ENTRANCE TO AMOLE DEL NORTE CHANNEL)
PRINT HYD            ID=3 CODE=5
```

HYDROGRAPH FROM AREA 306.80

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.667	76.7	3.333	.9	4.999	.5	6.666	.1
.167	.0	1.833	42.6	3.500	.8	5.166	.5	6.833	.1
.333	.0	2.000	28.7	3.666	.7	5.333	.6	6.999	.0
.500	.0	2.166	17.2	3.833	.6	5.499	.6	7.166	.0
.667	.0	2.333	8.2	4.000	.6	5.666	.6	7.333	.0
.833	.0	2.500	4.9	4.166	.5	5.833	.6	7.499	.0
1.000	.0	2.666	3.2	4.333	.5	5.999	.6	7.666	.0
1.167	.1	2.833	2.1	4.500	.5	6.166	.5	7.833	.0
1.333	13.3	3.000	1.5	4.666	.5	6.333	.3		

1.500	111.1	3.166	1.2	4.833	.5	6.499	.2

RUNOFF VOLUME = 1.42766 INCHES = 4.3858 ACRE-FEET
PEAK DISCHARGE RATE = 121.56 CFS AT 1.533 HOURS BASIN AREA = .0576 SQ. MI.

FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 16:30:28

APPENDIX B

- PRESSURE CALCULATIONS
- FLOWMASTER SHEETS

Total # of Lots = 114
Total Acres = 18.14
Du/Ac = 6.28 per DPM calculate percent D

45 x 110 Lots

Total Area = 6075 ft²
House = 1800 ft²
Drivepad/Sdwk/C&G/Paving = 1523 ft² ∴ % D = 55%

40 x 100 Lots

Total Area = 5000 ft²
House = 1700 ft²
Drivipad/Sdwk/C&G) Paving = 1920 ft² % D = 62.4%

∴ use D = 59%
B = 31%
C = 10%

ISAACSON & ARFMAN, P.A.

SUBJECT % Impervious for Zone RLI JOB NO. 9
BY MC DATE 9/26/97 SHEET NO. ___ OF ___

Q @ AP5 = 28.89 cfs

$Q_{1/2}$ street = 14.45 cfs
S = 1.37%
per DPM plate 22.3 D-1 D = .41 ft
per DPM plate 22.3 D-5 Q_{inlet} = 5.5 cfs (use 4 Type A inlets)

∴ pass through flow 28.89 - 22 = 6.89 cfs

Q @ AP6 = 63.5 cfs - 22 cfs = 41.5 cfs

$Q_{1/2}$ Street = 20.75 cfs D = .51 ft (per DPM plate 22.3 D-1)
S = 1.37%
per DPM plate 22.3 D-5 Q_{inlet} = 8 cfs (use 4 Type A inlets)

∴ pass through flow 41.5 - 32 = 9.5 cfs

$Q_{from\ Basin\ 2H}$ = 14.5 cfs

$Q_{1/2}$ = 7.25 cfs

S = 1.25%

$Q_{1/2}$ @ d=.67 = $87.41(.0125)^{.5}(6.32)(.43)^{.67}$ = 35.11 cfs
$Q_{1/2}$ @ d=.33 = $87.41(.0125)^{.5}(1.59)(.11)^{.67}$ = 3.56 cfs
d ≈ .37 ft

Per Dpm plate 22.3 D-5 Q_{inlet} = 4 cfs (use 2 Type A inlet @ Secret Valley)

∴ pass through 19.5 - 8 = 6.5 cfs

Q @ AP7 = 95.25 - 69 = 31.25 cfs

$Q_{1/2}$ street = 15.6 cfs D = .51 ft (per DPM plate 22.3 D-1)
S = .5%
per DPM plate 22.3 D-5 Q_{inlet} = 6.5 cfs (use 2 Type A inlets)

∴ pass through 31.25 - 13 = 18.25 cfs

Old Aspen Rd Storm Drain

From Amole del Norte to MH #4

$D = 3ft$ $\quad Q = 75 cfs$

$S = .87\%$ $\quad V = 10.61$ ft/sec

$E = 102.5$ $\quad A = 7.07$ ft^2

$E_2 = 100.81$ $\quad L = 215$

$P_1 = ?$ $\quad \varepsilon = .001$

$P_2 = 3.0$ ft

* Use Moody Diagram to find friction factor

$$N_{RE} = \frac{DV}{\nu} = \frac{10.61(3)}{1.21 \times 10^{-5}} = 2.63 \times 10^4 \quad \therefore f \approx .018$$

$$h_L = f\left(\frac{L}{D}\right)\left(V^2/2g\right) = 2.26 \text{ ft}$$

* find headloss from bend (30° Bend)

$$K_b = .25\sqrt{\Phi/90} = .14$$

$$h_b = .14\left(10.61^2/64.4\right) = .25 \text{ ft}$$

$$E_1 + P_1 + \cancel{V_1^2/2g}^{\,0} = E_2 + P_2 + \cancel{V_2^2/2g}^{\,0} + h_L + h_b$$

$$P_1 = 100.81 + 3 + .25 + 2.26 - 102.5 = 3.81 \text{ A}$$

$$\underline{HGL} = 102.5 + 3.81 = \underline{106.31} < 107.11 \checkmark dr$$

From MH4 to MH3

Try $D = 2.5$ $\quad Q = 62$ cfs

$S = 1.25\%$ $\quad V = 12.63$ ft/sec

$E_1 = 107.13$ $\quad A = 4.91$

$E_2 = 103$ $\quad L = 330$ ft

$P_1 = ?$

$P_2 = 3.31$

MH4 to MH3 (cont')

* Use Moody Diagram to find f

$N_{RE} = 12.63(2.5)/1.21\times10^{-5} = 2.61\times10^{6}$ $\quad f \approx .018$

$h_L = .018(330/2.5)(12.63^2/64.4) = 5.89$ ft

$P_1 = 3.31 + 103 + 5.89 - 107.13 = 5.07$ ft

HGL = 107.13 + 5.07 = 112.2 < 112.40 ✓ OK

from MH3 to MH2

D = 2.5 ft
S = 1.25%
E = 111.44
E_2 = 107.63
P_1 = ?
P_2 = 5.07

Q = 54 cfs
V = 10.99 ft/sec
A = 4.91 ft²
L = 305 ft

* find f (use Moody Diagram)

$N_{RE} = 2.27\times10^{6}$ $\quad f \approx .018$

$h_L = .018(305/2.5)(10.99^2/64.4) = 4.12$ ft

$P_1 = 107.63 + 5.07 + 4.12 - 111.44 = 5.38$ ft

HGL = 111.44 + 5.38 = 116.82 > 115.99 TOO HIGH!

⟶ ∴ Upsize pipe from MH4 to MH3 to 36" ϕ RCP. Will function under gravity (see Flowmaster) So use soffit of incoming pipe as control elevation (104.73).

P_2 = 2.5 ft

∴ $P_1 = 107.3 + 2.5 + 4.12 - 114.44 = 2.81$

HGL = 2.81 + 111.44 = 114.25 < 115.99 ✓ OK

MH2 to MH1 (future)

Try D = 1.5 ft
S = 1.259o
P_1 = ?
P_2 = 1.81
E_1 = 118.07
E_2 = 112.44

L = 450 ft
Q = 22 cfs
V = 12.45 ft/sec
A = 1.77 ft²

* find f (use Moody Diagram)

$N_{RE} = 1.54 \times 10^6$ ∴ f ≈ .019

$h_L = .019 (450/1.5)(12.45^2/64.9) = 13.72$

$P_1 = 112.44 + 13.72 + 1.81 - 118.07 = 9.9$ ft

HGL = 118.07 + 9.9 = 127.97 ~ 77 | 22.54

→ + use a 24" ϕ RCP under Gravity flow (see Flowmaster)

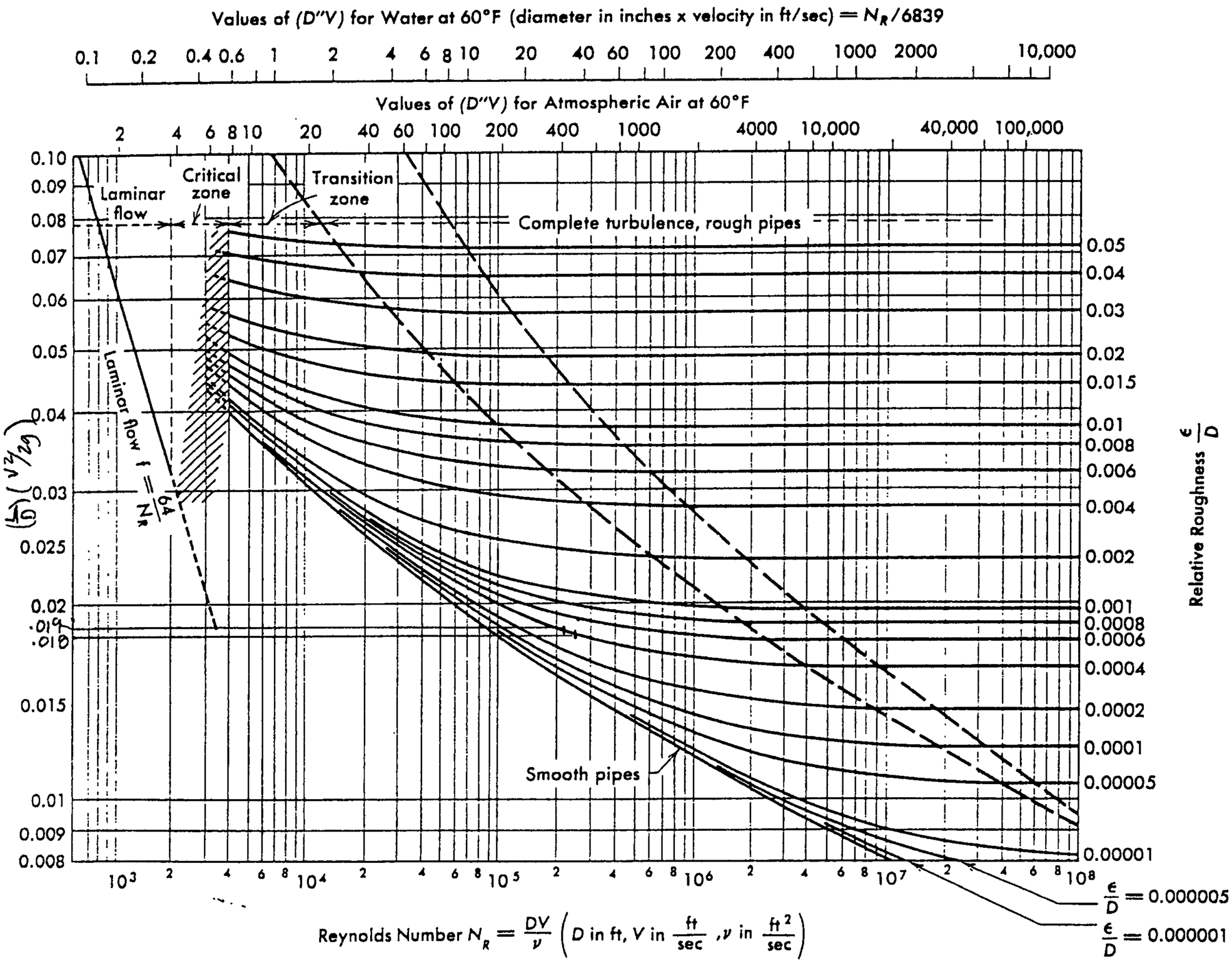


Fig. 3–3. Friction factor for pipes.

36" Diameter RCP from MH3 to MH4
Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\rhmvesd.fm2
Worksheet	36" RCP @ s= 1.25%
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Input Data		
Mannings Coefficient	0.013	
Channel Slope	1.25	%
Depth	36.0	in
Diameter	36.00	in

Results		
Discharge	74.57	cfs
Flow Area	7.07	ft^2
Wetted Perimeter	9.42	ft
Top Width	0.00	ft
Critical Depth	2.71	ft
Percent Full	100.00	
Critical Slope	0.010959	ft/ft
Velocity	10.55	ft/s
Velocity Head	1.73	ft
Specific Energy	FULL	ft
Froude Number	FULL	
Maximum Discharge	80.21	cfs
Full Flow Capacity	74.57	cfs
Full Flow Slope	0.012500	ft/ft

24" Diameter RCP from MH1 to MH2(future)
Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\rhmvesd.fm2
Worksheet	24" RCP from MH1 to MH2
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	1.25	%
Diameter	24.00	in
Discharge	22.00	cfs

Results		
Depth	17.3	in
Flow Area	2.43	ft^2
Wetted Perimeter	4.06	ft
Top Width	1.79	ft
Critical Depth	1.68	ft
Percent Full	72.12	
Critical Slope	0.009114	ft/ft
Velocity	9.07	ft/s
Velocity Head	1.28	ft
Specific Energy	2.72	ft
Froude Number	1.37	
Maximum Discharge	27.21	cfs
Full Flow Capacity	25.29	cfs
Full Flow Slope	0.009458	ft/ft
Flow is supercritical.		

DRAINAGE INFORMATION SHEET

PROJECT TITLE: MOUNTAIN VIEW ESTATES, UNIT TWO ZONE ATLAS/DRNG. FILE#: M-10 / D78

DRB # 97-420 10/21/97 EPC # WORK ORDER # 5802.82

LEGAL DESCRIPTION: MOUNTAIN VIEW ESTATES, UNIT TWO

CITY ADDRESS: UNSER & ARENAL RD.

ENGINEERING FIRM: Isaacson & Arfman, P.A. CONTACT: FRED C. ARFMAN
ADDRESS: 128 Monroe Street NE PHONE: 268-8828
CITY, STATE: Albuquerque, NM ZIP CODE: 87108

OWNER: LONGFORD HOMES OF NEW MEXICO CONTACT: CHRIS DUNN
ADDRESS: 7301 JEFFERSON ST. NE, STE G. PHONE: 761-9911
CITY, STATE: ALBUQUERQUE, NM ZIP CODE: 87109

ARCHITECT: N/A CONTACT:
ADDRESS: PHONE:
CITY, STATE: ZIP CODE:

SURVEYOR: ALDRICH LAND SURVEYING CONTACT: TIM ALDRICH
ADDRESS: PHONE: 884-1990
CITY, STATE: ZIP CODE:

CONTRACTOR: FRANKLIN EARTHMOVING CONTACT: JOHN ELLIS
ADDRESS: PHONE:
CITY, STATE: ZIP CODE:

TYPE OF SUBMITTAL:

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

PRE-DESIGN MEETING:

_____ YES
_____ NO
_____ COPY PROVIDED

RECEIVED
NOV 30 1998
HYDROLOGY SECTION

CHECK TYPE OF APPROVAL SOUGHT:

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

DATE SUBMITTED: 11.30.98

BY: FRED C. ARFMAN, P.E.
FOR ISAACSON & ARFMAN, P.A.

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

December 3, 1998

Fred C. Arfman, P.E.
Isaacson & Arfman
128 Monroe St. NE
Albuquerque, New Mexico 87108

RE: Grading and Drainage Certification for Mountain View Estates, Unit Two, (M10/D7B) Submitted for Release of Financial Guarantees, Engineer's Certification Stamp Dated 11/30/98.

Dear Mr. Arfman:

The above referenced Engineer's Certification is adequate to satisfy the Grading and Drainage certification requirement per the Infrastructure List dated October 21, 1997 for the release of Financial Guarantees for Mountain View Estates Unit 2.

If you have any questions, or if I may be of further assistance to you, please call me at 924-3982.

Sincerely,

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: Terri Martin, City Project #580282
Chris Dunn, Longford Homes
File

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

DRAINAGE INFORMATION SHEET

PROJECT TITLE: MOUNTAIN VIEW EST. UNIT ONE ZONE ATLAS/DRNG. FILE #: M-10/D78

DRB #: _____ EPC #: _____ WORK ORDER #: 580281

LEGAL DESCRIPTION: MOUNTAIN VIEW ESTATES, UNIT ONE

CITY ADDRESS: N/A

ENGINEERING FIRM: ISAACSON & ARFMAN CONTACT: FRED ARFMAN

ADDRESS: 128 MONROE ST. PHONE: 268-8828

OWNER: LONGFORD HOMES - N CONTACT: CHRIS MURTAGH (Murtagh)

ADDRESS: 7301 JEFF ST. STE G PHONE: 761-9911

87109

ARCHITECT: N/A. CONTACT: _____

ADDRESS: _____ PHONE: _____

SURVEYOR: ALDRICH LAND SURVEYING CONTACT: TIM A.

ADDRESS: _____ PHONE: 884-1990

CONTRACTOR: FRANKLIN EARTHMOVING CONTACT: JOHN ELLIS

ADDRESS: _____ PHONE: _____

TYPE OF SUBMITTAL:

____ DRAINAGE REPORT

____ DRAINAGE PLAN

____ CONCEPTUAL GRADING & DRAINAGE PLAN

____ GRADING PLAN

____ EROSION CONTROL PLAN

X ENGINEER'S CERTIFICATION

____ OTHER

PRE-DESIGN MEETING:

____ YES

____ NO

____ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

____ SKETCH PLAT APPROVAL

____ PRELIMINARY PLAT APPROVAL

____ S. DEV. PLAN FOR SUB'D. APPROVAL

____ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL

____ SECTOR PLAN APPROVAL

____ FINAL PLAT APPROVAL

____ FOUNDATION PERMIT APPROVAL

____ BUILDING PERMIT APPROVAL

____ CERTIFICATE OF OCCUPANCY APPROVAL

____ GRADING PERMIT APPROVAL

____ PAVING PERMIT APPROVAL

____ S.A.D. DRAINAGE REPORT

____ DRAINAGE REQUIREMENTS

X OTHER W.O. ACCEPTANCE (SPECIFY)
F.G. RELEASE

DATE SUBMITTED: 09 29 98

BY: FRED C. ARFMAN

RECEIVED
SEP 29 1998
HYDROLOGY SECTION

CITY OF
Albuquerque

October 8, 1998

Fred C. Arfman, P.E.
Isaacson & Arfman
128 Monroe St. NE
Albuquerque, New Mexico 87108

RE: Grading and Drainage Certification for Mountain View Estates, Unit One, (M10/D7B) Submitted for Release of Financial Guarantees, Engineer's Stamp Dated 9/29/98.

Dear Mr. Arfman:

The above referenced Engineer's Certification for Mountain View Estates Unit 1 is adequate to satisfy the Grading and Drainage certification requirements per the Infrastructure List dated October 21, 1997 for the release of Financial Guarantees for this Unit.

If you have any questions, or if I may be of further assistance to you, please call me at 924-3982.

Sincerely,

Susan Calongne

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: Terri Martin, City Project #580281
Chris Murtagh, Longford Homes
File

DRAINAGE INFORMATION SHEET

73
B82

PROJECT TITLE: MTN. VIEW ESTATES, UNIT TWO ZONE ATLAS/DRNG. FILE#: M-10/~~078~~

DRB # 97-420 EPC # WORK ORDER #

LEGAL DESCRIPTION: TRACT A, MTN. VIEW ESTATES, UNIT ONE BEING REPLATED AS MTN. VIEW ESTATES, UNIT TWO

CITY ADDRESS: N/A

ENGINEERING FIRM: Isaacson & Arfman, P.A. CONTACT: FRED ARFMAN
ADDRESS: 128 Monroe Street NE PHONE: 268-8828
CITY, STATE: Albuquerque, NM ZIP CODE: 87108

OWNER: LONGFORD HOMES OF NEW MEXICO CONTACT: JOHN MURTAGH
ADDRESS: 7301 JEFFERSON ST. N.E, STE G&H PHONE: 761-88-11
CITY, STATE: ALBUQ. NM ZIP CODE: 87109

ARCHITECT: N/A. CONTACT:
ADDRESS: PHONE:
CITY, STATE: ZIP CODE:

SURVEYOR: ALS CONTACT: TIM ALDRICH
ADDRESS: PHONE: 884-1990
CITY, STATE: ZIP CODE:

CONTRACTOR: FRANKLIN CONTACT: JOHN ELLIS
ADDRESS: PHONE:
CITY, STATE: ZIP CODE:

TYPE OF SUBMITTAL:

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

PRE-DESIGN MEETING:

_____ YES
_____ NO
_____ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

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

RECEIVED
FEB 25 1998
HYDROLOGY SECTION

DATE SUBMITTED: FEB. 24, 1998

BY: FRED C. ARFMAN
FOR ISAACSON & ARFMAN, P.A.

CITY OF
Albuquerque
Public Works Department
October 21, 1997

Martin J. Chávez, Mayor

Robert E. Gurulé, Director

Fred C. Arfman, P.E.
Isaacson & Arfman
128 Monroe St. NE
Albuquerque, New Mexico 87108

RE: Drainage Report and Grading and Drainage Plan for Mountain View Estates, Units One & Two, (M10/D7B) Submitted for Preliminary Plat and Grading Permit Approval, Engineer's Stamp Dated 9/30/97 on Report and Plans Dated 9/9/97.

Dear Mr. Arfman:

Based on the information provided in the submittals of October 1, 1997 and October 14, 1997, the above referenced Drainage Report and Plan are approved for Preliminary Plat action.

The plan dated September 9, 1997 is also approved for Rough Grading Permit release. Grading will not be allowed within the City's Amole del Norte right-of-way without concurrence from the City's Storm Drain Maintenance staff. Prior to Final Plat approval, or Work Order approval, concurrence must also be obtained for the proposed rundown structure into the Amole. This rundown must be compatible with access on that side of the channel.

As you are aware, the Engineer's Certification is required prior to release of financial guarantees for each Unit of this Subdivision. If you should have any questions, or if I may be of further assistance to you, please call me at 924-3982.

Sincerely,

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: Scott Roe, Longford Homes of New Mexico
Fred Aguirre, DRB-97-427
Glenn Jurgensen, Storm Drain/Arroyo Maintenance
Larry Caudill, Environmental Health
File

CITY OF
Albuquerque

March 5, 1998

Fred Arfman, P.E.
Isaacson & Arfman
128 Monroe St. NE
Albuquerque, NM 87108

RE: ROLLING HILLS UNIT 2 (M10-D7B). GRADING AND DRAINAGE PLAN FOR FINAL PLAT APPROVAL. ENGINEER'S STAMP DATED FEBRUARY 23, 1998.

Dear Mr. Arfman:

Based on the information provided on your February 25, 1998 submittal, the above referenced project is approved for Final Plat.

An Engineer's Certification is required for Subdivision Certification.

If I can be of further assistance, please feel free to contact me at 924-3984.

Sincerely,

Lisa Ann Manwill, P.E.
Hydrology

c: Andrew Garcia
File

DRAINAGE INFORMATION SHEET

PROJECT TITLE: Rolling Hills Unit 4&5 ZONE ATLAS/DRNG. FILE #: M-10, D73

`B #: _____ EPC #: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: Portion of Tract KK2, Town of Atrisco Grant

CITY ADDRESS: N/A

ENGINEERING FIRM: Isaacson & Arfman CONTACT: Melissa Combs

ADDRESS: 128 Monroe St NE PHONE: 268-8828

OWNER: Longford Homes of NM Inc CONTACT: Scott Rowe

ADDRESS: _____ PHONE: 250-3544

ARCHITECT: N/A CONTACT: _____

ADDRESS: _____ PHONE: _____

SURVEYOR: Aldrich Land Surveying CONTACT: Tim Aldrich

ADDRESS: _____ PHONE: 884-1990

CONTRACTOR: N/A CONTACT: _____

ADDRESS: _____ PHONE: _____

TYPE OF SUBMITTAL:

____ DRAINAGE REPORT

____ DRAINAGE PLAN

____ CONCEPTUAL GRADING & DRAINAGE PLAN

__✓__ GRADING PLAN

____ EROSION CONTROL PLAN

____ ENGINEER'S CERTIFICATION

____ OTHER

PRE-DESIGN MEETING:

____ YES

____ NO

____ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

____ SKETCH PLAT APPROVAL

____ PRELIMINARY PLAT APPROVAL

____ S. DEV. PLAN FOR SUB'D. APPROVAL

____ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL

____ SECTOR PLAN APPROVAL

____ FINAL PLAT APPROVAL

____ FOUNDATION PERMIT APPROVAL

____ BUILDING PERMIT APPROVAL

____ CERTIFICATE OF OCCUPANCY APPROVAL

__✓__ GRADING PERMIT APPROVAL

____ PAVING PERMIT APPROVAL

____ S.A.D. DRAINAGE REPORT

____ DRAINAGE REQUIREMENTS

____ OTHER _____ (SPECIFY)

DATE SUBMITTED: 9/9/97

BY: Melissa Combs

FOR: Isaacson & Arfman PA

RECEIVED
SEP 09 1997
HYDROLOGY SECTION

CITY OF
Albuquerque

September 30, 1997

Martin J. Chávez, Mayor

Melissa Combs
Isaacson & Arfman
128 Monroe St. NE
Albuquerque, NM 87108

RE: ROLLING HILLS UNIT 4 AND 5 (M10-D7B). GRADING AND DRAINAGE PLAN FOR GRADING PERMIT APPRCVAL. ENGINEER'S STAMP DATED SEPTEMBER 9, 1997 (GRADING DETAILS ONLY).

Dear Ms. Combs:

Based on the information provided on your September 9, 1997 submittal, City Hydrology has the following comments:

1. The Engineer's seal for the grading and drainage plan must be dated.

2. I assume there is a master plan that came up with allowable flow rates. Please discuss how this plan relates to an approved master plan.

3. What are the flows for this subdivision. Show me your calculations. Provide a narrative.

4. Indicate that all roof flow is directed to the front yard.

5. Garden walls or header walls will be required along each lots side yard. A fence is allowed to be constructed on top of a 12-inch (min) header wall.

6. I assume there is a wall at the top of the back yard berm. Show a section

If I can be of further assistance, please feel free to contact me at 924-3984.

Sincerely,

Lisa Ann Manwill, P.E.
Hydrology

c: Andrew Garcia
File

DEVELOPMENT & BUILDING SERVICE CENTER
ONE STOP SHOP
600 SECOND ST. N.W.
ATTENTION: Sandy
505-924-3900

Records Withdrawal Form

Project No A10-D78B **Date:** 08-16-06

Project Title: Rolling Hills 4 4 PS

a. ~~File~~ b. Mylars c. Redlines/Comments
d. Other Addendum

Requested by: Debi Rigdon JAM **Phone No.:** 345428
Name and Company

Comments:

_____

_____

_____

Anticipated Return Date: _____

I hereby accept full responsibility for the security of the above noted records/plans until return receipt acknowledgement is completed. Records/plans will be returned to the Development and Building Services Center on or before the indicted anticipated return date.

Delivery Picked Up By:

Name: Paul Naber **Organization:** ABQ Reprographics
Print

Signed: Paul Naber **Date:** 8-16-06

Office Use Only

Return Acknowledged:

Received By: _____ **Date:** 8-17-06
Print

DEVELOPMENT & BUILDING SERVICE CENTER
ONE STOP SHOP
600 SECOND ST. N.W.

ATTENTION: Sandy

505-924-3900

Records Withdrawal Form

Project No PR10-D7B **Date:** 08-16-06

Project Title: Rolling Hills U 4 PS

a. ~~File~~ b. Mylars c. Redlines/Comments
d. Other Addendum

Requested by: Debbie Trujillo JMA **Phone No.:** 345428
Name and Company

Comments:

_____

_____

_____

Anticipated Return Date: _____

I hereby accept full responsibility for the security of the above noted records/plans until return receipt acknowledgement is completed. Records/plans will be returned to the Development and Building Services Center on or before the indicted anticipated return date.

Delivery Picked Up By:

Name: Paul Naber **Organization:** ABQ Reprographics
Print

Signed: Paul Naber **Date:** 8-16-06

Office Use Only

Return Acknowledged:

Received By: RD **Date:** 8/17/06
Print

October 21, 1997

Fred C. Arfman, P.E.
Isaacson & Arfman
128 Monroe St. NE
Albuquerque, New Mexico 87108

RE: Drainage Report and Grading and Drainage Plan for Mountain View Estates, Units One & Two, (M10/D7B) Submitted for Preliminary Plat and Grading Permit Approval, Engineer's Stamp Dated 9/30/97 on Report and Plans Dated 9/9/97.

Dear Mr. Arfman:

Based on the information provided in the submittals of October 1, 1997 and October 14, 1997, the above referenced Drainage Report and Plan are approved for Preliminary Plat action.

The plan dated September 9, 1997 is also approved for Rough Grading Permit release. Grading will not be allowed within the City's Amole del Norte right-of-way without concurrence from the City's Storm Drain Maintenance staff. Prior to Final Plat approval, or Work Order approval, concurrence must also be obtained for the proposed rundown structure into the Amole. This rundown must be compatible with access on that side of the channel.

As you are aware, the Engineer's Certification is required prior to release of financial guarantees for each Unit of this Subdivision. If you should have any questions, or if I may be of further assistance to you, please call me at 924-3982.

Sincerely,

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: Scott Roe, Longford Homes of New Mexico
Fred Aguirre, DRB-97-427
Glenn Jurgensen, Storm Drain/Arroyo Maintenance
Larry Caudill, Environmental Health
File

DRAINAGE INFORMATION SHEET

New

PROJECT TITLE: Mountain View Estates Units One & Two ZONE ATLAS/DRNG. FILE #: M-10 ~~E~~ 7B

DRB #: 97-420 EPC #: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: A portion of Tract KK-2 & Parcel A-2-5, Anole del Norte (Town of Atrisco Grant, Unit 8)

CITY ADDRESS: _____

ENGINEERING FIRM: Isaacson & Arfman PA CONTACT: Melissa Combs

ADDRESS: 128 Monroe St NE PHONE: 268-8828

OWNER: Longford Homes of New Mexico CONTACT: Scott Roe

ADDRESS: 7404 Crystal Ridge Rd SW PHONE: 831-3331

ARCHITECT: N/A CONTACT: _____

ADDRESS: Aldrich Land Surveying PHONE: 884-1990

SURVEYOR: _____ CONTACT: Tim Aldrich

ADDRESS: _____ PHONE: _____

CONTRACTOR: N/A CONTACT: _____

ADDRESS: _____ PHONE: _____

TYPE OF SUBMITTAL:

✓ DRAINAGE REPORT

___ DRAINAGE PLAN

___ CONCEPTUAL GRADING & DRAINAGE PLAN

✓ GRADING PLAN

___ EROSION CONTROL PLAN

___ ENGINEER'S CERTIFICATION

___ OTHER

RECEIVED
OCT 01 1997
HYDROLOGY SECTION

PRE-DESIGN MEETING:

___ YES

___ NO

___ COPY PROVIDED

RECEIVED
SEP 01 1997
HYDROLOGY SECTION

CHECK TYPE OF APPROVAL SOUGHT:

___ SKETCH PLAT APPROVAL

✓ PRELIMINARY PLAT APPROVAL

___ S. DEV. PLAN FOR SUB'D. APPROVAL

___ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL

___ SECTOR PLAN APPROVAL

✓ FINAL PLAT APPROVAL

___ FOUNDATION PERMIT APPROVAL

___ BUILDING PERMIT APPROVAL

___ CERTIFICATE OF OCCUPANCY APPROVAL

✓ GRADING PERMIT APPROVAL

___ PAVING PERMIT APPROVAL

___ S.A.D. DRAINAGE REPORT

___ DRAINAGE REQUIREMENTS

___ OTHER _____ (SPECIFY)

DATE SUBMITTED: 10/1/97

BY: Melissa Combs

RECEIVED
SEP 01 1997
HYDROLOGY SECTION

Tina-
This page needs to go to Susan Calongne. Thx. ME

Isaacson & Arfman, P.A.

Consulting Engineering Associates

Letter of Transmittal

To STORM DRNG. MAINTENANCE Date 11.19.97

Job No.

Attn: GLEN J.

Reference MOUNTAIN VIEW ESTATES, UNIT ONE

Gentlemen: AMOLE DEL NORTE DIV. CHNL.

We transmit to you 1 copy(ies) of the following

- ☐ ____ Plats
- ☒ ORIGINAL Plans
- ☐ Specifications
- ☐ ____ Report
- ☐ Shop Drawings
- ☐ Submittals
- ☐ Material Specifications
- ☐ Copy of Letter
- ☐ ____
- ☐ ____

This information is transmitted:

- ☐ As per your request
- ☒ For your review & approval
- ☐ For your information
- ☐ For your attention
- ☒ For your signature
- ☐ ____
- ☐ ____
- ☐ For your files
- ☐ For your use
- ☐ Please review & return
- ☐ For return to your files
- ☒ Please advise

Remarks: O.K. C.O.A. Storm Drainage Maint. Dist.

By: FRED ARFMAN Copies To

128 Monroe, NE • Albuquerque, NM 87108 • (505) 268-8828