City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

December 29, 1999

Gregory J. Krenik, PE
Mark Goodwin & Associates
P.O. Box 90606,
Albuquerque, NM 87199

Re: Mountain View Estates Units 3 & 4 Grading and Drainage Plan
Engineer's Stamp dated 8-31-98, (M10/D7B1)
Engineering Certification dated 3-1-99

Dear Mr. Krenik,

Based upon the information provided in your submittal dated 12-17-99, Engineering Certification for Release of Financial Guarantee for the above referenced plan is approved.

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

Sincerely,

Bradley L. Bingham

Bradley L. Bingham, PE
Hydrology Review Engineer

C: Terri Martin CoA # 580283
file

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

M-10/D781

DRAINAGE CALCULATIONS

FOR

MOUNTAIN VIEW ESTATES

UNITS 3 & 4

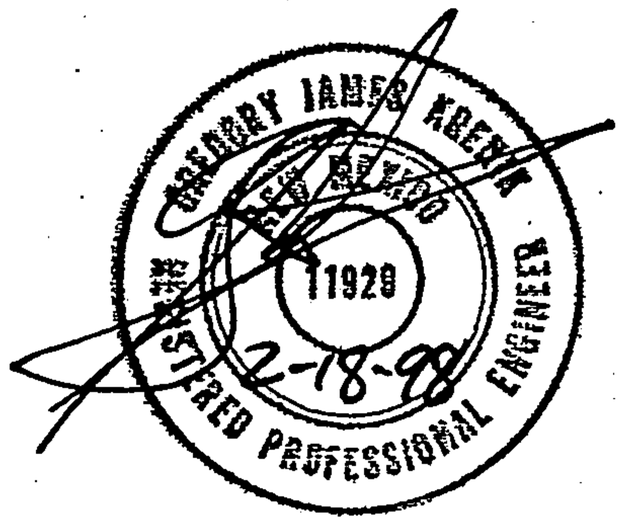
MARK GOODWIN & ASSOCIATES
CONSULTING ENGINEERS

DRAINAGE CALCULATIONS

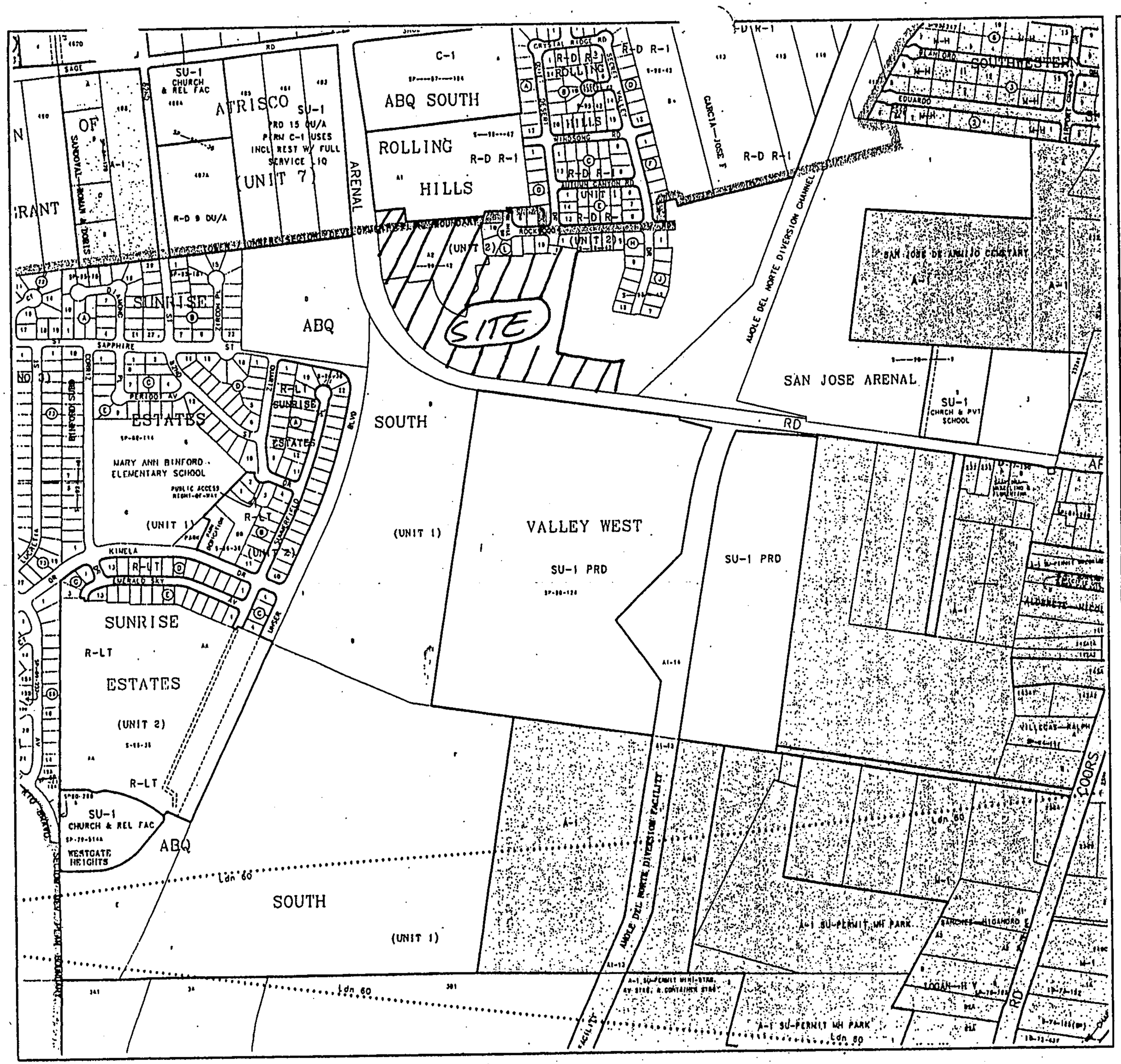
FOR

MOUNTAIN VIEW ESTATES

UNITS 3 & 4



D. MARK GOODWIN & ASSOCIATES



GRAPHIC SCALE IN FEET

250 0 500 1000

CITY OF Albuquerque

Albuquerque Geographic Information System

PLANNING DEPARTMENT

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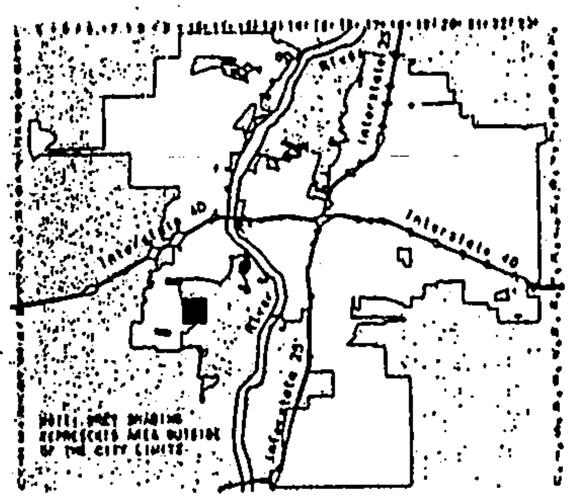
Map Amended through February 21, 1997



LEGAL DESCRIPTION

T10N

R2E

SEC 24

UNIFORM PROPERTY CODE

1-010-055

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

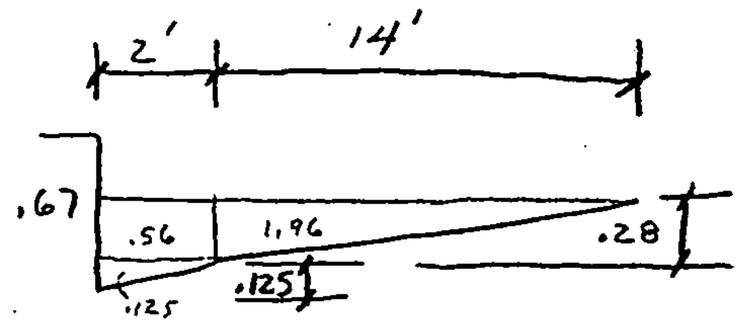
OUR PLAN GENERATES 1.02 CFS ADDITIONAL OVER THE MASTER PLAN AND THIS REPORT WILL SHOW THE DESIGNED STORM DRAIN SYSTEM CAN HANDLE THE ADDITIONAL FLOW.

- 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 ≈ 30.25 CFS OK

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



D. Mark Goodwin & Associates, P.A.
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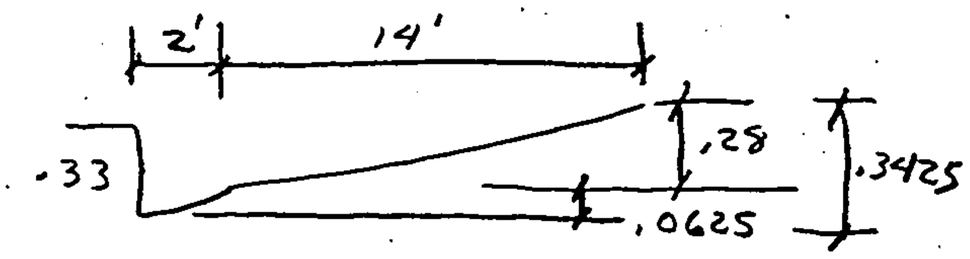
PROJECT Mountain View Units 3 & 4
SUBJECT Drainage Calcs
BY GSK DATE 2-11-98
CHECKED _____ DATE _____
SHEET 3 OF ____

- 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
$Q_{1/2} = 5.3866$ CFS

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

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 ≈ 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 ≈ 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

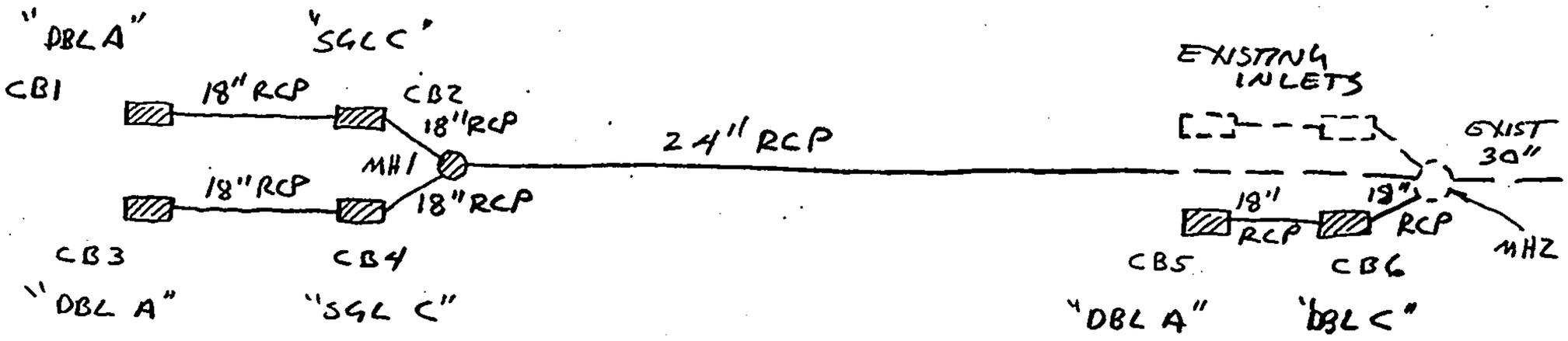
D. Mark Goodwin & Associates, P.A.
Consulting Engineers and Surveyors

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

- SIZE STORMDRAIN

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

```
START                TIME=0.0
**** HYDROGRAPH FOR MOUNTAIN VIEW OFFSITE - ROLLING HILLS UNIT 3
INFALL               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
MPUTE 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
PINT HYD             ID=1 CODE=1
NISH
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```
     AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
          RUN DATE (MON/DAY/YR) = 02/11/1998
          START TIME (HR:MIN:SEC) = 10:14:58     USER NO.= M_GOODWN.I01
          INPUT FILE = MTNVWOFF.DAT

START                    TIME=0.0
***** HYDROGRAPH FOR MOUNTAIN VIEW OFFSITE - ROLLING HILLS UNIT 3
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

                    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=0.003847 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
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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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START                   TIME=0.0
**** HYDROGRAPH FOR MOUNTAIN VIEW UNITS 3 & 4
INFALL                  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
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                        PER A=0 B=50.54 C=0 D=49.46
                        TP=0.1333 HR MASS RAINFALL=-1
RINT HYD                ID=1 CODE=1
NISH
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```
    AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
          RUN DATE (MON/DAY/YR) = 02/11/1998
          START TIME (HR:MIN:SEC) = 10:44:03     USER NO.= M_GOODWN.I01
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***** HYDROGRAPH FOR MOUNTAIN VIEW UNITS 3 & 4
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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 =
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     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
```

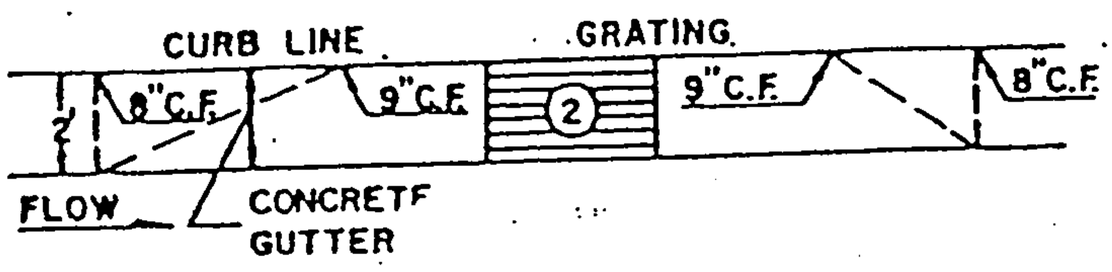
RUNOFF VOLUME = 1.35323 INCHES = 1.9337 ACRE-FEET
PEAK DISCHARGE RATE = 56.36 CFS AT 1.500 HOURS BASIN AREA = .0268 SQ. MI.

FINISH

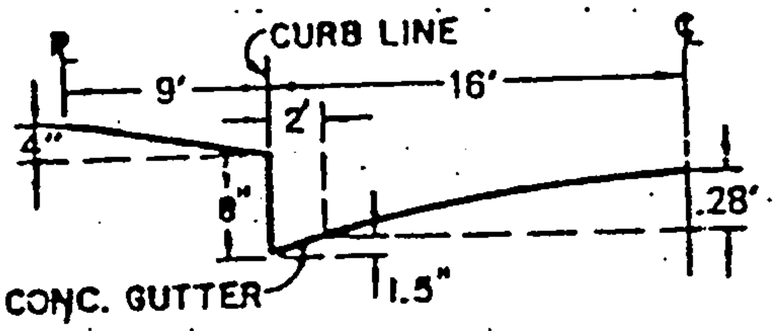
NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 10:44:10

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

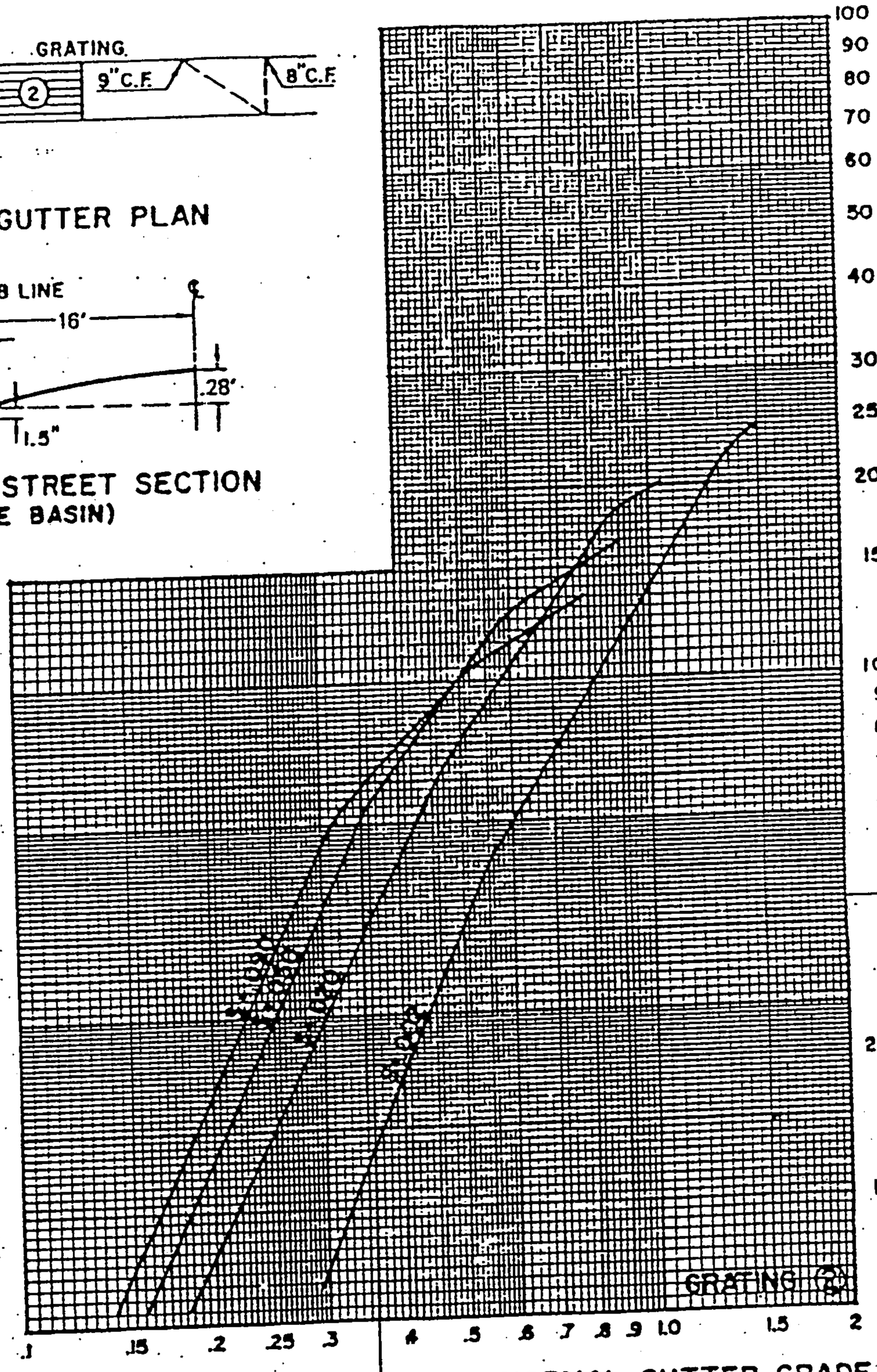
13



GRATING & GUTTER PLAN

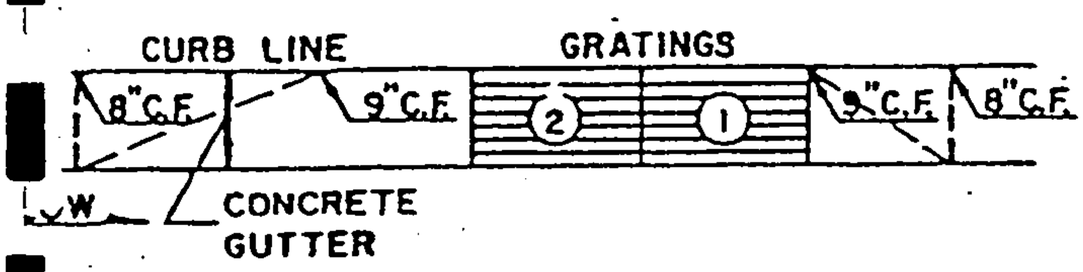


TYPICAL HALF STREET SECTION
(ABOVE BASIN)

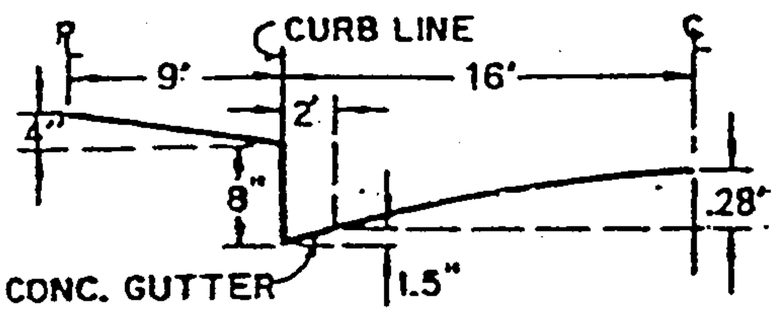


GRATING CAPACITIES FOR TYPE DOUBLE "A", "C," AND "D"

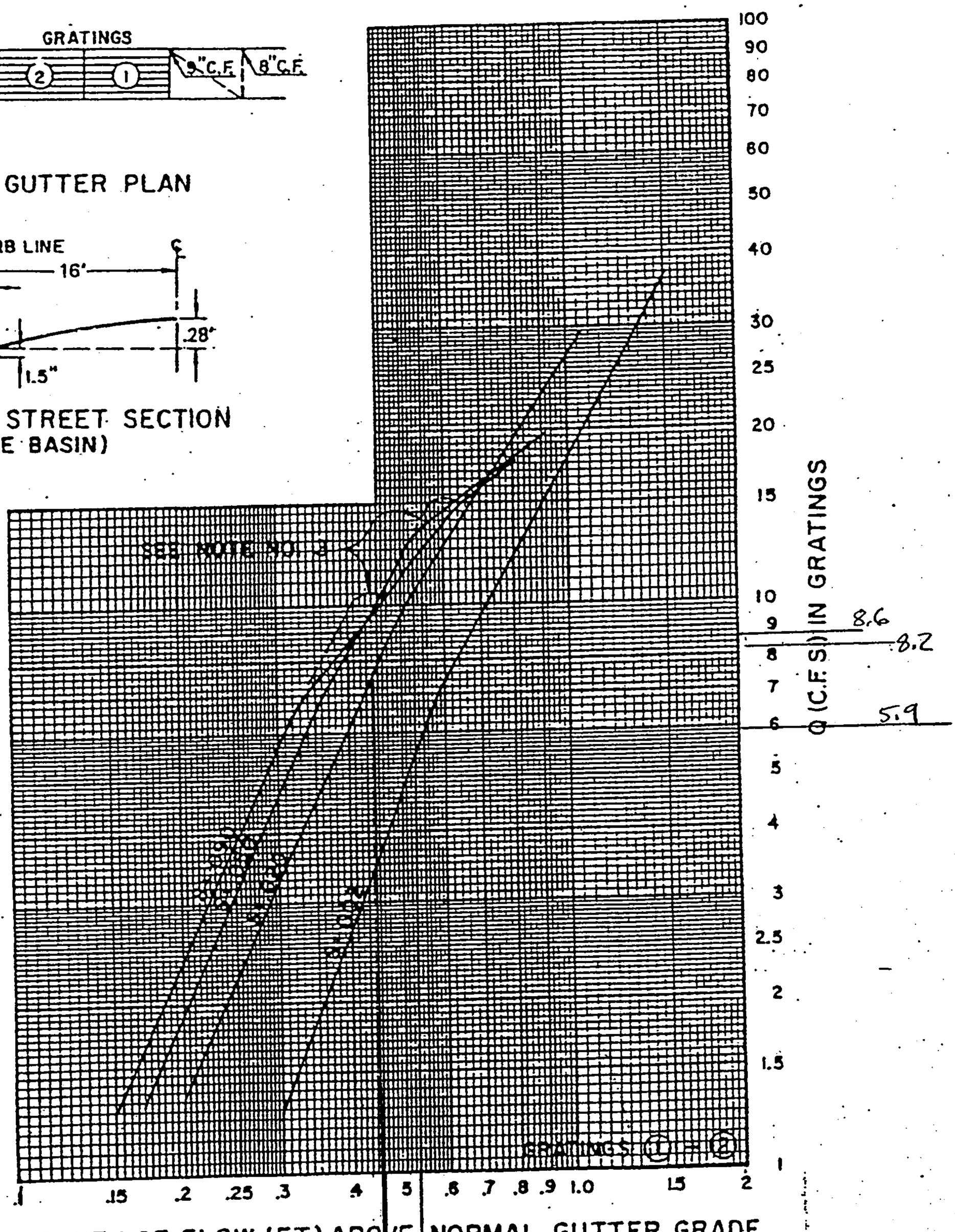
12



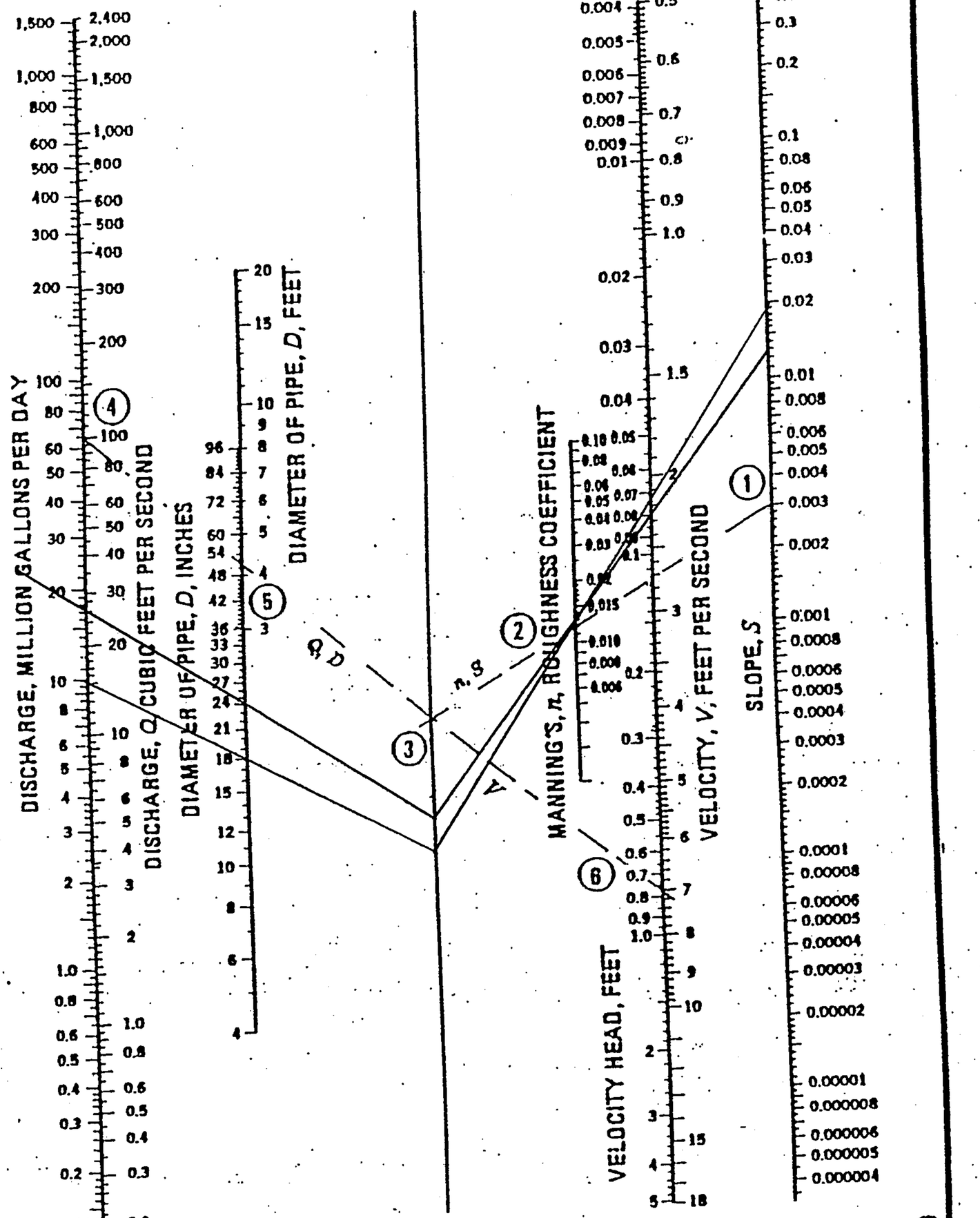
GRATING & GUTTER PLAN



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

Prepared by:

ISAACSON & ARFMAN, P.A.
128 Monroe Street, NE
Albuquerque, NM 87108
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RECEIVED
OCT 01 1997
HYDROLOGY SECTION

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~~ 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~~ 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~~ 2 would remain zoned as R-1.

Mountain View 3 & 4

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 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 HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW 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      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
	.5	.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       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
                                  1[illegible]0  14[illegible]  98.[illegible]  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 DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME 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        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=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[illegible] CO[illegible]ED [illegible]NIT[illegible] ABS[illegible]CTIO[illegible]/INFILTRATIO[illegible]UMBER 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 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          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
   [illegible]     [illegible]  [illegible]    [illegible]
```

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
Drivepad/Sdwk/C&G)Paving = 1420 ft² % D = 62.4%

∴ use D = 59%
B = 31%
C = 10%

ISAACSON & ARFMAN, P.A.

SUBJECT % Impervious for Zone RLT 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 = 1.3%
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 = $87.91(.0125)^{.5}(1.59)(.11)^{.67}$ = 3.56 cfs
d ≈ .37 ft

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

∴ pass through 19.5 - 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 = .8%
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 ft²
L = 215
ε = .001

* Use Moody Diagram to find friction factor

$$N_{RE} = \frac{DV}{\nu} = \frac{10.61(3)}{1.21\times10^{-5}} = 2.63\times10^{4} \quad \therefore f \approx .018$$

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

* find headloss from bend (30° Bend)

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

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

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

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

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

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

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

HGL: $2.81 + 111.44 = 114.25 < 115.99$ ✓OK

MH2 to MH1 (future)

Try $D = 1.5$ ft

$S = 1.2590$

$P_1 = ?$

$P_2 = 1.81$

$E_1 = 118.07$

$E_2 = 112.44$

$L = 450$ ft

$Q = 22$ cfs

$V = 12.45$ ft/sec

$A = 1.77$ ft^2

* find f (use Moody Diagram)

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

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

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

$HGL = 118.07 + 9.9 = 127.97 \text{ or } 122.54$

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

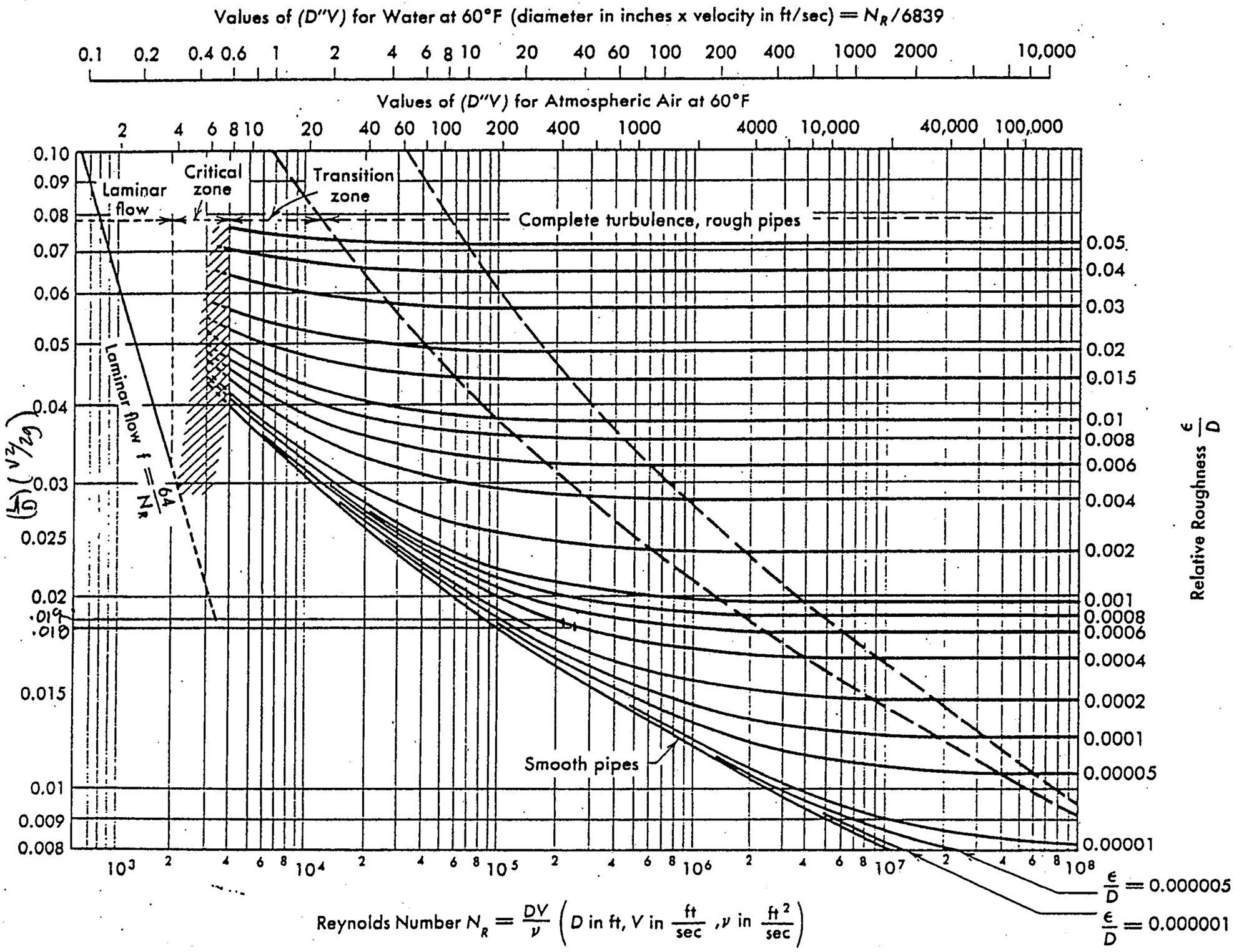


Fig. 3–3. Friction factor for pipes.

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	ft²
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	ft²
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 25, 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 19, 1998.

Dear Mr. Krenik:

Based on the information provided on your March 19, 1998 submittal, the above referenced project is approved for Preliminary Plat.

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

M-10/D7B1

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

CITY OF
Albuquerque

April 3, 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 31, 1998.

Dear Mr. Krenik:

Based on the information provided on your March 31, 1998 submittal, the above referenced project is approved for Preliminary Plat.

Prior to Final Plat approval, please address the following comments:

1. Please add the two storm drain laterals on Arenal to your infrastructure list. Also, the 18-inch RCP you have show on your list may be more appropriatly describes as being located in the Unser/Arenal Right-of-Way.

2. All storm drain improvements must be installed prior street construction

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

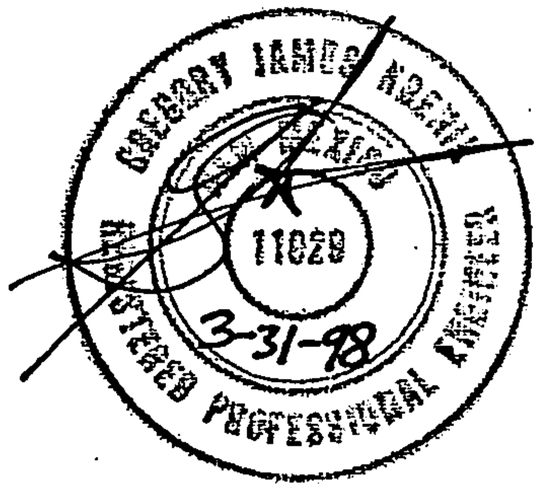
Sincerely,

Lisa Ann Manwill, P.E.
Hydrology

c: Andrew Garcia
File

ADDENDUM TO
DRAINAGE CALCULATIONS
for
MOUNTAIN VIEW ESTATES
Units 3 & 4

MARCH 1998



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

PROJECT Mountain View Units 3&4
SUBJECT Drainage Calcs
BY GJK DATE 3-31-98
CHECKED _____ DATE _____
SHEET 1 OF ____

- VERIFY IF STORMDRAIN IS REQUIRED IN UNSER BLVD.

AREA = 156' x 1800'
= 6.4463 AC = 0.010072 S.M.

BASED ON 10' BIKEPATH EASTSIDE
6' SIDEWALK WESTSIDE
37' F-F NORTHBOUND
37' F-F SOUTHBOUND

TYPE "D" = 57.69%
TYPE "B" = 42.31 %

FOR 10 YEAR STORM (REDUCTION OF 0.667)

P_1 = 1.28 in

P_6 = 1.50 in

FROM AHYMO OUTPUT sheets 2-4

Q = 13.18 CFS

Q ½ = 6.59 CFS

FIND CAPACITY OF 13' CURB LANE

d = 0.345 S = 1.5%
WP = 13.345
A = 1.775
V = 2.7896 F/S
Q = 4.9514 CFS

V = 3.2211 F/S
Q = 5.7175 CFS S = 2.0%

V = 3.6013 F/S
Q = 6.392 CFS S = 2.5%

- ADD A "DBL A" INLET AT THE NORTH END OF THE CHANNELIZED RIGHT TURNLANE.

S = 2%
FROM NOMO 5
Q GRATE = 4.4 CFS

Q PAST INLET = 6.59 - 4.4
= 2.19 CFS

- CONNECT THIS INLET TO THE 2 INLETS ON ARENAL WHICH ARE PART OF CITY PROJECT NO. 580391 - ARENAL ROAD STORMDRAIN WITH 18" RCP

```
START                    TIME=0.0
***** HYDROGRAPH FOR MOUNTAIN VIEW UNITS 3&4-UNSER RUNOFF
AINFALL                  TYPE=1 RAIN QUARTER=0.0 IN
                         RAIN ONE=1.28 IN RAIN SIX=1.50 IN
                         RAIN DAY=2.67 IN DT=0.03333 HR
OMPUTE NM HYD            ID=1 HYD NO=101.1 AREA=0.010072 SQ MI
                         PER A=0 B=42.31 C=0 D=57.69
                         TP=0.1333 HR MASS RAINFALL=-1
RINT HYD                 ID=1 CODE=1
INISH
```

```
    AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
          RUN DATE (MON/DAY/YR) = 03/31/1998
          START TIME (HR:MIN:SEC) = 09:28:27      USER NO.= M_GOODWN.I01
          INPUT FILE = MTNUNSER.DAT

START                    TIME=0.0
***** HYDROGRAPH FOR MOUNTAIN VIEW UNITS 3&4-UNSER RUNOFF
RAINFALL                 TYPE=1 RAIN QUARTER=0.0 IN
                         RAIN ONE=1.28 IN RAIN SIX=1.50 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    .0011    .0021    .0032    .0044    .0055    .0067
     .0079    .0091    .0104    .0117    .0130    .0144    .0158
     .0173    .0188    .0203    .0219    .0235    .0252    .0270
     .0288    .0307    .0327    .0347    .0369    .0391    .0415
     .0439    .0465    .0493    .0529    .0566    .0607    .0693
     .0888    .1187    .1616    .2202    .2972    .3954    .5177
     .6669    .8054    .8633    .9121    .9556    .9951   1.0314
    1.0652   1.0968   1.1264   1.1542   1.1805   1.2053   1.2288
    1.2510   1.2721   1.2922   1.3112   1.3292   1.3334   1.3373
    1.3410   1.3445   1.3479   1.3511   1.3542   1.3572   1.3600
    1.3628   1.3655   1.3680   1.3706   1.3730   1.3754   1.3777
    1.3799   1.3821   1.3843   1.3863   1.3884   1.3904   1.3923
    1.3942   1.3961   1.3980   1.3998   1.4015   1.4033   1.4050
    1.4066   1.4083   1.4099   1.4115   1.4131   1.4146   1.4161
    1.4176   1.4191   1.4206   1.4220   1.4234   1.4248   1.4262
    1.4276   1.4289   1.4302   1.4315   1.4328   1.4341   1.4354
    1.4366   1.4378   1.4391   1.4403   1.4415   1.4426   1.4438
    1.4450   1.4461   1.4472   1.4484   1.4495   1.4506   1.4517
    1.4527   1.4538   1.4549   1.4559   1.4570   1.4580   1.4590
    1.4600   1.4610   1.4620   1.4630   1.4640   1.4649   1.4659
    1.4669   1.4678   1.4687   1.4697   1.4706   1.4715   1.4724
    1.4733   1.4742   1.4751   1.4760   1.4769   1.4778   1.4786
    1.4795   1.4803   1.4812   1.4820   1.4829   1.4837   1.4845
    1.4853   1.4862   1.4870   1.4878   1.4886   1.4894   1.4901
    1.4909   1.4917   1.4925   1.4933   1.4940   1.4948   1.4955
    1.4963   1.4970   1.4978   1.4985   1.4993   1.5000

COMPUTE NM HYD           ID=1 HYD NO=101.1 AREA=0.010072 SQ MI
                         PER A=0 B=42.31 C=0 D=57.69
                         TP=0.1333 HR MASS RAINFALL=-1

     K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000    SHAPE CONSTANT, N =
     UNIT PEAK =    22.940    CFS    UNIT VOLUME =    .9988        B =    526.28        P60 = 1.28
     AREA =         .005811 SQ MI    IA =     .10000 INCHES    INF =     .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330


     K =    .141373HR    TP =    .133300HR    K/TP RATIO =   1.060565    SHAPE CONSTANT, N =
     UNIT PEAK =    9.8359    CFS    UNIT VOLUME =    .9986        B =    307.67        P60 = 1.28
     AREA =         .004261 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
```

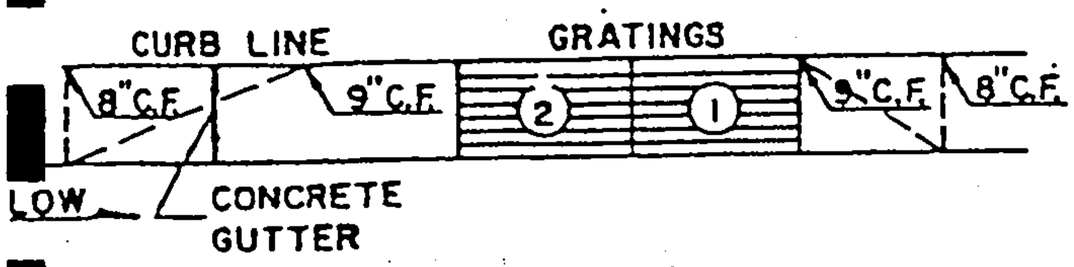
RUNOFF VOLUME = .83350 INCHES = .4477 ACRE-FEET
PEAK DISCHARGE RATE = 13.18 CFS AT 1.500 HOURS BASIN AREA = .0101 SQ. MI.

FINISH

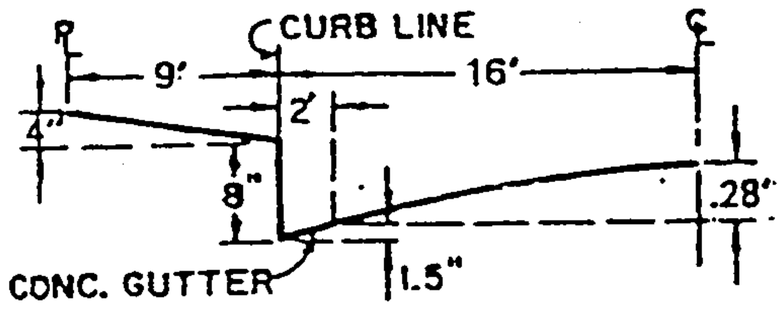
NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 09:28:34

5

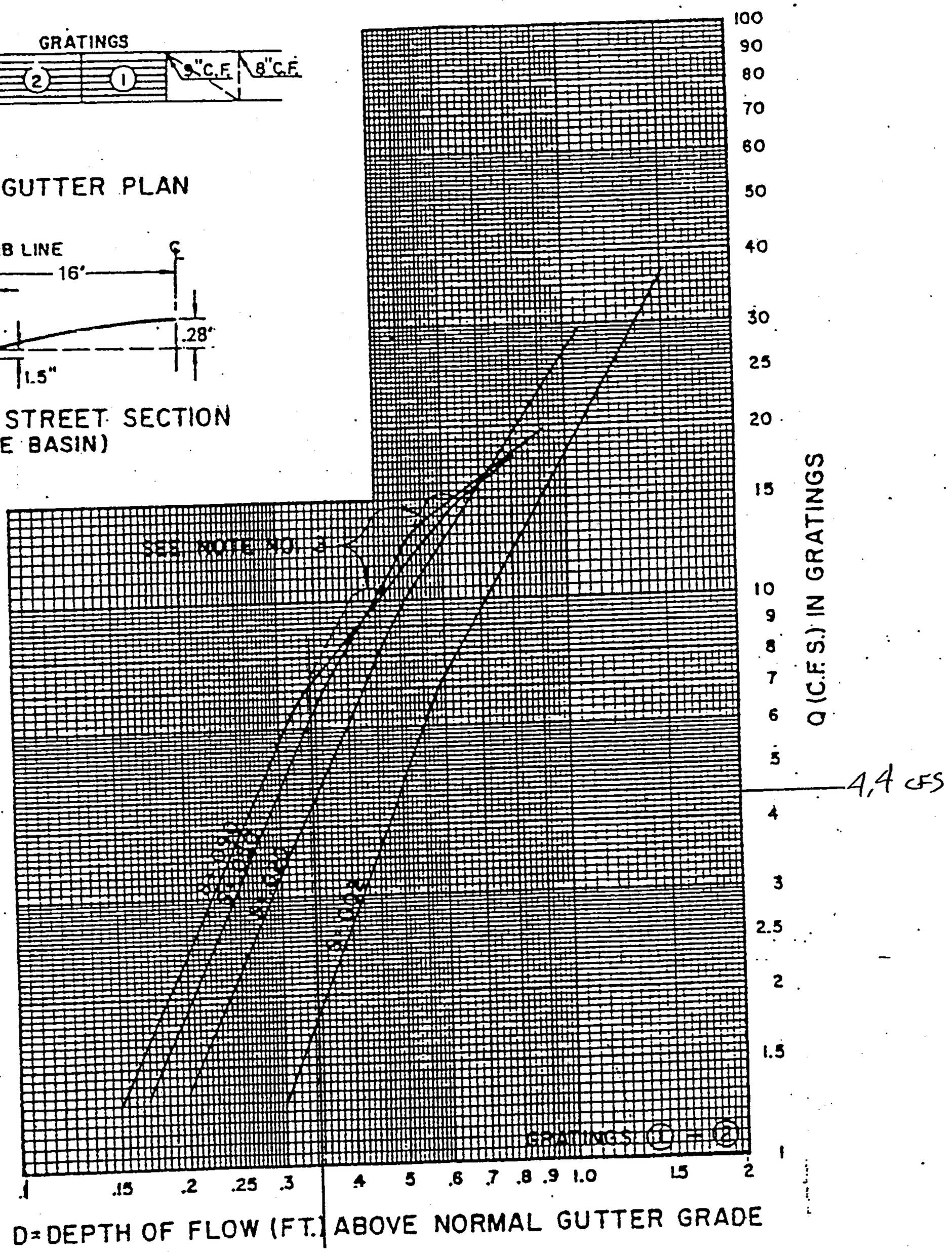
GRATING CAPACITIES FOR TYPE DOUBLE "A", "C," AND "D"



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



4.4 CFS

3.45

CITY OF
Albuquerque

September 24, 1998

Gregory J. Krenik, P.E.
Mark Goodwin & Associates, PA
P. O. Box 90606
Albuquerque, New Mexico 87199

RE: Grading and Drainage Plan for Mountain View Estates Units 3 & 4 (M10/D7B1), Submitted for Final Plat Approval, Engineer's Stamp Dated 8/31/98.

Dear Mr. Krenik:

Based on the information provided in the submittal of September 3, 1998, the above referenced plan is approved for Final Plat action.

The SIA must be in place prior to Final plat sign-off.

As you are aware, the Engineer's Certification is required prior to release of financial guarantees for each Unit of this Subdivision. 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: Scott Rowe, Longford Homes
File

M10/
MTN View Estates

PERMANENT EASEMENT

Grant of Permanent Easement, between **Empire Southwest LTD. Co.** ("Grantor"), whose address is 6121 Indian School Rd. Suite 200, **Albuquerque, NM 87110** and the City of Albuquerque, a New Mexico municipal corporation ("City"), whose address is PO Box 1293, Albuquerque, New Mexico, 87103.

Grantor grants to the City an exclusive, permanent easement ("Easement") in, over, upon and across the real property described on Exhibit "A" attached hereto ("Property") for the construction, installation, maintenance, repair, modification, replacement and operation of **PUBLIC WATER AND SEWER AND ACCESS IMPROVEMENTS, CITY PROJECT # 620781**, together with the right to remove trees, bushes, undergrowth and any other obstacles upon the Property if the City determines they interfere with the appropriate use of this Easement.

In the event Grantor constructs any improvements within the easement, the City has the right to enter upon Grantors property at any time and perform whatever inspection, installation, maintenance, repair modification or removal ("Work") it deems appropriate without liability to the City. If the work effects any improvements of Encroachments made by the Grantor, the City will not be financially or otherwise responsible for rebuilding or repairing of improvements or Encroachments. If in the opinion of the City, the Work to be performed by the City could endanger the structural integrity or otherwise damage the improvements of Encroachments, the Grantor shall, at its own expense, take whatever protective measures are required to safeguard the improvements or Encroachments.

Grantor covenants and warrants that Grantor is the owner in fee simple of the Property, that Grantor has a good lawful right to convey the Property or any part thereof and that Grantor will forever warrant and defend the title to the Property against all claims from all persons or entities.

The grant and other provisions of this Easement constitute covenants running with the land for the benefit of the City and its successors and assigns until terminated.

WITNESS my hand and seal this 7th day of September, 1999.

GRANTOR:

_____
(Individual)

GRANTOR: Empire Southwest LTD Co.

BY: Phillip Chin

ITS: Designated Agent
(Corporation or Partnership)

1999118169
5279063
Page: 1 of 3
09/13/1999 01:41P
Bk-9912 Pg-7798
Judy D. Woodward Bern. Co. EASE R 11.00

INDIVIDUAL

STATE OF _____)
) SS.
COUNTY OF _____)

This instrument was acknowledged before me on _____ day of _____, 19____, by _____.

_____
Notary Public

My Commission Expires:

_____

CORPORATION

STATE OF NEW MEXICO)
) SS.
COUNTY OF BERNALILLO)

This instrument was acknowledged before me on 9th day of Sept, 19 99, by Phillip C. WARD, of EMPIRE SOUTHWEST LTD, a NEW MEXICO LLC Corporation, on behalf of the corporation.

Timothy J. MacEvoy
Notary Public

My Commission Expires:
8/12/00

PARTNERSHIP

STATE OF _____)
) SS.
COUNTY OF _____)

This instrument was acknowledged before me on _____ day of _____, 19____, by _____, partner(s), on behalf of _____, a partnership.

_____
Notary Public

My Commission Expires:

_____

(EXHIBIT "A" ATTACHED)

Judy D. Woodward Bern. Co. EASE R 11.00
1999118169
5279883
Page: 2 of 3
09/13/1999 01:41P

PERMANENT EASEMENT

Grant of Permanent Easement, between the City of Albuquerque, a New Mexico municipal corporation ("Grantor"), whose address is P.O. Box 1293, Albuquerque, New Mexico 87103 and the City of Albuquerque, a New Mexico municipal corporation ("City"), whose address is P.O. Box 1293, Albuquerque New Mexico 87103.

Grantor grants to the City an exclusive, permanent easement ("Easement") in, over, upon and across the real property described on Exhibit "A" attached hereto ("Property") for the construction, installation, maintenance, repair, modification, replacement and operation of **PUBLIC SEWER, CITY PROJECT #620781**, together with the right to remove trees, bushes, undergrowth and any other obstacles upon the Property if the City determines they interfere with the appropriate use of this Easement.

The grant and other provisions of this easement constitute covenants running with the land for the benefit of the City and its successors and assigns until terminated.

WITNESS my hand and seal this 27th day of September, 1999.

GRANTOR:

By: _____
Lawrence Rael
Its: Chief Administrative Officer

STATE OF New Mexico)
)ss.
COUNTY OF Bernalillo)

This instrument was acknowledged before me this 27th day of September, 1999, by Lawrence Rael of City of Albuquerque, a Municipal Corp. corporation, on behalf of the corporation.

OFFICIAL SEAL
Kamala Levingston
NOTARY PUBLIC
STATE OF NEW MEXICO
My Commission Expires: 1/17/2001

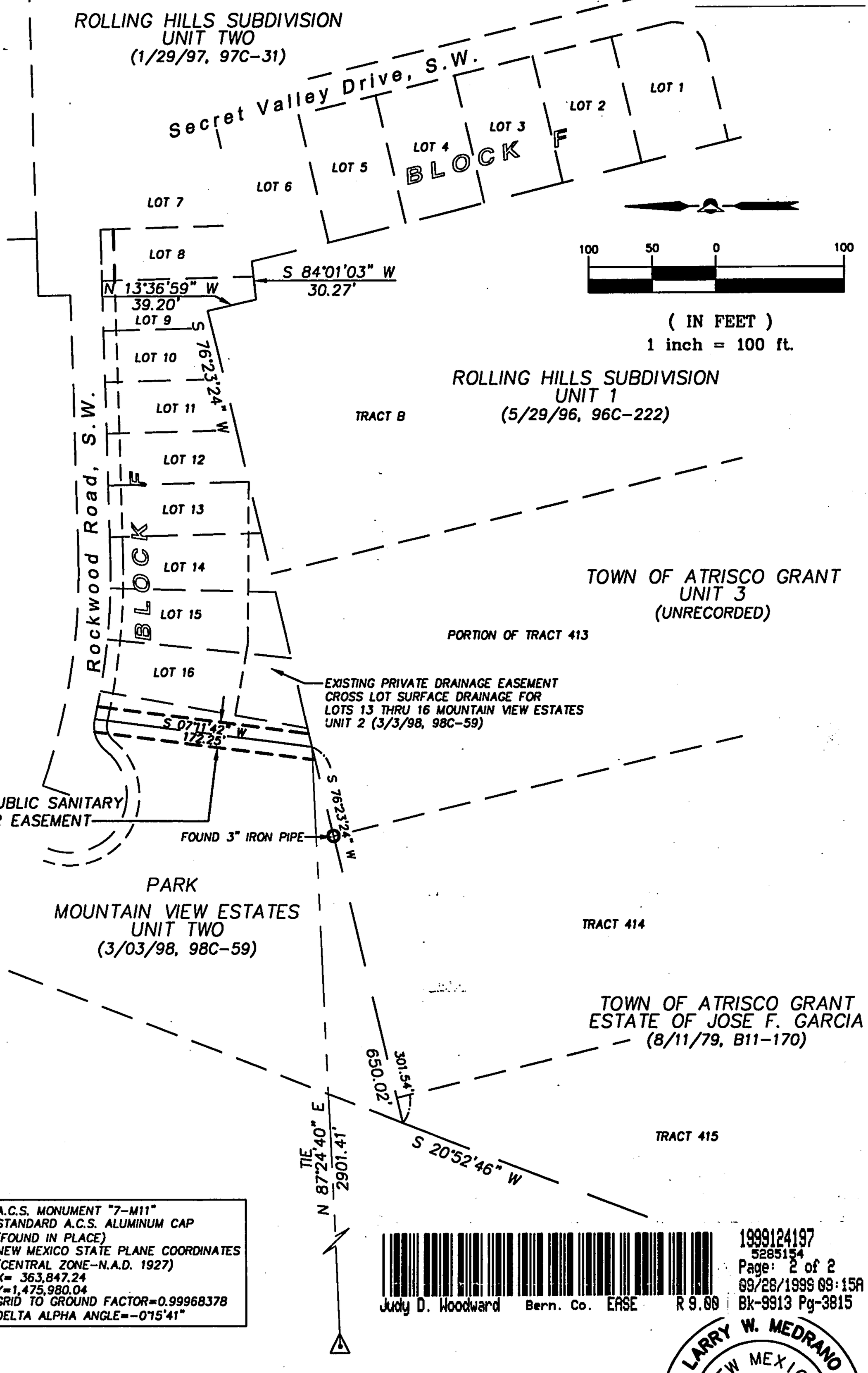
_____
Notary Public

My Commission Expires:

1999124197
5285154
Page: 1 of 2
09/28/1999 09:15A
Bk-9913 Pg-3815

Judy D. Woodward Bern. Co. EASE R 9.00

EXHIBIT "A"



A.C.S. MONUMENT "7-M11"
STANDARD A.C.S. ALUMINUM CAP
(FOUND IN PLACE)
NEW MEXICO STATE PLANE COORDINATES
(CENTRAL ZONE-N.A.D. 1927)
X= 363,847.24
Y=1,475,980.04
GRID TO GROUND FACTOR=0.99968378
DELTA ALPHA ANGLE=-0°15'41"

1999124197
5285154
Page: 2 of 2
09/28/1999 09:15A
Bk-9913 Pg-3815
Judy D. Woodward Bern. Co. EASE R 9.00

SURVEYOR'S CERTIFICATE

I, LARRY W. MEDRANO LICENSED UNDER THE LAWS OF THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THIS EASEMENT SURVEY WAS PREPARED BY ME OR UNDER MY DIRECTION FROM NOTES OF AN ACTUAL FIELD SURVEY, AND THE SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO.

LARRY W. MEDRANO
N.M.L.S. NO. 11993

8/27/99
DATE

LARRY W. MEDRANO
NEW MEXICO
11993
REGISTERED PROFESSIONAL SURVEYOR

PRECISION SURVEYS
8414-D JEFFERSON STREET NE
ALBUQUERQUE, NEW MEXICO 87113
PHONE 505 856 5700
FAX 505 856 7900

997069ex