City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

December 10, 1991

Paul Brasher, P.E.
Brasher Engineering
11930 Menaul Boulevard, NE #111
Albuquerque, New Mexico 87112

RE: DRAINAGE REPORT FOR SHAW MOBILE HOME PARK
RECEIVED NOVEMBER 13, 1991 FOR PRELIMINARY PLAT APPROVAL
(M-21/D6)

Dear Mr. Brasher:

Based on the information provided on the referenced submittal received November 13, 1991, the following concerns should be addressed:

1. Your plan indicates that the undeveloped acreage is not scheduled for development at this time, therefore a Bulk land Variance is requested. You also indicate that future development of these tracts will be dependent on further analysis of downstream capacity. Please review the Bulk Land Variance requirements, the preliminary plat requires that you address downstream capacity at this time for those undeveloped tracts. The reason being that we need to determine the additional downstream infrastructure required before we can grant a variance.

2. Who will be the agency maintaining the facility across the State Lands? I think you need to determine this before you can design the facility, since City Maintained facilities require permanent improvements made out of concrete. Since this facility will not be draining public streets, it is highly unlikely that the City can justify maintenance of this facility.

3. I believe that a portion of Basin A drains into Gibson Boulevard, please revise your basin boundaries accordingly.

4. Since the temporary asphalt swale shown on Gibson Boulevard does not drain public streets, who will maintain this facility?

Attached are additional comments from AMAFCA regarding this drainage plan, please respond to each comment accordingly. If you should have any questions, please do not hesitate to call me at 768-2650.

Cordially,

Gilbert Aldaz, P.E. & P.S.
City/County Floodplain Administrator

Enclosure

xc: Clifford E. Anderson, AMAFCA
Bob Foglesong, Bernalillo County

GA
(WP+3086)

BRASHER ENGINEERING INC.

January 23, 1991

Mr. Fred Aguirre, P.E.
City Hydrologist
Public Works Department
PO Box 1293
Albuquerque, New Mexico

SUBJECT: SHAW MOBILE HOME PARK OUTFALL
BEI JOB 91-002

Dear Fred:

Submitted herewith for Discussion is one copy of the conceptual drainage plan for Shaw Mobile Home Park. As we discussed on January 21, 1992, our original plan to discharge directly to the Tijeras Arroyo has been vetoed by downstream property owners. We therefore are pursuing connection to the future Eubank Storm Drainage System. Before we develop our plans any further we need to know the implications of utilizing the Eubank system. Specifically, what is the project schedule and will Shaw Mobile Home Park be required to participate financially?

Please plan a meeting with the appropriate City personnel to discuss the pertinent issues. If you have any questions and if I can help, please call.

Sincerely,

Dennis A. Lorenz, P.E.

11930 MENAUL NE, SUITE 111 ALBUQUERQUE, NEW MEXICO 87112 (505) 296-0422 (505) 296-0466 FAX

BRASHER ENGINEERING INC.

NOV 13 1991

November 11, 1991

Mr. Fred Aguirre, P.E.
City Hydrologist
Public Works Dept.
City of Albuquerque

Subject: Drainage Management Plan For Shaw Mobile Home Park

Dear Fred:

Submitted herewith for review and approval is one copy of the Drainage Management Plan, with Supplemental Drainage Calculations, for the subject project. The plan provides drainage management criteria which supports a subsequent platting action. A plat is being prepared to formally subdivide the existing mobile home park from the remaining undeveloped acreage. The plan also conceptualizes a drainage solution for the existing mobile home park, which has historically drained runoff across private property to the Tijeras Arroyo.

We realize that easements and maintenance agreements are necessary prior to plan/plat approval. Please review and comment as soon as possible so that we will be prepared for upcoming DRB hearings.

Sincerely

Dennis A. Lorenz, P.E.
Senior Engineer

cc: Bob Fogelsong, Public Works Dept, Bernalillo County, Cliff Anderson, AMAFCA

11930 MENAUL NE, SUITE 111 ALBUQUERQUE, NEW MEXICO 87112 (505) 296-0422 (505) 296-0466 FAX

DRAINAGE INFORMATION SHEET

PROJECT TITLE: SHAW MHP ZONE ATLAS/DRNG. FILE #: M21-D6

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

LEGAL DESCRIPTION: RECO CORP

CITY ADDRESS: 11100 GIBSON SE

ENGINEERING FIRM: BRASHER ENGR CONTACT: D. LORENZ

ADDRESS: 11930 MENAUL NE PHONE: 296 0422

OWNER: G. MITCHELL CONTACT: SAME

ADDRESS: 11100 GIBSON SE PHONE: _____

ARCHITECT: NA CONTACT: _____

ADDRESS: _____ PHONE: _____

SURVEYOR: NA CONTACT: _____

ADDRESS: _____ PHONE: _____

CONTRACTOR: NA CONTACT: _____

ADDRESS: _____ PHONE: _____

TYPE OF SUBMITTAL:

____ DRAINAGE REPORT

____ DRAINAGE PLAN

____ CONCEPTUAL GRADING & DRAINAGE PLAN

____ GRADING PLAN

____ EROSION CONTROL PLAN

____ ENGINEER'S CERTIFICATION

X OTHER TOPIC FOR DISCUSSION

PRE-DESIGN MEETING:

X YES

____ NO

____ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

____ SKETCH PLAT APPROVAL

____ PRELIMINARY PLAT APPROVAL

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

____ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL

____ SECTOR PLAN APPROVAL

____ FINAL PLAT APPROVAL

____ FOUNDATION PERMIT APPROVAL

____ BUILDING PERMIT APPROVAL

____ CERTIFICATE OF OCCUPANCY APPROVAL

____ GRADING PERMIT APPROVAL

____ PAVING PERMIT APPROVAL

____ S.A.D. DRAINAGE REPORT

____ DRAINAGE REQUIREMENTS

X OTHER SET UP (SPECIFY)
MEETING WITH HYDROLOGY STAFF. NO APPROVAL OR ACTION REQUESTED.

RECEIVED
JAN 27 1992

DATE SUBMITTED: 1-24-92

BY: D. LORENZ

DRAINAGE INFORMATION SHEET

PROJECT TITLE: SHAW MOBILE HOME PARK ZONE ATLAS/DRNG. FILE #: M21/D6

DRB #: — EPC #: — WORK ORDER #: —

LEGAL DESCRIPTION: RECO CORP TRACTS

CITY ADDRESS: 11100 GIBSON SE

ENGINEERING FIRM: BRASHER ENGINEERING CONTACT: PAUL BRASHER

ADDRESS: 11930 MENAUL NE #111 PHONE: 296 0422

OWNER: GENEAVA MITCHELL CONTACT: G. MITCHELL

ADDRESS: 11100 GIBSON SE PHONE:

ARCHITECT: NA CONTACT:

ADDRESS: PHONE:

SURVEYOR: NA CONTACT:

ADDRESS: PHONE:

CONTRACTOR: NA CONTACT:

ADDRESS: PHONE:

TYPE OF SUBMITTAL:

X DRAINAGE REPORT

___ DRAINAGE PLAN

___ CONCEPTUAL GRADING & DRAINAGE PLAN

___ GRADING PLAN

___ EROSION CONTROL PLAN

___ ENGINEER'S CERTIFICATION

___ OTHER _____

CHECK TYPE OF APPROVAL SOUGHT:

___ SKETCH PLAT APPROVAL

X PRELIMINARY PLAT APPROVAL

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

___ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL

___ SECTOR PLAN APPROVAL

___ FINAL PLAT APPROVAL

___ FOUNDATION PERMIT APPROVAL

___ BUILDING PERMIT APPROVAL

___ CERTIFICATE OF OCCUPANCY APPROVAL

___ GRADING PERMIT APPROVAL

___ PAVING PERMIT APPROVAL

___ S.A.D. DRAINAGE REPORT

___ DRAINAGE REQUIREMENTS

___ OTHER _____ (SPECIFY)

PRE-DESIGN MEETING:

X YES

___ NO

___ COPY PROVIDED

wp+3086

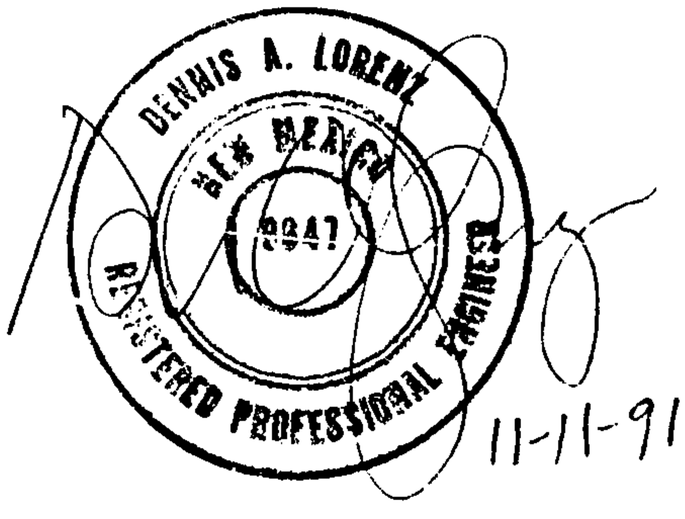
RECEIVED
NOV 13 1991
HYDROLOGY DIVISION

DATE SUBMITTED:

BY: D. LORENZ

DRAINAGE MANAGEMENT PLAN
FOR
SHAW MOBILE HOME PARK

SUPPLEMENTAL DRAINAGE CALCULATIONS



11-11-91

PROJECT NAME SHAW MHP JOB NO.

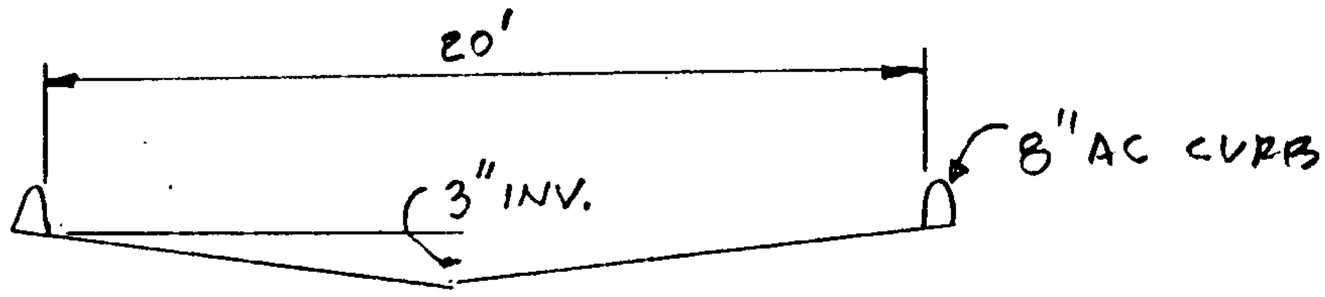
SUBJECT INFRASTRUCTURE SIZING

BY CK BY APPROVED BY DATE PAGE 1 OF

A. DRAINAGE IMPROVEMENT FROM SITE TO TIJERAS ARROYO.

1. CHANNEL

Q_{100} = 109.7 CFS BY MANNING'S EQN



S = 0.0120 n = 0.017 A = 0.25(20)(½) + 20(.67) = 20.1 SF

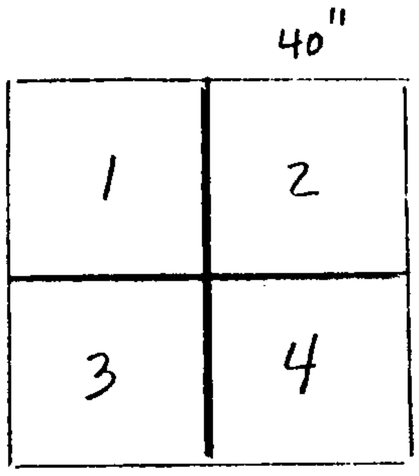
P = 21.67' R = 0.93'

$$Q = \frac{1.49}{n}(20.1)(0.93)^{2/3}(0.012)^{1/2}$$

Q_{MAX} = 124.2 CFS > Q_{100}

2. AREA DRAIN.

BUILD SPECIAL DROP INLET STRUCTURE WITH 4 - COA STD GRATES. PROVIDE PONDING AREA TO DEVELOP REQ'D HEAD.



USE WEIR EQN TO FIND H:

TOTAL L = P = 4(40) + 4(25) = 260" = 21.67'

Q_{100} = 109.7 CFS

$Q = LH^{3/2}(3.33)$

$$H = \left[\frac{Q}{3.33L}\right]^{2/3}$$

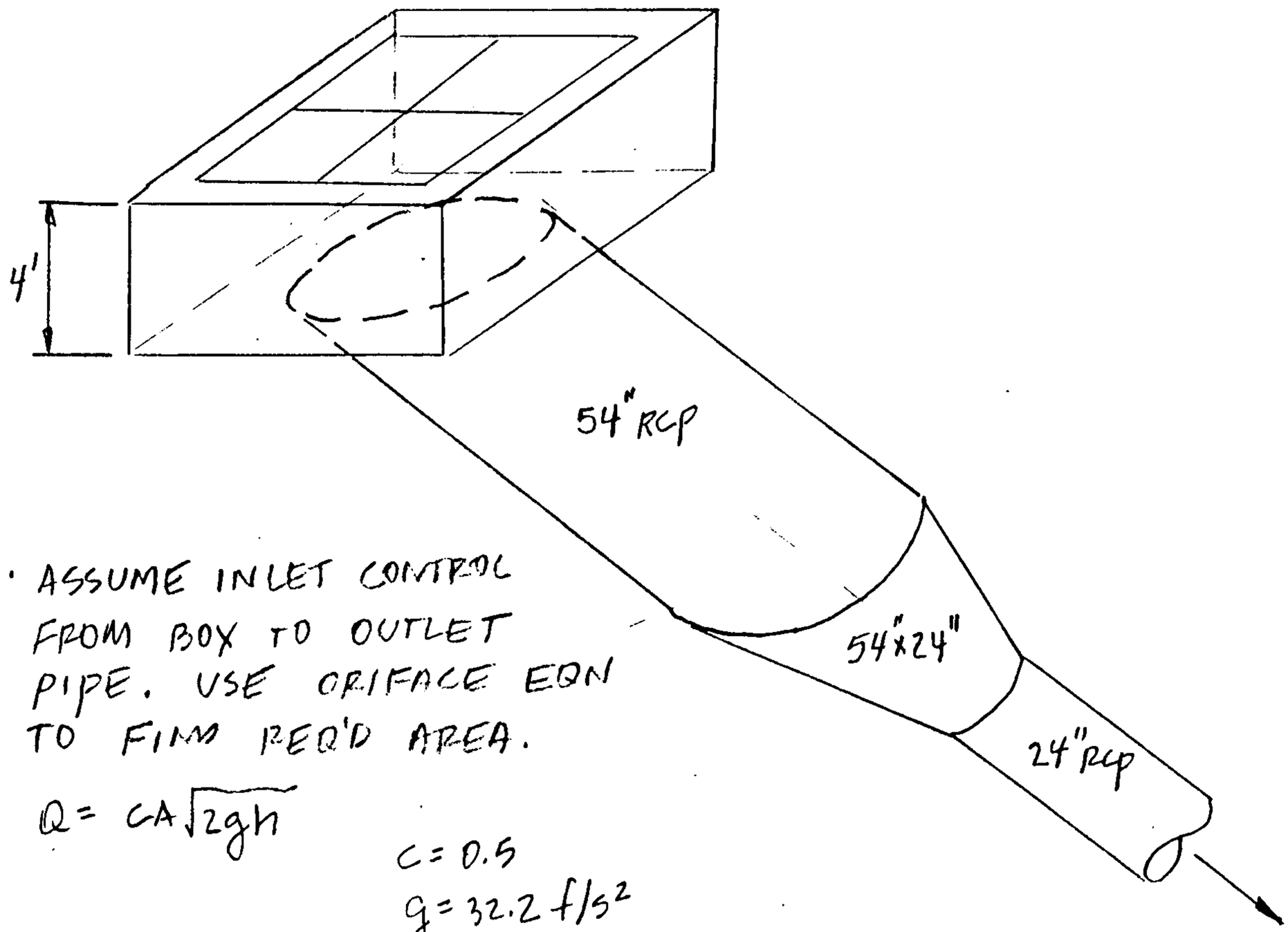
$H_{REQ'D}$ = 1.32'

PROJECT NAME SHAW MHP JOB NO.

SUBJECT INFRASTRUCTURE SIZING

BY CK. BY APPROVED BY DATE PAGE 2 OF

3. DROP INLET BOX & OUTLET



a. ASSUME INLET CONTROL FROM BOX TO OUTLET PIPE. USE ORIFACE EQN TO FIND REQ'D AREA.

$Q = CA\sqrt{2gh}$

$C = 0.5$

$g = 32.2\ f/s^2$

$h = 4'$

$Q = 109.7\ CFS$

$A = Q/C\sqrt{2gh} = 13.7\ SF$

$A_{54"} = 15.9\ SF$ ✓ USE 54" RCP - REDUCE TO MAINLINE

b. SIZE SD FROM BOX TO ARROYO

$S = 0.32 \quad n = 0.013$

SOLVE FOR D: $D" = \left[\frac{1630\,Qn}{\sqrt{S}}\right]^{3/8} = 22.7"$

USE 24" RCP

I cannot Agree with a 24" having this much capacity due to slope, I believe the 24" with inlet control similar to sizing a culvert will be reqd.

4. ENERGY DISSIPATOR

USE BAFFLED OUTLET PER DESIGN OF SMALL CANAL STRUCTURES, US DEPT OF THE INTERIOR, BUREAU OF RECLAMATION, US GOVT. PRINTING OFFICE, 1974, PG 310 - 322.

$V = \frac{Q}{A} = \frac{109.7\ CFS}{3.14\ SF} = 34.9\ FPS$

$d = 2.0'$

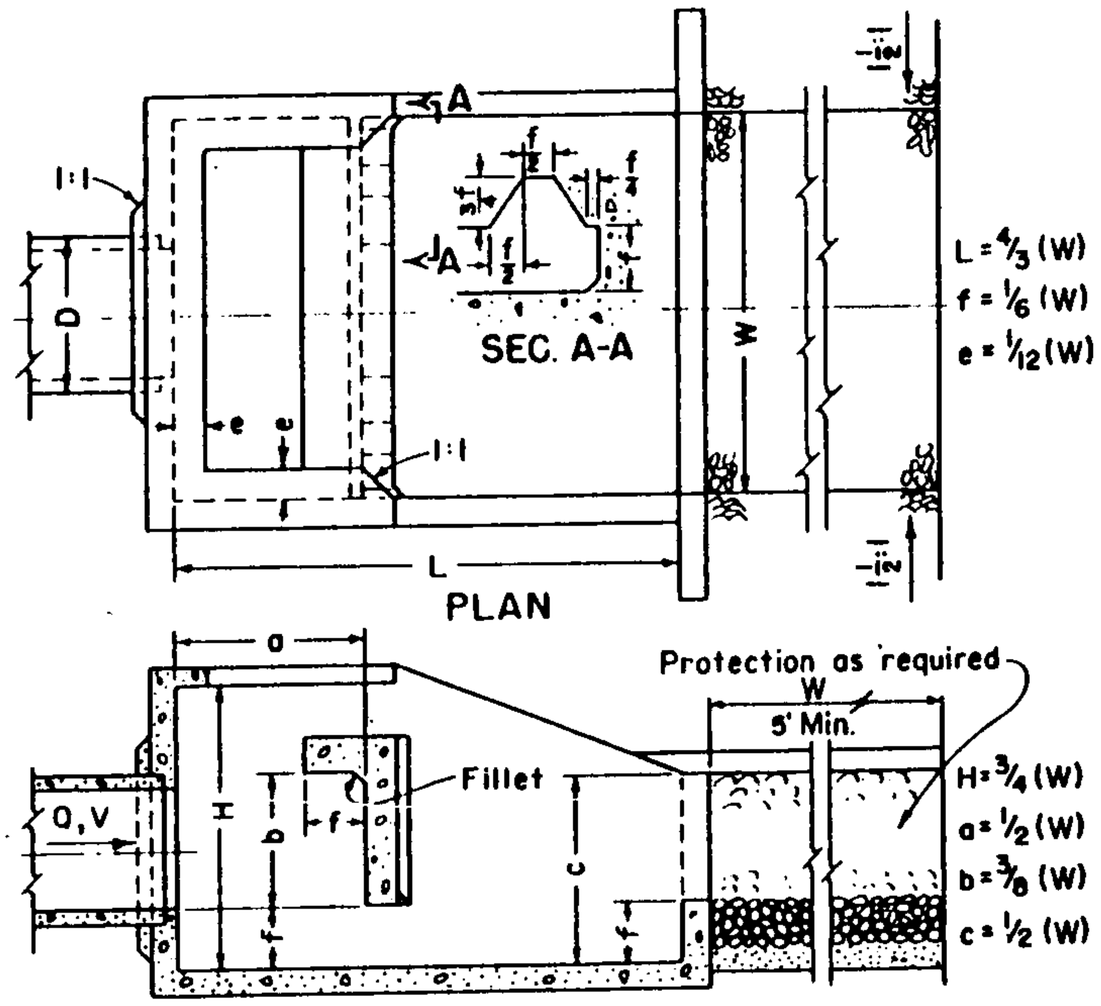
$F_R = V/\sqrt{gd} = 4.35$

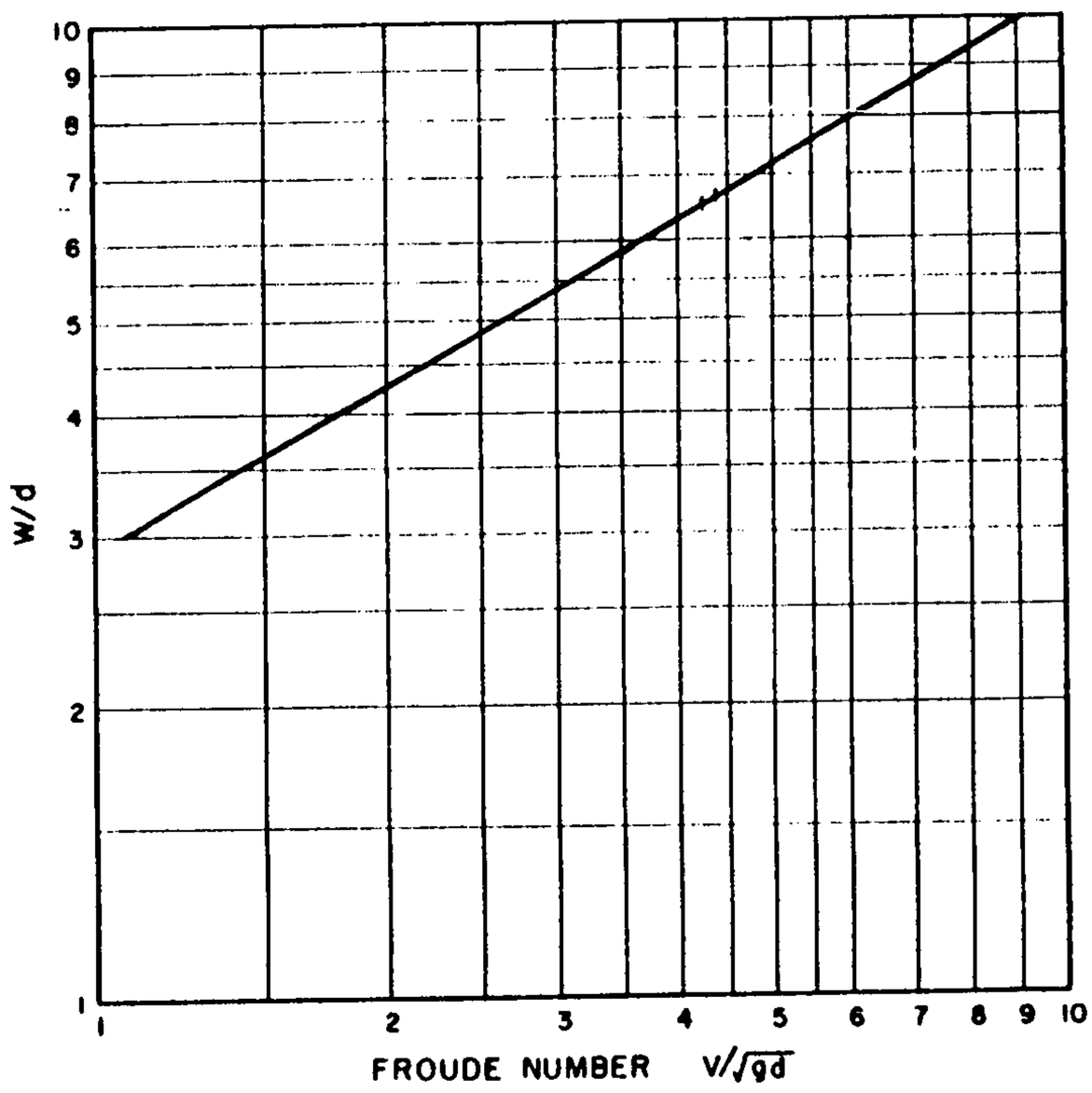
$\frac{W}{D} = 6.7$ (FIG 6-10)

MIN WIDTH $W = 6.7(2) = 13.4'$ USE 13'-6"

$L = 4/3\,W$	$= 17.95'$ USE	18'-0"
$f = W/6$	$= 2.25'$	2'-3"
$e = W/12$	$= 1.13'$	1'-3"
$H = 3/4\,W$	$= 10.13'$	10'-3"
$a = W/2$	$= 6.75'$	6'-9"
$b = 3/8\,W$	$= 5.06'$	5'-3"
$c = W/2$	$= 6.75'$	6'-9"

AMAFCA APPROVAL REQD.





W, ft., Is the inside width of the basin
V, fps, Is the theoretical velocity of the incoming flow and is $\sqrt{2gh}$
h, ft., Is the head to be dissipated
A, $ft.^2$, Is the area of flow entering the basin and is Q/V
d, ft., Represents the depth of flow entering the basin and is $\sqrt{A}$

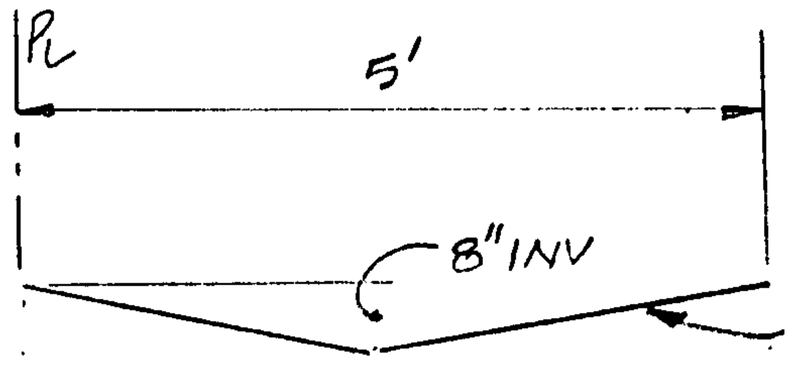
Figure 6-10. **Design width of basin. 103-D-1339**

PROJECT NAME SHAW MHP JOB NO.

SUBJECT INFRASTRUCTURE SIZING

BY CK BY APPROVED BY DATE PAGE 5 OF

B. SWALE ALONG GIBSON



$Q_{100} = 5.6$ CFS

BY MANNING'S EQN

$S = 0.012$ $n = 0.017$ $A = 1.68$ SF $R = 0.34'$

$P = 5'$

$Q_{MAX} = 7.8$ CFS > Q_{100}

Street Classification if Arterial Q10 Req.

CHECK GIBSON STREET DEPTH

$Q = 5.6 + 51.1 = 56.7$ CFS (BASINS B + C FUTURE)

$S = 0.8\%$ PER AS-BUILTS

PER DPM PLATE 22.3 D-2

$D_{100} = 0.85'$ - ASSUMES ALL FLOW IN EXISTING ½ STREET SECTION

$D_{100} = 0.64'$ - FUTURE FULL WIDTH (40' F-F)

INTERIM DEPTH: (BASIN B + C EXISTING)

$Q = 5.6 + 26.1 = 31.7$ CFS

$D_{100} = 0.67'$ - WITHIN EXIST. ½ STREET SECTION.

ALL FLOW IN GIBSON DRAINS TO EVBANK WHICH DRAINS TO EXIST. RETENTION POND AT RESEARCH PARK.

Who will maintain this section?

PROJECT NAME SHAW MHP JOB NO.

SUBJECT INFRASTRUCTURE SIZING

BY CK. BY APPROVED BY DATE PAGE 6 OF

D. CHECK STREET DEPTH ON RESEARCH ROAD

Q_{100} = 49.7 + 86.6 = 136.3 CFS (BASIN 3 + D FUTURE)

s = 1.24% PER AS-BUILTS.

D_{100} = 0.87'

INTERIM DEPTH: (BASIN 3 + D EXISTING)

Q_{100} = 49.7 + 23.8 = 73.5 CFS

D_{100} = 0.65'

ALL FLOW DRAINS TO EXIST. RETENTION POND AT RESEARCH PARK.

CAN EXIST. INLETS HANDLE DEVELOPED FLOWS?

STREET DEPTH ANALYSIS SHOWS THAT CAPACITY EXISTS FOR INTERIM CONDITIONS. FUTURE CAPACITY IS AT UPPER LIMIT AND WILL DEPEND ON DEVELOPMENT SENARIOS ON UNDEVELOPED PARCELS.

THE EXISTING RETENTION POND HAS CAPACITY OF 4.64 AC-FT. NEW HYMO CRITERIA SHOWS THAT THE POND IS AT CAPACITY WITHOUT INTRODUCTION OF FLOW FROM SHAW MHP. DURING INTERIM CONDITIONS FLOWS FROM SHAW MHP (BASINS B+C) WILL CONTINUE TO DRAIN IN HISTORICAL PATTERNS WHICH OUTFALL AT THE RETENTION POND. AS A RESULT OF DEVELOPMENT OF BASIN B FLOWS WILL DECREASE. FUTURE DEVELOPMENT OF BASINS C & D WILL REQUIRE ANALYSIS OF DOWNSTREAM CONDITIONS.

Bulk Land still requires that you developed scenario

HYMO PROGRAM (HYMO103A) - AMAFCA PUBLIC DOMAIN VERSION

START TIME=0.0

```
**** SHAW MOBILE HOME PARK*************************************************
****                                                                    ****
**** SCOPE:                                                             ****
**** Develop hydrology for the Shaw MHP to be used in the design of     ****
**** an outfall system across State Lands to the Tijeras Arroyo.        ****
****                                                                    ****
**** CRITERIA:                                                          ****
**** 1. Hydrology per Section 22.2, DPM, Vol 2, dated August 1991       ****
**** 2. Use HYMO103A, Dated Sept 1991                                   ****
**** 3. Ground cover as folllows:  Mobile Home    28% treatment B       ****
****                                             28% treatment C       ****
****                                             44% treatment D       ****
****                              Undeveloped   100% treatment B       ****
****                              Industrial     15% treatment B       ****
****                                             15% treatment C       ****
****                                             70% treatment D       ****
****                                                                   ****
**** 4. Rainfall:   P60/100  = 2.14 in.                                ****
****                P360/100 = 2.60 in.                                ****
**** 5. All flows are 100 year/6 hour                                  ****
***********************************************************************


**** DRAINAGE BASIN A: Total area = 0.0682 sq. mi. **********************
**** PERVIOUS PORTION ***************************************************

COMPUTE HYD          ID=1 HYD NO=101.1 DT=0.03333 DA=0.0368
                     IA=-.425 INF=-1.040 K=-0.2140 TP=-0.2362 RAIN=
                      .0000   .0028   .0056   .0084   .0113   .0143   .0174
                      .0205   .0237   .0269   .0303   .0337   .0373   .0409
                      .0446   .0484   .0524   .0564   .0606   .0650   .0695
                      .0741   .0790   .0840   .0892   .0947   .1004   .1064
                      .1127   .1193   .1263   .1322   .1385   .1453   .1599
                      .1924   .2424   .3143   .4124   .5143   .7056   .9102
                     1.1600  1.2646  1.3612  1.4428  1.5154  1.5815  1.6423
                     1.6987  1.7515  1.8010  1.8475  1.8914  1.9329  1.9721
                     2.0093  2.0446  2.0781  2.1098  2.3065  2.3131  2.3193
                     2.3252  2.3309  2.3363  2.3415  2.3465  2.3514  2.3561
                     2.3606  2.3650  2.3693  2.3734  2.3775  2.3814  2.3853
                     2.3890  2.3927  2.3963  2.3998  2.4032  2.4066  2.4099
                     2.4131  2.4163  2.4194  2.4225  2.4255  2.4285  2.4314
                     2.4343  2.4371  2.4399  2.4426  2.4453  2.4480  2.4506
                     2.4532  2.4557  2.4583  2.4608  2.4632  2.4656  2.4680
                     2.4704  2.4727  2.4751  2.4773  2.4796  2.4818  2.4840
                     2.4862  2.4884  2.4905  2.4927  2.4948  2.4968  2.4989
                     2.5009  2.5030  2.5050  2.5069  2.5089  2.5109  2.5128
                     2.5147  2.5166  2.5185  2.5203  2.5222  2.5240  2.5259
                     2.5277  2.5294  2.5312  2.5330  2.5347  2.5365  2.5382
                     2.5399  2.5416  2.5433  2.5450  2.5466  2.5483  2.5499
                     2.5515  2.5532  2.5548  2.5564  2.5580  2.5595  2.5611
                     2.5626  2.5642  2.5657  2.5672  2.5688  2.5703  2.5718
                     2.5733  2.5747  2.5762  2.5777  2.5791  2.5806  2.5820
                     2.5834  2.5849  2.5863  2.5877  2.5891  2.5905  2.5918
                     2.5932  2.5946  2.5960  2.5973  2.5987  2.6000
```

```
    K =    .214000HR     TP =    .236200HR      SHAPE CONSTANT, N =    3.91012
    UNIT PEAK =    54.395     CFS     UNIT VOLUME =     .9998          B =    349.1
    RUNOFF COMPUTED BY INITIAL ABSTRACTION - INFILTRATION METHOD

PRINT HYD              ID=1 CODE=1

                                        PARTIAL HYDROGRAPH  101


    RUNOFF VOLUME =      1.12732 INCHES
     PEAK DISCHARGE RATE =         40.93 CFS



**** DRAINAGE BASIN A ***************************************************
**** IMPERVIOUS PORTION *************************************************

COMPUTE HYD            ID=2 HYD NO=101.2 DT=0.03333 DA=0.0314
                       IA=-0.10 INF=0.04 K=-0.1289 TP=-0.2362 RAIN=-1

    K =    .128900HR     TP =    .236200HR      SHAPE CONSTANT, N =    7.09437
    UNIT PEAK =    69.887     CFS     UNIT VOLUME =     .9999          B =    525.7
    RUNOFF COMPUTED BY INITIAL ABSTRACTION - INFILTRATION METHOD

PRINT HYD              ID=2 CODE=1

                                        PARTIAL HYDROGRAPH  101


    RUNOFF VOLUME =      2.35525 INCHES
     PEAK DISCHARGE RATE =         68.92 CFS



**** DRAINAGE BASIN A ***************************************************
**** COMBINED HYDROGRAPH ************************************************

ADD HYD                ID=2 HYD NO=101.3 ID=1 ID=2
PRINT HYD              ID=2 CODE=1

                                        PARTIAL HYDROGRAPH  101


    RUNOFF VOLUME =      1.69267 INCHES
     PEAK DISCHARGE RATE =        109.66 CFS



**** DRAINAGE BASIN B - DEVELOPED CONDITION: Total Area = 0.0060 sq. mi. *
**** PREVIOUS PORTION ***************************************************

COMPUTE HYD            ID=1 HYD NO=102.1 DT=0.03333 DA=0.0015
                       IA=-0.425 INF=-1.040 K=-0.1906 TP=-0.2095 RAIN=-1

    K =    .190600HR     TP =    .209500HR      SHAPE CONSTANT, N =    3.89296
    UNIT PEAK =    2.4914     CFS     UNIT VOLUME =     .9945          B =    347.9
    RUNOFF COMPUTED BY INITIAL ABSTRACTION - INFILTRATION METHOD
```

```
PRINT HYD              ID=1 CODE=1

                                        PARTIAL HYDROGRAPH  102


     RUNOFF VOLUME =      1.12732 INCHES
      PEAK DISCHARGE RATE =         1.82 CFS



**** DRAINAGE BASIN B - DEVELOPED CONDITION ********************************
**** IMPERVIOUS PORTION ****************************************************

COMPUTE HYD            ID=2 HYD NO=102.2 DT=0.03333 DA=0.0015
                       IA=-0.10 INF=0.04 K=-0.0980 TP=-0.2095 RAIN=-1

     K =    .098000HR     TP =    .209500HR      SHAPE CONSTANT, N =    8.67976
     UNIT PEAK =   4.2676     CFS     UNIT VOLUME =     .9973        B =    596.0
     RUNOFF COMPUTED BY INITIAL ABSTRACTION - INFILTRATION METHOD

PRINT HYD              ID=2 CODE=1

                                        PARTIAL HYDROGRAPH  102


     RUNOFF VOLUME =      2.35525 INCHES
      PEAK DISCHARGE RATE =         3.75 CFS



**** DRAINAGE BASIN B - DEVELOPED CONDITION ********************************
**** COMBINED HYDROGRAPH ***************************************************

ADD HYD                ID=2 HYD NO=102.3 ID=1 ID=2
PRINT HYD              ID=2 CODE=1

                                        PARTIAL HYDROGRAPH  102


     RUNOFF VOLUME =      1.74129 INCHES
      PEAK DISCHARGE RATE =         5.56 CFS



**** DRAINAGE BASIN C - EXISTING CONDITION: Total Area = 0.0264 sq. mi. **
**** PREVIOUS PORTION ******************************************************

COMPUTE HYD            ID=1 HYD NO=103.1 DT=0.03333 DA=0.0264
                       IA=-0.50 INF=-1.25 K=-0.2177 TP=-0.2171 RAIN=-1

     K =    .217700HR     TP =    .217100HR      SHAPE CONSTANT, N =    3.52047
     UNIT PEAK =   39.134     CFS     UNIT VOLUME =     .9997        B =    321.8
     RUNOFF COMPUTED BY INITIAL ABSTRACTION - INFILTRATION METHOD

PRINT HYD              ID=1 CODE=1
```

PARTIAL HYDROGRAPH 103

RUNOFF VOLUME = .95732 INCHES
PEAK DISCHARGE RATE = 26.07 CFS

**** DRAINAGE BASIN D - EXISTING CONDITION: Total Area = 0.0241 sq. mi. **
**** PERVIOUS PORTION **********

COMPUTE HYD ID=1 HYD NO=104.1 DT=0.03333 DA=0.0241
IA=-0.50 INF=-1.25 K=-0.2177 TP=-0.2171 RAIN=-1

K = .217700HR TP = .217100HR SHAPE CONSTANT, N = 3.52047
UNIT PEAK = 35.725 CFS UNIT VOLUME = .9997 B = 321.8
RUNOFF COMPUTED BY INITIAL ABSTRACTION - INFILTRATION METHOD

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 104

RUNOFF VOLUME = .95732 INCHES
PEAK DISCHARGE RATE = 23.80 CFS

**** DRAINAGE BASIN B - EXISTING CONDITION **********
**** PERVIOUS PORTION **********

COMPUTE HYD ID=1 HYD NO=105.1 DT=0.03333 DA=0.004
IA=-0.35 INF=-0.83 K=-0.1712 TP=-0.2095 RAIN=-1

K = .171200HR TP = .209500HR SHAPE CONSTANT, N = 4.37314
UNIT PEAK = 7.2425 CFS UNIT VOLUME = .9980 B = 379.3
RUNOFF COMPUTED BY INITIAL ABSTRACTION - INFILTRATION METHOD

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 105

RUNOFF VOLUME = 1.33030 INCHES
PEAK DISCHARGE RATE = 5.72 CFS

**** DRAINAGE BASIN B - EXISTING CONDITION **********
**** IMPERVIOUS PORTION **********

COMPUTE HYD ID=2 HYD NO=105.2 DT=0.03333 DA=0.002
IA=-0.10 INF=0.04 K=-0.0980 TP=-0.2095 RAIN=-1

K = .098000HR TP = .209500HR SHAPE CONSTANT, N = 8.67976
UNIT PEAK = 5.6901 CFS UNIT VOLUME = .9981 B = 596.0
RUNOFF COMPUTED BY INITIAL ABSTRACTION - INFILTRATION METHOD

```
PRINT HYD              ID=2 CODE=1

                                        PARTIAL HYDROGRAPH  105


     RUNOFF VOLUME =      2.35525 INCHES
      PEAK DISCHARGE RATE =         5.00 CFS



**** DRAINAGE BASIN B - EXISTING CONDITION ********************************
**** COMBINED HYDROGRAPH ***************************************************

ADD HYD                ID=2 HYD NO=105.3 ID=1 ID=2
PRINT HYD              ID=2 CODE=1

                                        PARTIAL HYDROGRAPH  105


     RUNOFF VOLUME =      1.67195 INCHES
      PEAK DISCHARGE RATE =        10.72 CFS



**** DRAINAGE BASIN C - DEVELOPED CONDITION ********************************
**** PERVIOUS PORTION ******************************************************

COMPUTE HYD            ID=1 HYD NO=106.1 DT=0.03333 DA=0.008
                       IA=-0.4469 INF=-1.040 K=-0.1975 TP=-0.2171 RAIN=-1

     K =    .197500HR     TP =    .217100HR      SHAPE CONSTANT, N =    3.89325
     UNIT PEAK =    12.823     CFS     UNIT VOLUME =     .9990         B =    347.9
     RUNOFF COMPUTED BY INITIAL ABSTRACTION - INFILTRATION METHOD

PRINT HYD              ID=1 CODE=1

                                        PARTIAL HYDROGRAPH  106


     RUNOFF VOLUME =      1.11287 INCHES
      PEAK DISCHARGE RATE =         9.33 CFS



**** DRAINAGE BASIN C - DEVELOPED CONDITION ********************************
**** IMPERVIOUS PORTION ****************************************************

COMPUTE HYD            ID=2 HYD NO=106.2 DT=0.03333 DA=0.0184
                       IA=-0.10 INF=0.04 K=-0.1016 TP=-.02171 RAIN=-1

     K =    .101600HR     TP =    .021710HR      SHAPE CONSTANT, N =    1.33577
     UNIT PEAK =    76.977     CFS     UNIT VOLUME =     .9110         B =    90.82
     RUNOFF COMPUTED BY INITIAL ABSTRACTION - INFILTRATION METHOD

PRINT HYD              ID=2 CODE=1
```

PARTIAL HYDROGRAPH 106

RUNOFF VOLUME = 2.35525 INCHES
PEAK DISCHARGE RATE = 48.96 CFS

**** DRAINAGE BASIN C - DEVELOPED CONDITION **********
**** COMBINED HYDROGRAPH **********

ADD HYD ID=2 HYD NO=106.3 ID=1 ID=2
PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 106

RUNOFF VOLUME = 1.97877 INCHES
PEAK DISCHARGE RATE = 51.08 CFS

**** DRAINAGE BASIN D - DEVELOPED CONDITION **********
**** PERVIOUS PORTION **********

COMPUTE HYD ID=1 HYD NO=107.1 DT=0.03333 DA=0.0072
IA=-0.4469 INF=-1.0400 K=-0.1975 TP=-0.2171 RAIN=-1

K = .197500HR TP = .217100HR SHAPE CONSTANT, N = 3.89325
UNIT PEAK = 11.541 CFS UNIT VOLUME = .9989 B = 347.9
RUNOFF COMPUTED BY INITIAL ABSTRACTION - INFILTRATION METHOD

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 107

RUNOFF VOLUME = 1.11287 INCHES
PEAK DISCHARGE RATE = 8.39 CFS

**** DRAINAGE BASIN D - DEVELOPED CONDITION **********
**** IMPERVIOUS PORTION **********

COMPUTE HYD ID=2 HYD NO=107.2 DT=0.03333 DA=0.0169
IA=-0.10 INF=0.04 K=-0.1016 TP=-0.2171 RAIN=-1

K = .101600HR TP = .217100HR SHAPE CONSTANT, N = 8.67467
UNIT PEAK = 46.382 CFS UNIT VOLUME = .9996 B = 595.8
RUNOFF COMPUTED BY INITIAL ABSTRACTION - INFILTRATION METHOD

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 107

```
      RUNOFF VOLUME =      2.35525 INCHES
       PEAK DISCHARGE RATE =        41.45 CFS



**** DRAINAGE BASIN D - DEVELOPED CONDITION ********************************
**** COMBINED HYDROGRAPH ***************************************************

ADD HYD               ID=2 HYD NO=107.3 ID=1 ID=2
PRINT HYD             ID=2 CODE=1

                                        PARTIAL HYDROGRAPH  107


      RUNOFF VOLUME =      1.98409 INCHES
       PEAK DISCHARGE RATE =        49.66 CFS

**** DRAINAGE BASIN 1 - EXISTING CONDITION: Total area = 0.0139 sq. mi.***
**** PERVIOUS PORTION ******************************************************

COMPUTE HYD           ID=1 HYD NO=108.1 DT=0.03333 DA=0.0042
                      IA=-0.4250 INF=-1.040 K=-0.1213 TP=-0.1333 RAIN=-1

     K =    .121300HR     TP =    .133300HR      SHAPE CONSTANT, N =    3.89209
     UNIT PEAK =    10.962     CFS     UNIT VOLUME =     .9992         B =    347.9
     RUNOFF COMPUTED BY INITIAL ABSTRACTION - INFILTRATION METHOD

PRINT HYD             ID=1 CODE=1

                                        PARTIAL HYDROGRAPH  108


      RUNOFF VOLUME =      1.12732 INCHES
       PEAK DISCHARGE RATE =         6.93 CFS

**** DRAINAGE BASIN 1 ******************************************************
**** IMPERVIOUS PORTION ****************************************************

COMPUTE HYD           ID=2 HYD NO=108.2 DT=0.03333 DA=0.0097
                      IA=-0.10 INF=0.04 K=-0.0624 TP=-0.13333 RAIN=-1

     K =    .062400HR     TP =    .133330HR      SHAPE CONSTANT, N =    8.67404
     UNIT PEAK =    43.345     CFS     UNIT VOLUME =     .9997         B =    595.8
     RUNOFF COMPUTED BY INITIAL ABSTRACTION - INFILTRATION METHOD

PRINT HYD             ID=2 CODE=1

                                        PARTIAL HYDROGRAPH  108


      RUNOFF VOLUME =      2.35525 INCHES
       PEAK DISCHARGE RATE =        28.96 CFS
```

```
**** DRAINAGE BASIN 1 ************************************************
**** COMBINED HYDROGRAPH *********************************************

ADD HYD              ID=2 HYD NO=108.3 ID=1 ID=2
PRINT HYD            ID=2 CODE=1

                                        PARTIAL HYDROGRAPH  108


    RUNOFF VOLUME =     1.98422 INCHES
     PEAK DISCHARGE RATE =        35.89 CFS



**** DRAINAGE BASIN 2 - EXISTING CONDITION: Total area = 0.0156 sq. mi. **
**** PERVIOUS PORTION *************************************************

COMPUTE HYD          ID=1 HYD NO=109.1 DT=0.0333 DA=0.0048
                     IA=-0.4250 INF=-1.040 K=-0.1213 TP=-0.13333 RAIN=-1

    K =    .121300HR     TP =    .133330HR      SHAPE CONSTANT, N =    3.89301
    UNIT PEAK =    12.527     CFS     UNIT VOLUME =     .9993         B =    347.9
    RUNOFF COMPUTED BY INITIAL ABSTRACTION - INFILTRATION METHOD

PRINT HYD            ID=1 CODE=1

                                        PARTIAL HYDROGRAPH  109


    RUNOFF VOLUME =     1.12794 INCHES
     PEAK DISCHARGE RATE =         7.92 CFS



**** DRAINAGE BASIN 2 ************************************************
**** IMPERVIOUS PORTION ***********************************************

COMPUTE HYD          ID=2 HYD NO=109.2 DT=0.03333 DA=0.0109
                     IA=-0.10 INF=0.04 K=-0.0624 TP=-0.13333 RAIN=-1

    K =    .062400HR     TP =    .133330HR      SHAPE CONSTANT, N =    8.67404
    UNIT PEAK =    48.708     CFS     UNIT VOLUME =     .9997         B =    595.8
    RUNOFF COMPUTED BY INITIAL ABSTRACTION - INFILTRATION METHOD

PRINT HYD            ID=2 CODE=1

                                        PARTIAL HYDROGRAPH  109


    RUNOFF VOLUME =     2.35525 INCHES
     PEAK DISCHARGE RATE =        32.54 CFS
```

```
**** DRAINAGE BASIN 2 ***********************************************
**** COMBINED HYDROGRAPH ********************************************

ADD HYD              ID=2 HYD NO=109.3 ID=1 ID=2
PRINT HYD            ID=2 CODE=1

                                        PARTIAL HYDROGRAPH  109


    RUNOFF VOLUME =     1.98002 INCHES
     PEAK DISCHARGE RATE =       40.46 CFS



**** DRAINAGE BASIN 3 - EXISTING CONDITION:Total area = 0.0336 sq. mi. ***
**** PERVIOUS PORTION ************************************************

COMPUTE HYD          ID=1 HYD NO=110.1 DT=0.03333 DA=0.010
                     IA=-0.4250 INF=-1.040 K=-0.1213 TP=-0.13333 RAIN=-1

    K =    .121300HR     TP =    .133330HR      SHAPE CONSTANT, N =    3.89301
    UNIT PEAK =    26.099     CFS     UNIT VOLUME =     .9999         B =    347.9
    RUNOFF COMPUTED BY INITIAL ABSTRACTION - INFILTRATION METHOD

PRINT HYD            ID=1 CODE=1

                                        PARTIAL HYDROGRAPH  110


    RUNOFF VOLUME =     1.12732 INCHES
     PEAK DISCHARGE RATE =       16.48 CFS



**** DRAINAGE BASIN 3 ************************************************
**** IMPERVIOUS PORTION **********************************************

COMPUTE HYD          ID=2 HYD NO=110.2 DT=0.03333 DA=0.0235
                     IA=-0.10 INF=0.04 K=-0.0624 TP=-0.13333 RAIN=-1

    K =    .062400HR     TP =    .133330HR      SHAPE CONSTANT, N =    8.67404
    UNIT PEAK =    105.01     CFS     UNIT VOLUME =     .9999         B =    595.8
    RUNOFF COMPUTED BY INITIAL ABSTRACTION - INFILTRATION METHOD

PRINT HYD            ID=2 CODE=1

                                        PARTIAL HYDROGRAPH  110


    RUNOFF VOLUME =     2.35525 INCHES
     PEAK DISCHARGE RATE =       70.16 CFS



**** DRAINAGE BASIN 3 ************************************************
**** COMBINED HYDROGRAPH *********************************************
```

```
ADD HYD                 ID=2 HYD NO=110.3 ID=1 ID=2
PRINT HYD               ID=2 CODE=1

                                          PARTIAL HYDROGRAPH   110


     RUNOFF VOLUME =      1.98871 INCHES
      PEAK DISCHARGE RATE =        86.64 CFS



FINISH
```