# City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103


February 19, 1999

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

***RE: Grading and Drainage Certification for Desert Flower Subdivision Unit Four, (M10/D12D), Engineer's Certification Stamp Dated 2/9/99.***

Dear Mr. Arfman:

The above referenced Engineer's Certification for Desert Flower Subdivision Unit Four is adequate to satisfy the Grading and Drainage certification requirement per the Infrastructure List dated October 20, 1998, for the release of the Subdivision Improvements Agreement.

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

Sincerely,

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

c: Terri Martin, City Project # 602681
Bo Johnson, Curb Inc.
File

# DRAINAGE INFORMATION SHEET

PROJECT TITLE: Desert Flower Subdivision Unit 4 (M10/D12D) ZONE ATLAS/DRNG. FILE#: M-10/D12D

DRB # 98-5 10-20-98 EPC # _____ WORK ORDER # 602681

LEGAL DESCRIPTION: Tract B2-A Desert Flower Subdivision Unit 3

CITY ADDRESS: _____

ENGINEERING FIRM: Isaacson & Arfman, P.A. CONTACT: Fred Arfman

ADDRESS: 128 Monroe Street NE PHONE: 268-8828

CITY, STATE: Albuquerque, NM ZIP CODE: 87108

OWNER: Curb Inc CONTACT: BO Johnson

ADDRESS: 6301 Indian Sch. Rd Ste 680 PHONE: 881-9190

CITY, STATE: Albuquerque NM ZIP CODE: 87110

ARCHITECT: N/A CONTACT: _____

ADDRESS: _____ PHONE: _____

CITY, STATE: _____ ZIP CODE: _____

SURVEYOR: Walker Surveying Company CONTACT: _____

ADDRESS: 424 Shirk Ln SW PHONE: 266-6209

CITY, STATE: Albuquerque NM ZIP CODE: _____

CONTRACTOR: N/A CONTACT: _____

ADDRESS: _____ PHONE: _____

CITY, STATE: _____ ZIP CODE: _____

TYPE OF SUBMITTAL:

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

PRE-DESIGN MEETING:

_____ YES
X NO
_____ COPY PROVIDED

RECEIVED
FEB 10 1999
HYDROLOGY SECTION

CHECK TYPE OF APPROVAL SOUGHT:

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

DATE SUBMITTED: 2/10/99

BY: Melissa Cobbs
FOR ISAACSON & ARFMAN, P.A.

# City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103


December 3, 1998

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

***RE: Revised Grading and Drainage Plan for Desert Flower Subdivision, Unit Four, (M10/D12D) Submitted for Final Plat and Work Order Approval, Engineer's Stamp Dated 9/22/98.***

Dear Mr. Arfman:

Based on the information provided in the submittal of December 2, 1998, the above referenced Plan for Desert Flower Unit Four is approved for Final Plat action and Work Order sign-off.

As you are aware, the Grading and Drainage Certification is required prior to release of the Financial Guarantees for this Unit.

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

Sincerely,

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

c: Bo Johnson, P.E., Bokay Construction
File

Isaacson &
Arfman, P.A.

Consulting Engineering
Associates

# Letter of Transmittal

To Susan Calangne PE
COA Hydrology

Date 12-1-98

Job No.

Attn:

Reference Desert Flower 9 : (M10/D12D)

Gentlemen:

We transmit to you 1 copy(ies) of the following

- ☐ ____ Plats
- ☑ G & D Plans
- ☐ Specifications
- ☐ ____ Report
- ☐ Shop Drawings
- ☐ Submittals
- ☐ Material Specifications
- ☐ Copy of Letter
- ☐ ____
- ☐ ____

This information is transmitted:

- ☑ As per your request
- ☑ For your review & approval
- ☐ For your information
- ☐ For your attention
- ☐ For your signature
- ☐ ____
- ☐ ____
- ☑ For your files
- ☐ For your use
- ☐ Please review & return
- ☐ For return to your files
- ☐ Please advise

RECEIVED
DEC 02 1998
HYDROLOGY SECTION

Remarks: Susan - As we discussed earlier, I have attached a copy of the approved grading & drainage plan with the temporary rundown shifted away from the new SAS line for your files. If you have any questions please call.

By: Melissa Cousins

Copies To

128 Monroe, NE • Albuquerque, NM 87108 • (505) 268-8828

CITY OF
Albuquerque

September 28, 1998

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

***RE: Revised Grading and Drainage Plan for Desert Flower Subdivision, Unit Four, (M10/D12D) Submitted for Preliminary Plat and Work Order Approval, Engineer's Stamp Dated 9/22/98.***

Dear Mr. Arfman:

Based on the information provided in the submittal of September 28, 1998, the above referenced Plan for Desert Flower Unit Four is approved for Preliminary Plat action.

Please provide me with a copy of the proposed Infrastructure List and Plat for my files.

As you are aware, the Grading and Drainage Certification of the plan approved by the DRB is required prior to the release of the Financial Guarantees for each Unit. The SIA must be in place prior to Final plat sign-off.

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: Bo Johnson, P.E., Bokay Construction
File

Isaacson &
Arfman, P.A.

Consulting Engineering
Associates



# Letter of Transmittal

To Susan Calongne
COA · Hydrology

Date 9-28-98

Job No.

Attn:

Reference Desert Flower 4 - M101D1ZD

Gentlemen:

We transmit to you 1 copy(ies) of the following

- ☐ ____ Plats
- ☑ Grading & Drainage Plans
- ☐ Specifications
- ☐ ____ Report
- ☐ Shop Drawings
- ☐ Submittals
- ☐ Material Specifications
- ☐ Copy of Letter
- ☐ ____
- ☐ ____

This information is transmitted:

- ☑ As per your request
- ☑ For your review & approval
- ☐ For your information
- ☐ For your attention
- ☐ For your signature
- ☑ Add the backyard slope between phases.
- ☐ ____
- ☑ For your files
- ☐ For your use
- ☐ Please review & return
- ☐ For return to your files
- ☐ Please advise

Remarks:

By: Melissa Combs

Copies To

128 Monroe, NE • Albuquerque, NM 87108 • (505) 268-8828

CITY OF
Albuquerque

September 24, 1998

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

***RE: Drainage Report for Desert Flower Subdivision, Unit Four, Dated 9/1/98, and Grading and Drainage Plan, Dated 8/31/98, (M10/D12D) Submitted for Preliminary and Final Plat and Work Order Approval.***

Dear Mr. Arfman:

Based on the information provided in the submittal of September 1, 1998, the above referenced Report and Grading and Drainage Plans for all of Unit Four are approved for Preliminary Plat action.

If this Unit is to be divided into Units 4A and 4B, however, then the plan dated September 22, 1998 will have to be updated to show the temporary grading on 4B at the Unit boundary. It appears that the Unit boundary cuts through Lots 13 and 14 on the south side of Spring Flower Road. This must also be addressed.

Please provide me with a copy of the proposed Infrastructure List and Plat for my files.

As you are aware, the Grading and Drainage Certification of the plan approved by the DRB will be required prior to release of the Financial Guarantees. The SIA must be in place prior to Final plat sign-off.

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: Fred Aguirre
Bo Johnson, P.E., Bokay Construction
File

# DRAINAGE INFORMATION SHEET

Rev

PROJECT TITLE: Desert Flower Unit 4 ZONE ATLAS/DRNG. FILE#: M-10 Z

DRB #_____ EPC #_____ WORK ORDER #_____

LEGAL DESCRIPTION: A Portion of Tract B2, Desert Flower SD & A Portion of Mesa Enterprises Limited (Warranty Deed)

CITY ADDRESS: _____

ENGINEERING FIRM: Isaacson & Arfman, P.A. CONTACT: Melissa Combs

ADDRESS: 128 Monroe Street NE PHONE: 268-8828

CITY, STATE: Albuquerque, NM ZIP CODE: 87108

OWNER: Curb Inc CONTACT: Bo Johnson

ADDRESS: 6301 Indian School Rd Ste 680 PHONE: ~~881-9190~~ 899 9656

CITY, STATE: Albuquerque NM ZIP CODE: ~~87110~~ 87125

ARCHITECT: NA CONTACT: _____

ADDRESS: _____ PHONE: _____

CITY, STATE: _____ ZIP CODE: _____

SURVEYOR: Aldrich Land Surveying CONTACT: Tim Aldrich

ADDRESS: PO Box 30701 PHONE: 884-1990

CITY, STATE: Albuquerque NM ZIP CODE: 87190

CONTRACTOR: NA CONTACT: _____

ADDRESS: _____ PHONE: _____

CITY, STATE: _____ ZIP CODE: _____

TYPE OF SUBMITTAL:

✓ DRAINAGE REPORT
___ DRAINAGE PLAN
___ CONCEPTUAL GRADING & DRAINAGE PLAN
___ GRADING PLAN
___ EROSION CONTROL PLAN
___ ENGINEER'S CERTIFICATION
___ OTHER

PRE-DESIGN MEETING:

___ YES
✓ NO
___ COPY PROVIDED

RECEIVED
SEP 01 1998
HYDROLOGY SECTION

CHECK TYPE OF APPROVAL SOUGHT:

___ SKETCH PLAT APPROVAL
✓ PRELIMINARY PLAT APPROVAL
___ S.DEV. PLAN FOR SUB'D. APPROVAL
___ S.DEV. PLAN FOR BLDG. PERMIT APPROVAL
___ SECTOR PLAN APPROVAL
✓ FINAL PLAT APPROVAL
___ FOUNDATION PERMIT APPROVAL
___ BUILDING PERMIT APPROVAL
___ CERTIFICATE OF OCCUPANCY APPROVAL
___ GRADING PERMIT APPROVAL
___ PAVING PERMIT APPROVAL
___ S.A.D. DRAINAGE REPORT
___ DRAINAGE REQUIREMENTS
✓ OTHER (SPECIFY) Work Order

DATE SUBMITTED: 9-1-98

BY: Melissa Combs
FOR ISAACSON & ARFMAN, P.A.

Isaacson &
Arfman, P.A.

Consulting Engineering
Associates

# Letter of Transmittal

To Susan Calongne

COA Hydrology

Date 8-1-98

Job No.

Attn:

Reference Desert Flower 4

Gentlemen:

We transmit to you 1 copy(ies) of the following

- ☐ _____ Plats
- ☐ _____ Plans
- ☐ Specifications
- ☑ Drainage Report
- ☐ _____
- ☐ _____
- ☐ Shop Drawings
- ☐ Submittals
- ☐ Material Specifications
- ☐ Copy of Letter

This information is transmitted:

- ☐ As per your request
- ☑ For your review & approval
- ☐ For your information
- ☐ For your attention
- ☐ For your signature
- ☐ _____
- ☐ _____
- ☐ For your files
- ☐ For your use
- ☐ Please review & return
- ☐ For return to your files
- ☐ Please advise

Remarks: _____

By: Melissa Combs

Copies To _____

128 Monroe, NE • Albuquerque, NM 87108 • (505) 268-8828

**ISAACSON & ARFMAN, P.A.**

*Consulting Engineering Associates*

*Albuquerque, NM*

# DRAINAGE REPORT

## FOR

# DESERT FLOWER SUBDIVISION
# UNIT FOUR

## A 114 LOT SINGLE FAMILY
## RESIDENTIAL SUBDIVISION

## ALBUQUERQUE NEW MEXICO
## AUGUST 1998


**Prepared by:**

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


FRED C. ARFMAN
STATE OF NEW MEXICO
7322
REGISTERED PROFESSIONAL ENGINEER

09/01/98

**Fred C. Arfman, PE** **Date**

# TABLE OF CONTENTS

## INTRODUCTION

Desert Flower Unit Four is the fourth phase of a multiple phase subdivision. It is located to the south of Desert Flower Unit Two and to the east of Desert Flower Unit Three. It will have 114 single family lots, and will be constructed with utilities and paving improvements according to the City of Albuquerque Development Standards and Guidelines. Desert Flower Unit Four was addressed previously in the approved Desert Flower Revised Master Drainage Report (M10/D12). A portion of the area previously defined as Unit Five was added to this unit. The new phase line provides a more even distribution of lots for each unit. This report will provide a more in-depth drainage and grading solution for the area.

## I. PROJECT INFORMATION

LEGAL DESCRIPTION: A portion of Tract B2, Desert Flower Subdivision filed March 11, 1998, Volume 98C, Page 66.

A portion of Mesa Enterprises Limited (Warranty Deed) filed April 23, 1980, Book D118A, Page 945.

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

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: 1

NUMBER OF PROPOSED LOTS: 114

TOTAL AREA: 18.5478 Ac.
807,942 Sq. Ft.

## II. SITE CHARACTERISTICS

FLOOD HAZARD: No part of this development is affected nor contributes to a flood hazard as determined by Panel No. 35001C0336D and 35001C0337D of the September 20, 1996 edition of the F.E.M.A. Maps.

EXISTING CONDITIONS: This site is currently undeveloped and mostly undisturbed with native ground cover, typical of the City's west side. The site slopes downward toward the east ranging from 1 to 2 percent. It abuts Desert Flower Unit Two and the future Unit Five to the north, Unit Three to the west, Vista del Sol Mobile Home Subdivision to the south, and the Amole del Norte Diversion Channel to the east. No offsite storm waters cross the site. Offsite flows to the south of this phase are conveyed to the Amole del Norte Diversion Channel by an existing storm drain system. All undeveloped flows generated to the north of this unit flow overland to the Amole del Norte Diversion Channel and are covered under a blanket drainage easement. A temporary retention pond which is situated at the southwest corner of Unit Four captures the developed runoff from Unit Three.

PROPOSED CONDITIONS: Unit Four will be developed with 114 lots and will not require construction of a storm drain system. The existing temporary pond at the southwest property corner will be removed so the discharge from Unit Three can continue to the east along Spring Flower Road. The earthen rundown used to convey runoff from Saltbrush Road to the Amole del Norte Diversion Channel will also be removed. Runoff generated in Unit Four will flow north or south to either Spring Flower Road or Saltbrush Road (see Table 2, Flow Depths at Key Locations). The flows will then be conveyed east to the Amole del Norte Diversion Channel. All runoff in Spring Flower Road and Saltbrush Road will combine at Desert Breeze Drive and enter the channel via a concrete rundown (see attached FlowMaster sheet).

As per the second option outlined in the Master Drainage Report, both Purple Cone and Purple Fringe Roads in Unit Five will have hard line connections to the Amole del Norte Diversion Channel. This will eliminate the need for a storm drain connection at the terminus of Saltbrush Road. This option provides a better grading solution for the Unit Five lots which border the Amole del Norte Diversion Channel and the future units of Desert Springs Subdivision.

## CONCLUSIONS & RECOMMENDATIONS

The Drainage Study for Desert Flower Unit Four is consistent with the Desert Flower Subdivision Revised Master Drainage Report (MDR) previously approved by the Hydrology Division, P.W.D., City of Albuquerque. Desert Flower Subdivision Units One and Two are currently under construction and conform to the approved Desert Flower Subdivision MDR. Desert Flower Subdivision Unit Three is also in the work order process and conforms to the Desert Flower Subdivision MDR. The individual recommendations for Unit Four are presented below:

**UNIT FOUR:**

1. The temporary retention pond at the west property boundary shall be removed. Flows from Unit Three will be allowed to enter Unit Four via the continuation of Spring Flower Road.

2. The earthen rundown which conveys flows from Saltbrush to the Amole del Norte Diversion Channel will be removed. Flows from Unit Two will enter Unit Four via the continuation of Saltbrush Road.

3. A concrete rundown will be constructed from the eastern property line to the Amole del Norte Diversion Channel. The final design of the channel will be determined at DRC.

4. Adjacent lots may share a common lot line drainage swale (see Typical Lot Grading Detail).

5. No offsite storm water flows from the north, west, or south shall enter onto this subdivision phase.

# SUMMARY TABLES

## TABLE 1
## ONSITE BASIN SUMMARY

| Basin ID | Area (Sq. Mi.) | Contributing Basins | Cummulative Area (Sq. Mi.) | % A | % B | % C | % D | Basin Q (cfs) | Cummulative Q (cfs) |
|---|---|---|---|---|---|---|---|---|---|
| 100 | 0.00608 | 100 | 0.00608 | 0 | 29 | 29 | 42 | 12.7 | 12.7 |
| 101 | 0.00432 | 100,101 | 0.0104 | 0 | 29 | 29 | 42 | 9.0 | 20.9 |
| 102 | 0.00728 | 101*,102 | 0.01768 | 0 | 29 | 29 | 42 | 15.2 | 35.6 |
| 103 | 0.00347 | 102*,103 | 0.02116 | 0 | 29 | 29 | 42 | 7.2 | 42.7 |
| 104 | 0.00470 | 103*,104 | 0.00779 | 0 | 29 | 29 | 42 | 16.2 | 58.8 |
| 105 | 0.00400 | 105 | 0.00400 | 0 | 29 | 29 | 42 | 8.33 | 8.33 |
| 106 | 0.00390 | 105*,106 | 0.00790 | 0 | 29 | 29 | 42 | 8.1 | 16.1 |
| 107 | 0.00417 | 106*,107 | 0.01207 | 0 | 29 | 29 | 42 | 8.69 | 24.7 |
| 108 | 0.00738 | 108 | 0.00738 | 0 | 29 | 29 | 42 | 15.4 | 15.4 |
| 109 | 0.00672 | 108,109 | 0.0141 | 0 | 29 | 29 | 42 | 14.0 | 29.4 |
| 110 | 0.01450 | 110 | 0.01450 | 0 | 29 | 29 | 42 | 30.2 | 30.2 |
| 111 | 0.00315 | 111 | 0.00315 | 33 | 19 | 19 | 29 | 5.2 | 5.2 |
| 112 | 0.00292 | 111*,112 | 0.00606 | 0 | 29 | 29 | 42 | 6.1 | 11.0 |
| 113 | 0.00627 | 109*,112*,113 | 0.02643 | 0 | 29 | 29 | 42 | 13.0 | 52.7 |
| 114 | 0.00737 | 110*,114 | 0.02187 | 0 | 29 | 29 | 42 | 15.3 | 45.2 |
| 115 | 0.0063 | 115 | 0.0063 | 0 | 29 | 29 | 42 | 13.2 | 13.2 |
| 116 | 0.0052 | 113*,115,116,117 | 0.03929 | 0 | 29 | 29 | 42 | 10.95 | 78.8 |
| 117 | 0.00127 | 117 | 0.00127 | 0 | 29 | 29 | 42 | 2.7 | 2.7 |
| 118 | 0.0052 | 114*,119 | 0.02899 | 0 | 29 | 29 | 42 | 10.95 | 59.7 |
| 119 | 0.00186 | 119 | 0.00186 | 0 | 29 | 29 | 42 | 3.9 | 3.9 |
| 120 | 0.0044 | 107* | 0.01651 | 0 | 29 | 29 | 42 | 9.3 | 33.8 |
| 121 | 0.00220 | 120* | 0.01871 | 0 | 29 | 29 | 42 | 4.6 | 38.0 |
| 122 | 0.00784 | 104*,118*,121* | 0.12378 | 0 | 29 | 29 | 42 | 16.3 | 250.6 |

*Cumulative Q of basin

**TABLE 2**
**Flow Depth at Key Locations**

| Street | Location | Street Width | Curb Type | Slope (ft/ft) | Q100(cfs) | Depth (ft) | EG (ft) |
|---|---|---|---|---|---|---|---|
| Spring Flower Rd | @Desert Breeze Dr | 32 | STD | 0.0144 | 75.1 | 0.66 | 1.12 |
| Saltbrush Rd | @Desert Breeze Dr | 28 | STD | 0.005 | 38 | 0.64 | 0.79 |
| Scarlet Bloom Drive | @Spring Flower Rd | 32 | MTBL | 0.006 | 4.65 | 0.30 | 0.35 |
| Arizona Rose Drive | @Saltbrush Rd | 28 | MTBL | 0.006 | 6.03 | 0.33 | 0.38 |
| Desert Springs Drive | @Saltbrush Rd | 32 | STD | 0.02 | 8.3 | 0.30 | 0.44 |
| Cosmos Drive | @Saltbrush Rd | 28 | MTBL | 0.01 | 6.5 | 0.31 | 0.39 |
| Purple Canyon Drive | @Saltbrush Rd | 28 | MTBL | 0.01 | 8.1 | 0.33 | 0.42 |

* Flowrates listed are full street flows

elev. @ ... prop. lines?

10-yr depth x vel ≤ 6.5

100-yr d x V = 3.6 ok

# Rundown: Desert Breeze to Amole Channel
## Worksheet for Trapezoidal Channel

| Project Description | |
|---|---|
| Project File | c:\haestad\fmw\dtfwmrev.fm2 |
| Worksheet | Desert Breeze to Amole del Norte |
| Flow Element | Trapezoidal Channel |
| Method | Manning's Formula |
| Solve For | Channel Depth |

| Input Data | | |
|---|---|---|
| Mannings Coefficient | 0.013 | |
| Channel Slope | 4.10 | % |
| Left Side Slope | 3.00 | H : V |
| Right Side Slope | 3.00 | H : V |
| Bottom Width | 12.00 | ft |
| Discharge | 113.10 | cfs |

| Results | | |
|---|---|---|
| Depth | 0.57 | ft |
| Flow Area | 7.77 | ft² |
| Wetted Perimeter | 15.59 | ft |
| Top Width | 15.40 | ft |
| Critical Depth | 1.26 | ft |
| Critical Slope | 0.002520 | ft/ft |
| Velocity | 14.55 | ft/s |
| Velocity Head | 3.29 | ft |
| Specific Energy | 3.86 | ft |
| Froude Number | 3.61 | |
| Flow is supercritical. | | |

Notes:

* Preliminary Channel Sizing
* Assume Concrete Channel

# APPENDIX A

## ONSITE AHYMO SUMMARY & DETAILED OUTPUT
## 100-YEAR STORM

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =05/06/1998
INPUT FILE = dstmesa2.dat USER NO.= ISCARFNM.I01



| COMMAND | HYDROGRAPH IDENTIFICATION | FROM ID NO. | TO ID NO. | AREA (SQ MI) | PEAK DISCHARGE (CFS) | RUNOFF VOLUME (AC-FT) | RUNOFF (INCHES) | TIME TO PEAK (HOURS) | CFS PER ACRE | NOTATION | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *S | DESERT FLOWER SUBDIVISION - 100 YR POST DEVELOPMENT | | | | | | | | | | |
| *S | DSTmesa2.DAT | | | | | | | | | | |
| *S | REVISED BY: mjc 5/05/98 | | | | | | | | | | |
| START | | | | | | | | | | TIME= | .00 |
| RAINFALL TYPE= 1 | | | | | | | | | | RAIN6= | 2.200 |
| *S BASIN 100: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES | | | | | | | | | | | |
| COMPUTE NM HYD | 100.00 | - | 1 | .00608 | 12.66 | .421 | 1.29860 | 1.500 | 3.253 | PER IMP= | 42.00 |
| *S ** ROUTE BASIN 100 THROUGH 101 | | | | | | | | | | | |
| ROUTE | 100.10 | 1 | 2 | .00608 | 12.22 | .421 | 1.29863 | 1.533 | 3.141 | | |
| *S BASIN 101: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES | | | | | | | | | | | |
| COMPUTE NM HYD | 101.00 | - | 3 | .00432 | 9.00 | .299 | 1.29860 | 1.500 | 3.255 | PER IMP= | 42.00 |
| *S COMBINE BASINS 100 AND 101 TOGETHER | | | | | | | | | | | |
| ADD HYD | 101.10 | 2& 3 | 4 | .01040 | 20.93 | .720 | 1.29854 | 1.533 | 3.144 | | |
| *S BASIN 102: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES | | | | | | | | | | | |
| COMPUTE NM HYD | 102.00 | - | 5 | .00728 | 15.16 | .504 | 1.29860 | 1.500 | 3.252 | PER IMP= | 42.00 |
| *S COMBINE BASIN 102 TO HYDROGRAPH NO 101.1 | | | | | | | | | | | |
| ADD HYD | 102.10 | 4& 5 | 6 | .01769 | 35.60 | 1.225 | 1.29855 | 1.533 | 3.146 | | |
| *S BASIN 103: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES | | | | | | | | | | | |
| COMPUTE NM HYD | 103.00 | - | 7 | .00347 | 7.23 | .240 | 1.29860 | 1.500 | 3.256 | PER IMP= | 42.00 |
| *S COMBINE BASINS 103 AND HYDROGRAPH NO. 102.1 TOGETHER | | | | | | | | | | | |
| ADD HYD | 103.10 | 6& 7 | 8 | .02116 | 42.71 | 1.465 | 1.29854 | 1.500 | 3.155 | | |
| *S ** ROUTE BASIN 103.1 THROUGH 104 | | | | | | | | | | | |
| ROUTE | 103.20 | 8 | 9 | .02116 | 43.08 | 1.465 | 1.29857 | 1.533 | 3.182 | | |
| *S BASIN 104: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES | | | | | | | | | | | |
| COMPUTE NM HYD | 140.00 | - | 10 | .00779 | 16.21 | .540 | 1.29860 | 1.500 | 3.252 | PER IMP= | 42.00 |
| *S COMBINE BASIN 104 AND HYDROGRAPH 103.2 TOGETHER | | | | | | | | | | | |
| ADD HYD | 104.10 | 9&10 | 30 | .02895 | 58.77 | 2.005 | 1.29855 | 1.533 | 3.172 | | |
| *S BASIN 105: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES | | | | | | | | | | | |
| COMPUTE NM HYD | 105.00 | - | 13 | .00400 | 8.33 | .277 | 1.29860 | 1.500 | 3.255 | PER IMP= | 42.00 |
| *S ** ROUTE BASIN 105 THROUGH 106 | | | | | | | | | | | |
| ROUTE | 105.10 | 13 | 14 | .00400 | 8.22 | .277 | 1.29865 | 1.533 | 3.210 | | |
| *S BASIN 106: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES | | | | | | | | | | | |
| COMPUTE NM HYD | 106.10 | - | 15 | .00390 | 8.13 | .270 | 1.29860 | 1.500 | 3.255 | PER IMP= | 42.00 |
| *S COMBINE BASINS 106 AND 105.1 TOGETHER | | | | | | | | | | | |
| ADD HYD | 106.10 | 15&14 | 16 | .00790 | 16.08 | .547 | 1.29853 | 1.533 | 3.181 | | |
| *S ** ROUTE BASIN 106.1 THROUGH 107 | | | | | | | | | | | |
| ROUTE | 106.20 | 16 | 17 | .00790 | 16.26 | .547 | 1.29859 | 1.533 | 3.217 | | |
| *S BASIN 107: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES | | | | | | | | | | | |
| COMPUTE NM HYD | 107.00 | - | 18 | .00417 | 8.69 | .289 | 1.29860 | 1.500 | 3.255 | PER IMP= | 42.00 |
| *S COMBINE HYDROGRAPH NO 106.2 AND 107 TOGETHER | | | | | | | | | | | |
| ADD HYD | 107.10 | 18&17 | 20 | .01207 | 24.67 | .836 | 1.29853 | 1.533 | 3.193 | | |
| *S BASIN 108: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES | | | | | | | | | | | |
| COMPUTE NM HYD | 108.00 | - | 1 | .00738 | 15.37 | .511 | 1.29860 | 1.500 | 3.252 | PER IMP= | 42.00 |
| *S BASIN 109: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES | | | | | | | | | | | |
| COMPUTE NM HYD | 109.00 | - | 2 | .00672 | 13.99 | .465 | 1.29860 | 1.500 | 3.252 | PER IMP= | 42.00 |
| *S COMBINE BASINS 108 AND 109 TOGETHER | | | | | | | | | | | |
| ADD HYD | 109.10 | 1& 2 | 3 | .01410 | 29.36 | .977 | 1.29855 | 1.500 | 3.252 | | |
| *S ** ROUTE BASIN 109.1 THROUGH 113 | | | | | | | | | | | |
| ROUTE | 109.20 | 3 | 4 | .01410 | 29.20 | .977 | 1.29859 | 1.533 | 3.235 | | |
| *S BASIN 110: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES | | | | | | | | | | | |

| COMMAND | HYDROGRAPH IDENTIFICATION | FROM ID NO. | TO ID NO. | AREA (SQ MI) | PEAK DISCHARGE (CFS) | RUNOFF VOLUME (AC-FT) | RUNOFF (INCHES) | TIME TO PEAK (HOURS) | CFS PER ACRE | NOTATION |
|---|---|---|---|---|---|---|---|---|---|---|
| COMPUTE NM HYD | 110.00 | - | 5 | .01450 | 30.16 | 1.004 | 1.29860 | 1.500 | 3.250 | PER IMP= 42.00 |
| *S ** ROUTE BASIN 110 THROUGH 114 | | | | | | | | | | |
| ROUTE | 110.10 | 5 | 6 | .01450 | 30.00 | 1.004 | 1.29861 | 1.533 | 3.232 | |
| *S BASIN 111: PARK | | | | | | | | | | |
| COMPUTE NM HYD | 111.00 | - | 7 | .00315 | 5.20 | .169 | 1.00753 | 1.500 | 2.579 | PER IMP= 29.00 |
| *S ** ROUTE BASIN 111 THROUGH 112 | | | | | | | | | | |
| ROUTE | 111.10 | 7 | 8 | .00315 | 5.08 | .169 | 1.00760 | 1.533 | 2.519 | |
| *S BASIN 112: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES | | | | | | | | | | |
| COMPUTE NM HYD | 112.00 | - | 9 | .00292 | 6.08 | .202 | 1.29860 | 1.500 | 3.257 | PER IMP= 42.00 |
| *S COMBINE BASINS 111.1 AND 112 TOGETHER | | | | | | | | | | |
| ADD HYD | 112.10 | 8& 9 | 10 | .00606 | 10.96 | .371 | 1.14736 | 1.533 | 2.823 | |
| *S ** ROUTE BASIN 112.1 THROUGH 113 | | | | | | | | | | |
| ROUTE | 112.20 | 10 | 21 | .00606 | 10.87 | .371 | 1.14745 | 1.533 | 2.802 | |
| *S BASIN 113: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES | | | | | | | | | | |
| COMPUTE NM HYD | 113.00 | - | 12 | .00627 | 13.04 | .434 | 1.29860 | 1.500 | 3.253 | PER IMP= 42.00 |
| *S COMBINE BASINS 113 AND 112.2 TOGETHER | | | | | | | | | | |
| ADD HYD | 113.10 | 21&12 | 13 | .01233 | 23.49 | .805 | 1.22419 | 1.533 | 2.978 | |
| *S COMBINE BASINS 113 AND 109.2 TOGETHER | | | | | | | | | | |
| ADD HYD | 113.20 | 13& 4 | 14 | .02643 | 52.69 | 1.782 | 1.26387 | 1.533 | 3.115 | |
| *S BASIN 114: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES | | | | | | | | | | |
| COMPUTE NM HYD | 114.00 | - | 16 | .00737 | 15.34 | .510 | 1.29860 | 1.500 | 3.252 | PER IMP= 42.00 |
| *S COMBINE BASINS 110.1 AND 114 TOGETHER | | | | | | | | | | |
| ADD HYD | 114.10 | 16& 6 | 17 | .02187 | 45.17 | 1.515 | 1.29857 | 1.500 | 3.227 | |
| *S BASIN 115: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES | | | | | | | | | | |
| COMPUTE NM HYD | 115.00 | - | 18 | .00633 | 13.18 | .438 | 1.29860 | 1.500 | 3.253 | PER IMP= 42.00 |
| *S ** ROUTE BASIN 113.2 THROUGH 116 | | | | | | | | | | |
| ROUTE | 113.30 | 14 | 19 | .02643 | 52.85 | 1.782 | 1.26391 | 1.533 | 3.124 | |
| *S BASIN 116: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES | | | | | | | | | | |
| COMPUTE NM HYD | 116.00 | - | 22 | .00526 | 10.95 | .364 | 1.29860 | 1.500 | 3.254 | PER IMP= 42.00 |
| *S COMBINE BASINS 116 AND 113.3 TOGETHER | | | | | | | | | | |
| ADD HYD | 116.10 | 19&22 | 1 | .03169 | 63.45 | 2.146 | 1.26965 | 1.533 | 3.128 | |
| *S COMBINE BASINS 116.1 AND 115 TOGETHER | | | | | | | | | | |
| ADD HYD | 116.20 | 1&18 | 2 | .03802 | 76.21 | 2.584 | 1.27446 | 1.533 | 3.132 | |
| *S BASIN 117: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES | | | | | | | | | | |
| COMPUTE NM HYD | 117.00 | - | 3 | .00127 | 2.66 | .088 | 1.29860 | 1.500 | 3.268 | PER IMP= 42.00 |
| *S COMBINE BASINS 116.2 AND 117 TOGETHER | | | | | | | | | | |
| ADD HYD | 117.10 | 2& 3 | 4 | .03929 | 78.78 | 2.672 | 1.27523 | 1.533 | 3.133 | |
| *S ** ROUTE BASIN 114.1 THROUGH 118 | | | | | | | | | | |
| ROUTE | 114.20 | 17 | 5 | .02187 | 45.29 | 1.515 | 1.29859 | 1.533 | 3.236 | |
| *S BASIN 118: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES | | | | | | | | | | |
| COMPUTE NM HYD | 118.00 | - | 6 | .00526 | 10.95 | .364 | 1.29860 | 1.500 | 3.254 | PER IMP= 42.00 |
| *S COMBINE BASINS 118 AND 114.2 TOGETHER | | | | | | | | | | |
| ADD HYD | 118.10 | 6& 5 | 7 | .02713 | 55.89 | 1.879 | 1.29857 | 1.533 | 3.219 | |
| *S BASIN 119: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES | | | | | | | | | | |
| COMPUTE NM HYD | 119.00 | - | 8 | .00186 | 3.88 | .129 | 1.29860 | 1.500 | 3.263 | PER IMP= 42.00 |
| *S COMBINE BASINS 118.1 AND 119 TOGETHER | | | | | | | | | | |
| ADD HYD | 118.20 | 8& 7 | 9 | .02899 | 59.65 | 2.008 | 1.29856 | 1.533 | 3.215 | |
| *S ** ROUTE BASIN 107.2 THROUGH 120 | | | | | | | | | | |
| ROUTE | 107.30 | 20 | 10 | .01207 | 24.80 | .836 | 1.29858 | 1.533 | 3.211 | |
| *S BASIN 120: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES | | | | | | | | | | |
| COMPUTE NM HYD | 120.00 | - | 11 | .00444 | 9.25 | .308 | 1.29860 | 1.500 | 3.255 | PER IMP= 42.00 |
| *S COMBINE BASINS 120 AND 107.2 TOGETHER | | | | | | | | | | |

| COMMAND | HYDROGRAPH IDENTIFICATION | FROM ID NO. | TO ID NO. | AREA (SQ MI) | PEAK DISCHARGE (CFS) | RUNOFF VOLUME (AC-FT) | RUNOFF (INCHES) | TIME TO PEAK (HOURS) | CFS PER ACRE | NOTATION |
|---|---|---|---|---|---|---|---|---|---|---|
| ADD HYD | 120.10 | 11&10 | 12 | .01651 | 33.75 | 1.143 | 1.29854 | 1.533 | 3.194 | |
| *S ** ROUTE BASIN 120.1 THROUGH 121 | | | | | | | | | | |
| ROUTE | 120.20 | 12 | 13 | .01651 | 33.52 | 1.144 | 1.29857 | 1.533 | 3.173 | |
| *S BASIN 121: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES | | | | | | | | | | |
| COMPUTE NM HYD | 121.00 | - | 14 | .00220 | 4.59 | .152 | 1.29860 | 1.500 | 3.260 | PER IMP= 42.00 |
| *S COMBINE BASINS 121 AND 120.2 TOGETHER | | | | | | | | | | |
| ADD HYD | 121.10 | 14&13 | 15 | .01871 | 37.97 | 1.296 | 1.29853 | 1.533 | 3.171 | |
| *S ** ROUTE BASIN 104.1 THROUGH 122 | | | | | | | | | | |
| ROUTE | 104.20 | 30 | 23 | .02895 | 58.43 | 2.005 | 1.29857 | 1.533 | 3.154 | |
| *S BASIN 122: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES | | | | | | | | | | |
| COMPUTE NM HYD | 122.00 | - | 16 | .00784 | 16.32 | .543 | 1.29860 | 1.500 | 3.252 | PER IMP= 42.00 |
| *S COMBINE BASINS 122 AND 121.1 TOGETHER | | | | | | | | | | |
| ADD HYD | 122.10 | 16&15 | 17 | .02655 | 53.76 | 1.839 | 1.29854 | 1.533 | 3.164 | |
| *S COMBINE BASINS 122.1 AND 118.2 TOGETHER | | | | | | | | | | |
| ADD HYD | 122.20 | 17& 9 | 18 | .05554 | 113.41 | 3.847 | 1.29855 | 1.533 | 3.190 | |
| *S COMBINE BASINS 122.2 AND 117.1 TOGETHER | | | | | | | | | | |
| ADD HYD | 122.30 | 18& 4 | 19 | .09483 | 192.18 | 6.519 | 1.28889 | 1.533 | 3.166 | |
| *S COMBINE BASINS 122.3 AND 104.2 TOGETHER | | | | | | | | | | |
| ADD HYD | 122.40 | 19&23 | 20 | .12378 | 250.61 | 8.524 | 1.29115 | 1.533 | 3.164 | |
| *S OFFSITE BASINS: UNSER BLVD | | | | | | | | | | |
| *S BASIN 201.1: OFFSITE: UNSER BLVD. (FROM MEDIAN CURB TO R/W) | | | | | | | | | | |
| COMPUTE NM HYD | 201.10 | - | 1 | .00073 | 1.70 | .059 | 1.50556 | 1.500 | 3.630 | PER IMP= 60.00 |
| *S BASIN 201.2: OFFSITE: UNSER BLVD. (FROM MEDIAN CURB TO R/W) | | | | | | | | | | |
| COMPUTE NM HYD | 201.20 | - | 2 | .00281 | 6.49 | .226 | 1.50556 | 1.500 | 3.606 | PER IMP= 60.00 |
| *S BASIN 201.3: OFFSITE: UNSER BLVD. MEDIAN AREA | | | | | | | | | | |
| COMPUTE NM HYD | 201.30 | - | 3 | .00215 | 4.96 | .172 | 1.50556 | 1.500 | 3.608 | PER IMP= 60.00 |

FINISH

# ISAACSON & ARFMAN, P.A.

***Consulting Engineering Associates***

*Thomas O. Isaacson, PE & LS • Fred C. Arfman, PE*
*Scott M. McGee, PE*


9-17-98
Melissa to bring
X-section @
Lot 27 eg1
(make sure not over
ROW)
& revised plan

September 21, 1998

Ms. Susan Calongne, PE
Hydrology Division
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

**RE: Desert Flower Subdivision Unit 4**
**Drainage Report**

Dear Ms. Calongne:

Please find attached a revised grading and drainage map to be incorporated into the previously submitted report for Desert Flower Unit 4. The map was changed to reflect a phase line between Tract B Desert Flower Subdivision and the Mesa Enterprises Limited lands. The phase line was added since there is a possibility that the Mesa Enterprises Limited tract will not be annexed into the City in time to meet the deadline the developer has set to begin construction of Unit 4. If Unit 4 needs to be constructed in two phases, an earthen rundown along the future Spring Flower Road alignment will be included in the Phase 1 work order package. The rundown will have 4:1 maximum side slopes and will pass through a small desiltation area prior to entering the Amole del Norte Diversion Channel (see attached FlowMaster sheet). I have also attached the cross-section detail in front of Lot 27M you requested. As noted on the exhibit, the street can safely convey the required flowrate.

If you have any questions concerning this additional information, please contact me at 268-8828.

Respectfully yours,
**ISAACSON & ARFMAN, P.A.**

Melissa Combs

Melissa Combs
MC/rtl
Attachments


*128 Monroe St. NE • Albuquerque, NM 87108 • (505) 268-8828 • FAX (505) 268-2632*

# TEMP RUNDOWN: Unit 4 to Amole
## Worksheet for Trapezoidal Channel

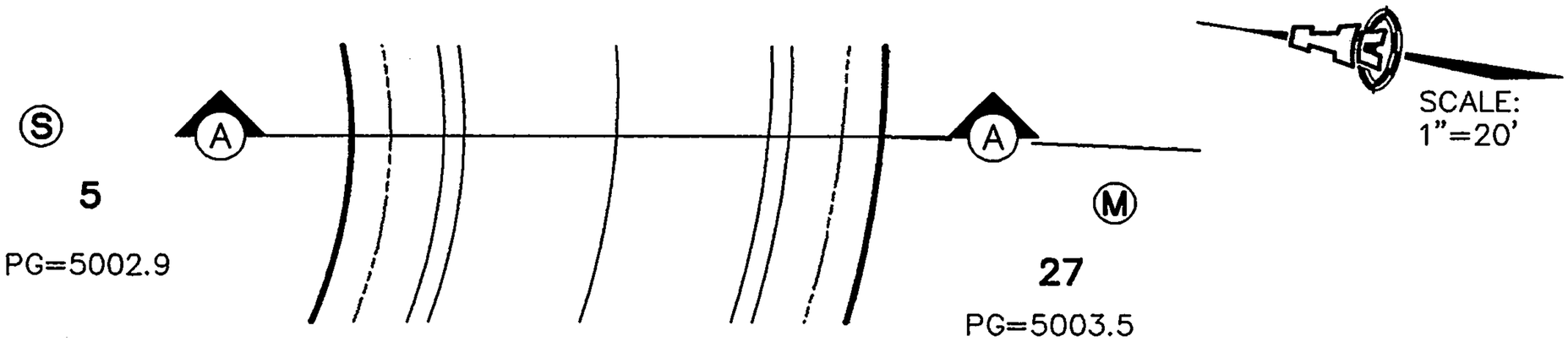
| Project Description | |
|---|---|
| Project File | c:\haestad\fmw\dtfwmrev.fm2 |
| Worksheet | TEMP RUNDOWN FROM SPRING FLOWER TO AMOLE |
| Flow Element | Trapezoidal Channel |
| Method | Manning's Formula |
| Solve For | Channel Depth |

| Input Data | | |
|---|---|---|
| Mannings Coefficient | 0.022 | |
| Channel Slope | 1.63 | % |
| Left Side Slope | 4.00 | H : V |
| Right Side Slope | 4.00 | H : V |
| Bottom Width | 32.00 | ft |
| Discharge | 75.10 | cfs |

| Results | | |
|---|---|---|
| Depth | 0.45 | ft |
| Flow Area | 15.32 | $ft^2$ |
| Wetted Perimeter | 35.74 | ft |
| Top Width | 35.62 | ft |
| Critical Depth | 0.54 | ft |
| Critical Slope | 0.008870 | ft/ft |
| Velocity | 4.90 | ft/s |
| Velocity Head | 0.37 | ft |
| Specific Energy | 0.83 | ft |
| Froude Number | 1.32 | |
| Flow is supercritical. | | |

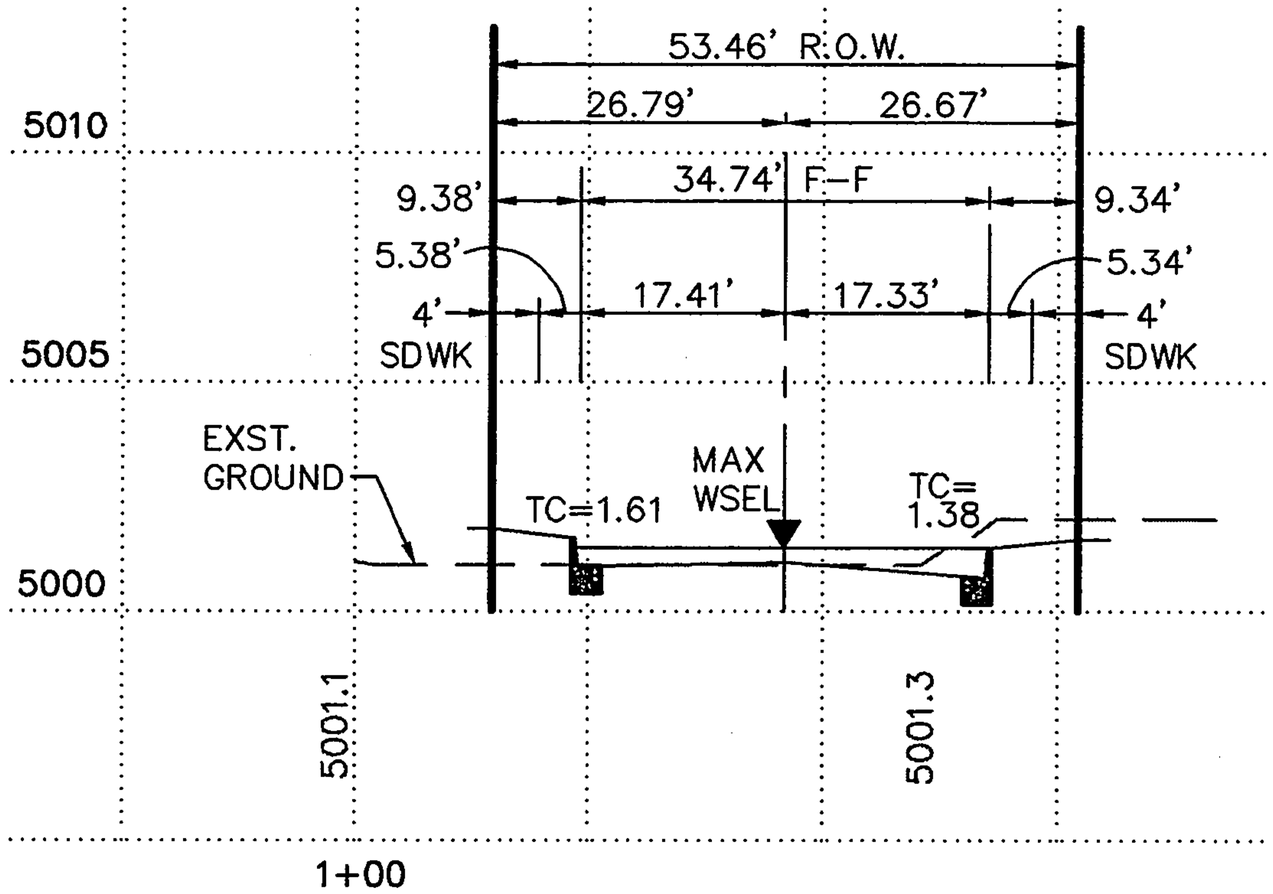
Notes:

* Preliminary Channel Sizing
* Assume Concrete Channel










**SECTION A-A**

SCALE: HORIZONTAL: 1"=20'
VERTICAL: 1"=5'

A = 15.19
WP = 35.85
R = 0.423
d = 0.67

$$Q=\frac{1.486}{0.017}(15.19)(0.0144)^{0.5}(0.423)^{0.67}$$

= 88.4 CFS > 75.1 CFS ✓OK

*ISAACSON & ARFMAN, P.A.*
*Consulting Engineering Associates*
*128 Monroe Street N.E.*
*Albuquerque* *New Mexico*

023EXH4.DWGems 09/21/98

```
AHYMO PROGRAM (AHYMO194) - AMARCA Hydrologic Model - January, 1994
     RUN DATE (MON/DAY/YR) = 05/07/1998
     START TIME (HR:MIN:SEC) = 10:37:32      USER NO.= ISCARFNM.I01
     INPUT FILE = dstmesa2.dat

*S                  DESERT FLOWER SUBDIVISION - 100 YR POST DEVELOPMENT
*S                  DSRTmesa.DAT
*S                  REVISED BY: mjc 5/05/98
*
START               RAINFALL BEGINS AT 0.0 HRS
RAINFALL            TYPE=1 RAIN QUARTER=0 RAIN ONE=1.87
                    RAIN SIX=2.20 RAIN DAY=2.66 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 100: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD      ID=1 HYD NO=100.00 AREA=0.00608 SQ MI
                    PER A=0 PER B=29 PER C=29 PER D=42
                    TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   10.082    CFS   UNIT VOLUME =    .9982       B =   526.28      P60 = 1.8700
    AREA =      .002554 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
```

K = .118429HR TP = .133300HR K/TP RATIO = .888442 SHAPE CONSTANT, N = 3.992480
UNIT PEAK = 9.3826 CFS UNIT VOLUME = .9991 B = 354.67 P60 = 1.8700
AREA = .003526 SQ MI IA = .42500 INCHES INF = 1.04000 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 = 1.29860 INCHES = .4211 ACRE-FEET
PEAK DISCHARGE RATE = 12.66 CFS AT 1.500 HOURS BASIN AREA = .0061 SQ. MI.

*S ** ROUTE BASIN 100 THROUGH 101
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=410 FT
SLP=.016

TRAVEL TIME TABLE
REACH= 1.0

| WATER DEPTH FEET | AVERAGE AREA SQ.FT. | FLOW RATE CFS | TRAVEL TIME HRS |
|---|---|---|---|
| .035 | .062 | .05 | .1376 |
| .071 | .248 | .33 | .0867 |
| .106 | .558 | .96 | .0661 |
| .141 | .992 | 2.07 | .0546 |
| .176 | 1.549 | 3.75 | .0471 |
| .212 | 2.231 | 6.10 | .0417 |
| .247 | 3.037 | 9.20 | .0376 |
| .282 | 3.966 | 13.13 | .0344 |
| .317 | 5.020 | 17.98 | .0318 |
| .353 | 6.144 | 25.01 | .0280 |
| .388 | 7.269 | 33.05 | .0250 |
| .423 | 8.395 | 41.95 | .0228 |
| .458 | 9.521 | 51.67 | .0210 |
| .494 | 10.647 | 62.16 | .0195 |
| .529 | 11.774 | 73.40 | .0183 |
| .564 | 12.901 | 85.36 | .0172 |
| .599 | 14.029 | 98.01 | .0163 |
| .635 | 15.157 | 111.33 | .0155 |
| .670 | 16.285 | 125.31 | .0148 |

```
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 =     1.29863 INCHES     =         .4211 ACRE-FEET
    PEAK DISCHARGE RATE =      12.22 CFS  AT   1.533 HOURS   BASIN AREA =    .0061 SQ. MI.


*S BASIN 101: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=3 HYD NO=101.00 AREA=0.004321 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   7.1650    CFS   UNIT VOLUME =     .9978       B =    526.28      P60 = 1.8700
    AREA =       .001815 SQ MI    IA =     .10000 INCHES    INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330


    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   6.6681    CFS   UNIT VOLUME =     .9984       B =    354.67      P60 = 1.8700
    AREA =       .002506 SQ MI    IA =     .42500 INCHES    INF =    1.04000 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 = 1.29860 INCHES = .2993 ACRE-FEET
PEAK DISCHARGE RATE = 9.00 CFS AT 1.500 HOURS BASIN AREA = .0043 SQ. MI.

```
*S COMBINE BASINS 100 AND 101 TOGETHER
ADD HYD              ID=4  HYD NO=101.1  ID=2  ID=3
PRINT HYD            ID=4  CODE=1
```

PARTIAL HYDROGRAPH 101.10

RUNOFF VOLUME = 1.29854 INCHES = .7203 ACRE-FEET
PEAK DISCHARGE RATE = 20.93 CFS AT 1.533 HOURS BASIN AREA = .0104 SQ. MI.

```
*S BASIN 102: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=5 HYD NO=102.00 AREA=0.007284 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1
```

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 12.078 CFS UNIT VOLUME = .9984 B = 526.28 P60 = 1.8700
AREA = .003059 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .118429HR TP = .133300HR K/TP RATIO = .888442 SHAPE CONSTANT, N = 3.992480
UNIT PEAK = 11.241 CFS UNIT VOLUME = .9993 B = 354.67 P60 = 1.8700
AREA = .004225 SQ MI IA = .42500 INCHES INF = 1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

```
PRINT HYD            ID=5   CODE=1
```

PARTIAL HYDROGRAPH 102.00

RUNOFF VOLUME = 1.29860 INCHES = .5045 ACRE-FEET
PEAK DISCHARGE RATE = 15.16 CFS AT 1.500 HOURS BASIN AREA = .0073 SQ. MI.

```
*S COMBINE BASIN 102 TO HYDROGRAPH NO 101.1
ADD HYD              ID=6  HYD NO=102.1  ID=4  ID=5
PRINT HYD            ID=6  CODE=1
```

PARTIAL HYDROGRAPH 102.10

RUNOFF VOLUME = 1.29855 INCHES = 1.2248 ACRE-FEET
PEAK DISCHARGE RATE = 35.60 CFS AT 1.533 HOURS BASIN AREA = .0177 SQ. MI.

*S BASIN 103: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD ID=7 HYD NO=103.00 AREA=0.00347 SQ MI
PER A=0 PER B=29 PER C=29 PER D=42
TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 5.7539 CFS UNIT VOLUME = .9973 B = 526.28 P60 = 1.8700
AREA = .001457 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .118429HR TP = .133300HR K/TP RATIO = .888442 SHAPE CONSTANT, N = 3.992480
UNIT PEAK = 5.3549 CFS UNIT VOLUME = .9980 B = 354.67 P60 = 1.8700
AREA = .002013 SQ MI IA = .42500 INCHES INF = 1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=7 CODE=1

PARTIAL HYDROGRAPH 103.00

RUNOFF VOLUME = 1.29860 INCHES = .2403 ACRE-FEET
PEAK DISCHARGE RATE = 7.23 CFS AT 1.500 HOURS BASIN AREA = .0035 SQ. MI.

*S COMBINE BASINS 103 AND HYDROGRAPH NO. 102.1 TOGETHER
ADD HYD ID=8 HYD NO=103.1 ID=6 ID=7
PRINT HYD ID=8 CODE=1

PARTIAL HYDROGRAPH 103.10

RUNOFF VOLUME = 1.29854 INCHES = 1.4651 ACRE-FEET
PEAK DISCHARGE RATE = 42.71 CFS AT 1.500 HOURS BASIN AREA = .0212 SQ. MI.

*S ** ROUTE BASIN 103.1 THROUGH 104
COMPUTE TRAVEL TIME ID=9 REACH NO=1 NO VS=1 L=520 FT
SLP=.0171

TRAVEL TIME TABLE

REACH= 1.0

| WATER DEPTH FEET | AVERAGE AREA SQ.FT. | FLOW RATE CFS | TRAVEL TIME HRS |
|---|---|---|---|
| .035 | .062 | .05 | .1745 |
| .071 | .248 | .33 | .1099 |
| .106 | .558 | .96 | .0839 |
| .141 | .992 | 2.07 | .0692 |
| .176 | 1.549 | 3.75 | .0597 |
| .212 | 2.231 | 6.10 | .0528 |
| .247 | 3.037 | 9.20 | .0477 |
| .282 | 3.966 | 13.13 | .0436 |
| .317 | 5.020 | 17.98 | .0403 |
| .353 | 6.144 | 25.01 | .0355 |
| .388 | 7.269 | 33.05 | .0318 |
| .423 | 8.395 | 41.95 | .0289 |
| .458 | 9.521 | 51.67 | .0266 |
| .494 | 10.647 | 62.16 | .0247 |
| .529 | 11.774 | 73.40 | .0232 |
| .564 | 12.901 | 85.36 | .0218 |
| .599 | 14.029 | 98.01 | .0207 |
| .635 | 15.157 | 111.33 | .0197 |
| .670 | 16.285 | 125.31 | .0188 |

```
ROUTE                ID=9 HYD NO=103.2 INFLOW ID=8 DT=0.0 HR
PRINT HYD            ID=9 CODE=1
```

PARTIAL HYDROGRAPH 103.20

RUNOFF VOLUME = 1.29857 INCHES = 1.4651 ACRE-FEET
PEAK DISCHARGE RATE = 43.08 CFS AT 1.533 HOURS BASIN AREA = .0212 SQ. MI.

```
*S BASIN 104: POSTDEVELOPMENT CONDITIONS WITH SIMGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=10 HYD NO=140.00 AREA=0.00779 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1
```

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 12.917 CFS UNIT VOLUME = .9985 B = 526.28 P60 = 1.8700
AREA = .003272 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .118429HR TP = .133300HR K/TP RATIO = .888442 SHAPE CONSTANT, N = 3.992480
UNIT PEAK = 12.021 CFS UNIT VOLUME = .9993 B = 354.67 P60 = 1.8700
AREA = .004518 SQ MI IA = .42500 INCHES INF = 1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

```
PRINT HYD             ID=10   CODE=1

                                PARTIAL HYDROGRAPH   140.00

    RUNOFF VOLUME =      1.29860 INCHES      =         .5395 ACRE-FEET
    PEAK DISCHARGE RATE =      16.21 CFS  AT    1.500 HOURS   BASIN AREA =    .0078 SQ. MI.


*S COMBINE BASIN 104 AND HYDROGRAPH 103.2 TOGETHER
ADD HYD               ID=30  HYD NO=104.1  ID=9  ID=10
PRINT HYD             ID=30  CODE=1

                                PARTIAL HYDROGRAPH   104.10

    RUNOFF VOLUME =      1.29855 INCHES      =        2.0046 ACRE-FEET
    PEAK DISCHARGE RATE =      58.77 CFS  AT    1.533 HOURS   BASIN AREA =    .0289 SQ. MI.


*S BASIN 105: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD        ID=13  HYD NO=105.00 AREA=0.004 SQ MI
                      PER A=0 PER B=29 PER C=29 PER D=42
                      TP=-0.1333 HR   MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   6.6327    CFS   UNIT VOLUME =     .9976       B =   526.28      P60 = 1.8700
    AREA =       .001680 SQ MI    IA =     .10000 INCHES    INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330


    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   6.1728    CFS   UNIT VOLUME =     .9982       B =   354.67      P60 = 1.8700
    AREA =       .002320 SQ MI    IA =     .42500 INCHES    INF =    1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD             ID=13  CODE=1

                                PARTIAL HYDROGRAPH   105.00

    RUNOFF VOLUME =      1.29860 INCHES      =         .2770 ACRE-FEET
    PEAK DISCHARGE RATE =       8.33 CFS  AT    1.500 HOURS   BASIN AREA =    .0040 SQ. MI.
```

*S ** ROUTE BASIN 105 THROUGH 106
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=14 REACH NO=1 NO VS=1 L=260 FT
SLP=.019

TRAVEL TIME TABLE
REACH= 1.0

| WATER DEPTH FEET | AVERAGE AREA SQ.FT. | FLOW RATE CFS | TRAVEL TIME HRS |
|---|---|---|---|
| .035 | .062 | .05 | .0872 |
| .071 | .248 | .33 | .0550 |
| .106 | .557 | .96 | .0419 |
| .141 | .991 | 2.07 | .0346 |
| .176 | 1.548 | 3.75 | .0298 |
| .212 | 2.229 | 6.09 | .0264 |
| .247 | 3.034 | 9.19 | .0238 |
| .282 | 3.962 | 13.18 | .0217 |
| .317 | 4.946 | 19.05 | .0188 |
| .353 | 5.930 | 25.73 | .0166 |
| .388 | 6.914 | 33.18 | .0151 |

```
                              .423        7.898        41.35        .0138
                              .458        8.883        50.21        .0128
                              .494        9.869        59.73        .0119
                              .529       10.854        69.89        .0112
                              .564       11.841        80.66        .0106
                              .599       12.827        92.01        .0101
                              .635       13.814       103.94        .0096
                              .670       14.801       116.42        .0092
ROUTE                 ID=14 HYD NO=105.1 INFLOW ID=13 DT=0.0 HR
PRINT HYD             ID=14 CODE=1

                                   PARTIAL HYDROGRAPH   105.10


    RUNOFF VOLUME =     1.29865 INCHES      =         .2770 ACRE-FEET
    PEAK DISCHARGE RATE =       8.22 CFS  AT    1.533 HOURS    BASIN AREA =    .0040 SQ. MI.


*S BASIN 106: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD        ID=15  HYD NO=106.10 AREA=0.0039 SQ MI
                      PER A=0 PER B=29 PER C=29 PER D=42
                      TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   6.4669    CFS   UNIT VOLUME =    .9976       B =   526.28       P60 = 1.8700
    AREA =      .001638 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   6.0185    CFS   UNIT VOLUME =    .9982       B =   354.67       P60 = 1.8700
    AREA =      .002262 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD             ID=15   CODE=1

                                   PARTIAL HYDROGRAPH   106.10


    RUNOFF VOLUME =     1.29860 INCHES      =         .2701 ACRE-FEET
    PEAK DISCHARGE RATE =       8.13 CFS  AT    1.500 HOURS    BASIN AREA =    .0039 SQ. MI.


*S COMBINE BASINS 106 AND 105.1 TOGETHER
ADD HYD               ID=16  HYD NO=106.1  ID=15  ID=14
PRINT HYD             ID=16  CODE=1
```

PARTIAL HYDROGRAPH 106.10

RUNOFF VOLUME = 1.29853 INCHES = .5471 ACRE-FEET
PEAK DISCHARGE RATE = 16.08 CFS AT 1.533 HOURS BASIN AREA = .0079 SQ. MI.

*S ** ROUTE BASIN 106.1 THROUGH 107
COMPUTE TRAVEL TIME ID=17 REACH NO=1 NO VS=1 L=260 FT
SLP=.017

TRAVEL TIME TABLE
REACH= 1.0

| WATER DEPTH FEET | AVERAGE AREA SQ.FT. | FLOW RATE CFS | TRAVEL TIME HRS |
|---|---|---|---|
| .035 | .062 | .05 | .0872 |
| .071 | .248 | .33 | .0550 |
| .106 | .557 | .96 | .0419 |
| .141 | .991 | 2.07 | .0346 |
| .176 | 1.548 | 3.75 | .0298 |
| .212 | 2.229 | 6.09 | .0264 |
| .247 | 3.034 | 9.19 | .0238 |
| .282 | 3.962 | 13.18 | .0217 |
| .317 | 4.946 | 19.05 | .0188 |
| .353 | 5.930 | 25.73 | .0166 |
| .388 | 6.914 | 33.18 | .0151 |
| .423 | 7.898 | 41.35 | .0138 |
| .458 | 8.883 | 50.21 | .0128 |
| .494 | 9.869 | 59.73 | .0119 |
| .529 | 10.854 | 69.89 | .0112 |
| .564 | 11.841 | 80.66 | .0106 |
| .599 | 12.827 | 92.01 | .0101 |
| .635 | 13.814 | 103.94 | .0096 |
| .670 | 14.801 | 116.42 | .0092 |

ROUTE ID=17 HYD NO=106.2 INFLOW ID=16 DT=0.0 HR
PRINT HYD ID=17 CODE=1

PARTIAL HYDROGRAPH 106.20

RUNOFF VOLUME = 1.29859 INCHES = .5471 ACRE-FEET
PEAK DISCHARGE RATE = 16.26 CFS AT 1.533 HOURS BASIN AREA = .0079 SQ. MI.

*S BASIN 107: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD ID=18 HYD NO=107.0 AREA=0.004171 SQ MI
PER A=0 PER B=29 PER C=29 PER D=42
TP=-0.1333 HR MASS RAIN=-1

```
    K =    .072649HR     TP =    .133300HR     K/TP RATIO =    .545000      SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =    6.9163     CFS    UNIT VOLUME =     .9978        B =    526.28       P60 = 1.8700
    AREA =       .001752 SQ MI     IA =     .10000 INCHES     INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330


    K =    .118429HR     TP =    .133300HR     K/TP RATIO =    .888442      SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =    6.4367     CFS    UNIT VOLUME =     .9984        B =    354.67       P60 = 1.8700
    AREA =       .002419 SQ MI     IA =     .42500 INCHES     INF =    1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD            ID=18  CODE=1

                                   PARTIAL HYDROGRAPH    107.00


    RUNOFF VOLUME =      1.29860 INCHES      =          .2889 ACRE-FEET
    PEAK DISCHARGE RATE =        8.69 CFS  AT    1.500 HOURS    BASIN AREA =    .0042 SQ. MI.


*S COMBINE HYDROGRAPH NO 106.2 AND 107 TOGETHER
ADD HYD              ID=20  HYD NO=107.1  ID=18  ID=17
PRINT HYD            ID=20  CODE=1

                                   PARTIAL HYDROGRAPH    107.10


    RUNOFF VOLUME =      1.29853 INCHES      =          .8360 ACRE-FEET
    PEAK DISCHARGE RATE =       24.67 CFS  AT    1.533 HOURS    BASIN AREA =    .0121 SQ. MI.


*S BASIN 108: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=1  HYD NO=108.0  AREA=0.007383 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1

    K =    .072649HR     TP =    .133300HR     K/TP RATIO =    .545000      SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =    12.242     CFS    UNIT VOLUME =     .9984        B =    526.28       P60 = 1.8700
    AREA =       .003101 SQ MI     IA =     .10000 INCHES     INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330


    K =    .118429HR     TP =    .133300HR     K/TP RATIO =    .888442      SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =    11.393     CFS    UNIT VOLUME =     .9993        B =    354.67       P60 = 1.8700
    AREA =       .004282 SQ MI     IA =     .42500 INCHES     INF =    1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD            ID=1  CODE=1
```

PARTIAL HYDROGRAPH  108.00

RUNOFF VOLUME =  1.29860 INCHES  =  .5113 ACRE-FEET
PEAK DISCHARGE RATE =  15.37 CFS  AT  1.500 HOURS  BASIN AREA =  .0074 SQ. MI.

*S BASIN 109: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD  ID=2  HYD NO=109.0  AREA=0.00672 SQ MI
PER A=0  PER B=29  PER C=29  PER D=42
TP=-0.1333 HR  MASS RAIN=-1

K =  .072649HR  TP =  .133300HR  K/TP RATIO =  .545000  SHAPE CONSTANT, N =  7.106420
UNIT PEAK =  11.143  CFS  UNIT VOLUME =  .9984  B =  526.28  P60 = 1.8700
AREA =  .002822 SQ MI  IA =  .10000 INCHES  INF =  .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  .033330

K =  .118429HR  TP =  .133300HR  K/TP RATIO =  .888442  SHAPE CONSTANT, N =  3.992480
UNIT PEAK =  10.370  CFS  UNIT VOLUME =  .9992  B =  354.67  P60 = 1.8700
AREA =  .003898 SQ MI  IA =  .42500 INCHES  INF =  1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  .033330

PRINT HYD  ID=2  CODE=1

PARTIAL HYDROGRAPH  109.00

RUNOFF VOLUME =  1.29860 INCHES  =  .4654 ACRE-FEET
PEAK DISCHARGE RATE =  13.99 CFS  AT  1.500 HOURS  BASIN AREA =  .0067 SQ. MI.

*S COMBINE BASINS 108 AND 109 TOGETHER
ADD HYD  ID=3  HYD NO=109.1  ID=1  ID=2
PRINT HYD  ID=3  CODE=1

PARTIAL HYDROGRAPH  109.10

RUNOFF VOLUME =  1.29855 INCHES  =  .9767 ACRE-FEET
PEAK DISCHARGE RATE =  29.36 CFS  AT  1.500 HOURS  BASIN AREA =  .0141 SQ. MI.

*S ** ROUTE BASIN 109.1 THROUGH 113
COMPUTE TRAVEL TIME  ID=4 REACH NO=1 NO VS=1 L=260 FT
SLP=.014

TRAVEL TIME TABLE

REACH= 1.0

| WATER DEPTH FEET | AVERAGE AREA SQ.FT. | FLOW RATE CFS | TRAVEL TIME HRS |
|---|---|---|---|
| .035 | .062 | .05 | .0872 |
| .071 | .248 | .33 | .0550 |
| .106 | .557 | .96 | .0419 |
| .141 | .991 | 2.07 | .0346 |
| .176 | 1.548 | 3.75 | .0298 |
| .212 | 2.229 | 6.09 | .0264 |
| .247 | 3.034 | 9.19 | .0238 |
| .282 | 3.962 | 13.18 | .0217 |
| .317 | 4.946 | 19.05 | .0188 |
| .353 | 5.930 | 25.73 | .0166 |
| .388 | 6.914 | 33.18 | .0151 |
| .423 | 7.898 | 41.35 | .0138 |
| .458 | 8.883 | 50.21 | .0128 |
| .494 | 9.869 | 59.73 | .0119 |
| .529 | 10.854 | 69.89 | .0112 |
| .564 | 11.841 | 80.66 | .0106 |
| .599 | 12.827 | 92.01 | .0101 |
| .635 | 13.814 | 103.94 | .0096 |
| .670 | 14.801 | 116.42 | .0092 |

```
ROUTE          ID=4 HYD NO=109.2 INFLOW ID=3 DT=0.0 HR
PRINT HYD      ID=4 CODE=1
```

PARTIAL HYDROGRAPH 109.20

RUNOFF VOLUME = 1.29859 INCHES = .9767 ACRE-FEET
PEAK DISCHARGE RATE = 29.20 CFS AT 1.533 HOURS BASIN AREA = .0141 SQ. MI.

*S BASIN 110: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES

```
COMPUTE NM HYD      ID=5  HYD NO=110.0  AREA=0.0145 SQ MI
                    PER A=0  PER B=29  PER C=29  PER D=42
                    TP=-0.1333 HR  MASS RAIN=-1
```

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 24.044 CFS UNIT VOLUME = .9989 B = 526.28 P60 = 1.8700
AREA = .006090 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .118429HR TP = .133300HR K/TP RATIO = .888442 SHAPE CONSTANT, N = 3.992480
UNIT PEAK = 22.376 CFS UNIT VOLUME = .9999 B = 354.67 P60 = 1.8700
AREA = .008410 SQ MI IA = .42500 INCHES INF = 1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=5 CODE=1

PARTIAL HYDROGRAPH 110.00

RUNOFF VOLUME = 1.29860 INCHES = 1.0042 ACRE-FEET
PEAK DISCHARGE RATE = 30.16 CFS AT 1.500 HOURS BASIN AREA = .0145 SQ. MI.

*S ** ROUTE BASIN 110 THROUGH 114
COMPUTE TRAVEL TIME ID=6 REACH NO=1 NO VS=1 L=260 FT
SLP=.0155

TRAVEL TIME TABLE
REACH= 1.0

| WATER DEPTH FEET | AVERAGE AREA SQ.FT. | FLOW RATE CFS | TRAVEL TIME HRS |
|---|---|---|---|
| .035 | .062 | .05 | .0872 |
| .071 | .248 | .33 | .0550 |
| .106 | .557 | .96 | .0419 |
| .141 | .991 | 2.07 | .0346 |
| .176 | 1.548 | 3.75 | .0298 |
| .212 | 2.229 | 6.09 | .0264 |
| .247 | 3.034 | 9.19 | .0238 |
| .282 | 3.962 | 13.18 | .0217 |
| .317 | 4.946 | 19.05 | .0188 |
| .353 | 5.930 | 25.73 | .0166 |
| .388 | 6.914 | 33.18 | .0151 |
| .423 | 7.898 | 41.35 | .0138 |
| .458 | 8.883 | 50.21 | .0128 |
| .494 | 9.869 | 59.73 | .0119 |
| .529 | 10.854 | 69.89 | .0112 |
| .564 | 11.841 | 80.66 | .0106 |
| .599 | 12.827 | 92.01 | .0101 |
| .635 | 13.814 | 103.94 | .0096 |
| .670 | 14.801 | 116.42 | .0092 |

ROUTE ID=6 HYD NO=110.1 INFLOW ID=5 DT=0.0 HR
PRINT HYD ID=6 CODE=1

PARTIAL HYDROGRAPH 110.10

RUNOFF VOLUME = 1.29861 INCHES = 1.0043 ACRE-FEET
PEAK DISCHARGE RATE = 30.00 CFS AT 1.533 HOURS BASIN AREA = .0145 SQ. MI.

```
*S BASIN 111: PARK
COMPUTE NM HYD       ID=7  HYD NO=111.0  AREA=0.003149 SQ MI
                     PER A=33  PER B=19  PER C=19  PER D=29
                     TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   3.6054    CFS   UNIT VOLUME =    .9961       B =   526.28       P60 = 1.8700
    AREA =      .000913 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .139463HR    TP =   .133300HR    K/TP RATIO =  1.046235     SHAPE CONSTANT, N =  3.374403
    UNIT PEAK =   5.2171    CFS   UNIT VOLUME =    .9973       B =   311.05       P60 = 1.8700
    AREA =      .002236 SQ MI    IA =    .52958 INCHES    INF =   1.33282 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=7  CODE=1

                                  PARTIAL HYDROGRAPH   111.00


    RUNOFF VOLUME =     1.00753 INCHES      =         .1692 ACRE-FEET
    PEAK DISCHARGE RATE =       5.20 CFS  AT   1.500 HOURS   BASIN AREA =    .0031 SQ. MI.


*S ** ROUTE BASIN 111 THROUGH 112
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
MIN ELEV=100.00 FT MAX ELEV=100.33 FT
CH SLP=.02 FP SLP=.02 N=.017 DIST=28 FT
DIST  ELEV  DIST  ELEV  DIST  ELEV
  0  100.33 0.1  100.00   14   100.28
27.9 100.00 28.0 100.33

                RATING CURVE VALLEY SECTION  1.0
     WATER          FLOW          FLOW          TOP
   SURFACE          AREA          RATE         WIDTH
     ELEV          SQ FT           CFS          FT
   100.00            .00           .00           .00
   100.02            .02           .01          1.74
   100.03            .06           .05          3.47
   100.05            .14           .15          5.21
   100.07            .24           .31          6.94
   100.09            .38           .57          8.68
   100.10            .54           .93         10.41
   100.12            .74          1.40         12.15
   100.14            .96          2.00         13.88
   100.16           1.22          2.73         15.62
   100.17           1.51          3.62         17.35
   100.19           1.82          4.67         19.09
   100.21           2.17          5.88         20.82
   100.23           2.55          7.28         22.56
```

| | | | |
|---|---|---|---|
| 100.24 | 2.95 | 8.88 | 24.29 |
| 100.26 | 3.39 | 10.67 | 26.03 |
| 100.28 | 3.86 | 12.67 | 27.77 |
| 100.30 | 4.34 | 15.35 | 27.98 |
| 100.31 | 4.83 | 18.31 | 27.99 |
| 100.33 | 5.32 | 21.46 | 28.00 |

COMPUTE TRAVEL TIME ID=8 REACH NO=1 NO VS=1 L=300 FT
SLP=.018

TRAVEL TIME TABLE

REACH= 1.0

| WATER DEPTH FEET | AVERAGE AREA SQ.FT. | FLOW RATE CFS | TRAVEL TIME HRS |
|---|---|---|---|
| .017 | .015 | .01 | .1611 |
| .035 | .060 | .05 | .1015 |
| .052 | .136 | .15 | .0775 |
| .069 | .241 | .31 | .0639 |
| .087 | .377 | .57 | .0551 |
| .104 | .543 | .93 | .0488 |
| .122 | .739 | 1.40 | .0440 |
| .139 | .965 | 2.00 | .0403 |
| .156 | 1.221 | 2.73 | .0372 |
| .174 | 1.507 | 3.62 | .0347 |
| .191 | 1.824 | 4.67 | .0326 |
| .208 | 2.171 | 5.88 | .0307 |
| .226 | 2.547 | 7.28 | .0291 |
| .243 | 2.954 | 8.88 | .0277 |
| .261 | 3.391 | 10.67 | .0265 |
| .278 | 3.859 | 12.67 | .0254 |
| .295 | 4.345 | 15.35 | .0236 |
| .313 | 4.831 | 18.31 | .0220 |
| .330 | 5.317 | 21.46 | .0206 |

ROUTE ID=8 HYD NO=111.1 INFLOW ID=7 DT=0.0 HR
PRINT HYD ID=8 CODE=1

PARTIAL HYDROGRAPH 111.10

RUNOFF VOLUME = 1.00760 INCHES = .1692 ACRE-FEET
PEAK DISCHARGE RATE = 5.08 CFS AT 1.533 HOURS BASIN AREA = .0031 SQ. MI.

*S BASIN 112: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD ID=9 HYD NO=112.0 AREA=0.002915 SQ MI
PER A=0 PER B=29 PER C=29 PER D=42
TP=-0.1333 HR MASS RAIN=-1

```
    K =    .072649HR     TP =    .133300HR     K/TP RATIO =    .545000      SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =    4.8336     CFS    UNIT VOLUME =     .9969        B =    526.28       P60 = 1.8700
    AREA =       .001224 SQ MI     IA =     .10000 INCHES     INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330


    K =    .118429HR     TP =    .133300HR     K/TP RATIO =    .888442      SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =    4.4984     CFS    UNIT VOLUME =     .9975        B =    354.67       P60 = 1.8700
    AREA =       .001691 SQ MI     IA =     .42500 INCHES     INF =    1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD            ID=9  CODE=1

                                    PARTIAL HYDROGRAPH   112.00


    RUNOFF VOLUME =      1.29860 INCHES      =          .2019 ACRE-FEET
    PEAK DISCHARGE RATE =        6.08 CFS  AT    1.500 HOURS    BASIN AREA =    .0029 SQ. MI.


*S COMBINE BASINS 111.1 AND 112 TOGETHER
ADD HYD              ID=10  HYD NO=112.1  ID=8  ID=9
PRINT HYD            ID=10  CODE=1

                                    PARTIAL HYDROGRAPH   112.10


    RUNOFF VOLUME =      1.14736 INCHES      =          .3711 ACRE-FEET
    PEAK DISCHARGE RATE =       10.96 CFS  AT    1.533 HOURS    BASIN AREA =    .0061 SQ. MI.


*S ** ROUTE BASIN 112.1 THROUGH 113
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=21 REACH NO=1 NO VS=1 L=260 FT
SLP=.006

TRAVEL TIME TABLE

REACH= 1.0

| WATER DEPTH FEET | AVERAGE AREA SQ.FT. | FLOW RATE CFS | TRAVEL TIME HRS |
|---|---|---|---|
| .035 | .062 | .05 | .0872 |
| .071 | .248 | .33 | .0550 |
| .106 | .558 | .96 | .0419 |
| .141 | .992 | 2.07 | .0346 |
| .176 | 1.549 | 3.75 | .0298 |
| .212 | 2.231 | 6.10 | .0264 |
| .247 | 3.037 | 9.20 | .0238 |
| .282 | 3.966 | 13.13 | .0218 |
| .317 | 5.020 | 17.98 | .0202 |
| .353 | 6.144 | 25.01 | .0177 |
| .388 | 7.269 | 33.05 | .0159 |
| .423 | 8.395 | 41.95 | .0145 |
| .458 | 9.521 | 51.67 | .0133 |
| .494 | 10.647 | 62.16 | .0124 |
| .529 | 11.774 | 73.40 | .0116 |
| .564 | 12.901 | 85.36 | .0109 |
| .599 | 14.029 | 98.01 | .0103 |
| .635 | 15.157 | 111.33 | .0098 |
| .670 | 16.285 | 125.31 | .0094 |

ROUTE ID=21 HYD NO=112.2 INFLOW ID=10 DT=0.0 HR
PRINT HYD ID=21 CODE=1

PARTIAL HYDROGRAPH 112.20

RUNOFF VOLUME = 1.14745 INCHES = .3711 ACRE-FEET
PEAK DISCHARGE RATE = 10.87 CFS AT 1.533 HOURS BASIN AREA = .0061 SQ. MI.

```
*S BASIN 113: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=12  HYD NO=113.0  AREA=0.006265 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   10.389    CFS   UNIT VOLUME =    .9982       B =   526.28      P60 = 1.8700
    AREA =    .002631 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   9.6681    CFS   UNIT VOLUME =    .9991       B =   354.67      P60 = 1.8700
    AREA =      .003634 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=12  CODE=1

                                  PARTIAL HYDROGRAPH   113.00


    RUNOFF VOLUME =     1.29860 INCHES      =         .4339 ACRE-FEET
    PEAK DISCHARGE RATE =      13.04 CFS  AT   1.500 HOURS   BASIN AREA =    .0063 SQ. MI.


*S COMBINE BASINS 113 AND 112.2 TOGETHER
ADD HYD              ID=13  HYD NO=113.1  ID=21  ID=12
PRINT HYD            ID=13  CODE=1

                                  PARTIAL HYDROGRAPH   113.10


    RUNOFF VOLUME =     1.22419 INCHES      =         .8050 ACRE-FEET
    PEAK DISCHARGE RATE =      23.49 CFS  AT   1.533 HOURS   BASIN AREA =    .0123 SQ. MI.


*S COMBINE BASINS 113 AND 109.2 TOGETHER
ADD HYD              ID=14  HYD NO=113.2  ID=13  ID=4
PRINT HYD            ID=14  CODE=1

                                  PARTIAL HYDROGRAPH   113.20


    RUNOFF VOLUME =     1.26387 INCHES      =        1.7817 ACRE-FEET
    PEAK DISCHARGE RATE =      52.69 CFS  AT   1.533 HOURS   BASIN AREA =    .0264 SQ. MI.
```

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*S BASIN 114: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=16  HYD NO=114.0  AREA=0.00737 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   12.221    CFS   UNIT VOLUME =    .9984       B =   526.28      P60 = 1.8700
    AREA =      .003095 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   11.373    CFS   UNIT VOLUME =    .9993       B =   354.67      P60 = 1.8700
    AREA =      .004275 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=16  CODE=1

                                  PARTIAL HYDROGRAPH   114.00


    RUNOFF VOLUME =     1.29860 INCHES      =         .5104 ACRE-FEET
    PEAK DISCHARGE RATE =      15.34 CFS  AT   1.500 HOURS   BASIN AREA =    .0074 SQ. MI.


*S COMBINE BASINS 110.1 AND 114 TOGETHER
ADD HYD              ID=17  HYD NO=114.1  ID=16  ID=6
PRINT HYD            ID=17  CODE=1

                                  PARTIAL HYDROGRAPH   114.10


    RUNOFF VOLUME =     1.29857 INCHES      =        1.5146 ACRE-FEET
    PEAK DISCHARGE RATE =      45.17 CFS  AT   1.500 HOURS   BASIN AREA =    .0219 SQ. MI.


*S BASIN 115: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=18  HYD NO=115.0  AREA=0.00633 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   10.496    CFS   UNIT VOLUME =    .9982       B =   526.28      P60 = 1.8700
    AREA =      .002659 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   9.7684    CFS   UNIT VOLUME =    .9991       B =   354.67      P60 = 1.8700
    AREA =      .003671 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
```

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=18 CODE=1

PARTIAL HYDROGRAPH 115.00

RUNOFF VOLUME = 1.29860 INCHES = .4384 ACRE-FEET
PEAK DISCHARGE RATE = 13.18 CFS AT 1.500 HOURS BASIN AREA = .0063 SQ. MI.

*S ** ROUTE BASIN 113.2 THROUGH 116
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=550 FT
SLP=.0125

--AV-- --ME ---LE

REACH= 1.0

| WATER DEPTH FEET | AVERAGE AREA SQ.FT. | FLOW RATE CFS | TRAVEL TIME HRS |
|---|---|---|---|
| .035 | .062 | .05 | .1846 |
| .071 | .248 | .33 | .1163 |
| .106 | .558 | .96 | .0887 |
| .141 | .992 | 2.07 | .0732 |
| .176 | 1.549 | 3.75 | .0631 |
| .212 | 2.231 | 6.10 | .0559 |
| .247 | 3.037 | 9.20 | .0504 |
| .282 | 3.966 | 13.13 | .0461 |
| .317 | 5.020 | 17.98 | .0427 |
| .353 | 6.144 | 25.01 | .0375 |
| .388 | 7.269 | 33.05 | .0336 |
| .423 | 8.395 | 41.95 | .0306 |
| .458 | 9.521 | 51.67 | .0282 |
| .494 | 10.647 | 62.16 | .0262 |
| .529 | 11.774 | 73.40 | .0245 |
| .564 | 12.901 | 85.36 | .0231 |
| .599 | 14.029 | 98.01 | .0219 |
| .635 | 15.157 | 111.33 | .0208 |
| .670 | 16.285 | 125.31 | .0199 |

ROUTE ID=19 HYD NO=113.3 INFLOW ID=14 DT=0.0 HR
PRINT HYD ID=19 CODE=1

PARTIAL HYDROGRAPH 113.30

RUNOFF VOLUME = 1.26391 INCHES = 1.7817 ACRE-FEET
PEAK DISCHARGE RATE = 52.85 CFS AT 1.533 HOURS BASIN AREA = .0264 SQ. MI.

*S BASIN 116: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD ID=22 HYD NO=116.0 AREA=0.00526 SQ MI
PER A=0 PER B=29 PER C=29 PER D=42
TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 8.7220 CFS UNIT VOLUME = .9981 B = 526.28 P60 = 1.8700
AREA = .002209 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .118429HR TP = .133300HR K/TP RATIO = .888442 SHAPE CONSTANT, N = 3.992480
UNIT PEAK = 8.1172 CFS UNIT VOLUME = .9988 B = 354.67 P60 = 1.8700
AREA = .003051 SQ MI IA = .42500 INCHES INF = 1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

```
PRINT HYD             ID=22  CODE=1

                                PARTIAL HYDROGRAPH   116.00

    RUNOFF VOLUME =     1.29860 INCHES      =         .3643 ACRE-FEET
    PEAK DISCHARGE RATE =      10.95 CFS  AT    1.500 HOURS   BASIN AREA =    .0053 SQ. MI.


*S COMBINE BASINS 116 AND 113.3 TOGETHER
ADD HYD               ID=1  HYD NO=116.1  ID=19  ID=22
PRINT HYD             ID=1  CODE=1

                                PARTIAL HYDROGRAPH   116.10

    RUNOFF VOLUME =     1.26965 INCHES      =        2.1460 ACRE-FEET
    PEAK DISCHARGE RATE =      63.45 CFS  AT    1.533 HOURS   BASIN AREA =    .0317 SQ. MI.


*S COMBINE BASINS 116.1 AND 115 TOGETHER
ADD HYD               ID=2  HYD NO=116.2  ID=1  ID=18
PRINT HYD             ID=2  CODE=1

                                PARTIAL HYDROGRAPH   116.20

    RUNOFF VOLUME =     1.27446 INCHES      =        2.5844 ACRE-FEET
    PEAK DISCHARGE RATE =      76.21 CFS  AT    1.533 HOURS   BASIN AREA =    .0380 SQ. MI.


*S BASIN 117: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD        ID=3  HYD NO=117.0  AREA=0.00127 SQ MI
                      PER A=0  PER B=29  PER C=29  PER D=42
                      TP=-0.1333 HR  MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   2.1059    CFS   UNIT VOLUME =     .9941       B =   526.28      P60 = 1.8700
    AREA =       .000533 SQ MI    IA =     .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330


    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   1.9599    CFS   UNIT VOLUME =     .9937       B =   354.67      P60 = 1.8700
    AREA =       .000737 SQ MI    IA =     .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD             ID=3  CODE=1
```

PARTIAL HYDROGRAPH 117.00

RUNOFF VOLUME = 1.29860 INCHES = .0880 ACRE-FEET
PEAK DISCHARGE RATE = 2.66 CFS AT 1.500 HOURS BASIN AREA = .0013 SQ. MI.

```
*S COMBINE BASINS 116.2 AND 117 TOGETHER
ADD HYD              ID=4  HYD NO=117.1  ID=2  ID=3
PRINT HYD            ID=4  CODE=1
```

PARTIAL HYDROGRAPH 117.10

RUNOFF VOLUME = 1.27523 INCHES = 2.6723 ACRE-FEET
PEAK DISCHARGE RATE = 78.78 CFS AT 1.533 HOURS BASIN AREA = .0393 SQ. MI.

```
*S ** ROUTE BASIN 114.1 THROUGH 118
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=550 FT
SLP=.0052

TRAVEL TIME TABLE

REACH= 1.0

| WATER DEPTH FEET | AVERAGE AREA SQ.FT. | FLOW RATE CFS | TRAVEL TIME HRS |
|---|---|---|---|
| .035 | .062 | .05 | .1846 |
| .071 | .248 | .33 | .1163 |
| .106 | .558 | .96 | .0887 |
| .141 | .992 | 2.07 | .0732 |
| .176 | 1.549 | 3.75 | .0631 |
| .212 | 2.231 | 6.10 | .0559 |
| .247 | 3.037 | 9.20 | .0504 |
| .282 | 3.966 | 13.13 | .0461 |
| .317 | 5.020 | 17.98 | .0427 |
| .353 | 6.144 | 25.01 | .0375 |
| .388 | 7.269 | 33.05 | .0336 |
| .423 | 8.395 | 41.95 | .0306 |
| .458 | 9.521 | 51.67 | .0282 |
| .494 | 10.647 | 62.16 | .0262 |
| .529 | 11.774 | 73.40 | .0245 |
| .564 | 12.901 | 85.36 | .0231 |
| .599 | 14.029 | 98.01 | .0219 |
| .635 | 15.157 | 111.33 | .0208 |
| .670 | 16.285 | 125.31 | .0199 |

ROUTE  ID=5 HYD NO=114.2 INFLOW ID=17 DT=0.0 HR
PRINT HYD  ID=5 CODE=1

PARTIAL HYDROGRAPH  114.20

RUNOFF VOLUME = 1.29859 INCHES = 1.5147 ACRE-FEET
PEAK DISCHARGE RATE = 45.29 CFS AT 1.533 HOURS BASIN AREA = .0219 SQ. MI.

*S BASIN 118: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD  ID=6 HYD NO=118.0 AREA=0.00526 SQ MI
PER A=0 PER B=29 PER C=29 PER D=42
TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 8.7220 CFS UNIT VOLUME = .9981 B = 526.28 P60 = 1.8700
AREA = .002209 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

```
    K =   .118429HR     TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   8.1172    CFS   UNIT VOLUME =    .9988       B =   354.67      P60 = 1.8700
    AREA =       .003051 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=6  CODE=1

                                  PARTIAL HYDROGRAPH   118.00


    RUNOFF VOLUME =     1.29860 INCHES     =        .3643 ACRE-FEET
    PEAK DISCHARGE RATE =      10.95 CFS  AT   1.500 HOURS   BASIN AREA =   .0053 SQ. MI.


*S COMBINE BASINS 118 AND 114.2 TOGETHER
ADD HYD             ID=7  HYD NO=118.1  ID=6  ID=5
PRINT HYD           ID=7  CODE=1

                                  PARTIAL HYDROGRAPH   118.10


    RUNOFF VOLUME =     1.29857 INCHES     =       1.8789 ACRE-FEET
    PEAK DISCHARGE RATE =      55.89 CFS  AT   1.533 HOURS   BASIN AREA =   .0271 SQ. MI.


*S BASIN 119: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD      ID=8  HYD NO=119.0  AREA=0.00186 SQ MI
                    PER A=0  PER B=29  PER C=29  PER D=42
                    TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR     TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   3.0842    CFS   UNIT VOLUME =    .9955       B =   526.28      P60 = 1.8700
    AREA =       .000781 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR     TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   2.8703    CFS   UNIT VOLUME =    .9958       B =   354.67      P60 = 1.8700
    AREA =       .001079 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=8  CODE=1

                                  PARTIAL HYDROGRAPH   119.00


    RUNOFF VOLUME =     1.29860 INCHES     =        .1288 ACRE-FEET
    PEAK DISCHARGE RATE =       3.88 CFS  AT   1.500 HOURS   BASIN AREA =   .0019 SQ. MI.
```

```
*S COMBINE BASINS 118.1 AND 119 TOGETHER
ADD HYD              ID=9  HYD NO=118.2  ID=8  ID=7
PRINT HYD            ID=9  CODE=1
```

PARTIAL HYDROGRAPH 118.20

RUNOFF VOLUME = 1.29856 INCHES = 2.0077 ACRE-FEET
PEAK DISCHARGE RATE = 59.65 CFS AT 1.533 HOURS BASIN AREA = .0290 SQ. MI.

```
*S ** ROUTE BASIN 107.2 THROUGH 120
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=10 REACH NO=1 NO VS=1 L=250 FT
                     SLP=.005
```

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=10 HYD NO=107.3 INFLOW ID=20 DT=0.0 HR
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 107.30

RUNOFF VOLUME = 1.29858 INCHES = .8360 ACRE-FEET
PEAK DISCHARGE RATE = 24.80 CFS AT 1.533 HOURS BASIN AREA = .0121 SQ. MI.

*S BASIN 120: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD ID=11 HYD NO=120.0 AREA=0.00444 SQ MI
PER A=0 PER B=29 PER C=29 PER D=42
TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 7.3623 CFS UNIT VOLUME = .9978 B = 526.28 P60 = 1.8700
AREA = .001865 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .118429HR TP = .133300HR K/TP RATIO = .888442 SHAPE CONSTANT, N = 3.992480
UNIT PEAK = 6.8518 CFS UNIT VOLUME = .9984 B = 354.67 P60 = 1.8700
AREA = .002575 SQ MI IA = .42500 INCHES INF = 1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

```
PRINT HYD             ID=11  CODE=1

                                   PARTIAL HYDROGRAPH   120.00

    RUNOFF VOLUME =      1.29860 INCHES      =         .3075 ACRE-FEET
    PEAK DISCHARGE RATE =        9.25 CFS  AT    1.500 HOURS   BASIN AREA =    .0044 SQ. MI.


*S COMBINE BASINS 120 AND 107.2 TOGETHER
ADD HYD               ID=12  HYD NO=120.1  ID=11  ID=10
PRINT HYD             ID=12  CODE=1

                                   PARTIAL HYDROGRAPH   120.10

    RUNOFF VOLUME =      1.29854 INCHES      =        1.1435 ACRE-FEET
    PEAK DISCHARGE RATE =       33.75 CFS  AT    1.533 HOURS   BASIN AREA =    .0165 SQ. MI.


*S ** ROUTE BASIN 120.1 THROUGH 121
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=13 REACH NO=1 NO VS=1 L=325 FT
                     SLP=.005

                                TRAVEL TIME TABLE
                                              REACH=  1.0

                                WATER         AVERAGE       FLOW          TRAVEL
                                DEPTH         AREA          RATE          TIME
                                FEET          SQ.FT.        CFS           HRS
                                   .035          .062           .05         .1091
                                   .071          .248           .33         .0687
                                   .106          .558           .96         .0524
                                   .141          .992          2.07         .0433
                                   .176         1.549          3.75         .0373
                                   .212         2.231          6.10         .0330
                                   .247         3.037          9.20         .0298
                                   .282         3.966         13.13         .0273
                                   .317         5.020         17.98         .0252
                                   .353         6.144         25.01         .0222
                                   .388         7.269         33.05         .0199
                                   .423         8.395         41.95         .0181
                                   .458         9.521         51.67         .0166
                                   .494        10.647         62.16         .0155
                                   .529        11.774         73.40         .0145
                                   .564        12.901         85.36         .0136
                                   .599        14.029         98.01         .0129
                                   .635        15.157        111.33         .0123
                                   .670        16.285        125.31         .0117
ROUTE                ID=13 HYD NO=120.2 INFLOW ID=12 DT=0.0 HR
PRINT HYD            ID=13 CODE=1

                                    PARTIAL HYDROGRAPH   120.20


    RUNOFF VOLUME =     1.29857 INCHES     =       1.1435 ACRE-FEET
    PEAK DISCHARGE RATE =      33.52 CFS  AT   1.533 HOURS   BASIN AREA =   .0165 SQ. MI.


*S BASIN 121: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD       ID=14  HYD NO=121.0  AREA=0.0022 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   3.6480    CFS   UNIT VOLUME =    .9961       B =   526.28      P60 = 1.8700
    AREA =      .000924 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
```

```
    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   3.3950    CFS   UNIT VOLUME =     .9966       B =   354.67      P60 = 1.8700
    AREA =       .001276 SQ MI    IA =     .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD           ID=14  CODE=1

                                    PARTIAL HYDROGRAPH   121.00


    RUNOFF VOLUME =     1.29860 INCHES      =         .1524 ACRE-FEET
    PEAK DISCHARGE RATE =        4.59 CFS  AT   1.500 HOURS   BASIN AREA =    .0022 SQ. MI.


*S COMBINE BASINS 121 AND 120.2 TOGETHER
ADD HYD             ID=15  HYD NO=121.1  ID=14  ID=13
PRINT HYD           ID=15  CODE=1

                                    PARTIAL HYDROGRAPH   121.10


    RUNOFF VOLUME =     1.29853 INCHES      =        1.2958 ACRE-FEET
    PEAK DISCHARGE RATE =       37.97 CFS  AT   1.533 HOURS   BASIN AREA =    .0187 SQ. MI.


*S ** ROUTE BASIN 104.1 THROUGH 122
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=23 REACH NO=1 NO VS=1 L=480 FT
SLP=.0184

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=23 HYD NO=104.2 INFLOW ID=30 DT=0.0 HR
PRINT HYD ID=23 CODE=1

PARTIAL HYDROGRAPH 104.20

RUNOFF VOLUME = 1.29857 INCHES = 2.0046 ACRE-FEET
PEAK DISCHARGE RATE = 58.43 CFS AT 1.533 HOURS BASIN AREA = .0289 SQ. MI.

*S BASIN 122: POSTDEVELOPMENT CONDITIONS WITH SINGLE FAMILY RESIDENTIAL HOMES
COMPUTE NM HYD ID=16 HYD NO=122.0 AREA=0.00784 SQ MI
PER A=0 PER B=29 PER C=29 PER D=42
TP=-0.1333 HR MASS RAIN=-1

```
    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   13.000    CFS   UNIT VOLUME =     .9985       B =   526.28      P60 = 1.8700
    AREA =       .003293 SQ MI    IA =     .10000 INCHES    INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330


    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   12.099    CFS   UNIT VOLUME =     .9993       B =   354.67      P60 = 1.8700
    AREA =       .004547 SQ MI    IA =     .42500 INCHES    INF =    1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD           ID=16  CODE=1

                                  PARTIAL HYDROGRAPH   122.00


    RUNOFF VOLUME =     1.29860 INCHES      =         .5430 ACRE-FEET
    PEAK DISCHARGE RATE =      16.32 CFS  AT   1.500 HOURS   BASIN AREA =    .0078 SQ. MI.


*S COMBINE BASINS 122 AND 121.1 TOGETHER
ADD HYD             ID=17  HYD NO=122.1  ID=16  ID=15
PRINT HYD           ID=17  CODE=1

                                  PARTIAL HYDROGRAPH   122.10


    RUNOFF VOLUME =     1.29854 INCHES      =        1.8388 ACRE-FEET
    PEAK DISCHARGE RATE =      53.76 CFS  AT   1.533 HOURS   BASIN AREA =    .0266 SQ. MI.


*S COMBINE BASINS 122.1 AND 118.2 TOGETHER
ADD HYD             ID=18  HYD NO=122.2  ID=17  ID=9
PRINT HYD           ID=18  CODE=1

                                  PARTIAL HYDROGRAPH   122.20


    RUNOFF VOLUME =     1.29855 INCHES      =        3.8465 ACRE-FEET
    PEAK DISCHARGE RATE =     113.41 CFS  AT   1.533 HOURS   BASIN AREA =    .0555 SQ. MI.


*S COMBINE BASINS 122.2 AND 117.1 TOGETHER
ADD HYD             ID=19  HYD NO=122.3  ID=18  ID=4
PRINT HYD           ID=19  CODE=1

                                  PARTIAL HYDROGRAPH   122.30
```

```
    RUNOFF VOLUME =      1.28889 INCHES      =        6.5188 ACRE-FEET
    PEAK DISCHARGE RATE =      192.18 CFS  AT    1.533 HOURS    BASIN AREA =    .0948 SQ. MI.


*S COMBINE BASINS 122.3 AND 104.2 TOGETHER
ADD HYD              ID=20  HYD NO=122.4  ID=19  ID=23
PRINT HYD            ID=20  CODE=1

                                PARTIAL HYDROGRAPH   122.40


    RUNOFF VOLUME =      1.29115 INCHES      =        8.5235 ACRE-FEET
    PEAK DISCHARGE RATE =      250.61 CFS  AT    1.533 HOURS    BASIN AREA =    .1238 SQ. MI.


*S OFFSITE BASINS:  UNSER BLVD
*S BASIN 201.1: OFFSITE: UNSER BLVD. (FROM MEDIAN CURB TO R/W)
COMPUTE NM HYD       ID=1  HYD NO=201.1  AREA=0.00073 SQ MI
                     PER A=0  PER B=20 PER C=20 PER D=60
                     TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   1.7292    CFS   UNIT VOLUME =    .9933       B =   526.28      P60 = 1.8700
    AREA =       .000438 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   .77692    CFS   UNIT VOLUME =    .9831       B =   354.67      P60 = 1.8700
    AREA =       .000292 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=1  CODE=1

                                PARTIAL HYDROGRAPH   201.10


    RUNOFF VOLUME =      1.50556 INCHES      =         .0586 ACRE-FEET
    PEAK DISCHARGE RATE =       1.70 CFS  AT    1.500 HOURS    BASIN AREA =    .0007 SQ. MI.


*S BASIN 201.2: OFFSITE: UNSER BLVD. (FROM MEDIAN CURB TO R/W)
COMPUTE NM HYD       ID=2  HYD NO=201.2  AREA=0.002814 SQ MI
                     PER A=0  PER B=20  PER C=20  PER D=60
                     TP=-0.1333 HR  MASS RAIN=-1
```

```
    K =    .072649HR     TP =    .133300HR     K/TP RATIO =    .545000      SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   6.6659     CFS   UNIT VOLUME =     .9976        B =   526.28       P60 = 1.8700
    AREA =       .001688 SQ MI     IA =     .10000 INCHES     INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330


    K =    .118429HR     TP =    .133300HR     K/TP RATIO =    .888442      SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   2.9949     CFS   UNIT VOLUME =     .9958        B =   354.67       P60 = 1.8700
    AREA =       .001126 SQ MI     IA =     .42500 INCHES     INF =    1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD            ID=2  CODE=1

                                   PARTIAL HYDROGRAPH   201.20


    RUNOFF VOLUME =     1.50556 INCHES      =         .2260 ACRE-FEET
    PEAK DISCHARGE RATE =        6.49 CFS  AT    1.500 HOURS   BASIN AREA =    .0028 SQ. MI.


*S BASIN 201.3: OFFSITE: UNSER BLVD. MEDIAN AREA
COMPUTE NM HYD       ID=3  HYD NO=201.3  AREA=0.002147 SQ MI
                     PER A=0  PER B=20  PER C=20  PER D=60
                     TP=-0.1333 HR  MASS RAIN=-1
    K =    .072649HR     TP =    .133300HR     K/TP RATIO =    .545000      SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   5.0859     CFS   UNIT VOLUME =     .9973        B =   526.28       P60 = 1.8700
    AREA =       .001288 SQ MI     IA =     .10000 INCHES     INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330


    K =    .118429HR     TP =    .133300HR     K/TP RATIO =    .888442      SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   2.2850     CFS   UNIT VOLUME =     .9948        B =   354.67       P60 = 1.8700
    AREA =       .000859 SQ MI     IA =     .42500 INCHES     INF =    1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD            ID=3  CODE=1

                                   PARTIAL HYDROGRAPH   201.30


    RUNOFF VOLUME =     1.50556 INCHES      =         .1724 ACRE-FEET
    PEAK DISCHARGE RATE =        4.96 CFS  AT    1.500 HOURS   BASIN AREA =    .0021 SQ. MI.


FINISH

    NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 10:37:34
```