PRELIMINARY DRAINAGE REPORT
for
LA BUENA VISTA
MARICOPA COUNTY, ARIZONA

July 12, 1994

Prepared for:

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Date Signed 7-12-94
ARIZONA, U.S.A.

Prepared by:

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CVL

FLOOD CONTROL DISTRICT
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REMARKS

Preliminary Drainage Report
for
La Buena Vista
Maricopa County, Arizona

TABLE OF CONTENTS

		Page
1.0	INTRODUCTION	1
2.0	PROJECT DESCRIPTION	1
3.0	OFFSITE HYDROLOGY	1
4.0	ONSITE DRAINAGE	3
	4.1 Drainage Plan	3
	4.2 Major Washes	3
	4.3 Retention Requirements	3
5.0	FLOOD INSURANCE RATE MAP	4
6.0	CONCLUSIONS	6
7.0	REFERENCES	7

LIST OF FIGURES

Figure 1	Location Map	2
Figure 2	Flood Insurance Rate Map	5

APPENDICES

A. Computation Sheets

B. HEC-1 Model

C. HEC-2 Output

1.0 INTRODUCTION

Coe & Van Loo Consultants, Inc., (CVL) has been contracted by U.S. Homes to provide site engineering services for La Buena Vista. The purpose of this report is to present the proposed drainage plan for La Buena Vista. This report addresses offsite drainage, onsite drainage, street flow and retention requirements.

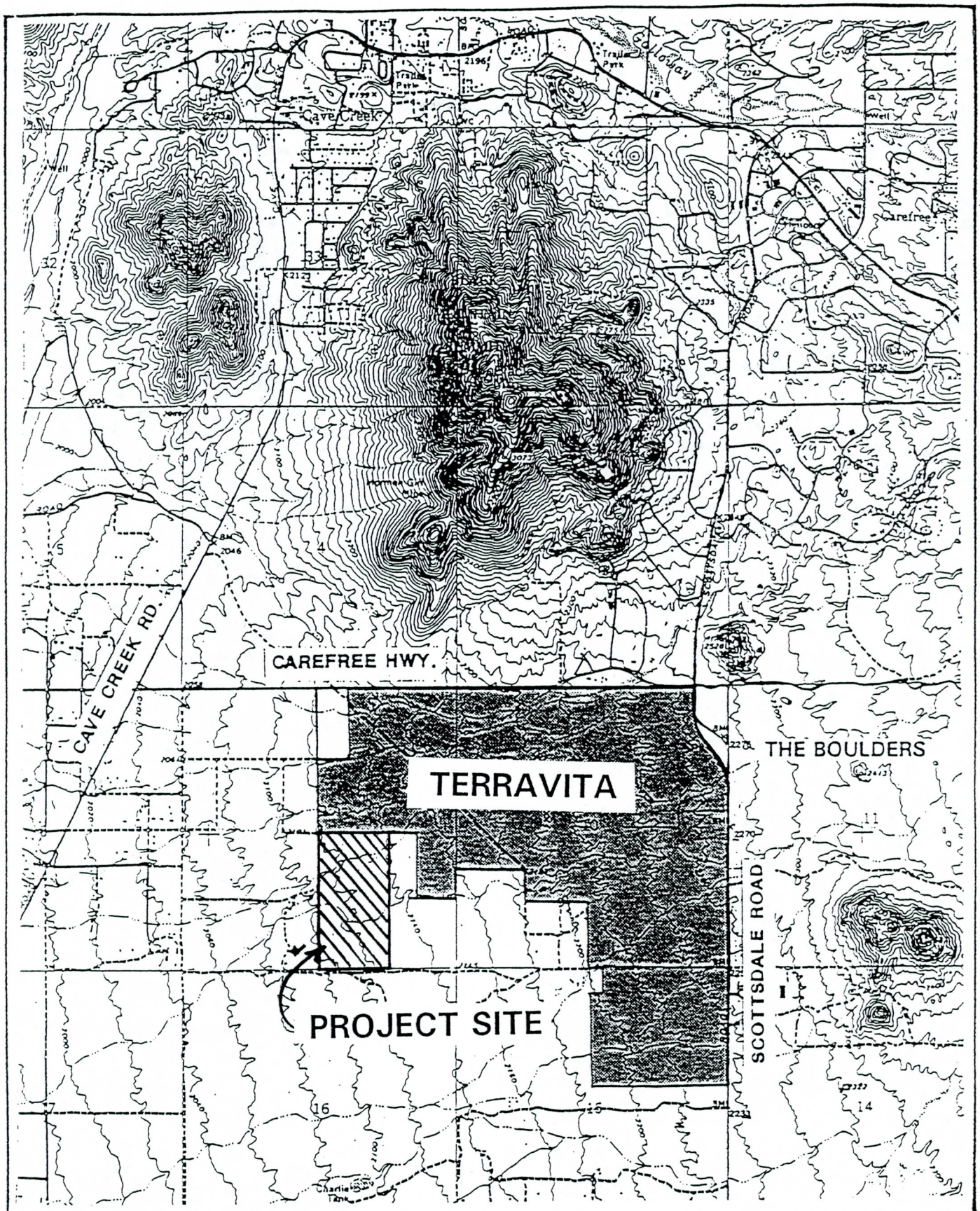
2.0 PROJECT DESCRIPTION

La Buena Vista is a proposed single family subdivision located at the northeast corner of 60th Street and Dove Valley Road intersection (see Figure 1). More specifically, the site is located in the east half of Section 9, Township 5 North, Range 4 East of the Gila and Salt River Base and Meridian. The site encompasses an area of approximately 80 acres and is currently undeveloped land that slopes from the northeast to the southwest at an approximately 2.1 percent slope. Two major washes traverse the site creating three sub-areas. The offsite drainage areas that contribute to the two washes include portions of the Terravita and Boulders planned community development, in addition to currently undeveloped land.

3.0 OFFSITE HYDROLOGY

The offsite drainage areas that impact the project are shown in Plate 1. The computed 100-year peak discharge entering the project site for the two major washes are 1841 cfs and 929 cfs for the north and south washes, respectively. The HEC-1 analysis for the major washes are given in Appendix B.

Three minor washes also impact the project site, two of which are tributaries to the south wash. The third wash extends along the southern property line adjacent to Dove Valley Road. The peak discharges for these washes were computed using the computer code (RATIONAL)



N.T.S.

60TH STREET AND DOVE VALLEY ROAD
LOCATION MAP

FIGURE 1

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developed by the Flood Control District of Maricopa County based on the rational method. Figure 2 summarizes the peak discharges entering the project site for the two major washes and the three minor washes. The peak discharge calculations for the three minor washes are presented in Appendix A.

4.0 ONSITE DRAINAGE

4.1 Drainage Plan

On-site drainage will be conveyed through the streets and drainage channels to the retention basins, which are located as shown in Plate 2. These retention basins have capacity to retain the 100-year, 2-hour event. The streets within the project site will be designed to convey the 10-year storm below top of curb.

4.2 Major Washes

As indicated in Plate 2, two major washes impact the project site. The HEC-2 computer program was used to delineate the 100-year floodplains shown in Plate 3. The HEC-2 analyses are given in Appendix C.

It is intended that the two major washes remain in natural condition within wash corridors, as shown in Plate 2. To protect the site from any possible horizontal migration of the washes, buried concrete cutoff walls are proposed along the wash corridor boundaries, per the typical section on Plate 2.

4.3 Retention Requirements

The project site involves three areas of development separated by wash corridors. Retention basins, with capacity for the 100-year, 2-hour event, will be provided for each of the developed areas. Retention computations are given in Appendix A.

5.0 FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map (FIRM) for Maricopa County, Arizona and Incorporated Areas, Map Number 04013C0815F (revised December 3, 1993) published by FEMA, indicates that the proposed project site is in Zone X (shaded) (see Figure 2).

Zone X (shaded) is defined by FEMA as:

> Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

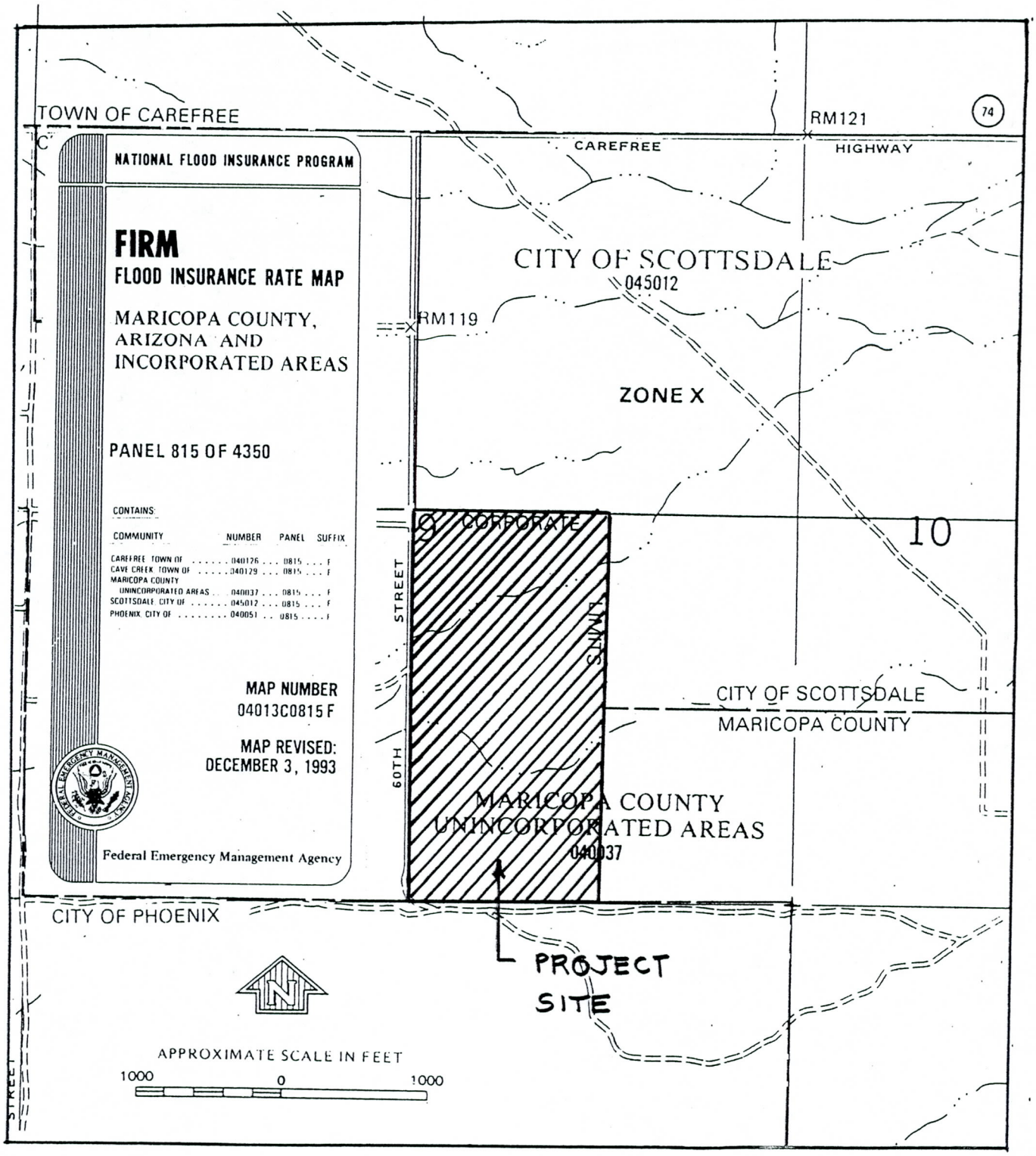

FIGURE 2 – FLOOD INSURANCE RATE MAP (FIRM)

6.0 CONCLUSIONS

1. Based on the information provided in this report, the site will be developed in accordance with the drainage design procedures and guidelines for Maricopa County, Arizona (References 1 and 2).

2. The offsite peak flows for the two major washes entering the project site were computed using HEC-1. The offsite peak flows for the minor washes were determined from the computer program (RATIONAL) developed by the FCDMC based on the rational method (Ref. 3).

3. The 10-year runoff will be conveyed within street curbs.

4. Full 100-year, 2-hour retention will be provided in the proposed retention basins.

7.0 REFERENCES

1. Flood Control District of Maricopa County, *Drainage Design Manual for Maricopa County, Arizona - Volume II: Hydraulics*, November 1991.

2. Coe & Van Loo Consultants, Inc., *Terravita Master Drainage Report (Zoning Case No. 59-Z-N-92)*, prepared for Del Webb Corporation, June 11, 1993.

3. Flood Control District of Maricopa County, *Drainage Design Manual for Maricopa County, Arizona - Volume I: Hydrology*, June 1, 1992.

4. Federal Emergency Management Agency, *Flood Insurance Rate Map (FIRM): Maricopa County, Arizona and Incorporated Areas, Map Number 04013C0815F*, map revised December 3, 1993.

Appendices

Appendix A
Computation Sheets

COE & VAN LOO
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LANDSCAPE ARCHITECTURE

Project US HOMES
Project No. 94-0047-01
Sheet No. _____ of _____
Calculated by CCC Date 4/8/94
Checked by DWD Date 4/8/94

COMPUTATION OF VOLUME

(A) Rainfall Depth, P_{100} (2-hr) = 2.75" per Maricopa Co. Manual

Area	Acreage	Runoff Coeff. C *	Rainfall Depth P_{100} (in)	Volume Ac Ft	Approx. Area Required (Ac)
A	26.643	0.65	2.75	4.0	2.5 +/-
B	26.326	0.65	2.75	3.9	2.4 +/-
C	6.2905	0.65	2.75	0.94	0.7 +/-

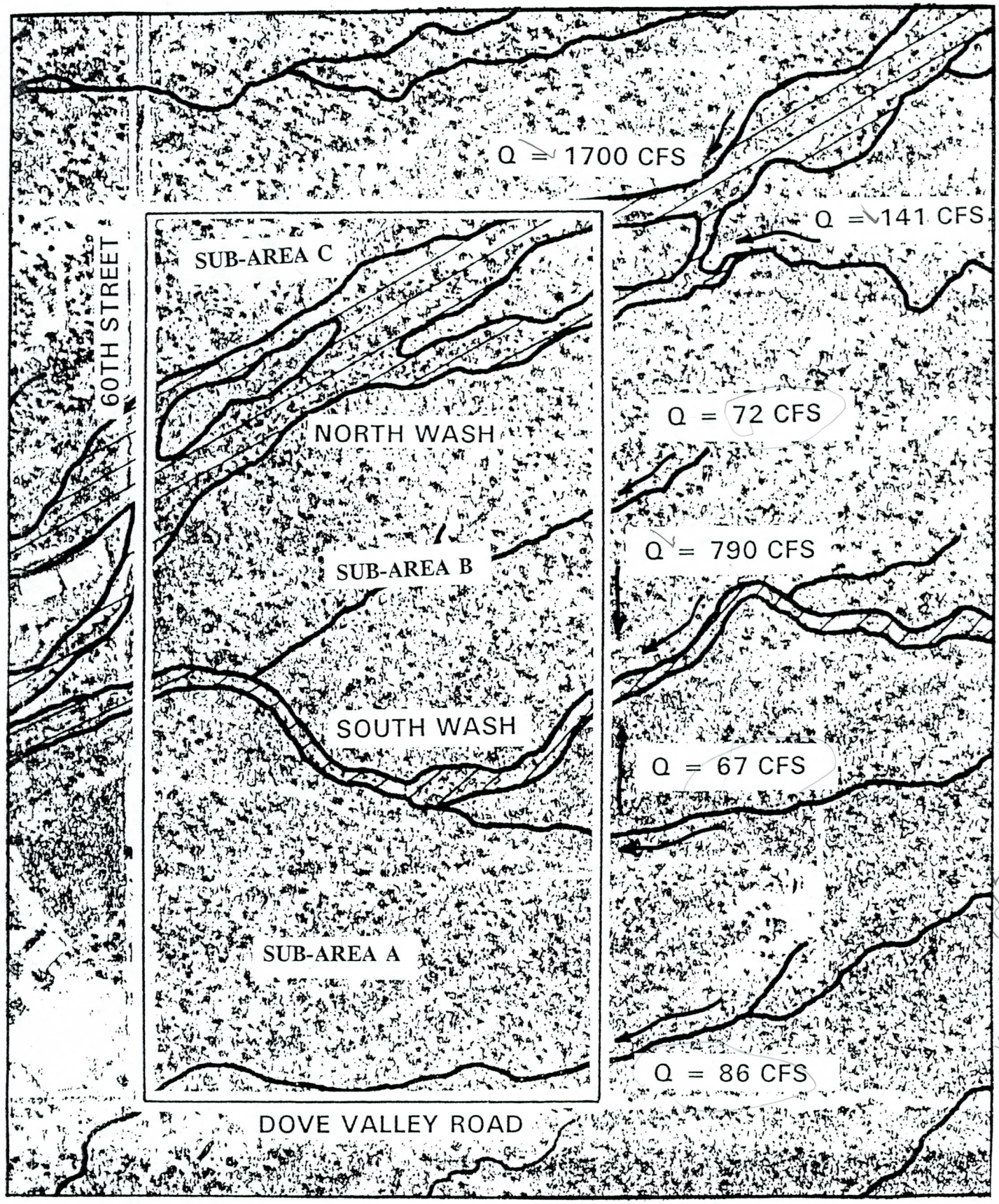
* Single Family, 100-yr

(B) Rainfall Depth, P_{100} (2-hr) = 2.82" per City of Scottsdale Manual

Area	Acreage	Runoff Coeff. C*	Rainfall Depth P_{100} (in)	Volume (Ac Ft)
A	26.643	0.65	2.82	4.07
B	26.326	0.65	2.82	4.021
C	6.2905	0.65	2.82	0.961

* Single Family, 100-year

NOTE: THE RETENTION VOLUME COMPUTED IN (A) IS USED BECAUSE THE PROJECT SITE IS WITHIN THE JURIDICTION OF MARICOPA COUNTY.



C28=
C62=79
C56=1700
S11 Q=140
S12 Q=79
S66=139
S68=84

FLOOD PEAKS ENTERING THE PROJECT SITE AND SUB-AREAS.

Flood Control District of Maricopa County
Hydrologic Design Manual Rational Method

Computed by: CARLOS C. CARRIAGA Date: 07-06-94

LOCATION DATA

Location: MINOR WASH S-1

Project Name: 60TH STREET AND Subarea id: ~~SUB-AREA~~ A1

Drainage Area Cover: 18.94

DESIGN DATA

Drainage Area	18.94	acres
Watercourse Length	2300.0	feet
Top Elevation	2166.0	feet
Bottom Elevation	2120.0	feet
Slope	.02000	feet/feet
Roughness Coefficient (Kb)	.06240	
10-Year, 6-Hour Rainfall	2.70	inches

missing area for cp3

Hydrological Summary Table

Parameter	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
Q (cfs)	20	28	32	48	60	72
C	0.350	0.350	0.350	0.385	0.420	0.438
Tc (min)	16.5	14.5	13.8	12.3	11.7	11.0
i (in/hr)	3.1	4.3	4.9	6.6	7.6	8.7

Flood Control District of Maricopa County
Hydrologic Design Manual Rational Method

Computed by: CARLOS C. CARRIAGA Date: 07-06-94

LOCATION DATA

Location: MINOR WASH S-2

Project Name: 60TH STREET AND Subarea id: ~~SUB-AREA~~ X2

Drainage Area Cover: 21.29

DESIGN DATA

Drainage Area	21.29	acres
Watercourse Length	2500.0	feet
Top Elevation	2170.0	feet
Bottom Elevation	2120.0	feet
Slope	.02000	feet/feet
Roughness Coefficient (Kb)	.11680	
10-Year, 6-Hour Rainfall	2.70	inches

Hydrological Summary Table

Parameter	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
Q (cfs)	17	24	31	43	55	67
C	0.350	0.350	0.350	0.385	0.420	0.438
Tc (min)	26.5	23.2	21.2	19.4	18.2	17.2
i (in/hr)	2.3	3.3	4.2	5.2	6.2	7.2

Flood Control District of Maricopa County
Hydrologic Design Manual Rational Method

Computed by: CARLOS C. CARRIAGA Date: 07-06-94

LOCATION DATA

Location: MINOR WASH S-3

Project Name: 60TH STREET AND Subarea id: A3

Drainage Area Cover: 28.55

DESIGN DATA

Drainage Area	28.55 acres Why ?
Watercourse Length	3000.0 feet
Top Elevation	2180.0 feet
Bottom Elevation	2120.0 feet
Slope	.02000 feet/feet
Roughness Coefficient (Kb)	.11360
10-Year, 6-Hour Rainfall	2.70 inches

Hydrological Summary Table

Parameter	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
Q (cfs)	21	30	39	55	70	86
C	0.350	0.350	0.350	0.385	0.420	0.438
Tc (min)	29.5	25.7	23.3	21.2	20.0	18.9
i (in/hr)	2.1	3.0	3.9	5.0	5.9	6.9

Flood Control District of Maricopa County
Hydrologic Design Manual Rational Method

Computed by: CCC Date: 07-11-94

LOCATION DATA

Location: LA BUENA VISTA

Project Name: áááááááááááááá Subarea id: C1

Drainage Area Cover: 10.77

DESIGN DATA

Drainage Area	10.78	acres
Watercourse Length	1250.0	feet
Top Elevation	2126.0	feet
Bottom Elevation	2100.0	feet
Slope	.02080	feet/feet
Roughness Coefficient (Kb)	.03350	
10-Year, 6-Hour Rainfall	2.20	inches

Hydrological Summary Table

Parameter	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
Q (cfs)	16	23	26	37	46	55
C	0.450	0.450	0.450	0.495	0.540	0.563
Tc (min)	8.3	7.4	7.0	6.4	6.0	5.7
i (in/hr)	3.4	4.7	5.4	6.9	7.9	9.1

Flood Control District of Maricopa County
Hydrologic Design Manual Rational Method

Computed by: CCC Date: 07-11-94

LOCATION DATA

Location: LA BUENA VISTA

Project Name: áááááááááááááá Subarea id: C2

Drainage Area Cover: 7.82

DESIGN DATA

Drainage Area	7.82	acres
Watercourse Length	1350.0	feet
Top Elevation	2128.0	feet
Bottom Elevation	2100.0	feet
Slope	.02074	feet/feet
Roughness Coefficient (Kb)	.03440	
10-Year, 6-Hour Rainfall	2.20	inches

Hydrological Summary Table

Parameter	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
Q (cfs)	12	16	18	26	33	39
C	0.450	0.450	0.450	0.495	0.540	0.563
Tc (min)	8.9	7.9	7.5	6.8	6.4	6.1
i (in/hr)	3.3	4.5	5.2	6.8	7.8	9.0

Flood Control District of Maricopa County
Hydrologic Design Manual Rational Method

Computed by: CCC Date: 07-11-94

LOCATION DATA

Location: LA BUENA VISTA

Project Name: áááááááááááááá Subarea id: C3

Drainage Area Cover: 4.06

DESIGN DATA

Drainage Area	4.06	acres
Watercourse Length	670.0	feet
Top Elevation	2113.5	feet
Bottom Elevation	2102.0	feet
Slope	.01716	feet/feet
Roughness Coefficient (Kb)	.03620	
10-Year, 6-Hour Rainfall	2.20	inches

Hydrological Summary Table

Parameter	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
Q (cfs)	7	9	11	15	19	22
C	0.450	0.450	0.450	0.495	0.540	0.563
Tc (min)	6.5	5.8	5.4	5.0	5.0	5.0
i (in/hr)	3.7	5.1	6.1	7.4	8.5	9.6

Flood Control District of Maricopa County
Hydrologic Design Manual Rational Method

Computed by: CCC Date: 07-12-94

LOCATION DATA

Location: 60TH ST AND DOVE VALLEY RD

Project Name: LA BUENA VISTA Subarea id: C4

Drainage Area Cover: 8.39

DESIGN DATA

Drainage Area	8.39	acres
Watercourse Length	1980.0	feet
Top Elevation	2127.5	feet
Bottom Elevation	2106.5	feet
Slope	.01061	feet/feet
Roughness Coefficient (Kb)	.03423	
10-Year, 6-Hour Rainfall	2.20	inches

Hydrological Summary Table

Parameter	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
Q (cfs)	10	14	16	24	30	36
C	0.450	0.450	0.450	0.495	0.540	0.563
Tc (min)	14.3	12.6	12.0	10.7	10.2	9.7
i (in/hr)	2.7	3.7	4.2	5.7	6.5	7.5

Flood Control District of Maricopa County
Hydrologic Design Manual Rational Method

Computed by: CCC Date: 07-12-94

LOCATION DATA

Location: 60TH ST AND DOVE VALLEY RD

Project Name: LA BUENA VISTA Subarea id: C5

Drainage Area Cover: 6.35

DESIGN DATA

Drainage Area	6.35	acres
Watercourse Length	1155.0	feet
Top Elevation	2131.0	feet
Bottom Elevation	2110.0	feet
Slope	.01818	feet/feet
Roughness Coefficient (Kb)	.03498	
10-Year, 6-Hour Rainfall	2.20	inches

Hydrological Summary Table

Parameter	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
Q (cfs)	10	13	15	21	27	32
C	0.450	0.450	0.450	0.495	0.540	0.563
Tc (min)	8.6	7.6	7.2	6.5	6.2	5.9
i (in/hr)	3.3	4.6	5.3	6.8	7.9	9.1

Flood Control District of Maricopa County
Hydrologic Design Manual Rational Method

Computed by: CCC Date: 07-12-94

LOCATION DATA

Location: 60TH ST AND DOVE VALLEY RD

Project Name: LA BUENA VISTA Subarea id: C6

Drainage Area Cover: 6.75

DESIGN DATA

Drainage Area	6.75	acres
Watercourse Length	970.0	feet
Top Elevation	2131.0	feet
Bottom Elevation	2110.0	feet
Slope	.02165	feet/feet
Roughness Coefficient (Kb)	.03482	
10-Year, 6-Hour Rainfall	2.20	inches

Hydrological Summary Table

Parameter	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
Q (cfs)	11	15	18	24	30	36
C	0.450	0.450	0.450	0.495	0.540	0.563
Tc (min)	7.3	6.4	6.0	5.6	5.3	5.0
i (in/hr)	3.6	4.9	5.8	7.2	8.3	9.6

Flood Control District of Maricopa County
Hydrologic Design Manual Rational Method

Computed by: CCC Date: 07-12-94

LOCATION DATA

Location: 60TH ST AND DOVE VALLEY RD

Project Name: LA BUENA VISTA Subarea id: C7

Drainage Area Cover: 3.97

DESIGN DATA

Drainage Area	3.97	acres
Watercourse Length	730.0	feet
Top Elevation	2125.0	feet
Bottom Elevation	2110.0	feet
Slope	.02055	feet/feet
Roughness Coefficient (Kb)	.03626	
10-Year, 6-Hour Rainfall	2.20	inches

Hydrological Summary Table

Parameter	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
Q (cfs)	7	9	11	15	18	21
C	0.450	0.450	0.450	0.495	0.540	0.563
Tc (min)	6.4	5.7	5.3	5.0	5.0	5.0
i (in/hr)	3.7	5.1	6.1	7.4	8.5	9.6

Project LA BUENA VISTA
Project No. 94-004701
Sheet No. _____ of _____
Calculated by CCC Date 7/12/94

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

STREET CAPACITY CHECK @ C_1

Vertical Curb (6")

CROSS SECTION PARAMETERS: FILENAME: VER-14C1.SEC

No. of Cross Section Points:	5	Bed Slope:	0.02080	Max Elev.:	10.50
Bank Stations.....Left:	0.0	Right....:	28.2	Min Elev.:	10.00
Encroachment Stations..Left:		Right....:			
Manning-n Values.....LOB:	0.015	CHANNEL..:	0.015	ROB.....:	0.015

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	10.50	0.00	2)	10.00	0.08	3)	10.28	14.08
4)	10.00	28.08	5)	10.50	28.16			

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
10.50	71.6	7.1	2.08	0.015	0.4	28.2	10.1	29.0	10.73

NOTES:

Q_{10} = 26 CFS @ C_1

Q_T at C_1 = 71.6 CFS

$Q_T > Q_{10}$ ∴ OK

Project LA BUENA VISTA
Project No. 94-0047-01
Sheet No. _____ of _____
Calculated by CCC Date 7/12/94

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

STREET CAPACITY CHECK AT C2

ROLL TYPE CURB (4")

CROSS SECTION PARAMETERS: FILENAME: C2-ROL14.SEC

No. of Cross Section Points:	15	Bed Slope:	0.01300	Max Elev.:	10.33
Bank Stations.....Left:	0.0	Right....:	29.2	Min Elev.:	10.00
Encroachment Stations..Left:		Right....:			
Manning-n Values.....LOB:	0.015	CHANNEL..:	0.015	ROB.....:	0.015

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	10.33	0.00	2)	10.28	0.40	3)	10.17	0.79
4)	10.06	1.19	5)	10.00	1.58	6)	10.04	2.00
7)	10.06	2.04	8)	10.25	14.58	9)	10.06	27.12
10)	10.04	27.17	11)	10.00	27.58	12)	10.06	27.98
13)	10.17	28.38	14)	10.28	28.77	15)	10.33	29.17

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
10.33	18.7	3.6	1.49	0.015	0.2	29.2	5.2	29.3	10.39

NOTES:

Q_{10} @ C_1 = 18 CFS

Q_T @ C_1 = 18.7 CFS

$Q_T > Q_{10}$ ∴ OK

Project LA BUENA VISTA
Project No. 94-0047-01
Sheet No. _____ of _____
Calculated by CCC Date 7/12/94

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

STREET CAPACITY CHECK @ C_3

ROLL TYPE CURB (4")

CROSS SECTION PARAMETERS: FILENAME: C3-ROL14.SEC

No. of Cross Section Points: 15 Bed Slope: 0.03000 Max Elev.: 10.33
Bank Stations.....Left: 0.0 Right....: 29.2 Min Elev.: 10.00
Encroachment Stations..Left: Right....:
Manning-n Values.....LOB: 0.015 CHANNEL..: 0.015 ROB.....: 0.015

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	10.33	0.00	2)	10.28	0.40	3)	10.17	0.79
4)	10.06	1.19	5)	10.00	1.58	6)	10.04	2.00
7)	10.06	2.04	8)	10.25	14.58	9)	10.06	27.12
10)	10.04	27.17	11)	10.00	27.58	12)	10.06	27.98
13)	10.17	28.38	14)	10.28	28.77	15)	10.33	29.17

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
10.33	28.4	5.4	2.27	0.015	0.2	29.2	5.2	29.3	10.46

NOTES:

Q_{10} @ C_3 = 11 CFS

Q_T @ C_3 = 28.4 CFS

$Q_T > Q_{10}$ ∴ OK

Project LA BUENA VISTA
Project No. 94-0047-01
Sheet No. _____ of _____
Calculated by CCC Date 7/12/94

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

STREET CAPACITY CHECK @ C4

ROLL TYPE CURB (4')

CROSS SECTION PARAMETERS: FILENAME: C4-ROL14.SEC

No. of Cross Section Points: 15 Bed Slope: 0.01400 Max Elev.: 10.33
Bank Stations.....Left: 0.0 Right....: 29.2 Min Elev.: 10.00
Encroachment Stations..Left: Right....:
Manning-n Values.....LOB: 0.015 CHANNEL..: 0.015 ROB.....: 0.015

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	10.33	0.00	2)	10.28	0.40	3)	10.17	0.79
4)	10.06	1.19	5)	10.00	1.58	6)	10.04	2.00
7)	10.06	2.04	8)	10.25	14.58	9)	10.06	27.12
10)	10.04	27.17	11)	10.00	27.58	12)	10.06	27.98
13)	10.17	28.38	14)	10.28	28.77	15)	10.33	29.17

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
10.33	19.4	3.7	1.55	0.015	0.2	29.2	5.2	29.3	10.39

NOTES:

Q_{10} @ C_4 = 16 CFS

Q_T @ C_4 = 19.4 CFS

$Q_T > Q_{10}$ ∴ OK

Project LA BUENA VISTA
Project No. 94-0047-01
Sheet No. _____ of _____
Calculated by CCC Date 7/12/94

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

STREET CAPACITY CHECK @ C5

ROLL TYPE CURB (4")

CROSS SECTION PARAMETERS: FILENAME: C5-ROL14.SEC

No. of Cross Section Points: 15 Bed Slope: 0.03000 Max Elev.: 10.33
Bank Stations.....Left: 0.0 Right....: 29.2 Min Elev.: 10.00
Encroachment Stations..Left: Right....:
Manning-n Values.....LOB: 0.015 CHANNEL..: 0.015 ROB.....: 0.015

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	10.33	0.00	2)	10.28	0.40	3)	10.17	0.79
4)	10.06	1.19	5)	10.00	1.58	6)	10.04	2.00
7)	10.06	2.04	8)	10.25	14.58	9)	10.06	27.12
10)	10.04	27.17	11)	10.00	27.58	12)	10.06	27.98
13)	10.17	28.38	14)	10.28	28.77	15)	10.33	29.17

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
10.33	28.4	5.4	2.27	0.015	0.2	29.2	5.2	29.3	10.46

NOTES:

Q_{10} @ C_5 = 15 CFS

Q_T @ C_5 = 28.4 CFS

$Q_T > Q_{10}$ ∴ ok

Project LA BUENA VISTA
Project No. 94-0047-01
Sheet No. _____ of _____
Calculated by CCC Date 7/12/94

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

STREET CAPACITY CHECK @ C6

ROLL TYPE CURB (4")

CROSS SECTION PARAMETERS: FILENAME: C6-ROL14.SEC

No. of Cross Section Points: 15 Bed Slope: 0.01800 Max Elev.: 10.33
Bank Stations.....Left: 0.0 Right....: 29.2 Min Elev.: 10.00
Encroachment Stations..Left: Right....:
Manning-n Values.....LOB: 0.015 CHANNEL..: 0.015 ROB.....: 0.015

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	10.33	0.00	2)	10.28	0.40	3)	10.17	0.79
4)	10.06	1.19	5)	10.00	1.58	6)	10.04	2.00
7)	10.06	2.04	8)	10.25	14.58	9)	10.06	27.12
10)	10.04	27.17	11)	10.00	27.58	12)	10.06	27.98
13)	10.17	28.38	14)	10.28	28.77	15)	10.33	29.17

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
10.33	22.0	4.2	1.75	0.015	0.2	29.2	5.2	29.3	10.41

NOTES:

Q_{10} @ C6 = 18 CFS

Q_T @ C6 = 22 CFS

$Q_T > Q_{10}$ ∴ ok

Project LA BUENA VISTA
Project No. 94-0047-01
Sheet No. _____ of _____
Calculated by CCC Date 7/12/94

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

STREET CAPACITY CHECK @ C7

ROLL TYPE CURB (4")

CROSS SECTION PARAMETERS: FILENAME: C7-ROL14.SEC

No. of Cross Section Points:	15	Bed Slope:	0.03000	Max Elev.:	10.33
Bank Stations.....Left:	0.0	Right....:	29.2	Min Elev.:	10.00
Encroachment Stations..Left:		Right....:			
Manning-n Values.....LOB:	0.015	CHANNEL..:	0.015	ROB.....:	0.015

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	10.33	0.00	2)	10.28	0.40	3)	10.17	0.79
4)	10.06	1.19	5)	10.00	1.58	6)	10.04	2.00
7)	10.06	2.04	8)	10.25	14.58	9)	10.06	27.12
10)	10.04	27.17	11)	10.00	27.58	12)	10.06	27.98
13)	10.17	28.38	14)	10.28	28.77	15)	10.33	29.17

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)	CRWS(ft)
10.33	28.4	5.4	2.27	0.015	0.2	29.2	5.2	29.3	10.46

NOTES:

Q_{10} @ C7 = 18 CFS

Q_T @ C7 = 28.4 CFS

$Q_T > Q_{10}$ ∴ ok

Appendix B
HEC-1 Model

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Project _____
Project No. _____
Sheet No. 1 of _____
Calculated by DWD Date 2/93
Checked by _____ Date _____

Precipitation Values: Return Period vs Duration

Duration	Return Period 2YR	10 YR	25 YR	50YR	100 YR
5 min	0.39"	0.56"	0.65"	0.72"	0.80"
15 min	0.71"	1.02"	1.18"	1.31"	1.46"
30 min	0.93	1.35"	1.56"	1.73"	1.94"
1 hr	1.14"	1.65"	1.90"	2.11"	2.36"
2 hr	1.27"	1.87"	2.17"	2.42"	2.70"
3 hr	1.36"	2.01"	2.34"	2.63"	2.92"
6 hr	1.53"	2.29"	2.68"	3.02"	3.35"

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LANDSCAPE ARCHITECTURE

Project _____

Project No. _____

Sheet No. 2 of _____

Calculated by DWD Date _____

Checked by _____ Date _____

Soil Unit Information:

Soil Unit # (1)	Soil Name (1)	Hydrologic (1) Group	SCS (2) Curve No.
6	Anthony-Arrzo Complex	A	63
96	Pinaleno-Tres Hermanos Complex	B	77
33	Eloa-Very Gravely Loam	C	85
61	Gran-Wickenburg Complex	D	88
63	Gran-Wickenburg-Rock Outcrop Complex	D	88
93	Nickel-Cave Complex	B/D	77/88
72	Lehmans-Rock Outcrop Complex	D	88

Notes

(1) Source: "Soil Survey of Aguila-Carefree Area, Parts of Maricopa and Pinal Counties" by the USDA-SCS 1986

(2) Poor Hydrologic Condition Assumed - Based on Figure 2.2-20: City of Scottsdale: Section 2.2

See Plate 6

APPENDIX A

Steps for Determination of Precipitation Values for Various Durations and Return Periods.

Sheet 1 of 3

(Source: Addendum to "Hydrologic Design for Highway Drainage in Arizona," April 1975, and ADOT, April 17, 1987)

Step 1: From the precipitation maps, Figures 2.2-1 through 2.2-12, determine the precipitation values for the six and twenty four hour durations storms for return periods of 2, 5, 10, 25, 50, and 100 years. Tabulate these values in Table 1 in the column headed "Map Values."

Table 1

Return Period (Years)	Precipitaton Values (Inches)			
	6 hour duration		24 hour duration	
	Map Value	Corrected Value	Map Value	Corrected Value
2	1.51"	1.53"	1.88"	1.91"
5	1.93"	2.00"	2.62"	2.60"
10	2.27"	2.29"	3.02"	3.05"
25	2.73"	2.68"	3.58"	3.58"
50	3.05"	3.02"	4.04"	4.07"
100	3.36"	3.35"	4.56"	4.55"

NOTE: There is a possibility of making an error while reading the maps because: (1) a site is not easy to locate precisely on a series of 12 maps, (2) there may be some slight registration differences in printing, and (3) precise interpolation between isolines is difficult. In order to minimize any errors in reading the maps, these values should be plotted on the diagram "Precipitation Depth versus Return Period," Appendix A, Figure 1.

Step 2: Plot these values on the diagram "Precipitation Depth versus Return Period," Appendix A, Figure 1.

Step 3: Draw a line of best fit through the 6 hour precipitation values and another line through the 24 hour precipitation values.

Step 4: Tabulate the values represented by the lines of best fit, obtained in Step 3, in the column of Table 1 entitled "Corrected Value."

NOTE: The 1 hour precipitation value is needed to determine the 2 and 3 hour values as well as the 5, 10, 15, and 30 minute values.

APPENDIX A

Steps for Determination of Precipitation Values for Various Durations and Return Periods.

Sheet 3 of 3

(Source: Addendum to "Hydrologic Design for Highway Drainage in Arizona," April 1975, and ADOT April 17, 1987)

Step 5: Using the 6 and 24 hour values for the 2 year and 100 year return periods, from Table 1 (corrected values), solve the following equations to determine the 1 hour values:

$$Y_2 = -0.011 + 0.942(X_1^2 / X_2)$$

$$Y_{100} = 0.494 + 0.755(X_3^2 / X_4)$$

Where: Y_2 = 2 year 1 hour value
Y_{100} = 100 year 1 hour value
X_1 = 2 year 6 hour value from Table 1
X_2 = 2 year 24 hour value from Table 1
X_3 = 100 year 6 hour value from Table 1
X_4 = 100 year 24 hour value from Table 1

Step 6: To determine 1 hour precipitation values for the other return periods, first plot the 2 year 1 hour value and the 100 year 1 hour value on Figure 1. Connect the two points by a straight line. The values on this line will give the 1 hour precipitation values for the various return periods.

Step 7: To determine the 2 and 3 hour precipitation values, use the following formula with data far the appropriate return period from Table 1 (corrected values):

$$P_{2\ hour} = 0.341\ (P_{6\ hour}) + 0.659\ (P_{1\ hour})$$
$$P_{3\ hour} = 0.569\ (P_{6\ hour}) + 0.431\ (P_{1\ hour})$$

Step 8: The 12 hour precipitation value for any return period is determined by the following equation:

$$P_{12hr} = 0.49\ P_{24\ hour} + 0.51\ P_{6\ hour}$$

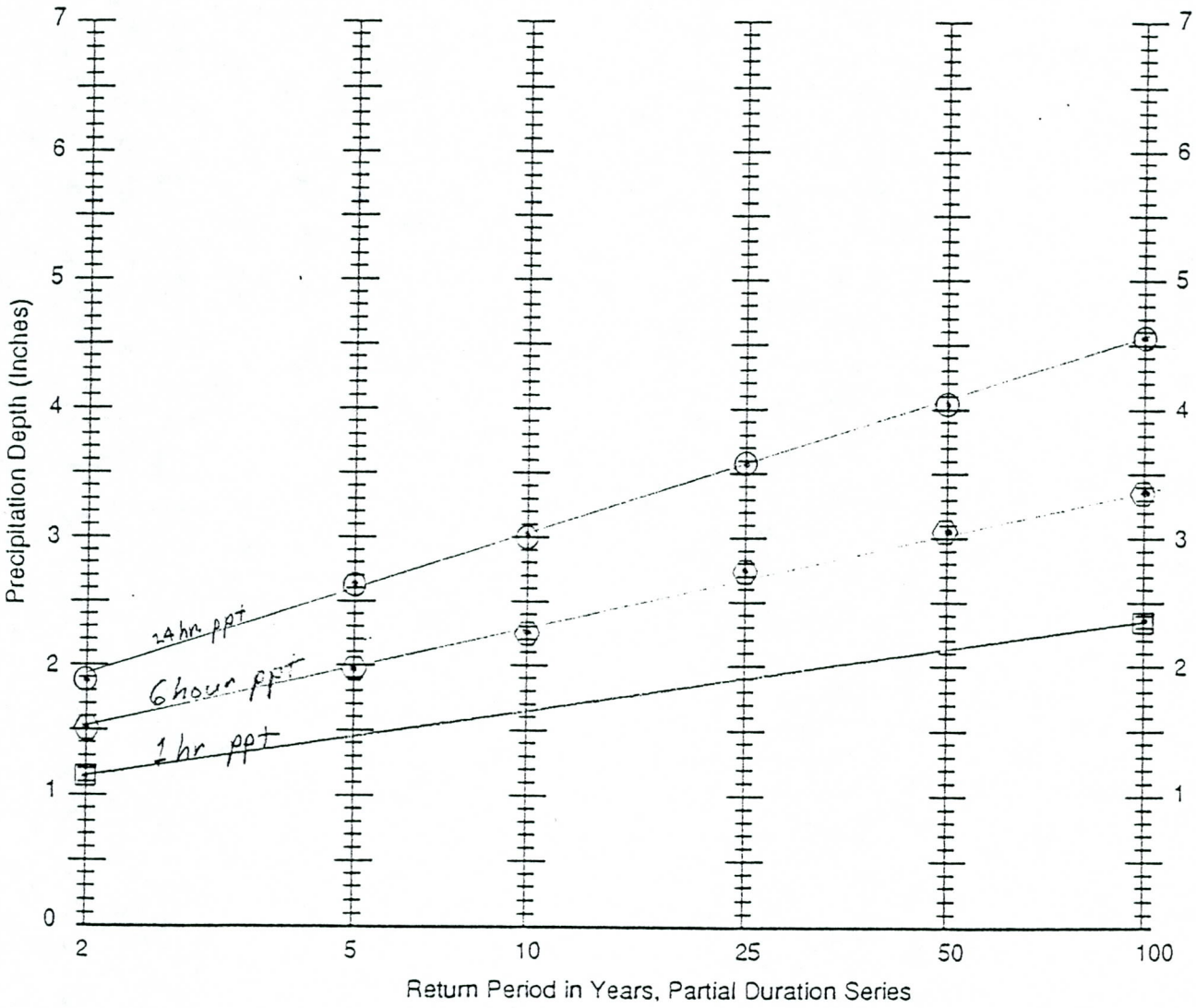
Step 9: To determine precipitation values for durations less than 1 hour for any return period, multiply the 1 hour depth by the following ration:

Duration (minutes) :	5	10	15	30
Ratio to one hour*:	.34	.51	.62	.82

*From Arkell and Richards (1986) per FCDMC's Hydrology Manual (9-90)

APPENDIX A

Figure 1
Precipitation Depth Versus Return Period for Partial - Duration Series
Sheet 2 of 3
(Source: Addendum to "Hydrologic Design for Highway Drainage in Arizona," April 1975)



Project: Desert Reserve

Station: _____

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Project Terravita
Project No. 44-0001
Sheet No. 3 of
Calculated by DWD Date 2/93
Checked by Date

- 1 Hour PPT Values Based On Table 1

$$Y_{2yr-1hr} = -0.011 + 0.942(1.53^2/1.91) = 1.14''$$

$$Y_{100yr-1hr} = 0.494 + 0.755(3.35^2/4.55) = 2.36''$$

From Figure 1:

$$Y_{5YR-1hr} = 1.45''$$

$$Y_{10YR-1hr} = 1.65''$$

$$Y_{25YR-1hr} = 1.90''$$

$$Y_{50YR-1hr} = 2.11''$$

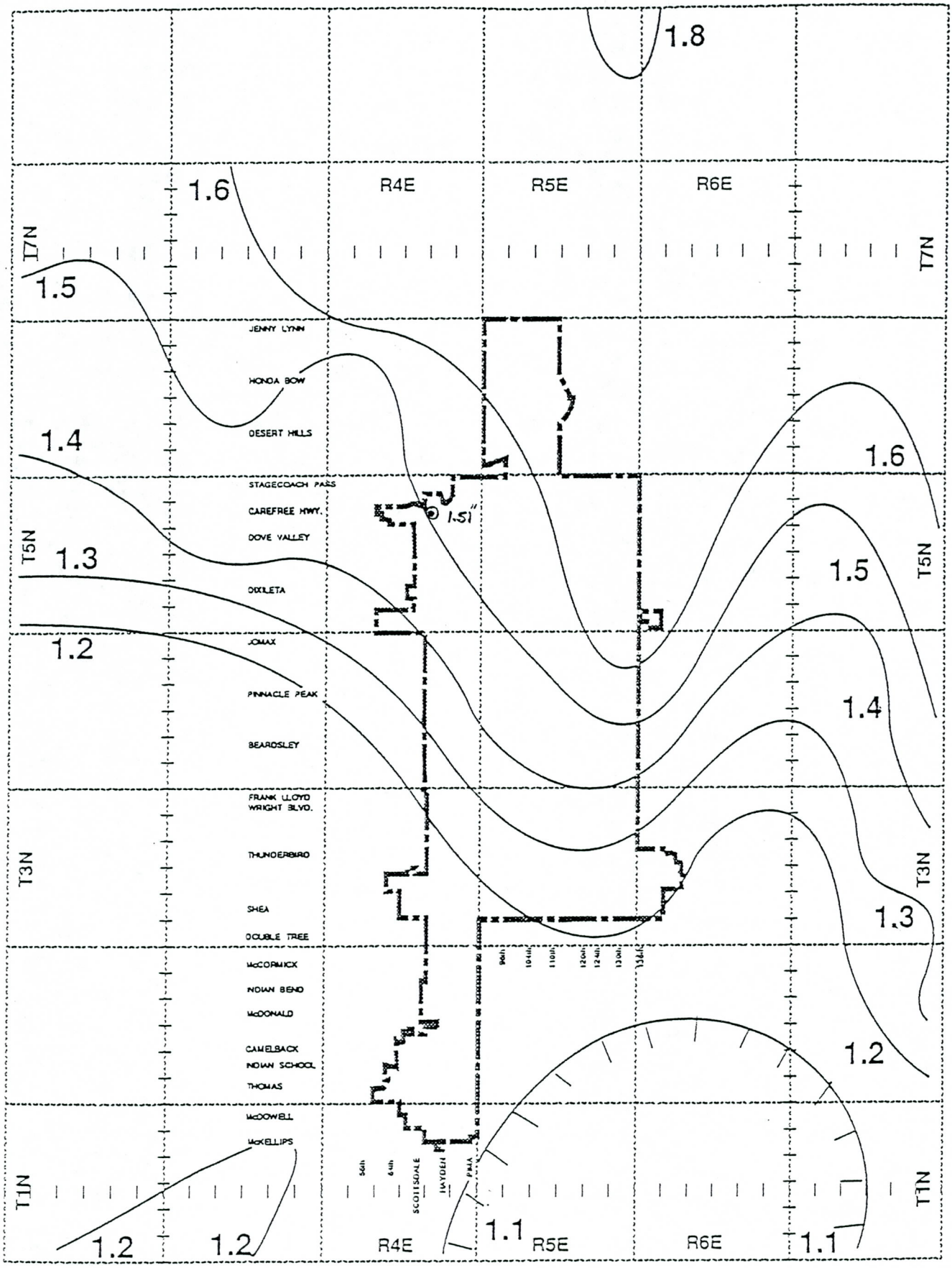

FIGURE 2.2-1

Isopluvials 2 Year 6 Hour Precipitation in Inches

Rainfall Data From NOAA Atlas 2, Vol. VIII

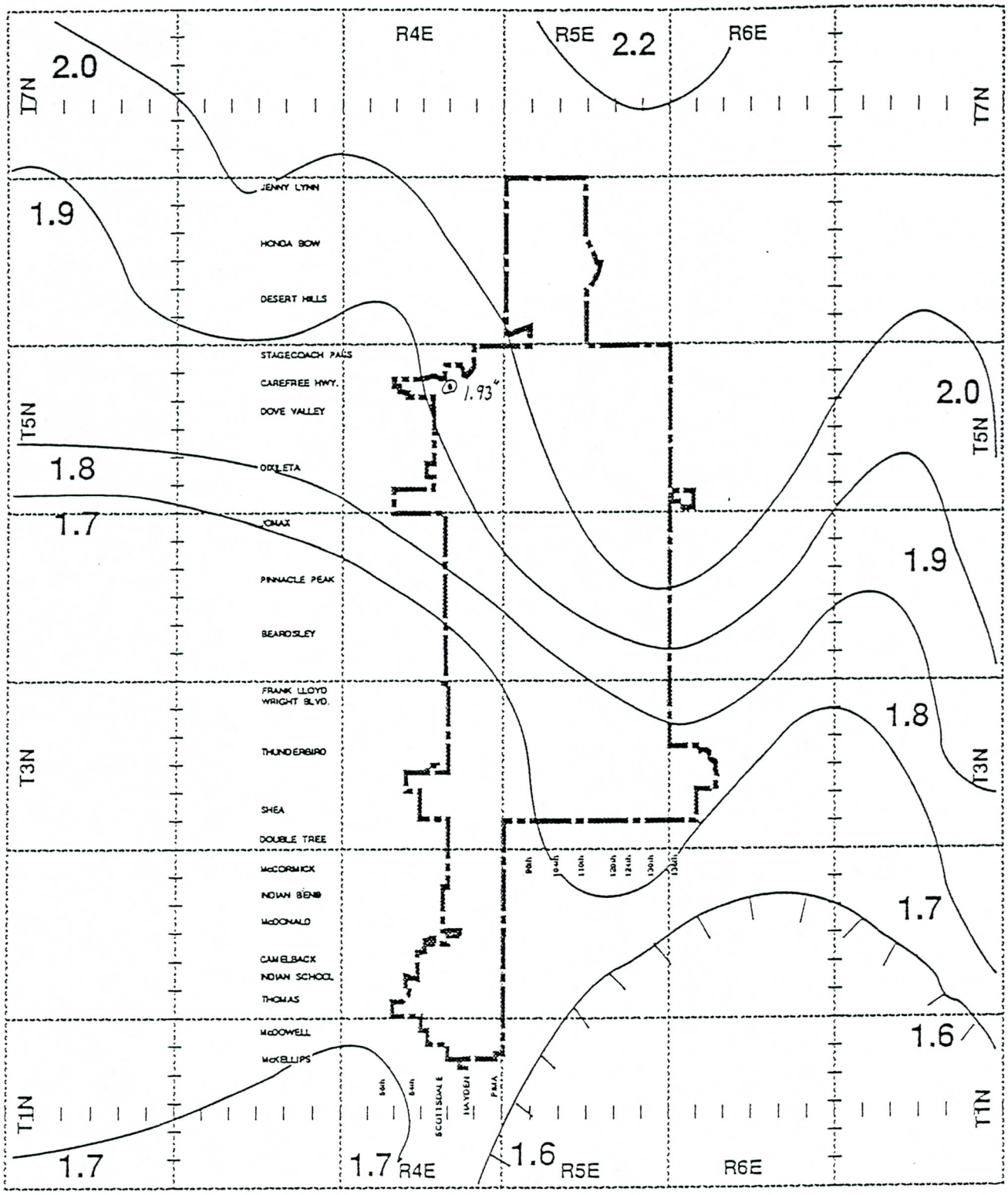

FIGURE 2.2-2

Isopluvials 5 Year 6 Hour Precipitation in Inches

Rainfall Data From NOAA Atlas 2, Vol. VIII

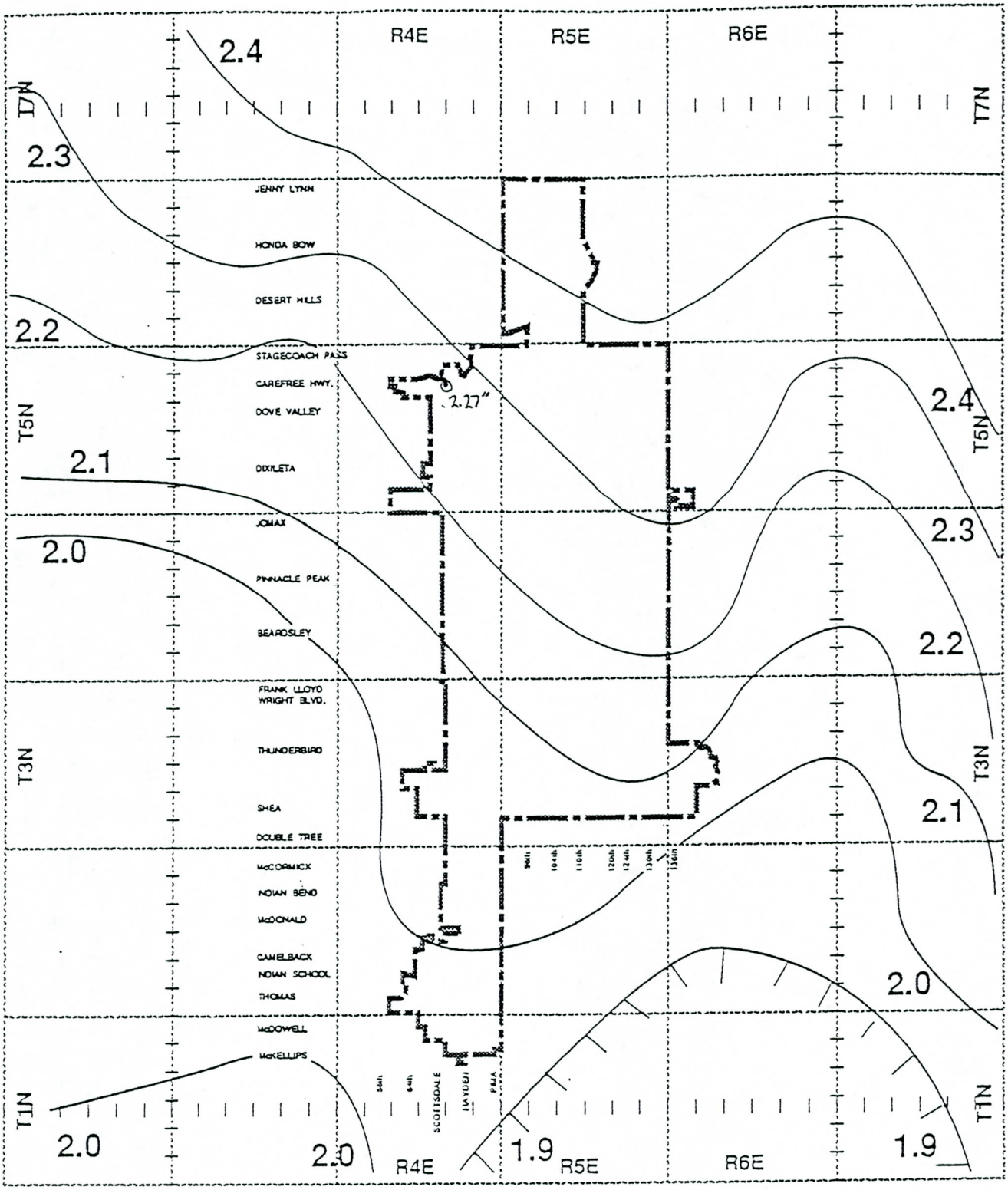

FIGURE 2.2-3

Isopluvials 10 Year 6 Hour Precipitation in Inches

Rainfall Data From NOAA Atlas 2, Vol. VIII

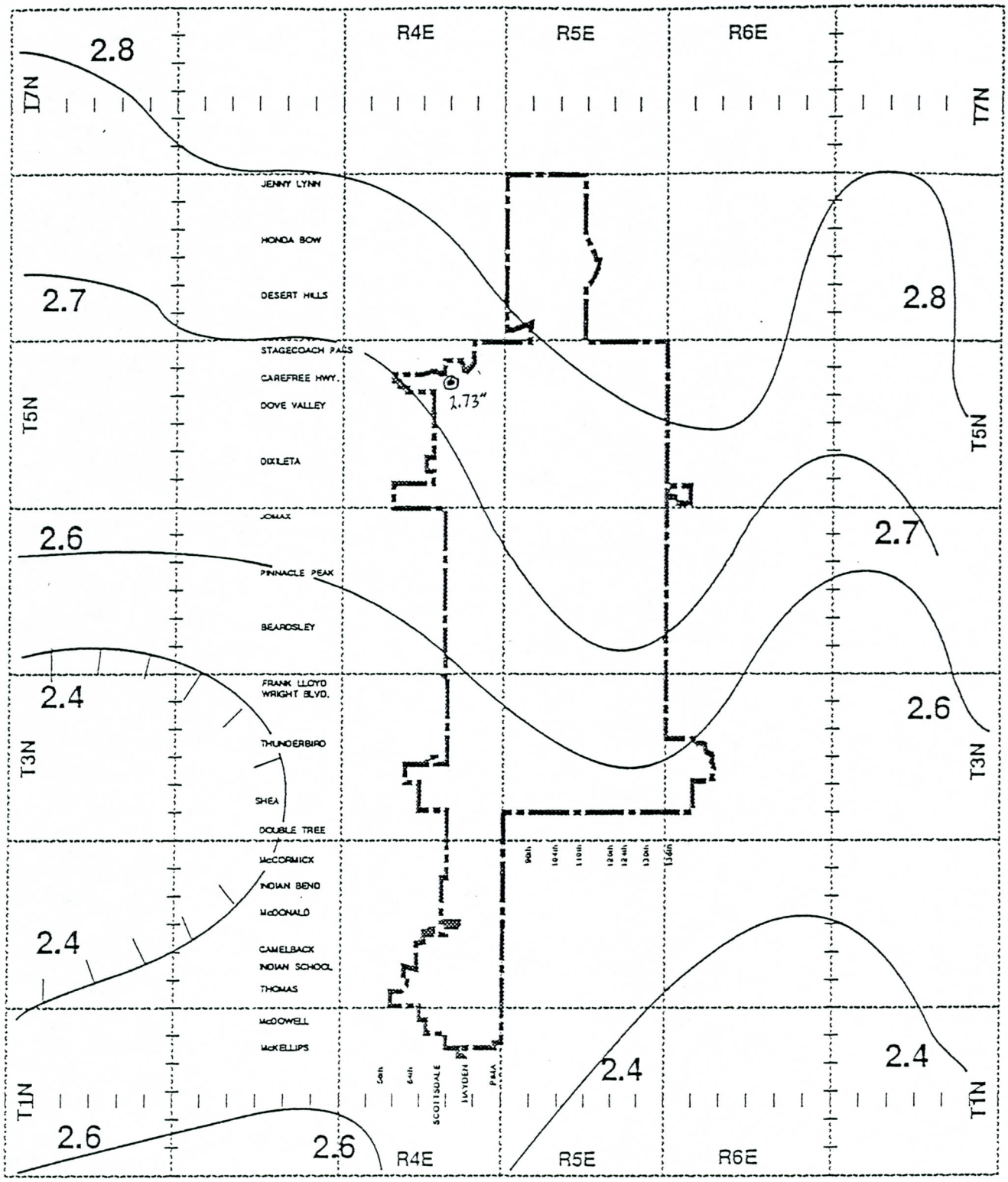

FIGURE 2.2-4

Isopluvials 25 Year 6 Hour Precipitation in Inches

Rainfall Data From NOAA Atlas 2, Vol. VIII

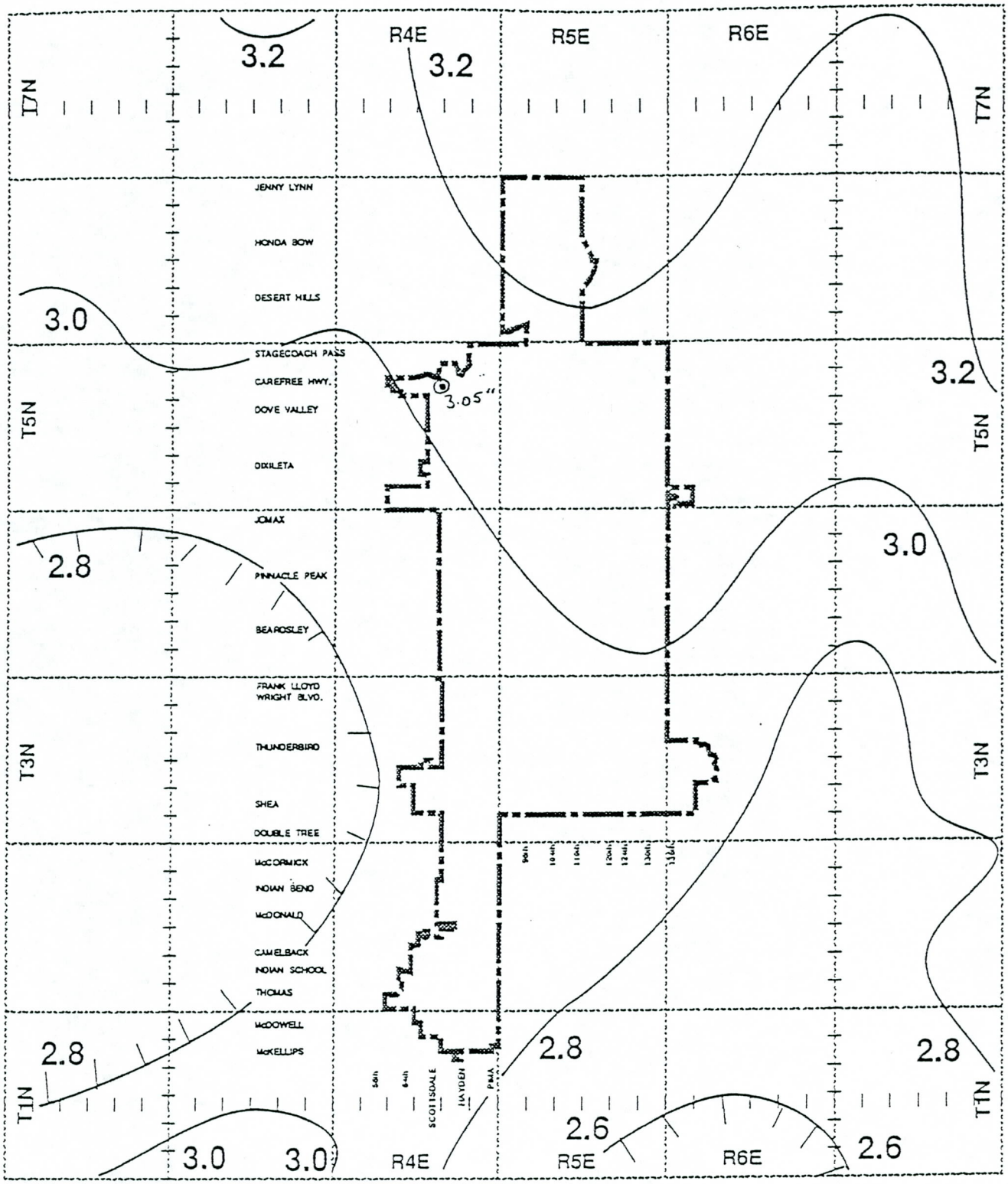

FIGURE 2.2-5

Isopluvials 50 Year 6 Hour Precipitation in Inches

Rainfall Data From NOAA Atlas 2, Vol. VIII

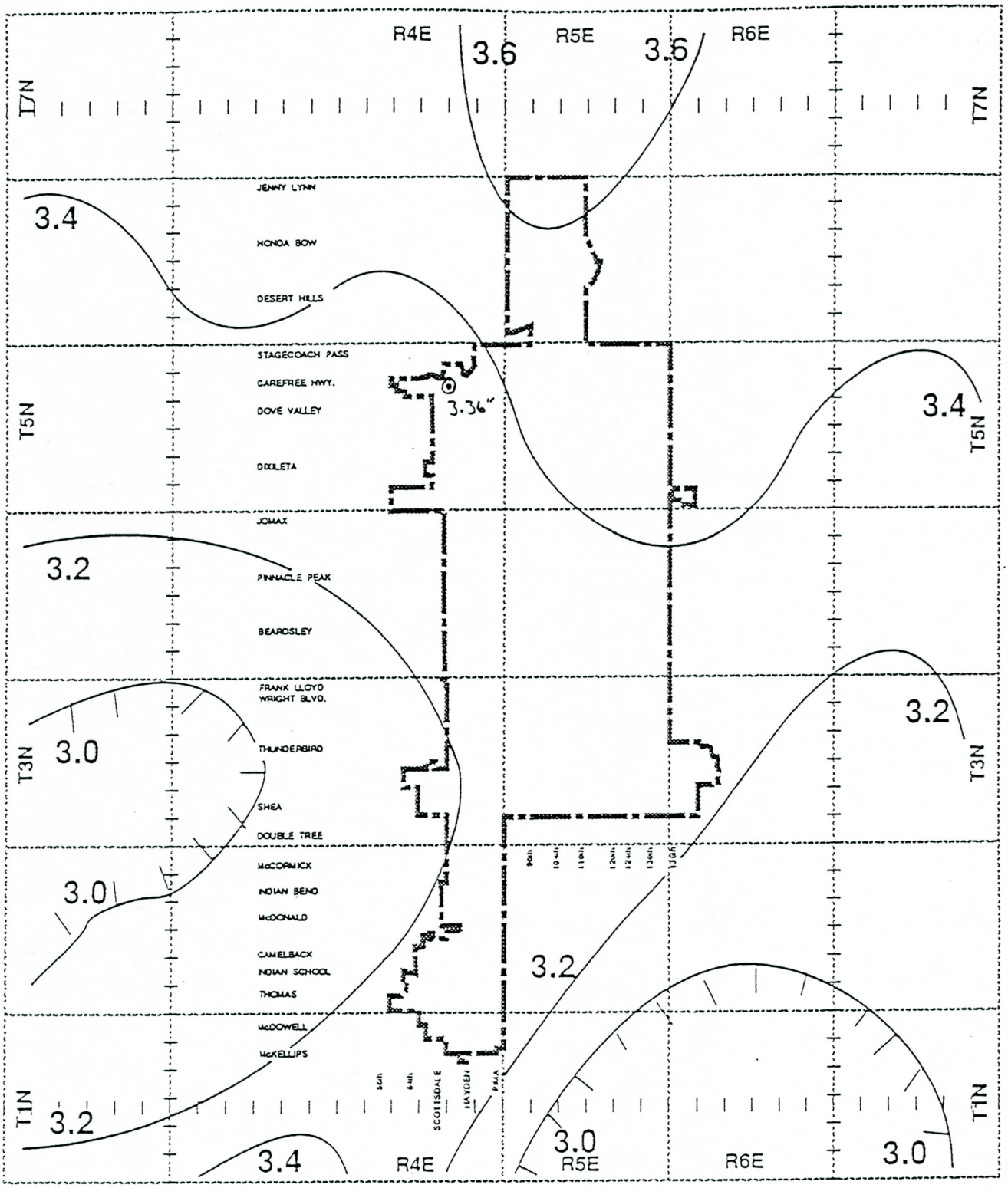

FIGURE 2.2-6

Isopluvials 100 Year 6 Hour Precipitation in Inches

Rainfall Data From NOAA Atlas 2, Vol. VIII

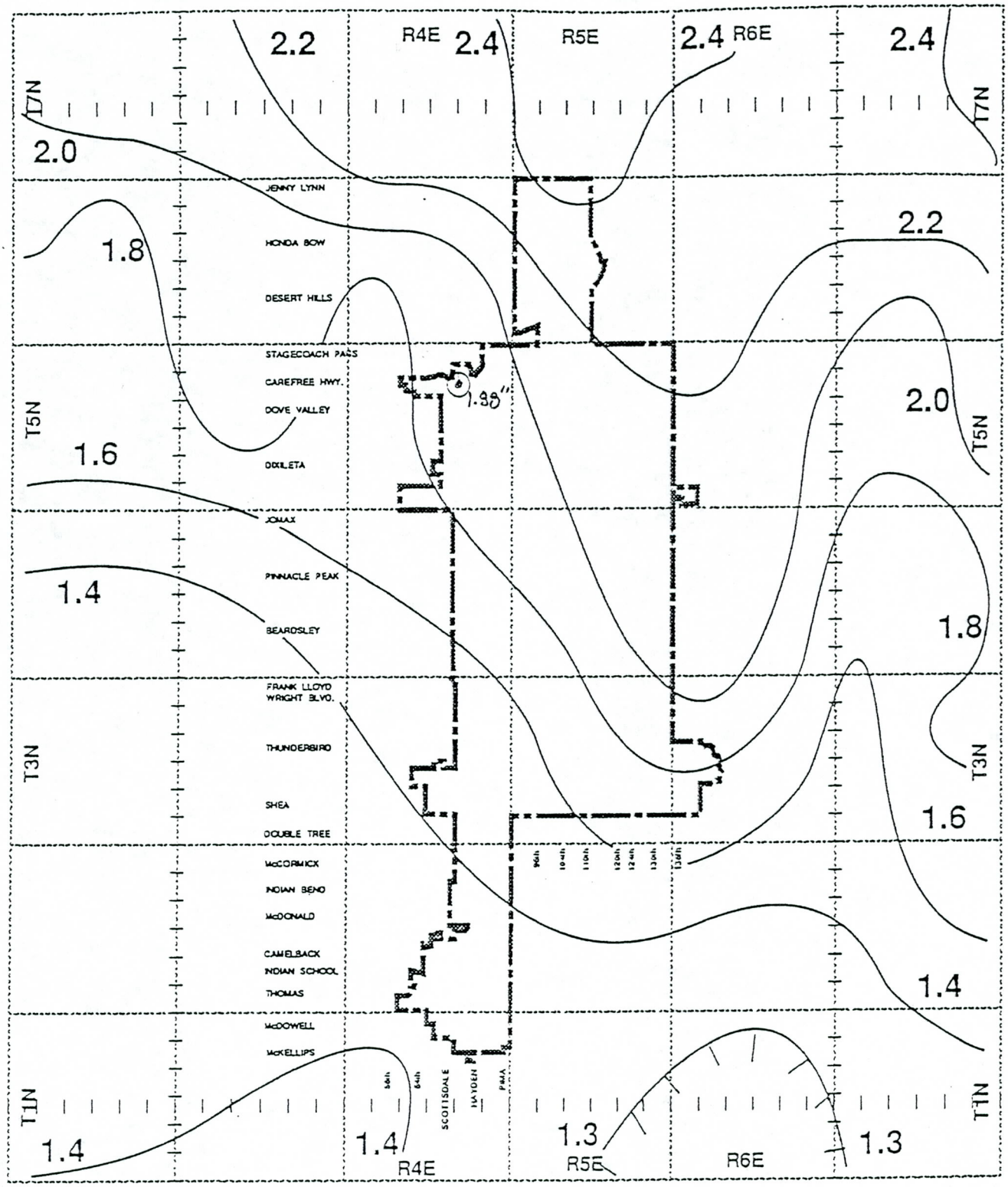

FIGURE 2.2-7

Isopluvials 2 Year 24 Hour Precipitation in Inches

Rainfall Data From NOAA Atlas 2, Vol. VIII

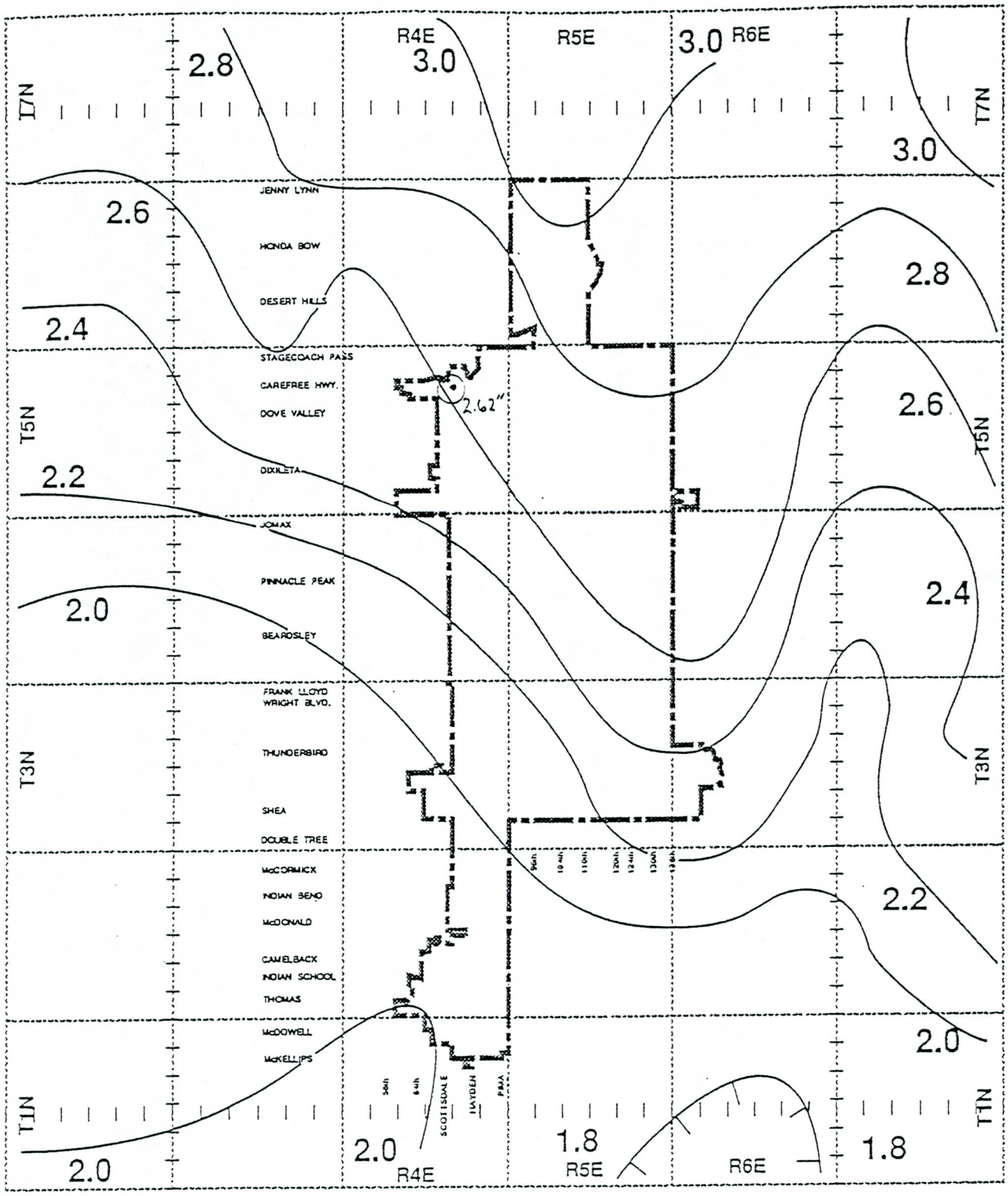

FIGURE 2.2-8

Isopluvials 5 Year 24 Hour Precipitation in Inches

Rainfall Data From NOAA Atlas 2, Vol. VIII

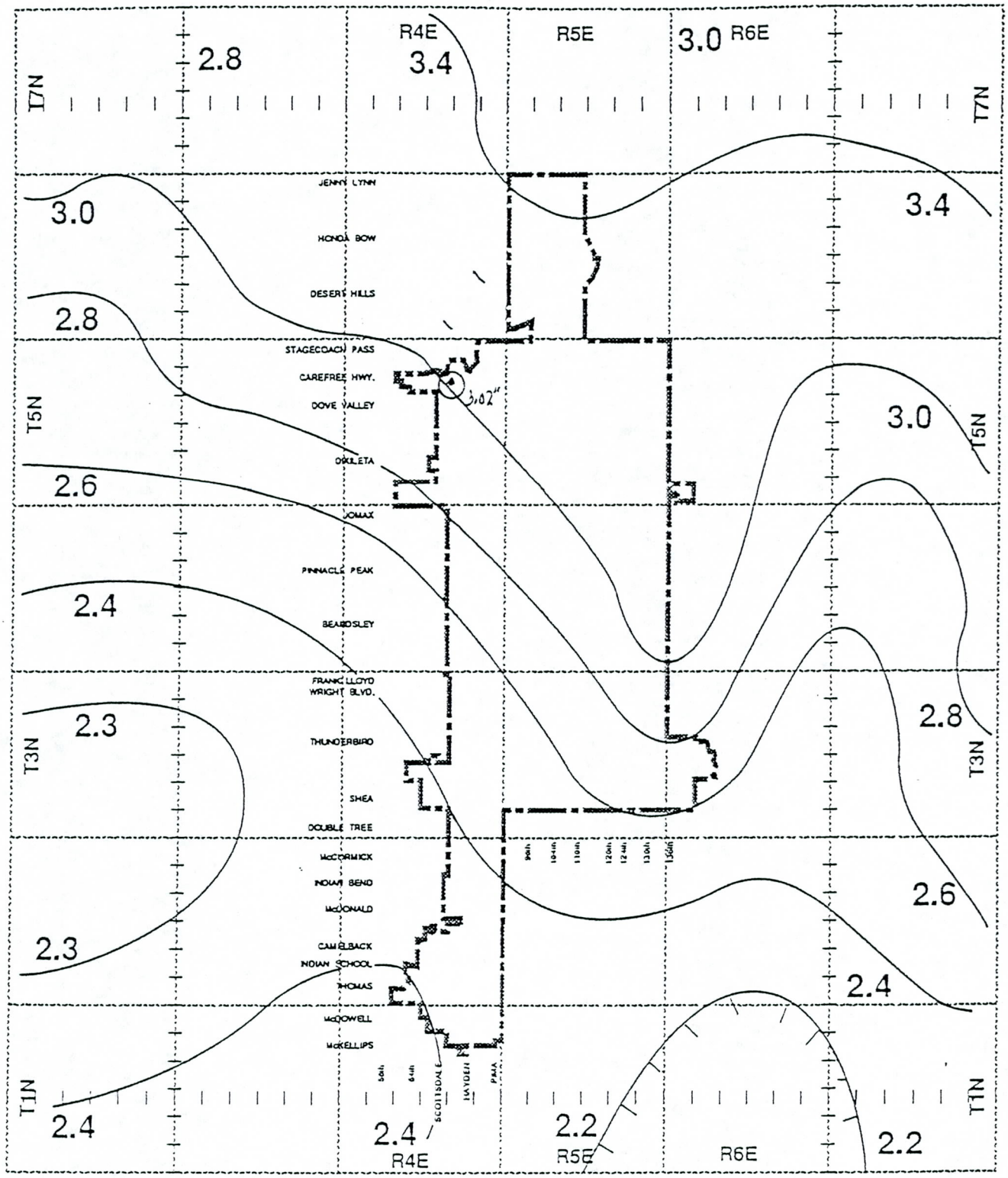

FIGURE 2.2-9

Isopluvials 10 Year 24 Hour Precipitation in Inches

Rainfall Data From NOAA Atlas 2, Vol. VIII

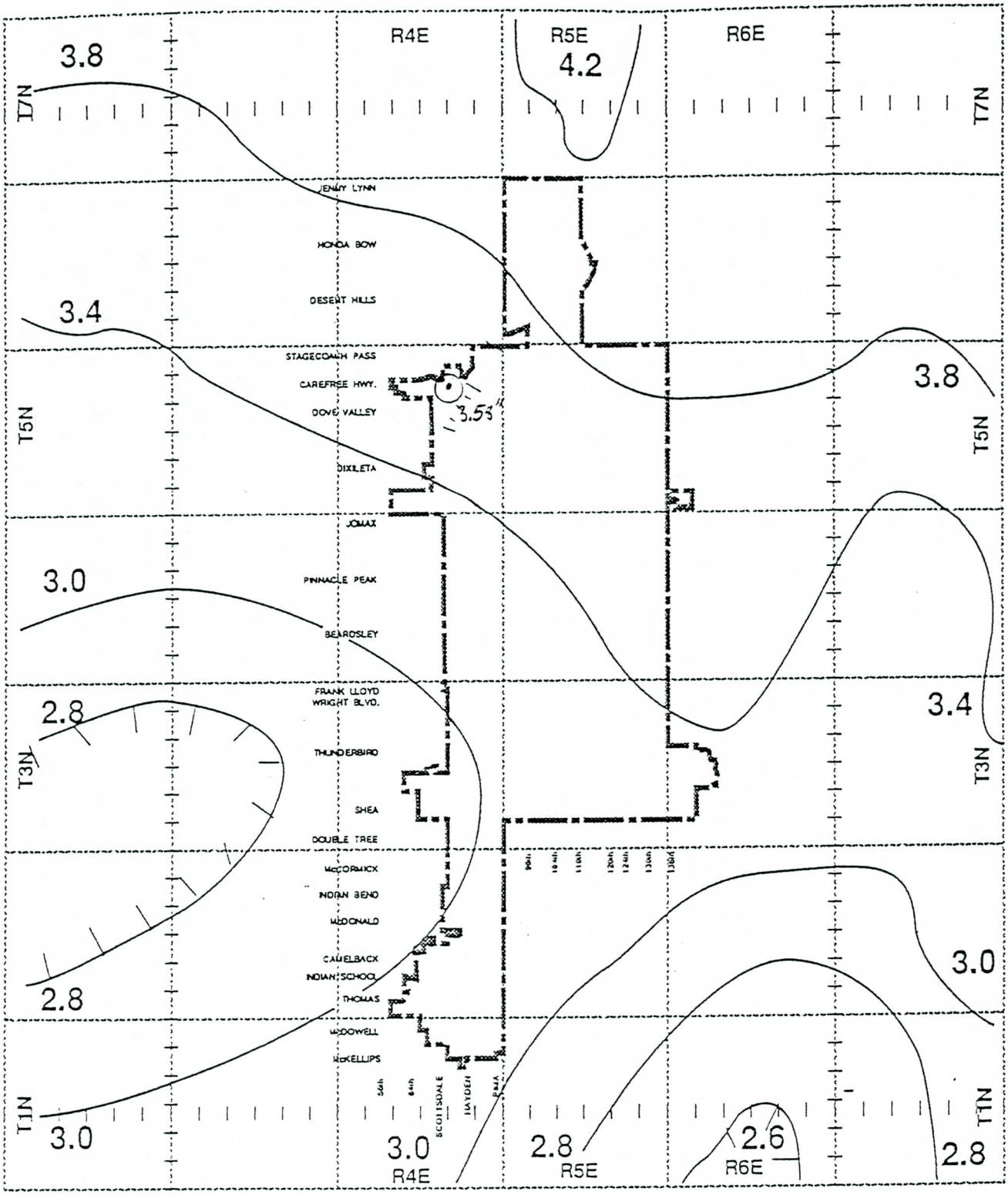

FIGURE 2.2-10

Isopluvials 25 Year 24 Hour Precipitation in Inches

Rainfall Data From NOAA Atlas 2, Vol. VIII

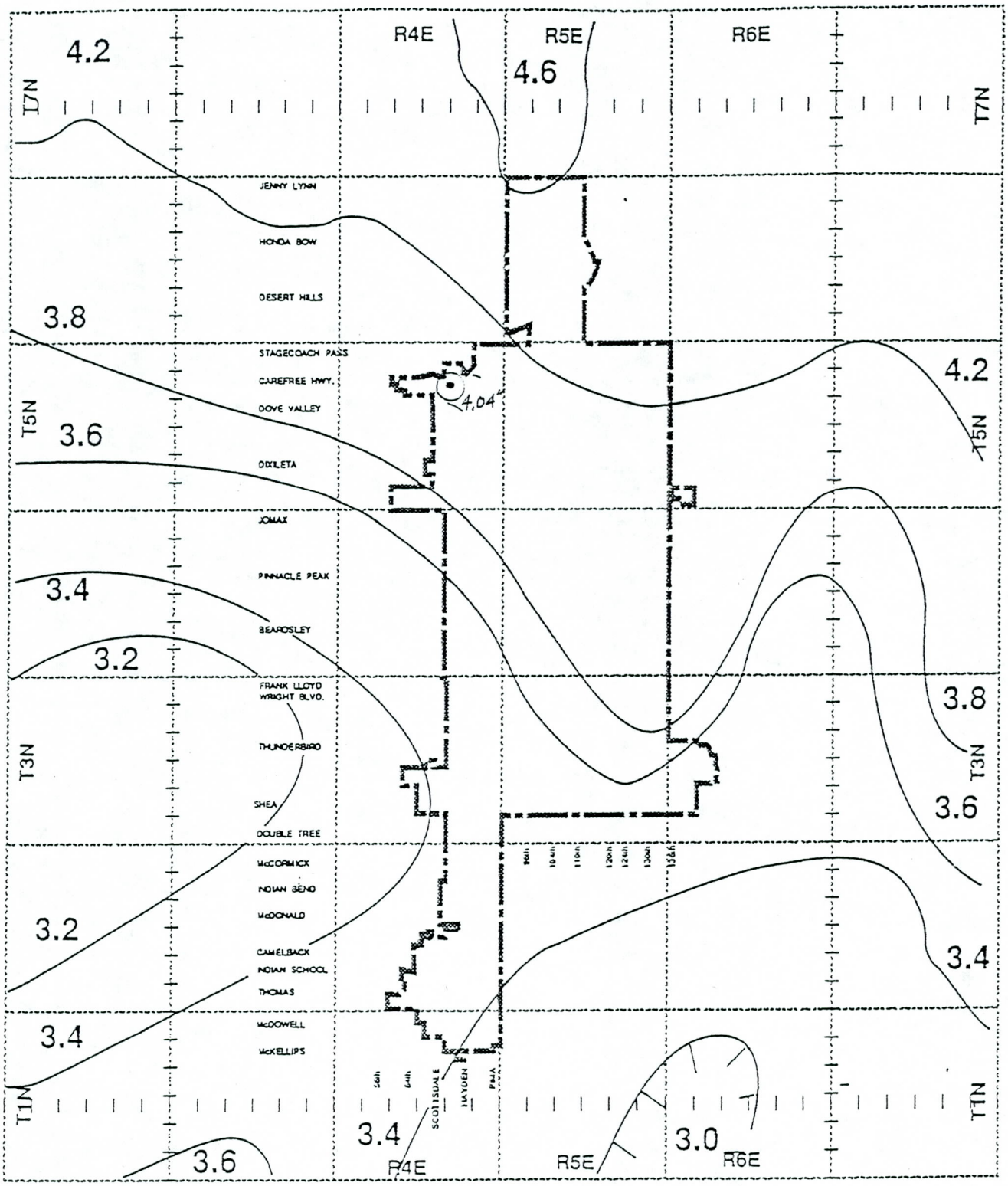

FIGURE 2.2-11

Isopluvials 50 Year 24 Hour Precipitation in Inches

Rainfall Data From NOAA Atlas 2, Vol. VIII

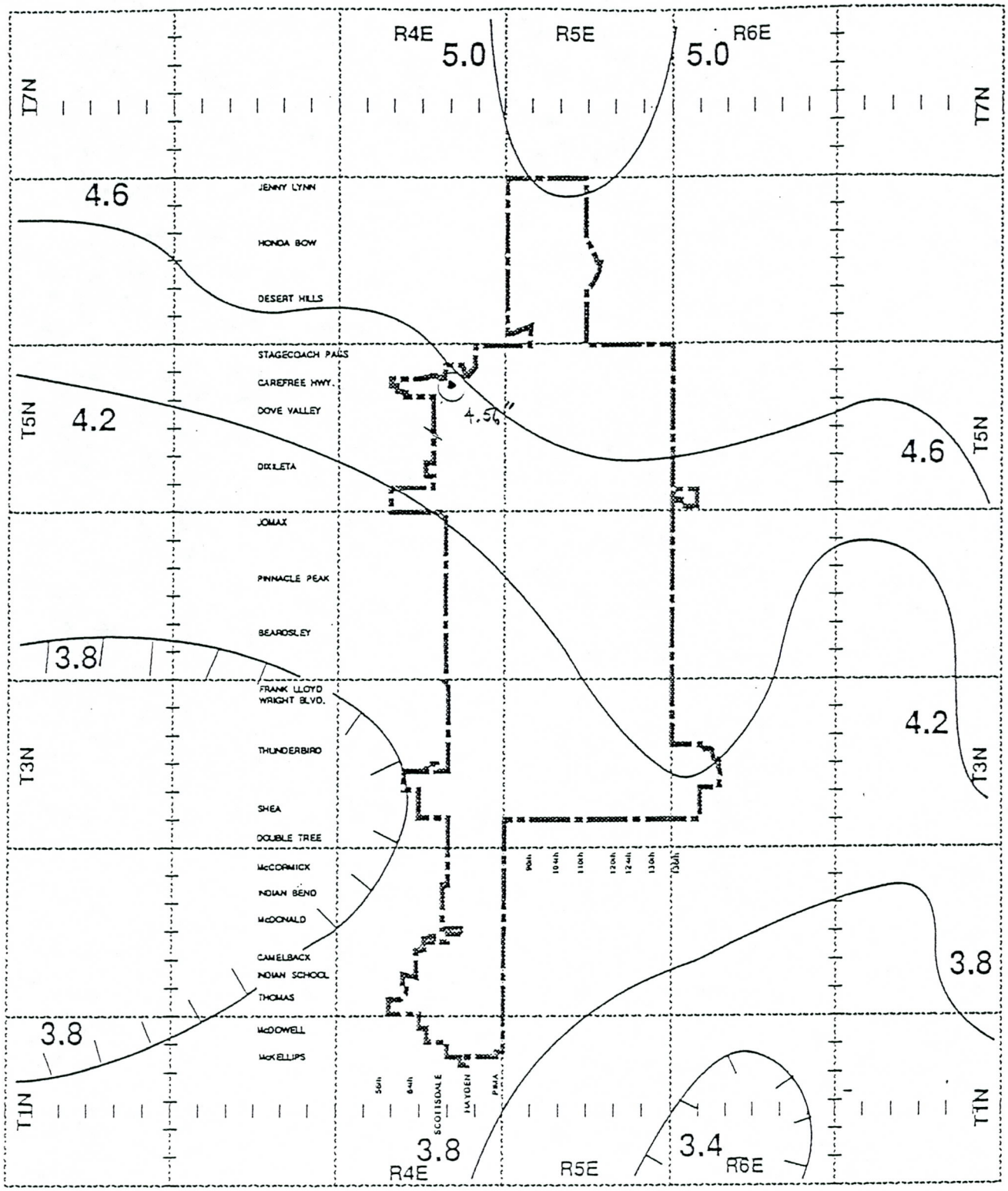

FIGURE 2.2-12

Isopluvials 100 Year 24 Hour Precipitation in Inches

Rainfall Data From NOAA Atlas 2, Vol. VIII

CURVE NUMBER COMPUTATIONS - EXISTING CONDITIONS

PERCENTAGE OF SOIL UNIT IN SUB-BASIN
Watershed Condition Assumed : POOR

BASIN ID	UNIT 6 (CN=63)	UNIT 96 (CN=77)	UNIT 33 (CN=85)	UNITS 61, 63,93,72 (CN=88)	WEIGHTED CURVE NUMBER	PERCENT URBAN	EST. D.U. PER ACRE	PERCENT IMPERVIOUS	TOTAL PERCENT IMPERVIOUS
OFF-SITE SUB-BASINS									
S8			100		85	80	2.5	32	26
S10			25	75	87	60	2.5	32	19
S12			100		85	100	2.5	32	32
S14			50	50	87	90	2.5	32	29
S16		20		80	86	100	2.5	32	32
S20			40	60	87	95	2.5	32	30
S30			10	90	88	95	4	40	38
S40	2	3	90	5	84	50	2	29	15
S50	5		20	75	86	100	3	35	35
S60		5	30	65	87	40	4	40	16
S70			100		85	100	4	40	40
S80			90	10	85				
S90			70	30	86				
S94			70	30	86				
S100			65	35	86				
ON-SITE SUB-BASINS									
S13	5			95	87				
S24	5	55	40		80				
S26	2	90	8		77				
S28	8	2	90		83				
S32		90	10		78				
S54	5	40	55		81				
S56	5	95			76				
S62		5	95		85				
S64	5		95		84				
S66		100			77				
S68	5	95			76				
S82	5		95		84				
S92			100		85				
S101			100		85				
S102			100		85				
S110		20	80		83				
S120			90	10	85				
S140			100		85				
S150			100		85				

ROUTING PARAMETERS - NORMAL DEPTH STORAGE

NMIN = 5 MIN

NSTPS = ((L)/(V*NMIN))(1 MIN/60 SEC)

WHERE: NSTPS = NUMBER OF TIME STEPS

L = REACH LENGTH (ft)

V = AVERAGE VELOCITY (fps)

NMIN = NO. OF MINUTES IN EACH TIME STEP

ROUTE ID	SLOPE (ft/ft)	REACH LENGTH(ft)	BOT. WIDTH OF CHAN.(FT)	OVERBANK WIDTHS(ft)	AVE. VEL.(fps)	NSTPS
R20	0.017	2050	60	50 & 50	8.5	0.8
R25	0.017	3550	60	50 & 50	8.5	1.4
R2L	0.017	3850	20	40 & 40	7.5	1.7
R30	0.018	2250	20	40 & 40	7.9	0.9
R48	0.023	8400	12	40 & 40	9.0	3.1
R51	0.015	3050	20	40 & 40	7.0	1.5
R54	0.016	4150	60	50 & 50	8.0	1.7
R70	0.017	6850	20	40 & 40	7.9	2.9
R5R	0.018	1470	12	40 & 40	7.7	0.6
R5L	0.018	1750	12	40 & 40	7.7	0.8
R80	0.018	2320	12	40 & 40	7.7	1.0
R90	0.018	3510	12	40 & 40	7.7	1.5
R94	0.018	1950	12	40 & 40	7.7	0.8
R100	0.018	1320	12	40 & 40	7.7	0.6
R102	0.018	1580	12	40 & 40	7.7	0.7

- TRAVEL TIME COMPUTATIONS
OFF-SITE BASINS - EXISTING CONDITIONS

BASIN ID	S8	S10	S12	S14	S16	S20	S30	S40	S50	S60	S70	S80	S90	S94	S100
SUB-BASIN AREA(SQ.MI.):	0.031	0.368	0.034	0.119	0.044	1.910	0.420	1.600	0.530	1.810	0.029	0.058	0.063	0.132	0.148
SHEET FLOW:(1)															
Manning-n Value:	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.011	0.13	0.13	0.13	0.13
Slope(ft/ft):	0.1	0.1	0.05	0.1	0.05	0.025	0.025	0.025	0.025	0.025	0.025	0.1	0.1	0.1	0.1
Flow Length(ft):	100	100	100	100	100	200	200	200	200	200	200	100	100	100	100
TRAVEL TIME T1(hr):	0.090	0.090	0.119	0.090	0.119	0.274	0.274	0.274	0.274	0.274	0.038	0.090	0.090	0.090	0.090
SHALLOW CONC. FLOW:(2)															
Flow Length(ft):	500	500	500	500	500	750	750	750	750	750	750	500	500	500	500
Slope(ft/ft):	0.05	0.05	0.05	0.05	0.05	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.05	0.05	0.05
Average Velocity(fps):	3.30	3.30	3.30	3.30	3.30	2.25	2.25	2.25	2.25	2.25	2.25	3.30	3.30	3.30	3.30
TRAVEL TIME T1(hr):	0.04	0.04	0.04	0.04	0.04	0.09	0.09	0.09	0.09	0.09	0.09	0.04	0.04	0.04	0.04
MAIN CHANNEL:(3)															
Flow Length(ft):	900	5680	900	3000	1500	20500	7650	25230	10410	23520	1250	2850	2400	3500	3850
Average Velocity(fps):	5.00	5.50	5.00	5.00	5.00	5.50	5.50	5.50	5.50	5.50	5.00	5.50	5.50	5.50	5.50
TRAVEL TIME T1(hr):	0.05	0.29	0.05	0.17	0.08	1.04	0.39	1.27	0.53	1.19	0.07	0.14	0.12	0.18	0.19
TOTAL TRAVEL LENGTH(FT)	1500	6280	1500	3600	2100	21450	8600	26180	11360	24470	2200	3450	3000	4100	4450
TOTAL TRAVEL TIME(hr):	0.183	0.419	0.211	0.299	0.245	1.402	0.753	1.641	0.892	1.555	0.200	0.276	0.254	0.309	0.327
LAG TIME = 0.6 Tc (hr):	0.110	0.252	0.127	0.180	0.147	0.841	0.452	0.985	0.535	0.933	0.120	0.166	0.152	0.186	0.196

NOTES:
(1) Based on Manning's kinimatic solution(Scottsdale Hydrology Manual: Section 2.2)
(2) Based on Figure B-1(Scottsdale Hydrology Manual: Section 2.2)
(3) Based on normal depth computations for various channels

- TRAVEL TIME COMPUTATIONS
ON-SITE BASINS - EXISTING CONDITIONS

BASIN ID	S13	S24	S26	S28	S32	S54	S56	S62	S64	S66	S68	S82	S92	S110	S120
SUB-BASIN AREA(SQ.MI.):	0.078	0.034	0.119	0.081	0.074	0.044	0.171	0.193	0.017	0.115	0.047	0.052	0.083	0.109	0.052
SHEET FLOW:(1)															
Manning-n Value:	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.011	0.13	0.13	0.13	0.13
Slope(ft/ft):	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025
Flow Length(ft):	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
TRAVEL TIME T1(hr):	0.274	0.274	0.274	0.274	0.274	0.274	0.274	0.274	0.274	0.274	0.038	0.274	0.274	0.274	0.274
SHALLOW CONC. FLOW:(2)															
Flow Length(ft):	750	750	750	750	750	750	750	750	500	500	750	750	750	750	750
Slope(ft/ft):	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Average Velocity(fps):	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25
TRAVEL TIME T1(hr):	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.06	0.06	0.09	0.09	0.09	0.09	0.09
MAIN CHANNEL:(3)															
Flow Length(ft):	2800	1850	3700	2000	1800	1700	6200	7150	550	850	1200	2600	1700	3750	2200
Average Velocity(fps):	4.50	4.00	5.00	4.50	4.50	4.00	5.00	5.00	4.00	5.00	4.00	4.50	4.50	5.00	4.50
TRAVEL TIME T1(hr):	0.17	0.13	0.21	0.12	0.11	0.12	0.34	0.40	0.04	0.05	0.08	0.16	0.10	0.21	0.14
TOTAL TRAVEL LENGTH(FT)	3750	2800	4650	2950	2750	2650	7150	8100	1250	1550	2150	3550	2650	4700	3150
TOTAL TRAVEL TIME(hr):	0.540	0.495	0.572	0.490	0.478	0.485	0.711	0.764	0.374	0.383	0.214	0.527	0.472	0.575	0.503
LAG TIME = 0.6 Tc (hr):	0.324	0.297	0.343	0.294	0.287	0.291	0.427	0.458	0.224	0.230	0.128	0.316	0.283	0.345	0.302

NOTES:
(1) Based on Manning's kinimatic solution(Scottsdale Hydrology Manual: Section 2.2)
(2) Based on Figure B-1(Scottsdale Hydrology Manual: Section 2.2)
(3) Based on normal depth computations for various channels

- TRAVEL TIME COMPUTATIONS
ON-SITE BASINS - EXISTING CONDITIONS

BASIN ID	S101	S102	S140	S150
SUB-BASIN AREA(SQ.MI.):	0.047	0.014	0.032	0.013
SHEET FLOW:(1)				
Manning-n Value:	0.13	0.13	0.13	0.13
Slope(ft/ft):	0.025	0.025	0.025	0.025
Flow Length(ft):	200	200	200	200
TRAVEL TIME T1(hr):	0.274	0.274	0.274	0.274
SHALLOW CONC. FLOW:(2)				
Flow Length(ft):	750	300	500	300
Slope(ft/ft):	0.02	0.02	0.02	0.02
Average Velocity(fps):	2.25	2.25	2.25	2.25
TRAVEL TIME T1(hr):	0.09	0.04	0.06	0.04
MAIN CHANNEL:(3)				
Flow Length(ft):	1400	1300	1650	1200
Average Velocity(fps):	4.50	4.50	4.00	4.00
TRAVEL TIME T1(hr):	0.09	0.08	0.11	0.08
TOTAL TRAVEL LENGTH(FT)	2350	1800	2350	1700
TOTAL TRAVEL TIME(hr):	0.453	0.391	0.450	0.395
LAG TIME = 0.6 Tc (hr):	0.272	0.235	0.270	0.237

NOTES:
(1) Based on Manning's kinimatic solution(Scottsdale Hydrology Manual: Section 2.2)
(2) Based on Figure B-1(Scottsdale Hydrology Manual: Section 2.2)
(3) Based on normal depth computations for various channels

```
****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*          SEPTEMBER 1990              *
*           VERSION 4.0                *
*                                      *
* RUN DATE  07/12/1994  TIME  11:43:57 *
*                                      *
****************************************
```

```
****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*           (916) 756-1104             *
*                                      *
****************************************
```

```
X     X  XXXXXXX   XXXXX           X
X     X  X        X     X         XX
X     X  X        X               X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X               X
X     X  X        X     X         X
X     X  XXXXXXX   XXXXX          XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  1           ID        H1BV100E
  2           ID        LA BUENA VISTA - EXISTING CONDITIONS: OFFSITE DRAINAGE
  3           ID        CONSISTENT WITH TERRAVITA MASTER DRAINAGE PLAN
  4           ID        100 YR - 6HR RAINFALL EVENT
  5           ID        HEC-1 HYPOTHETICAL DISTRIBUTION
  6           ID        LAG TIMES: travel time calculations
  7           ID        CURVE NUMBERS: RANGE 76 TO 88
  8           ID                VEGETATION: POOR CONDITION DESERT SHRUB
  9           ID                SOIL TYPES:  A, B, C & D
 10           ID        DEPTH AREA REDUCTION FACTORS (PER NOAA HYDRO-40)
 11           ID        AREA(SQMI)      %
 12           ID        --------------------
 13           ID         0             1.0
 14           ID         1             0.99
 15           ID         2             0.98
 16           ID         3             0.97
 17           ID         4             0.965
 18           ID        --------------------
              *DIAGRAM
 19           IT       5                    300
 20           IO       5       0
 21           JR    PREC   1.000    0.99   0.980   0.970   0.965

 22           KK     S14
 23           KM    SUB-BASIN S14: OFF-SITE
 24           PH                    0.80    1.46    2.36    2.70    2.92    3.35
 25           BA    .119
 26           LS              87     29.
 27           UD     .18

 28           KK     S16
 29           KM    SUB-BASIN S16: OFF-SITE
 30           BA    .044
 31           LS              86     32.
 32           UD    .147

 33           KK     S20
 34           KM    SUB-BASIN S20: OFF-SITE
 35           BA    1.91
 36           LS              87     30.
 37           UD    .841

 38           KK     R20
 39           KM     ROUTE S20 THRU S24
 40           KM      BOTTOM WIDTH OF MAIN CHANNEL = 60':(TYPICAL)
 41           KM      DEPTH OF MAIN CHANNEL = 2.5':(TYPICAL)
 42           KM      OVERBANKS = 50':(TYPICAL)
 43           RS       1    ELEV      10
 44           RC    .055    .035    .055    2050    .017
 45           RX    48.5    51.5   101.5     104     164   166.5   216.5   219.5
 46           RY    15.5    12.5    12.5      10      10    12.5    12.5    15.5
```

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  47          KK     S24
  48          KM    SUB-BASIN S24: ON-SITE
  49          BA    .034
  50          LS              80
  51          UD    .297

  52          KK     C24
  53          KM     COMBINE S14, S16, S20/R20, & S24
  54          HC       4

  55          KK   DIV1R
  56          KM    DIVERT #1:DIV1R - FLOW IN MAIN CHANNEL: WASH 1
  57          DT   DIV1L
  58          DI      0.      9.    132.    458.   1140.   2174.   3491.
  59          DQ      0.      0.     48.    223.    647.   1330.   2208.

  60          KK   RET1L
  61          KM    RETRIEVE DIV1L
  62          DR   DIV1L

  63          KK   DIV2R
  64          KM    DIVERT #2:DIV2R - FLOW IN MAIN CHANNEL: WASH 1
  65          DT   DIV2L
  66          DI      0.      8.     50.    188.    370.    697.   1376.
  67          DQ      0.      8.     38.    119.    203.    361.    613.

  68          KK     C25
  69          KM    COMBINE DIV1R & DIV2R
  70          HC       2

  71          KK     R25
  72          KM    ROUTE C25 THRU S13
  73          KM      BOTTOM WIDTH OF MAIN CHANNEL = 60':(TYPICAL)
  74          KM      DEPTH OF MAIN CHANNEL = 2.5':(TYPICAL)
  75          KM      OVERBANKS = 50':(TYPICAL)
  76          RS       1    ELEV      10
  77          RC    .055    .035    .055    3550    .017
  78          RX    48.5    51.5   101.5     104     164   166.5   216.5   219.5
  79          RY    15.5    12.5    12.5      10      10    12.5    12.5    15.5

  80          KK      S8
  81          KM    SUB-BASIN S8: OFF-SITE
  82          BA    .031
  83          LS              85     26.
  84          UD    .110

  85          KK     S10
  86          KM    SUB-BASIN S10: OFF-SITE
  87          BA    .368
  88          LS              87     19.
  89          UD    .252
```

Same wash or different wash

reason for divert not seen

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  90          KK     S12
  91          KM    SUB-BASIN S12: OFF-SITE
  92          BA    .034
  93          LS              85     32.
  94          UD    .127

  95          KK     S13
  96          KM    SUB-BASIN S13: ON-SITE
  97          BA    .034
  98          LS              87
  99          UD    .324

 100          KK     C13
 101          KM     COMBINE S8, S10, S12, S13, & R25: WASH 1
 102          HC      5

 103          KK   DIV3R
 104          KM    DIVERT #3:DIV2R - FLOW IN MAIN CHANNEL: WASH 1
 105          KM              DIV2L - WASH 1B
 106          DT   DIV3L
 107          DI      0.    315.    550.    875.   1280.   1975.
 108          DQ      0.     0.1     20.     65.    110.    380.

 109          KK   RET2L
 110          KM     RETRIEVE DIV2L
 111          DR   DIV2L

 112          KK     R2L
 113          KM     ROUTE DIV2L THRU S26
 114          KM      BOTTOM WIDTH OF MAIN CHANNEL = 20':(TYPICAL)
 115          KM      DEPTH OF MAIN CHANNEL = 2.5':(TYPICAL)
 116          KM      OVERBANKS = 40':(TYPICAL)
 117          RS       2    ELEV      10
 118          RC    .055    .035    .055    3850    .017
 119          RX    48.5    51.5    91.5      94     114   116.5   156.5   159.5
 120          RY    15.5    12.5    12.5      10      10    12.5    12.5    15.5

 121          KK     S26
 122          KM    SUB-BASIN S26: ON-SITE
 123          BA    .119
 124          LS              77
 125          UD    .343

 126          KK     C26
 127          KM    COMBINE R2L & S26: WASH 1A
 128          HC       2

 129          KK    NULL
 130          HC       2
```

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 131          KK     S30
 132          KM    SUB-BASIN S30: OFF-SITE
 133          BA     .42
 134          LS              88     38.
 135          UD    .452

 136          KK     R30
 137          KM    ROUTE S30 THRU S32: WASH 2A
 138          KM      BOTTOM WIDTH OF MAIN CHANNEL = 20':(TYPICAL)
 139          KM      DEPTH OF MAIN CHANNEL = 2.5':(TYPICAL)
 140          KM      OVERBANKS = 40':(TYPICAL)
 141          RS       1    ELEV      10
 142          RC    .055    .035    .055    2250    .018
 143          RX    48.5    51.5    91.5      94     114   116.5   156.5   159.5
 144          RY    15.5    12.5    12.5      10      10    12.5    12.5    15.5

 145          KK     S32
 146          KM    SUB-BASIN S32: ON-SITE
 147          BA    .074
 148          LS              78
 149          UD    .287

 150          KK     C32
 151          KM    COMBINE S30/R30 & S32: WASH 2A
 152          HC       2

 153          KK     S40
 154          KM    SUB-BASIN S40: OFF-SITE
 155          BA    1.60
 156          LS              84     15.
 157          UD    .985

 158          KK     R48
 159          KM      BOTTOM WIDTH OF MAIN CHANNEL = 12':(TYPICAL)
 160          KM      DEPTH OF MAIN CHANNEL = 2.5':(TYPICAL)
 161          KM      OVERBANKS = 40':(TYPICAL)
 162          RS       2    ELEV      10
 163          RC    .055    .035    .055    8400    .023
 164          RX    48.5    51.5    91.5      94     106   108.5   148.5   151.5
 165          RY    15.5    12.5    12.5      10      10    12.5    12.5    15.5

 166          KK     S50
 167          KM    SUB-BASIN S50: OFF-SITE
 168          BA     .53
 169          LS              86     35.
 170          UD    .535

 171          KK     C51
 172          KM    COMBINE R48/S40 & S50: WASH 2
 173          HC       2
```

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 174          KK     R51
 175          KM    ROUTE C51 THRU BASIN 54: WASH 2
 176          KM      BOTTOM WIDTH OF MAIN CHANNEL = 20':(TYPICAL)
 177          KM      DEPTH OF MAIN CHANNEL = 2.5':(TYPICAL)
 178          KM      OVERBANKS = 40':(TYPICAL)
 179          RS       2    ELEV      10
 180          RC    .055    .035    .055    3050    .015
 181          RX    48.5    51.5    91.5      94     114   116.5   156.5   159.5
 182          RY    15.5    12.5    12.5      10      10    12.5    12.5    15.5

 183          KK     S54
 184          KM    SUB-BASIN S54: ON-SITE
 185          BA    .044
 186          LS              81
 187          UD    .291

 188          KK     C54
 189          KM    COMBINE S54, C51, C32: WASH 2
 190          HC       3

 191          KK     R54
 192          KM    ROUTE C54 THRU BASIN 56: WASH 2
 193          KM      BOTTOM WIDTH OF MAIN CHANNEL = 60':(TYPICAL)
 194          KM      DEPTH OF MAIN CHANNEL = 2.5':(TYPICAL)
 195          KM      OVERBANKS = 50':(TYPICAL)
 196          RS       2    ELEV      10
 197          RC    .055    .035    .055    4150    .016
 198          RX    48.5    51.5   101.5     104     164   166.5   216.5   219.5
 199          RY    15.5    12.5    12.5      10      10    12.5    12.5    15.5

 200          KK     S56
 201          KM    SUB-BASIN S56: ON-SITE
 202          BA    .171
 203          LS              76
 204          UD    .427

 205          KK     C56
 206          KM    COMBINE S56 & R54: WASH 2
 207          HC       2

 208          KK    NULL
 209          HC       2

 210          KK     S60
 211          KM    SUB-BASIN S60: OFF-SITE
 212          BA    1.81
 213          LS              87     16.
 214          UD    .933
```

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 215          KK   DIV4R
 216          KM    DIVERT 4: DIV4R-> WASH 3 & DIV4L-> WASH 4
 217          DT   DIV4L
 218          DI      0.    294.    633.   1081.   1186.   2008.
 219          DQ      0.    188.    372.    606.    530.   1028.

 220          KK     S70
 221          KM    SUB-BASIN S70: OFF-SITE
 222          BA    .029
 223          LS              85     40.
 224          UD    .120

 225          KK     C70
 226          KM    COMBINE DIV4R & S70: WASH 3
 227          HC       2

 228          KK     R70
 229          KM    ROUTE C70 THRU S62
 230          KM      BOTTOM WIDTH OF MAIN CHANNEL = 20':(TYPICAL)
 231          KM      DEPTH OF MAIN CHANNEL = 2.5':(TYPICAL)
 232          KM      OVERBANKS = 40':(TYPICAL)
 233          RS       3    ELEV      10
 234          RC    .055    .035    .055    6850    .017
 235          RX    48.5    51.5    91.5      94     114   116.5   156.5   159.5
 236          RY    15.5    12.5    12.5      10      10    12.5    12.5    15.5

 237          KK     S62
 238          KM    SUB-BASIN S62: ON-SITE
 239          BA    .193
 240          LS              85
 241          UD    .458

 242          KK     C62
 243          KM    COMBINE S62 & C70: WASH 3
 244          HC       2

 245          KK    NULL
 246          HC       2

 247          KK   RET4L
 248          KM    RETRIEVE DIV4L: WASH 4
 249          DR   DIV4L

 250          KK     S64
 251          KM    SUB-BASIN S64: ON-SITE
 252          BA    .017
 253          LS              84
 254          UD    .224
```

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 255          KK     C64
 256          KM    COMBINE DIV4L & S64: WASH 4
 257          HC       2

 258          KK   DIV5R
 259          KM    DIVERT 5: DIV5R -> WASH 4A: DIV5L MAIN CHANNEL OF WASH 4
 260          DT   DIV5L
 261          DI      0.     11.     71.    204.    665.   1556.   3038.
 262          DQ      0.      0.     24.    128.    329.    762.   1656.

 263          KK     R5R
 264          KM    ROUTE DIV5R THRU S66: WASH 4A
 265          KM      BOTTOM WIDTH OF MAIN CHANNEL = 12':(TYPICAL)
 266          KM      DEPTH OF MAIN CHANNEL = 2.5':(TYPICAL)
 267          KM      OVERBANKS = 40':(TYPICAL)
 268          RS       1    ELEV      10
 269          RC    .055    .035    .055    1470    .018
 270          RX   48.5    51.5    91.5      94     106   108.5   148.5   151.5
 271          RY   15.5    12.5    12.5      10      10    12.5    12.5    15.5

 272          KK     S66
 273          KM    SUB-BASIN S66: ON-SITE
 274          BA    .115
 275          LS              77
 276          UD    .230

 277          KK     C66
 278          KM    COMBINE S66 & R5R: WASH 4A
 279          HC       2

 280          KK    NULL
 281          HC       2

 282          KK   RET5L
 283          KM    RETRIEVE DIV5L: MAIN CHANNEL WASH 4
 284          DR   DIV5L

 285          KK     R5L
 286          KM    ROUTE DIV5L THRU S68: WASH 4
 287          KM      BOTTOM WIDTH OF MAIN CHANNEL = 12':(TYPICAL)
 288          KM      DEPTH OF MAIN CHANNEL = 2.5':(TYPICAL)
 289          KM      OVERBANKS = 40':(TYPICAL)
 290          RS       1    ELEV      10
 291          RC    .055    .035    .055    1750    .018
 292          RX   48.5    51.5    91.5      94     106   108.5   148.5   151.5
 293          RY   15.5    12.5    12.5      10      10    12.5    12.5    15.5

 294          KK     S68
 295          KM    SUB-BASIN S68: ON-SITE
 296          BA    .056
 297          LS              76
 298          UD    .128
```

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 299          KK     C68
 300          KM    COMBINE S68 & R5L: WASH 4
 301          HC       2

 302          KK    NULL
 303          HC       2

 304          KK     S80
 305          KM    SUB-BASIN S80: OFF-SITE
 306          BA    .058
 307          LS              85
 308          UD    .166

 309          KK     R80
 310          KM    ROUTE S80 THRU S82:
 311          KM      BOTTOM WIDTH OF MAIN CHANNEL = 12':(TYPICAL)
 312          KM      DEPTH OF MAIN CHANNEL = 2.5':(TYPICAL)
 313          KM      OVERBANKS = 40':(TYPICAL)
 314          RS       1    ELEV      10
 315          RC    .055    .035    .055    3590    .018
 316          RX    48.5    51.5    91.5      94     106   108.5   148.5   151.5
 317          RY    15.5    12.5    12.5      10      10    12.5    12.5    15.5

 318          KK     S82
 319          KM    SUB-BASIN S82: ON-SITE
 320          BA    .052
 321          LS              84
 322          UD    .316

 323          KK     C82
 324          KM    COMBINE S82 & R80:
 325          HC       2

 326          KK    NULL
 327          HC       2

 328          KK     S92
 329          KM    SUB-BASIN S92: ON-SITE
 330          BA    .083
 331          LS              85
 332          UD    .283

 333          KK     S90
 334          KM    SUB-BASIN S90: OFF-SITE
 335          BA    .063
 336          LS              86
 337          UD    .152

 338          KK     R90
 339          KM    ROUTE S90 THRU S92
 340          KM      BOTTOM WIDTH OF MAIN CHANNEL = 12':(TYPICAL)
 341          KM      DEPTH OF MAIN CHANNEL = 2.5':(TYPICAL)
 342          KM      OVERBANKS = 40':(TYPICAL)
 343          RS       2    ELEV      10
```

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 344          RC    .055    .035    .055    3500    .018
 345          RX    48.5    51.5    91.5      94     106   108.5   148.5   151.5
 346          RY    15.5    12.5    12.5      10      10    12.5    12.5    15.5

 347          KK     C92
 348          KM    COMBINE S92 & R90:
 349          HC       2

 350          KK     S94
 351          KM    SUB-BASIN S94: OFF-SITE
 352          BA    .132
 353          LS              86
 354          UD    .186

 355          KK     R94
 356          KM    ROUTE S94 TO C100
 357          KM      BOTTOM WIDTH OF MAIN CHANNEL = 12':(TYPICAL)
 358          KM      DEPTH OF MAIN CHANNEL = 2.5':(TYPICAL)
 359          KM      OVERBANKS = 40':(TYPICAL)
 360          RS       1    ELEV      10
 361          RC    .055    .035    .055    1950    .018
 362          RX    48.5    51.5    91.5      94     106   108.5   148.5   151.5
 363          RY    15.5    12.5    12.5      10      10    12.5    12.5    15.5

 364          KK    S100
 365          KM    SUB-BASIN S100: OFF-SITE
 366          BA    .148
 367          LS              86
 368          UD    .196

 369          KK    R100
 370          KM    ROUTE S100 TO C100
 371          KM      BOTTOM WIDTH OF MAIN CHANNEL = 12':(TYPICAL)
 372          KM      DEPTH OF MAIN CHANNEL = 2.5':(TYPICAL)
 373          KM      OVERBANKS = 40':(TYPICAL)
 374          RS       1    ELEV      10
 375          RC    .055    .035    .055    1320    .018
 376          RX    48.5    51.5    91.5      94     106   108.5   148.5   151.5
 377          RY    15.5    12.5    12.5      10      10    12.5    12.5    15.5

 378          KK    S101
 379          KM    SUB-BASIN S101: ON-SITE
 380          BA    .047
 381          LS              85
 382          UD    .272

 383          KK    C100
 384          KM        COMBINE R94, R100 & S101
 385          HC       3
```

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 386          KK    R102
 387          KM    ROUTE C100 TO C102
 388          KM      BOTTOM WIDTH OF MAIN CHANNEL = 12':(TYPICAL)
 389          KM      DEPTH OF MAIN CHANNEL = 2.5':(TYPICAL)
 390          KM      OVERBANKS = 40':(TYPICAL)
 391          RS       1    ELEV      10
 392          RC    .055    .035    .055    1580    .018
 393          RX    48.5    51.5    91.5      94     106   108.5   148.5   151.5
 394          RY    15.5    12.5    12.5      10      10    12.5    12.5    15.5

 395          KK    S102
 396          KM    SUB-BASIN S102: ON-SITE
 397          BA    .014
 398          LS              85
 399          UD    .235

 400          KK    C102
 401          KM        COMBINE R102 & S102
 402          HC       2

 403          KK    C103
 404          KM        COMBINE C92 & C102:WASH 6
 405          HC       2

 406          KK    S150
 407          KM    SUB-BASIN S150: ON-SITE
 408          BA    .020
 409          LS              86
 410          UD

 411          KK    S140
 412          KM    SUB-BASIN S140: ON-SITE
 413          BA    .031
 414          LS              86
 415          UD

 416          KK    S110
 417          KM   SUB-BASIN S110: ON-SITE
 418          BA    .109
 419          LS              83
 420          UD    .345

 421          KK    NULL
 422          HC       3

 423          KK    S120
 424          KM   SUB-BASIN S120: ON-SITE
 425          BA    .052
 426          LS              85
 427          UD    .302
```

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 428          KK     S28
 429          KM    SUB-BASIN S28: ON-SITE
 430          BA    .081
 431          LS              83
 432          UD    .294

 433          KK    NULL
 434          HC       2
 435          ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

```
INPUT
 LINE     (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

 NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

 22         S14
              .
              .
 28           .         S16
              .           .
              .           .
 33           .           .         S20
              .           .           V
              .           .           V
 38           .           .         R20
              .           .           .
              .           .           .
 47           .           .           .         S24
              .           .           .           .
              .           .           .           .
 52         C24.................................
              .
              .
 57           .-------->   DIV1L
 55       DIV1R
              .
              .
 62           .           .<-------   DIV1L
 60           .       RET1L
              .           .
              .           .
 65           .           .------->   DIV2L
 63           .       DIV2R
              .           .
              .           .
 68         C25............
              V
              V
 71         R25
              .
              .
 80           .          S8
              .           .
              .           .
 85           .           .         S10
              .           .           .
              .           .           .
 90           .           .           .         S12
              .           .           .           .
              .           .           .           .
 95           .           .           .           .         S13
              .           .           .           .           .
              .           .           .           .           .
100         C13.............................................
              .
              .
106           .-------->   DIV3L
103       DIV3R
              .
              .
111           .           .<-------   DIV2L
109           .       RET2L
              .           V
              .           V
112           .         R2L
              .           .
```

```
          .          .
121       .          .        S26
          .          .          .
          .          .          .
126       .        C26............
          .          .
          .          .
129     NULL............
          .
          .
131       .        S30
          .          V
          .          V
136       .        R30
          .          .
          .          .
145       .          .        S32
          .          .          .
          .          .          .
150       .        C32............
          .          .
          .          .
153       .          .        S40
          .          .          V
          .          .          V
158       .          .        R48
          .          .          .
          .          .          .
166       .          .          .        S50
          .          .          .          .
          .          .          .          .
171       .          .        C51............
          .          .          V
          .          .          V
174       .          .        R51
          .          .          .
          .          .          .
183       .          .          .        S54
          .          .          .          .
          .          .          .          .
188       .        C54........................
          .          V
          .          V
191       .        R54
          .          .
          .          .
200       .          .        S56
          .          .          .
          .          .          .
205       .        C56............
          .          .
          .          .
208     NULL............
          .
          .
210       .        S60
          .          .
          .          .
217       .          .-------->   DIV4L
215       .      DIV4R
          .          .
          .          .
220       .          .        S70
          .          .          .
          .          .          .
225       .        C70............
          .          V
          .          V
228       .        R70
```

```
            .           .
            .           .
237         .           .         S62
            .           .           .
            .           .           .
242         .         C62............
            .           .
            .           .
245       NULL............
            .
            .
249         .           .<-------   DIV4L
247         .       RET4L
            .           .
            .           .
250         .           .         S64
            .           .           .
            .           .           .
255         .         C64............
            .           .
            .           .
260         .           .------->   DIV5L
258         .       DIV5R
            .           V
            .           V
263         .         R5R
            .           .
            .           .
272         .           .         S66
            .           .           .
            .           .           .
277         .         C66............
            .           .
            .           .
280       NULL............
            .
            .
284         .           .<-------   DIV5L
282         .       RET5L
            .           V
            .           V
285         .         R5L
            .           .
            .           .
294         .           .         S68
            .           .           .
            .           .           .
299         .         C68............
            .           .
            .           .
302       NULL............
            .
            .
304         .         S80
            .           V
            .           V
309         .         R80
            .           .
            .           .
318         .           .         S82
            .           .           .
            .           .           .
323         .         C82............
            .           .
            .           .
326       NULL............
            .
            .
328         .         S92
```

```
                .         .
                .         .
333             .         .        S90
                .         .         V
                .         .         V
338             .         .        R90
                .         .         .
                .         .         .
347             .       C92............
                .         .
                .         .
350             .         .        S94
                .         .         V
                .         .         V
355             .         .        R94
                .         .         .
                .         .         .
364             .         .         .       S100
                .         .         .          V
                .         .         .          V
369             .         .         .       R100
                .         .         .          .
                .         .         .          .
378             .         .         .          .        S101
                .         .         .          .          .
                .         .         .          .          .
383             .         .       C100.......................
                .         .         V
                .         .         V
386             .         .       R102
                .         .         .
                .         .         .
395             .         .         .       S102
                .         .         .          .
                .         .         .          .
400             .         .       C102............
                .         .         .
                .         .         .
403             .       C103............
                .         .
                .         .
406             .         .       S150
                .         .         .
                .         .         .
411             .         .         .       S140
                .         .         .          .
                .         .         .          .
416             .         .         .          .        S110
                .         .         .          .          .
                .         .         .          .          .
421             .         .       NULL........................
                .         .         .
                .         .         .
423             .         .         .       S120
                .         .         .          .
                .         .         .          .
428             .         .         .          .         S28
                .         .         .          .          .
                .         .         .          .          .
433             .         .         .       NULL............
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*            SEPTEMBER 1990            *
*             VERSION 4.0              *
*                                      *
*  RUN DATE  07/12/1994  TIME  11:43:57 *
*                                      *
****************************************
```

```
****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*           (916) 756-1104             *
*                                      *
****************************************
```

```
                    H1BV100E
                    LA BUENA VISTA - EXISTING CONDITIONS: OFFSITE DRAINAGE
                    CONSISTENT WITH TERRAVITA MASTER DRAINAGE PLAN
                    100 YR - 6HR RAINFALL EVENT
                    HEC-1 HYPOTHETICAL DISTRIBUTION
                    LAG TIMES: travel time calculations
                    CURVE NUMBERS: RANGE 76 TO 88
                            VEGETATION: POOR CONDITION DESERT SHRUB
                            SOIL TYPES:  A, B, C & D
                    DEPTH AREA REDUCTION FACTORS (PER NOAA HYDRO-40)
                    AREA(SQMI)      %
                    ---------------------
                     0             1.0
                     1             0.99
                     2             0.98
                     3             0.97
                     4             0.965
                    ---------------------

20 IO          OUTPUT CONTROL VARIABLES
                     IPRNT           5  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE

   IT          HYDROGRAPH TIME DATA
                      NMIN           5  MINUTES IN COMPUTATION INTERVAL
                     IDATE      1    0  STARTING DATE
                     ITIME        0000  STARTING TIME
                        NQ         300  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE      2    0  ENDING DATE
                    NDTIME        0055  ENDING TIME
                    ICENT           19  CENTURY MARK

               COMPUTATION INTERVAL     .08 HOURS
                    TOTAL TIME BASE   24.92 HOURS

        ENGLISH UNITS
             DRAINAGE AREA         SQUARE MILES
             PRECIPITATION DEPTH   INCHES
             LENGTH, ELEVATION     FEET
             FLOW                  CUBIC FEET PER SECOND
             STORAGE VOLUME        ACRE-FEET
             SURFACE AREA          ACRES
             TEMPERATURE           DEGREES FAHRENHEIT

   JP          MULTI-PLAN OPTION
                     NPLAN           1  NUMBER OF PLANS

   JR          MULTI-RATIO OPTION
                 RATIOS OF PRECIPITATION
               1.00       .99       .98       .97       .96
```

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

					RATIOS APPLIED TO PRECIPITATION				
OPERATION	STATION	AREA	PLAN		RATIO 1	RATIO 2	RATIO 3	RATIO 4	RATIO 5
					1.00	.99	.98	.97	.96
HYDROGRAPH AT	S14	.12	1	FLOW	293.	289.	285.	281.	279.
				TIME	3.25	3.25	3.25	3.25	3.25
HYDROGRAPH AT	S16	.04	1	FLOW	116.	114.	113.	111.	110.
				TIME	3.17	3.17	3.17	3.17	3.17
HYDROGRAPH AT	S20	1.91	1	FLOW	1811.	1788.	1764.	1741.	1729.
				TIME	3.92	3.92	3.92	3.92	3.92
ROUTED TO	R20	1.91	1	FLOW	1796.	1773.	1750.	1727.	1716.
				TIME	4.00	4.00	4.00	4.00	4.00
			** PEAK STAGES IN FEET **						
			1	STAGE	12.72	12.70	12.68	12.67	12.66
				TIME	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT	S24	.03	1	FLOW	41.	41.	40.	39.	39.
				TIME	3.42	3.42	3.42	3.42	3.42
4 COMBINED AT	C24	2.11	1	FLOW	1842.	1819.	1795.	1771.	1760.
				TIME	4.00	4.00	4.00	4.00	4.00
DIVERSION TO	DIV1L	2.11	1	FLOW	1111.	1095.	1080.	1064.	1056.
				TIME	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT	DIV1R	2.11	1	FLOW	731.	723.	715.	707.	703.
				TIME	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT	RET1L	.00	1	FLOW	1111.	1095.	1080.	1064.	1056.
				TIME	4.00	4.00	4.00	4.00	4.00
DIVERSION TO	DIV2L	.00	1	FLOW	515.	509.	503.	497.	494.
				TIME	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT	DIV2R	.00	1	FLOW	596.	586.	577.	567.	562.
				TIME	4.00	4.00	4.00	4.00	4.00
2 COMBINED AT	C25	2.11	1	FLOW	1328.	1310.	1292.	1274.	1265.
				TIME	4.00	4.00	4.00	4.00	4.00
ROUTED TO	R25	2.11	1	FLOW	1316.	1298.	1280.	1263.	1254.
				TIME	4.08	4.08	4.08	4.08	4.08
			** PEAK STAGES IN FEET **						
			1	STAGE	12.29	12.27	12.25	12.23	12.22
				TIME	4.08	4.08	4.08	4.08	4.08
HYDROGRAPH AT	S8	.03	1	FLOW	89.	88.	87.	86.	85.
				TIME	3.17	3.17	3.17	3.17	3.17
HYDROGRAPH AT	S10	.37	1	FLOW	730.	721.	711.	701.	696.
				TIME	3.33	3.33	3.33	3.33	3.33
HYDROGRAPH AT	S12	.03	1	FLOW	95.	94.	92.	91.	90.
				TIME	3.17	3.17	3.17	3.17	3.17
HYDROGRAPH AT	S13	.03	1	FLOW	54.	53.	53.	52.	51.
				TIME	3.42	3.42	3.42	3.42	3.42

5 COMBINED AT	C13	2.57	1	FLOW	1451.	1432.	1413.	1395.	1385.
				TIME	4.00	4.00	4.00	4.00	4.00
DIVERSION TO	DIV3L	2.57	1	FLOW	177.	169.	162.	154.	151.
				TIME	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT	DIV3R	2.57	1	FLOW	1275.	1263.	1252.	1240.	1234.
				TIME	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT	RET2L	.00	1	FLOW	515.	509.	503.	497.	494.
				TIME	4.00	4.00	4.00	4.00	4.00
ROUTED TO	R2L	.00	1	FLOW	506.	501.	495.	489.	487.
				TIME	4.17	4.17	4.17	4.17	4.17
			** PEAK STAGES IN FEET **						
			1	STAGE	12.47	12.46	12.44	12.43	12.42
				TIME	4.17	4.17	4.17	4.17	4.17
HYDROGRAPH AT	S26	.12	1	FLOW	115.	112.	110.	108.	107.
				TIME	3.42	3.42	3.42	3.42	3.42
2 COMBINED AT	C26	.12	1	FLOW	537.	531.	525.	519.	516.
				TIME	4.08	4.08	4.08	4.08	4.08
2 COMBINED AT	NULL	2.69	1	FLOW	1809.	1792.	1774.	1757.	1749.
				TIME	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT	S30	.42	1	FLOW	651.	643.	635.	627.	623.
				TIME	3.50	3.50	3.50	3.50	3.50
ROUTED TO	R30	.42	1	FLOW	621.	614.	608.	601.	597.
				TIME	3.58	3.58	3.58	3.58	3.58
			** PEAK STAGES IN FEET **						
			1	STAGE	12.69	12.68	12.66	12.65	12.65
				TIME	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT	S32	.07	1	FLOW	82.	81.	79.	78.	77.
				TIME	3.33	3.33	3.33	3.33	3.33
2 COMBINED AT	C32	.49	1	FLOW	680.	672.	664.	656.	652.
				TIME	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT	S40	1.60	1	FLOW	1137.	1120.	1103.	1087.	1078.
				TIME	4.08	4.08	4.08	4.08	4.08
ROUTED TO	R48	1.60	1	FLOW	1079.	1062.	1045.	1029.	1020.
				TIME	4.42	4.42	4.42	4.42	4.42
			** PEAK STAGES IN FEET **						
			1	STAGE	13.57	13.55	13.54	13.52	13.51
				TIME	4.42	4.42	4.42	4.42	4.42
HYDROGRAPH AT	S50	.53	1	FLOW	693.	685.	676.	667.	662.
				TIME	3.58	3.58	3.58	3.58	3.58
2 COMBINED AT	C51	2.13	1	FLOW	1315.	1293.	1271.	1249.	1238.
				TIME	4.25	4.25	4.25	4.25	4.25
ROUTED TO	R51	2.13	1	FLOW	1306.	1284.	1263.	1242.	1231.
				TIME	4.33	4.33	4.33	4.33	4.33
			** PEAK STAGES IN FEET **						
			1	STAGE	13.67	13.65	13.62	13.60	13.59
				TIME	4.33	4.33	4.33	4.33	4.33
HYDROGRAPH AT	S54	.04	1	FLOW	57.	56.	55.	54.	53.

				TIME	3.33	3.33	3.33	3.33	3.33
3 COMBINED AT	C54	2.67	1	FLOW	1696.	1675.	1654.	1632.	1621.
				TIME	3.75	3.75	3.75	3.75	3.75
ROUTED TO	R54	2.67	1	FLOW	1651.	1631.	1613.	1596.	1586.
				TIME	3.92	3.83	3.83	3.83	3.83
			** PEAK STAGES IN FEET **						
			1	STAGE	12.65	12.63	12.62	12.60	12.59
				TIME	3.92	3.83	3.83	3.83	3.83
HYDROGRAPH AT	S56	.17	1	FLOW	135.	132.	129.	127.	125.
				TIME	3.50	3.50	3.50	3.58	3.58
2 COMBINED AT	C56	2.84	1	FLOW	1742.	1722.	1703.	1684.	1673.
				TIME	3.83	3.83	3.83	3.83	3.83
2 COMBINED AT	NULL	5.53	1	FLOW	3530.	3491.	3454.	3420.	3401.
				TIME	3.92	3.92	3.83	3.83	3.83
HYDROGRAPH AT	S60	1.81	1	FLOW	1489.	1468.	1448.	1428.	1418.
				TIME	4.00	4.00	4.08	4.08	4.08
DIVERSION TO	DIV4L	1.81	1	FLOW	714.	701.	689.	676.	670.
				TIME	4.00	4.00	4.08	4.08	4.08
HYDROGRAPH AT	DIV4R	1.81	1	FLOW	775.	767.	759.	751.	747.
				TIME	4.00	4.00	4.08	4.08	4.08
HYDROGRAPH AT	S70	.03	1	FLOW	86.	85.	84.	83.	82.
				TIME	3.17	3.17	3.17	3.17	3.17
2 COMBINED AT	C70	1.84	1	FLOW	781.	773.	765.	756.	752.
				TIME	4.00	4.00	4.00	4.00	4.00
ROUTED TO	R70	1.84	1	FLOW	750.	740.	730.	722.	718.
				TIME	4.33	4.33	4.42	4.42	4.42
			** PEAK STAGES IN FEET **						
			1	STAGE	12.93	12.91	12.90	12.89	12.88
				TIME	4.33	4.33	4.42	4.42	4.42
HYDROGRAPH AT	S62	.19	1	FLOW	226.	223.	219.	216.	214.
				TIME	3.58	3.58	3.58	3.58	3.58
2 COMBINED AT	C62	2.03	1	FLOW	809.	798.	787.	777.	772.
				TIME	4.33	4.33	4.33	4.33	4.33
2 COMBINED AT	NULL	7.56	1	FLOW	4231.	4183.	4135.	4085.	4060.
				TIME	3.92	3.92	3.92	3.92	3.92
HYDROGRAPH AT	RET4L	.00	1	FLOW	714.	701.	689.	676.	670.
				TIME	4.00	4.00	4.08	4.08	4.08
HYDROGRAPH AT	S64	.02	1	FLOW	29.	28.	28.	27.	27.
				TIME	3.25	3.25	3.25	3.25	3.25
2 COMBINED AT	C64	.02	1	FLOW	718.	705.	693.	680.	674.
				TIME	4.00	4.00	4.00	4.00	4.00
DIVERSION TO	DIV5L	.02	1	FLOW	355.	349.	342.	336.	333.
				TIME	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT	DIV5R	.02	1	FLOW	363.	357.	350.	344.	341.
				TIME	4.00	4.00	4.00	4.00	4.00
ROUTED TO	R5R	.02	1	FLOW	359.	353.	347.	340.	337.
				TIME	4.08	4.08	4.08	4.08	4.08

			** PEAK STAGES IN FEET **						
			1	STAGE	12.62	12.61	12.59	12.56	12.55
				TIME	4.08	4.08	4.08	4.08	4.08
HYDROGRAPH AT	S66	.12	1	FLOW	139.	136.	134.	131.	130.
				TIME	3.33	3.33	3.33	3.33	3.33
2 COMBINED AT	C66	.13	1	FLOW	379.	373.	366.	360.	356.
				TIME	4.08	4.08	4.08	4.08	4.08
2 COMBINED AT	NULL	7.70	1	FLOW	4597.	4539.	4484.	4428.	4399.
				TIME	4.00	3.92	3.92	3.92	3.92
HYDROGRAPH AT	RET5L	.00	1	FLOW	355.	349.	342.	336.	333.
				TIME	4.00	4.00	4.00	4.00	4.00
ROUTED TO	R5L	.00	1	FLOW	350.	344.	338.	332.	329.
				TIME	4.08	4.08	4.08	4.08	4.08
			** PEAK STAGES IN FEET **						
			1	STAGE	12.60	12.58	12.55	12.53	12.52
				TIME	4.08	4.08	4.08	4.08	4.08
HYDROGRAPH AT	S68	.06	1	FLOW	84.	83.	81.	79.	78.
				TIME	3.17	3.17	3.17	3.17	3.17
2 COMBINED AT	C68	.06	1	FLOW	357.	351.	345.	339.	336.
				TIME	4.08	4.08	4.08	4.08	4.08
2 COMBINED AT	NULL	7.75	1	FLOW	4946.	4881.	4814.	4748.	4717.
				TIME	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT	S80	.06	1	FLOW	121.	119.	117.	116.	115.
				TIME	3.25	3.25	3.25	3.25	3.25
ROUTED TO	R80	.06	1	FLOW	96.	94.	93.	91.	90.
				TIME	3.33	3.33	3.33	3.33	3.33
			** PEAK STAGES IN FEET **						
			1	STAGE	11.23	11.21	11.20	11.19	11.18
				TIME	3.33	3.33	3.33	3.33	3.33
HYDROGRAPH AT	S82	.05	1	FLOW	74.	73.	72.	70.	70.
				TIME	3.42	3.42	3.42	3.42	3.42
2 COMBINED AT	C82	.11	1	FLOW	168.	165.	162.	159.	158.
				TIME	3.33	3.33	3.33	3.33	3.33
2 COMBINED AT	NULL	7.86	1	FLOW	4984.	4919.	4854.	4792.	4761.
				TIME	4.00	4.00	3.92	3.92	3.92
HYDROGRAPH AT	S92	.08	1	FLOW	132.	130.	128.	126.	125.
				TIME	3.33	3.33	3.33	3.33	3.33
HYDROGRAPH AT	S90	.06	1	FLOW	139.	137.	135.	133.	132.
				TIME	3.17	3.17	3.17	3.17	3.17
ROUTED TO	R90	.06	1	FLOW	126.	124.	122.	120.	119.
				TIME	3.33	3.33	3.33	3.33	3.33
			** PEAK STAGES IN FEET **						
			1	STAGE	11.45	11.43	11.42	11.40	11.40
				TIME	3.33	3.33	3.33	3.33	3.33
2 COMBINED AT	C92	.15	1	FLOW	258.	254.	250.	246.	244.
				TIME	3.33	3.33	3.33	3.33	3.33
HYDROGRAPH AT	S94	.13	1	FLOW	276.	272.	268.	264.	262.

				TIME	3.25	3.25	3.25	3.25	3.25
ROUTED TO	R94	.13	1	FLOW	257.	253.	250.	246.	244.
				TIME	3.33	3.33	3.33	3.33	3.33
			** PEAK STAGES IN FEET **						
			1	STAGE	12.20	12.19	12.17	12.15	12.14
				TIME	3.33	3.33	3.33	3.33	3.33
HYDROGRAPH AT	S100	.15	1	FLOW	301.	296.	292.	287.	285.
				TIME	3.25	3.25	3.25	3.25	3.25
ROUTED TO	R100	.15	1	FLOW	285.	282.	278.	274.	272.
				TIME	3.33	3.33	3.25	3.25	3.25
			** PEAK STAGES IN FEET **						
			1	STAGE	12.34	12.33	12.31	12.29	12.28
				TIME	3.33	3.33	3.25	3.25	3.25
HYDROGRAPH AT	S101	.05	1	FLOW	77.	76.	74.	73.	73.
				TIME	3.33	3.33	3.33	3.33	3.33
3 COMBINED AT	C100	.33	1	FLOW	619.	610.	601.	592.	588.
				TIME	3.33	3.33	3.33	3.33	3.33
ROUTED TO	R102	.33	1	FLOW	564.	555.	546.	538.	533.
				TIME	3.42	3.42	3.42	3.42	3.42
			** PEAK STAGES IN FEET **						
			1	STAGE	13.03	13.01	13.00	12.98	12.98
				TIME	3.42	3.42	3.42	3.42	3.42
HYDROGRAPH AT	S102	.01	1	FLOW	24.	24.	24.	23.	23.
				TIME	3.33	3.33	3.33	3.33	3.33
2 COMBINED AT	C102	.34	1	FLOW	585.	576.	567.	558.	553.
				TIME	3.42	3.42	3.42	3.42	3.42
2 COMBINED AT	C103	.49	1	FLOW	839.	826.	812.	798.	790.
				TIME	3.33	3.33	3.33	3.33	3.33
HYDROGRAPH AT	S150	.02	1	FLOW	74.	73.	72.	71.	70.
				TIME	3.08	3.08	3.08	3.08	3.08
HYDROGRAPH AT	S140	.03	1	FLOW	115.	113.	111.	109.	109.
				TIME	3.08	3.08	3.08	3.08	3.08
HYDROGRAPH AT	S110	.11	1	FLOW	141.	139.	137.	134.	133.
				TIME	3.42	3.42	3.42	3.42	3.42
3 COMBINED AT	NULL	.16	1	FLOW	221.	217.	214.	210.	208.
				TIME	3.08	3.08	3.08	3.08	3.08
HYDROGRAPH AT	S120	.05	1	FLOW	79.	77.	76.	75.	74.
				TIME	3.33	3.33	3.33	3.33	3.33
HYDROGRAPH AT	S28	.08	1	FLOW	114.	112.	110.	108.	107.
				TIME	3.33	3.33	3.33	3.33	3.33
2 COMBINED AT	NULL	.13	1	FLOW	193.	189.	186.	183.	182.
				TIME	3.33	3.33	3.33	3.33	3.33

*** NORMAL END OF HEC-1 ***

Appendix C
HEC-2 Output

South Wash
(File Name: H2SWASH)

Q:\940047\ADMIN\47-007RP.WP5

```
*********************************************
*  HEC-2 WATER SURFACE PROFILES             *
                                            *
  Version   4.6.0;  February 1991           *
*                                           *
*  RUN DATE    07JUL94    TIME    10:21:42  *
*********************************************
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****************************************
*  U.S. ARMY CORPS OF ENGINEERS        *
*  HYDROLOGIC ENGINEERING CENTER       *
*  609 SECOND STREET, SUITE D          *
*  DAVIS, CALIFORNIA 95616-4687        *
*          (916) 756-1104              *
****************************************
```

```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX             XXXXXXX
```

South Wash

THIS RUN EXECUTED 07JUL94 10:21:42

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************************************
HEC-2 WATER SURFACE PROFILES

Version   4.6.0;  February 1991
************************************

T1      US HOME - SOUTH WASH    (FILE NAME: H2SWASH)
T2      HEC-2 ANALYSIS OF THE SOUTH WASH
T3       100-YEAR DESIGN DISCHARGE

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

      0        2        0        0    0.0177       0        0        0      2099       0

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

      1        0       -1        0        0       0        0        0        0        0

CHECK QT AND NC CARDS

QT       1      929
NC    0.05     0.05     0.03      0.1      0.3
X1       1       13       73      305        0        0        0
GR    2102        1     2100       73   2098.9      105     2098      130   2097.1      165
GR    2097      190   2096.6      200   2097.2      220     2098      255     2099      282
GR    2100      305     2101      350     2102      400

ET             7.1                                         130      198
X1       2       13      153      175      325      310      320
GR    2105       78   2104.2      130     2104      138     2103      145     2102      153
GR  2101.4      154   2100.9      163   2101.2      171     2102      175     2103      181
GR    2104      188   2104.2      198   2104.6      215

ET             7.1                                          21      120
X1       3       16       69       85      212      269      250
GR    2108        1   2108.6       17   2108.9       21   2108.6       34     2108       39
GR  2107.9       53     2106       67     2105       69     2105       77   2104.9       85
GR    2106       94     2107     99.5     2108      105   2108.3    112.5   2108.6      120
GR  2108.5      158

ET             7.1                                          20      135
X1       4       14       40       59      390      300      355
GR    2116        1   2114.3       20     2113       32     2112       40   2111.8       49
GR  2111.7       52     2112       59   2113.4       81   2112.7      100     2112      107
GR  2112.5      110   2113.5      128     2114      135   2114.4      158

ET             7.1                                          30      212
X1       5       21       52      120      368      309      358
GR    2122        1   2121.5       30     2120       50   2118.5       52     2118       54
GR  2117.6       62     2118       70   2118.2       75     2118       80   2119.1       92
GR  2118.3      103   2118.8      120     2120      138   2120.3      155     2120      163
GR  2119.5      170   2119.4      180     2120      190   2120.2      200     2121      211
GR    2122      232
```

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ET                7.1                                                  20        139
X1        6        13        59        88       350       315       360
GR     2126         1      2126         2    2127.2        20      2126        50      2125        53
GR   2124.6        59    2124.2        62    2124.2        75    2124.3        82    2124.6        88
GR     2126       113      2128       139      2126       165
  EJ ENDS INPUT  OF REACH MODEL
  ER RECORD ENDS THE RUN
```

```
 SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
 Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
 TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
 SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


*PROF 1

CCHV=     .100 CEHV=     .300
*SECNO 1.000
3720 CRITICAL DEPTH ASSUMED
    1.000      1.91   2098.51   2098.51   2099.00   2099.04       .53       .00       .00   2100.00
    929.0        .0     929.0        .0        .0     158.8        .0        .0        .0   2100.00
      .00       .00      5.85       .00      .000      .030      .000      .000   2096.60    115.76
  .013295        0.        0.        0.         0        15         0       .00    153.09    268.84


*SECNO 2.000
3280 CROSS SECTION      2.00 EXTENDED       .16 FEET


3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      130.0     198.0  TYPE=      1  TARGET=       68.000
    2.000      3.86   2104.76   2104.76       .00   2105.86      1.09      2.92       .17   2102.00
    929.0     109.6     726.3      93.0      32.3      78.0      29.1       1.1        .8   2102.00
      .01      3.40      9.31      3.20      .050      .030      .050      .000   2100.90    130.00
  .006648      325.      320.      310.        20        14         0       .00     68.00    198.00


*SECNO 3.000
3280 CROSS SECTION      3.00 EXTENDED       .16 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=       21.0     120.0  TYPE=      1  TARGET=       99.000
    3.000      3.76   2108.66   2108.66       .00   2109.64       .98      1.65       .01   2105.00
    929.0     135.2     569.6     224.2      42.2      59.0      52.7       1.9       1.2   2104.90
      .02      3.20      9.65      4.25      .050      .030      .050      .000   2104.90     31.23
  .006659      212.      250.      269.        20         8         0       .00     88.77    120.00
```

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 SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
 Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
 TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
 SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


SECNO 4.000
685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

470 ENCROACHMENT STATIONS=       20.0     135.0  TYPE=      1  TARGET=      115.000
   4.000      2.62   2114.32   2114.32       .00   2115.04       .72      2.77       .03   2112.00
   929.0      83.0     426.0     420.0      22.6      46.7     107.4       3.2       2.0   2112.00
     .04      3.68      9.11      3.91      .050      .030      .050      .000   2111.70     20.00
 .010196      390.      355.      300.        20        19         0       .00    115.00    135.00


SECNO 5.000

3265 DIVIDED FLOW

685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

470 ENCROACHMENT STATIONS=       30.0     212.0  TYPE=      1  TARGET=      182.000
   5.000      2.56   2120.16   2120.16       .00   2120.86       .70      3.25       .00   2118.50
   929.0       4.2     864.6      60.2       2.0     125.0      30.0       4.5       3.0   2118.80
     .05      2.09      6.92      2.00      .050      .030      .050      .000   2117.60     47.85
 .008684      368.      358.      309.        20         8         0       .00    138.67    198.07


SECNO 6.000
280 CROSS SECTION      6.00 EXTENDED       .97 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
693 PROBABLE MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=       20.0     139.0  TYPE=      1  TARGET=      119.000
   6.000      2.77   2126.97   2126.97       .00   2127.85       .88      2.97       .06   2124.60
   929.0      92.2     670.1     166.7      29.1      77.8      47.7       5.7       3.9   2124.60
     .06      3.17      8.62      3.49      .050      .030      .050      .000   2124.20     25.84
 .008132      350.      360.      315.        20         8         0       .00     99.72    125.56
```

THIS RUN EXECUTED 07JUL94 10:21:42

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.0; February 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

100-YEAR DESIGN DISCHAR

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	1.000	.00	.00	.00	2096.60	929.00	2098.51	2098.51	2099.04	132.95	5.85	158.78	80.57
*	2.000	320.00	.00	.00	2100.90	929.00	2104.76	2104.76	2105.86	66.48	9.31	139.36	113.94
*	3.000	250.00	.00	.00	2104.90	929.00	2108.66	2108.66	2109.64	66.59	9.65	153.95	113.84
*	4.000	355.00	.00	.00	2111.70	929.00	2114.32	2114.32	2115.04	101.96	9.11	176.71	92.00
*	5.000	358.00	.00	.00	2117.60	929.00	2120.16	2120.16	2120.86	86.84	6.92	157.07	99.69
*	6.000	360.00	.00	.00	2124.20	929.00	2126.97	2126.97	2127.85	81.32	8.62	154.57	103.02

100-YEAR DESIGN DISCHAR

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
1.000	929.00	2098.51	.00	.00	-.49	153.09	.00
2.000	929.00	2104.76	.00	6.25	.00	68.00	320.00
3.000	929.00	2108.66	.00	3.90	.00	88.77	250.00
4.000	929.00	2114.32	.00	5.65	.00	115.00	355.00
5.000	929.00	2120.16	.00	5.84	.00	138.67	358.00
6.000	929.00	2126.97	.00	6.80	.00	99.72	360.00

SUMMARY OF ERRORS AND SPECIAL NOTES

```
CAUTION SECNO=      1.000  PROFILE=  1  CRITICAL DEPTH ASSUMED

CAUTION SECNO=      2.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      2.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      2.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=      3.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      3.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      3.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=      4.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      4.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      4.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=      5.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      5.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      5.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=      6.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      6.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      6.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
```

North Wash
(File Names: H2NW-RCH & H2NW-LCH)

Q:\940047\ADMIN\47-007RP.WP5

Project US HOME
Project No. 94-0047-01
Sheet No. _____ of _____
Calculated by CCC Date 4/27/94

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

RIGHT CHANNEL - OFFSITE

CROSS SECTION PARAMETERS: FILENAME: NWASHS1R.SEC

No. of Cross Section Points: 18 Bed Slope:0.01700 Max Elev.:2140.60
Bank Stations.....Left: 978.0 Right....: 1025.0 Min Elev.:2136.80
Encroachment Stations..Left: 951.0 Right....: 1064.0
Manning-n Values.....LOB: 0.045 CHANNEL..: 0.030 ROB.....: 0.045

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	2143.00	819.00	2)	2142.00	856.00	3)	2140.00	874.00
4)	2138.00	888.00	5)	2137.90	891.00	6)	2138.00	894.00
7)	2140.00	936.00	8)	2140.60	951.00	9)	2140.00	968.00
10)	2138.00	971.00	11)	2136.90	978.00	12)	2136.80	1000.00
13)	2137.10	1006.00	14)	2137.10	1014.00	15)	2136.90	1025.00
16)	2138.00	1040.00	17)	2140.00	1052.00	18)	2140.50	1064.00

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
2137.00	6.4	1.6	0.790	0.030	0.1	33.5	4.1	33.5
2138.00	335.7	5.4	1.009	0.033	0.9	69.0	61.9	69.1
2139.00	1096.2	8.1	1.081	0.035	1.8	76.5	134.7	77.0
2139.50	1603.6	9.2	1.105	0.035	2.2	80.3	173.8	81.0
2140.00	2190.0	10.2	1.123	0.035	2.6	84.0	214.9	84.9
2140.50	2532.9	9.6	1.096	0.036	2.4	110.2	263.4	111.1

NOTES:

Project US HOVE
Project No. 94-0047
Sheet No. _____ of _____
Calculated by CCC Date 4/27/94

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

LEFT CHANNEL -OFFSITE

CROSS SECTION PARAMETERS: FILENAME: NWASHS1L.SEC

No. of Cross Section Points: 18 Bed Slope:0.01880 Max Elev.:2143.00
Bank Stations.....Left: 888.0 Right....: 894.0 Min Elev.:2137.90
Encroachment Stations..Left: 819.0 Right....: 951.0
Manning-n Values.....LOB: 0.045 CHANNEL..: 0.030 ROB.....: 0.045

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	2143.00	819.00	2)	2142.00	856.00	3)	2140.00	874.00
4)	2138.00	888.00	5)	2137.90	891.00	6)	2138.00	894.00
7)	2140.00	936.00	8)	2140.60	951.00	9)	2140.00	968.00
10)	2138.00	971.00	11)	2136.90	978.00	12)	2136.80	1000.00
13)	2137.10	1006.00	14)	2137.10	1014.00	15)	2136.90	1025.00
16)	2138.00	1040.00	17)	2140.00	1052.00	18)	2140.50	1064.00

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
2138.00	0.3	0.9	0.726	0.030	0.1	6.0	0.3	6.0
2139.00	72.0	3.5	0.809	0.041	0.6	34.0	20.3	34.1
2140.00	348.5	5.1	0.857	0.043	1.1	62.0	68.3	62.2
2141.00	968.8	6.7	0.904	0.043	1.7	86.0	145.3	86.3
2142.00	2016.5	8.6	0.957	0.044	2.5	95.0	235.8	95.3
2143.00	3103.0	8.9	0.962	0.044	2.6	132.0	349.3	132.3

NOTES:

COE & VAN LOO
PLANNING • ENGINEERING
LANDSCAPE ARCHITECTURE

Project 60TH STREET & DOVE VALLEY RD
Project No. 94-0047
Sheet No. _____ of _____
Calculated by CCC Date 4/27/94
Checked by _____ Date _____

SPLIT FLOW FOR THE PEAK DISCHARGE Q = 1700 CFS
(OFF SITE)

STAGE (FT)	DISCHARGE (CFS) LEFT CHANNEL	RIGHT CHANNEL	TOTAL
	NWASHS1L	NWASHS1R	
2137.9	0	283.9	283.9
2138.0	0.3	335.7	336.0
2138.5	17.7	671.4	689.1
2139.0	72.0	1096.2	1168.2
2139.3	128.5	1391.0	1519.5
2139.33	135.3	1422.1	1557.4
2139.4	152.0	1495.6	1647.6
2139.44	162.0	1538.0	1700.0
2139.45	164.7	1549.2	1713.9

PERCENTAGE

Q_{LEFT} = 162 CFS Q_{RIGHT} = 1538 CFS

% = 9.53% % = 90.47%

Project DS HOME
Project No. 94-0047
Sheet No. _____ of _____
Calculated by CCC Date 4/27/94

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

CROSS SECTION PARAMETERS: FILENAME: NWASHS2R.SEC

No. of Cross Section Points: 23 Bed Slope:0.02000 Max Elev.:2126.30
Bank Stations.....Left: 1169.0 Right....: 1185.0 Min Elev.:2124.40
Encroachment Stations..Left: 1095.0 Right....: 1205.0
Manning-n Values.....LOB: 0.045 CHANNEL..: 0.030 ROB.....: 0.045

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	2125.90	930.00	2)	2124.00	987.00	3)	2122.80	989.00
4)	2122.40	998.00	5)	2122.30	1000.00	6)	2122.50	1002.00
7)	2124.00	1007.00	8)	2126.00	1016.00	9)	2126.20	1023.00
10)	2126.00	1032.00	11)	2124.40	1048.00	12)	2125.40	1075.00
13)	2125.50	1095.00	14)	2125.30	1101.00	15)	2125.80	1118.00
16)	2125.40	1138.00	17)	2124.70	1147.00	18)	2125.00	1156.00
19)	2124.50	1169.00	20)	2124.40	1177.00	21)	2124.40	1185.00
22)	2126.00	1191.00	23)	2126.30	1205.00			

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
2124.50	1.5	1.2	0.794	0.030	0.1	16.4	1.2	16.4
2125.00	42.6	2.8	0.854	0.036	0.3	44.1	15.1	44.2
2125.50	153.7	3.8	0.868	0.039	0.6	68.9	40.7	69.1
2126.00	398.0	4.7	0.886	0.041	0.9	96.0	84.4	96.3
2126.20	529.5	5.1	0.896	0.041	1.0	105.3	104.5	105.6
2126.30	603.5	5.2	0.901	0.041	1.0	110.0	115.3	110.3

NOTES:

Project US HOME
Project No. 90 -0047-01
Sheet No. _____ of _____
Calculated by CCC Date 4/27/94

UNIFORM FLOW COMPUTATIONS

LOCATION/DESCRIPTION:

CROSS SECTION PARAMETERS: FILENAME: NWASHS2L.SEC

No. of Cross Section Points: 23 Bed Slope:0.02352 Max Elev.:2126.20
Bank Stations.....Left: 998.0 Right....: 1002.0 Min Elev.:2122.30
Encroachment Stations..Left: 930.0 Right....: 1095.0
Manning-n Values.....LOB: 0.045 CHANNEL..: 0.030 ROB.....: 0.045

CROSS SECTION POINTS - Elevations & Stations in feet:

No.	Elev.	Sta.	No.	Elev.	Sta.	No.	Elev.	Sta.
1)	2125.90	930.00	2)	2124.00	987.00	3)	2122.80	989.00
4)	2122.40	998.00	5)	2122.30	1000.00	6)	2122.50	1002.00
7)	2124.00	1007.00	8)	2126.00	1016.00	9)	2126.20	1023.00
10)	2126.00	1032.00	11)	2124.40	1048.00	12)	2125.40	1075.00
13)	2125.50	1095.00	14)	2125.30	1101.00	15)	2125.80	1118.00
16)	2125.40	1138.00	17)	2124.70	1147.00	18)	2125.00	1156.00
19)	2124.50	1169.00	20)	2124.40	1177.00	21)	2124.40	1185.00
22)	2126.00	1191.00	23)	2126.30	1205.00			

COMPUTED PARAMETERS:

WSEL(ft)	Q(cfs)	V(fps)	Fr No.	ne	D(ft)	TW(ft)	A(sf)	WP(ft)
2122.50	0.9	1.5	0.825	0.033	0.1	6.3	0.6	6.3
2123.00	21.5	3.3	0.877	0.040	0.4	15.0	6.6	15.2
2124.00	147.5	6.1	0.986	0.041	1.2	20.0	24.1	20.6
2125.00	331.2	4.9	0.912	0.043	0.9	76.7	68.0	77.4
2126.00	1118.1	6.0	0.945	0.044	1.3	149.0	186.4	149.9
2126.20	1351.3	6.2	0.952	0.044	1.3	165.0	217.8	165.9

NOTES:

COE & VAN LOO
PLANNING • ENGINEERING
LANDSCAPE ARCHITECTURE

Project 60TH STREET & DOVE VALLEY RD
Project No. 94-0047
Sheet No. _____ of _____
Calculated by CCC Date 4/27/94
Checked by _____ Date _____

SPLIT FLOW FOR THE PEAK DISCHARGE Q = 1538 CFS
(ONSITE)

STAGE (FT)	DISCHARGE (CFS) LEFT CHANNEL NWASH2L	RIGHT CHANNEL NWASH2R	TOTAL
2122.5	0.9	0	0.9
2124.5	199.1	1.5	200.6
2125.0	331.2	42.6	373.8
2125.5	562.3	153.7	716.0
2125.9	981.5	328.4	1309.9
2125.95	1048.9	362.5	1411.4
2125.96	1062.6	369.5	1432.1
2126.0	1118.1	398.0	1516.1
2126.01	1132.1	405.9	1538.0
2126.02	1139.9	410.3	1550.2

Q_{LEFT} = 1132.1 CFS Q_{RIGHT} = 405.9 CFS

% = 73.61 % % = 26.39 %

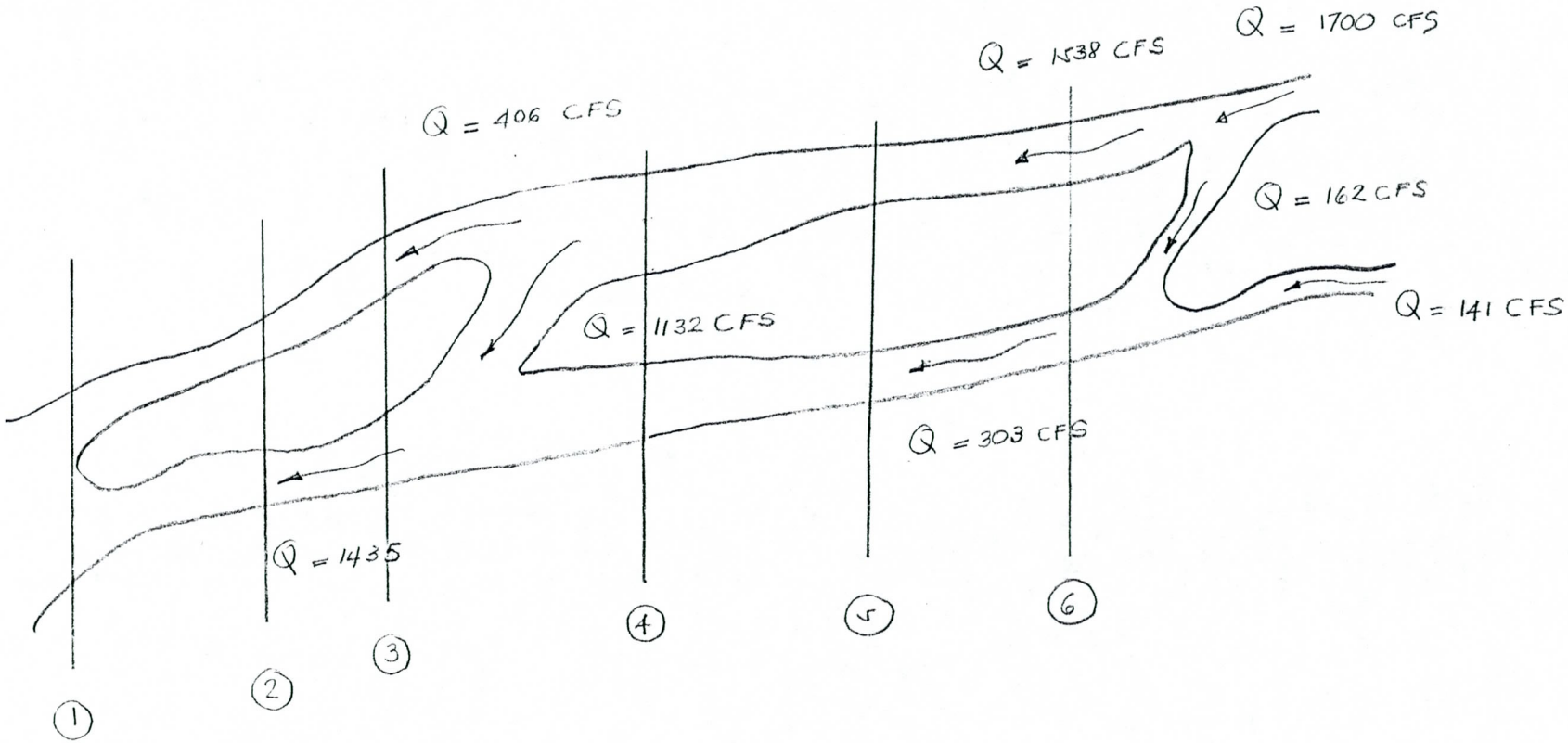

Fig A-1 – SPLIT FLOW ANALYSIS FOR THE NORTH WASH

NTS

```
*****************************************
*  HEC-2 WATER SURFACE PROFILES         *
*                                       *
*  Version   4.6.0;  February 1991      *
*                                       *
*  RUN DATE    07JUL94    TIME   11:24:12 *
*****************************************
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****************************************
*  U.S. ARMY CORPS OF ENGINEERS        *
*  HYDROLOGIC ENGINEERING CENTER       *
*  609 SECOND STREET, SUITE D          *
*  DAVIS, CALIFORNIA 95616-4687        *
*          (916) 756-1104              *
****************************************
```

```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X       X     X            X     X
X     X  X       X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X       X                  X
X     X  X       X     X            X
X     X  XXXXXXX   XXXXX            XXXXXXX
```

North Wash

(RIGHT CHANNEL)

THIS RUN EXECUTED 07JUL94 11:24:12

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************************************
HEC-2 WATER SURFACE PROFILES

Version   4.6.0;  February 1991
************************************
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```
T1      US HOME  - NORTH WASH   (FILE NAME: H2NW-RCH)
T2      HEC-2 ANALYSIS OF THE NORTH WASH (100-YEAR DISCHARGE)
T3      ****************************************************
```

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	2	0	0	-1	0	0	0	2106	0

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1	0	-1	0	0	0	0	0	0	0

CHECK QT AND NC CARDS

QT	1	406								
ET		7.1					385	543		
NC	0.05	0.05	0.03	0.1	0.3					
X1	1	27	415	440	0	0	0			
GR	2106	98	2106	100	2106	110	2104.8	159	2104.1	165
GR	2104.4	178	2106	184	2106.2	215	2106	253	2105	257
GR	2104	259	2103.7	268	2104	276	2104.6	350	2104.9	385
GR	2104	415	2104.4	440	2106	460	2106.7	488	2107.2	505
GR	2107.8	525	2108	534	2108	543	2107.3	550	2106.3	585
GR	2107.6	620	2106	650						
ET		7.1					255	378		
X1	2	33	326	340	300	305	310			
GR	2112.2	0	2110.2	40	2110	45	2110	46	2110	51
GR	2110.2	55	2110	63	2109.6	68	2108.7	71	2108.7	85
GR	2108	90	2108.4	100	2108.6	125	2109.7	152	2110	155
GR	2111.3	180	2110.3	205	2110	212	2109.6	215	2110	220
GR	2112	255	2112	285	2111.9	300	2111	310	2110	326
GR	2109.9	334	2110	340	2111.5	348	2110	375	2110	378
GR	2110	382	2112	410	2113.7	445				
ET		7.1					249	337		
X1	3	23	314	323	250	220	240			
GR	2115.7	70	2115.8	78	2115.5	92	2114	97	2113.6	104
GR	2114	111	2114.4	126	2114.1	141	2114	145	2114.1	149
GR	2115.6	165	2114.2	181	2114.4	185.5	2114.1	190	2115.7	194
GR	2116	202	2116.1	249	2116	296	2115	314	2115.1	323
GR	2116	325	2116.5	337	2116	365				

```
ET              7.1                                          385       493
X1        4      27       425       435       305       345       295
GR   2121.8      80    2121.8       105    2120.2       147      2120       151    2119.1       155
GR     2119     161      2120       165    2121.1       170      2121       210    2120.5       250
GR     2120     255    2119.5       257    2119.5       269      2120       272    2121.6       300
GR     2122     325    2122.9       385      2122       425    2121.1       429      2122       435
GR   2122.2     442      2122       446    2121.6       452    2121.8       460      2122       462
GR   2122.7     465    2122.8       493

QT        1    1538
ET              7.1                                          330       496
X1        5      27       345       388       310       310       305
GR   2127.9      90    2127.9        91    2126.5       108      2126       121    2124.6       126
GR     2124     132    2124.2       138      2126       143      2128       158      2128       171
GR     2126     199    2124.7       214      2126       221      2127       273      2128       320
GR   2128.3     330      2128       343      2126       345    2125.6       350    2125.8       365
GR     2126     388    2126.7       440    2127.1       479      2128       485    2128.2       487
GR   2128.5     496      2128       557

ET              7.1                                          255       438
X1        6      27       400       420       265       270       290
GR     2134       0    2133.2        20      2132        70    2132.3        95      2132       120
GR     2131     130      2130       140    2128.7       148    2128.9       156      2130       160
GR     2132     190      2134       226    2134.8       255      2134       285    2133.6       320
GR     2134     352    2134.2       360      2134       368      2132       376    2131.6       384
GR   2130.6     400    2130.7       420      2132       424      2134       429    2134.3       438
GR     2134     445      2134       471
  EJ END INPUT OF REACH MODEL
  ER RECORD ENDS THE RUN
```

```
 SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
 Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
 TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
 SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


*PROF 1


CHV=     .100 CEHV=     .300
*SECNO 1.000
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      385.0     543.0  TYPE=      1  TARGET=      158.000
   1.000      1.90   2105.60   2105.60       .00   2106.19       .58       .00       .00   2104.00
   406.0     129.8     253.9      22.3      34.6      35.1       9.0        .0        .0   2104.40
     .00      3.75      7.24      2.47      .050      .030      .050      .000   2103.70    385.00
 .013609        0.        0.        0.         0        14         0       .00     70.04    455.04


*SECNO 2.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      255.0     378.0  TYPE=      1  TARGET=      123.000
   2.000      3.74   2111.74   2111.74       .00   2112.30       .56      3.85       .00   2110.00
   406.0      78.9     198.3     128.8      23.0      25.1      40.1        .6        .5   2110.00
     .02      3.43      7.89      3.22      .050      .030      .050      .000   2108.00    301.72
 .011637      300.      310.      305.         5        27         0       .00     76.28    378.00


*SECNO 3.000
3280 CROSS SECTION      3.00 EXTENDED       .93 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      249.0     337.0  TYPE=      1  TARGET=       88.000
   3.000      3.33   2116.93   2116.93       .00   2117.43       .51      2.90       .01   2115.00
   406.0     232.4     142.6      31.0      66.9      16.9      10.9       1.1       1.0   2115.10
     .03      3.48      8.44      2.85      .050      .030      .050      .000   2113.60    249.00
 .012553      250.      240.      220.        20         9         0       .00     88.00    337.00


*SECNO 4.000
3280 CROSS SECTION      4.00 EXTENDED       .44 FEET

7185 MINIMUM SPECIFIC ENERGY
```

```
SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      385.0     493.0  TYPE=      1  TARGET=      108.000
   4.000      4.24   2123.24   2123.24       .00   2123.66       .43      3.96       .01   2122.00
   406.0      89.4     132.3     184.3      31.4      16.9      52.3       1.8       1.7   2122.00
     .05      2.85      7.85      3.52      .050      .030      .050      .000   2119.00    385.00
 .012810      305.      295.      345.         3        15         0       .00    108.00    493.00


SECNO 5.000
3280 CROSS SECTION      5.00 EXTENDED       .15 FEET

185 MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      330.0     496.0  TYPE=      1  TARGET=      166.000
   5.000      4.15   2128.15   2128.15       .00   2129.03       .88      3.48       .14   2126.00
  1538.0       6.5     915.0     616.4       2.8     100.4     146.4       3.0       2.6   2126.00
     .06      2.32      9.12      4.21      .050      .030      .050      .000   2124.00    336.37
 .010942      310.      305.      310.         7         5         0       .00    150.16    486.53


*SECNO 6.000
280 CROSS SECTION      6.00 EXTENDED       .74 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      255.0     438.0  TYPE=      1  TARGET=      183.000
   6.000      6.04   2134.74   2134.74       .00   2135.60       .86      2.21       .00   2130.60
  1538.0     636.9     797.8     103.2     178.6      81.7      27.5       4.7       3.6   2130.70
     .07      3.57      9.76      3.75      .050      .030      .050      .000   2128.70    257.40
 .005946      265.      290.      270.        20        18         0       .00    180.60    438.00
```

THIS RUN EXECUTED 07JUL94 11:24:12

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.0; February 1991
****

OTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

****

UMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	1.000	.00	.00	.00	2103.70	406.00	2105.60	2105.60	2106.19	136.09	7.24	78.70	34.80
	2.000	310.00	.00	.00	2108.00	406.00	2111.74	2111.74	2112.30	116.37	7.89	88.18	37.64
*	3.000	240.00	.00	.00	2113.60	406.00	2116.93	2116.93	2117.43	125.53	8.44	94.63	36.24
	4.000	295.00	.00	.00	2119.00	406.00	2123.24	2123.24	2123.66	128.10	7.85	100.54	35.87
*	5.000	305.00	.00	.00	2124.00	1538.00	2128.15	2128.15	2129.03	109.42	9.12	249.56	147.03
	6.000	290.00	.00	.00	2128.70	1538.00	2134.74	2134.74	2135.60	59.46	9.76	287.82	199.45

****

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
1.000	406.00	2105.60	.00	.00	.00	70.04	.00
2.000	406.00	2111.74	.00	6.14	.00	76.28	310.00
3.000	406.00	2116.93	.00	5.18	.00	88.00	240.00
4.000	406.00	2123.24	.00	6.31	.00	108.00	295.00
5.000	1538.00	2128.15	.00	4.92	.00	150.16	305.00
6.000	1538.00	2134.74	.00	6.58	.00	180.60	290.00

SUMMARY OF ERRORS AND SPECIAL NOTES

```
CAUTION SECNO=      1.000  PROFILE=  1  CRITICAL DEPTH ASSUMED

CAUTION SECNO=      2.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      2.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=      3.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      3.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      3.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=      4.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      4.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=      5.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      5.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=      6.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      6.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      6.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
```

```
*********************************************
*  HEC-2 WATER SURFACE PROFILES             *
*                                           *
*  Version   4.6.0;  February 1991          *
*                                           *
*  RUN DATE    07JUL94    TIME    11:14:08  *
*********************************************
```

```
****************************************
*  U.S. ARMY CORPS OF ENGINEERS        *
*  HYDROLOGIC ENGINEERING CENTER       *
*  609 SECOND STREET, SUITE D          *
*  DAVIS, CALIFORNIA 95616-4687        *
*          (916) 756-1104              *
****************************************
```

```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX              XXXXXXX
```

NORTH WASH

(LEFT CHANNEL)

THIS RUN EXECUTED 07JUL94 11:14:08

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************************************
HEC-2 WATER SURFACE PROFILES

Version   4.6.0;  February 1991
************************************
```

```
T1      US HOME  - NORTH WASH   (FILE NAME: H2NW-LCH)
T2      HEC-2 ANALYSIS OF THE NORTH WASH (100-YEAR DISCHARGE)
T3      ****************************************************
```

1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	2	0	0	-1	0	0	0	2106	0
2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1	0	-1	0	0	0	0	0	0	0

CHECK QT AND NC CARDS

QT	1	1435								
T		7.1					100	385		
C	0.05	0.05	0.03	0.1	0.3					
X1	1	27	165	178	0	0	0			
GR	2106	98	2106	100	2106	110	2104.8	159	2104.1	165
GR	2104.4	178	2106	184	2106.2	215	2106	253	2105	257
GR	2104	259	2103.7	268	2104	276	2104.6	350	2104.9	385
GR	2104	415	2104.4	440	2106	460	2106.7	488	2107.2	505
GR	2107.8	525	2108	534	2108	543	2107.3	550	2106.3	585
GR	2107.6	620	2106	650						
ET		7.1					40	255		
X1	2	33	71	100	300	305	310			
GR	2112.2	0	2110.2	40	2110	45	2110	46	2110	51
GR	2110.2	55	2110	63	2109.6	68	2108.7	71	2108.7	85
GR	2108	90	2108.4	100	2108.6	125	2109.7	152	2110	155
GR	2111.3	180	2110.3	205	2110	212	2109.6	215	2110	220
GR	2112	255	2112	285	2111.9	300	2111	310	2110	326
GR	2109.9	334	2110	340	2111.5	348	2110	375	2110	378
GR	2110	382	2112	410	2113.7	445				
T		7.1					78	249		
X1	3	23	97	149	250	220	240			
GR	2115.7	70	2115.8	78	2115.5	92	2114	97	2113.6	104
GR	2114	111	2114.4	126	2114.1	141	2114	145	2114.1	149
GR	2115.6	165	2114.2	181	2114.4	185.5	2114.1	190	2115.7	194
GR	2116	202	2116.1	249	2116	296	2115	314	2115.1	323
GR	2116	325	2116.5	337	2116	365				

QT	1	1132								
ET		7.1					210	385		
X1	4	27	257	269	305	345	295			
GR	2121.8	80	2121.8	105	2120.2	147	2120	151	2119.1	155
GR	2119	161	2120	165	2121.1	170	2121	210	2120.5	250
GR	2120	255	2119.5	257	2119.5	269	2120	272	2121.6	300
GR	2122	325	2122.9	385	2122	425	2121.1	429	2122	435
GR	2122.2	442	2122	446	2121.6	452	2121.8	460	2122	462
GR	2122.7	465	2122.8	493						
QT	1	1538								
ET		7.1					330	496		
X1	5	27	345	388	310	310	305			
GR	2127.9	90	2127.9	91	2126.5	108	2126	121	2124.6	126
GR	2124	132	2124.2	138	2126	143	2128	158	2128	171
GR	2126	199	2124.7	214	2126	221	2127	273	2128	320
GR	2128.3	330	2128	343	2126	345	2125.6	350	2125.8	365
GR	2126	388	2126.7	440	2127.1	479	2128	485	2128.2	487
GR	2128.5	496	2128	557						
ET		7.1					255	438		
X1	6	27	400	420	265	270	290			
GR	2134	0	2133.2	20	2132	70	2132.3	95	2132	120
GR	2131	130	2130	140	2128.7	148	2128.9	156	2130	160
GR	2132	190	2134	226	2134.8	255	2134	285	2133.6	320
GR	2134	352	2134.2	360	2134	368	2132	376	2131.6	384
GR	2130.6	400	2130.7	420	2132	424	2134	429	2134.3	438
GR	2134	445	2134	471						
QT	1	1435								
ET		7.1					78	249		
X1	-3	23	97	149	250	220	240			
GR	2115.7	70	2115.8	78	2115.5	92	2114	97	2113.6	104
GR	2114	111	2114.4	126	2114.1	141	2114	145	2114.1	149
GR	2115.6	165	2114.2	181	2114.4	185.5	2114.1	190	2115.7	194
GR	2116	202	2116.1	249	2116	296	2115	314	2115.1	323
GR	2116	325	2116.5	337	2116	365				
QT	1	303								
ET		7.1					80	210		
X1	4.1	27	155	161	305	345	295			
GR	2121.8	80	2121.8	105	2120.2	147	2120	151	2119.1	155
GR	2119	161	2120	165	2121.1	170	2121	210	2120.5	250
GR	2120	255	2119.5	257	2119.5	269	2120	272	2121.6	300
GR	2122	325	2122.9	385	2122	425	2121.1	429	2122	435
GR	2122.2	442	2122	446	2121.6	452	2121.8	460	2122	462
GR	2122.7	465	2122.8	493						

```
ET          7.1                                          90      330
X1    5.1    27     126     132     310     310     305
GR  2127.9   90  2127.9      91  2126.5     108    2126      121  2124.6     126
GR    2124  132  2124.2     138    2126     143    2128      158    2128     171
GR    2126  199  2124.7     214    2126     221    2127      273    2128     320
GR  2128.3  330    2128     343    2126     345  2125.6      350  2125.8     365
GR    2126  388  2126.7     440  2127.1     479    2128      485  2128.2     487
GR  2128.5  496    2128     557

ET          7.1                                           0      255
X1    6.1    27     148     156     265     270     290
GR    2134     0  2133.2      20    2132      70  2132.3       95    2132     120
GR    2131   130    2130     140  2128.7     148  2128.9      156    2130     160
GR    2132   190    2134     226  2134.8     255    2134      285  2133.6     320
GR    2134   352  2134.2     360    2134     368    2132      376  2131.6     384
GR  2130.6   400  2130.7     420    2132     424    2134      429  2134.3     438
GR    2134   445    2134     471
EJ END INPUT OF REACH MODEL
ER RECORD ENDS THE RUN
```

```
 SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
 Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
 TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
 SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

*PROF 1


CCHV=     .100 CEHV=     .300
*SECNO 1.000

3265 DIVIDED FLOW

3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      100.0     385.0  TYPE=      1  TARGET=      285.000
   1.000      2.12   2105.82   2105.82       .00   2106.49       .67       .00       .00   2104.10
  1435.0     107.0     208.7    1119.2      29.3      20.4     190.6        .0        .0   2104.40
     .00      3.66     10.25      5.87      .050      .030      .050      .000   2103.70    117.52
 .023573        0.        0.        0.         0        10         0       .00    197.06    385.00


*SECNO 2.000

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=       40.0     255.0  TYPE=      1  TARGET=      215.000
   2.000      3.00   2111.00   2111.00       .00   2111.74       .74      4.45       .02   2108.70
  1435.0     102.5     669.6     662.9      32.9      73.5     156.0       1.8       1.3   2108.40
     .01      3.12      9.12      4.25      .050      .030      .050      .000   2108.00     40.00
 .009834      300.      310.      305.         5        11         0       .00    184.24    237.50


*SECNO 3.000
3280 CROSS SECTION      3.00 EXTENDED       .50 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=       78.0     249.0  TYPE=      1  TARGET=      171.000
   3.000      2.90   2116.50   2116.50       .00   2117.28       .77      2.10       .01   2114.00
  1435.0      61.5    1020.1     353.4      20.7     125.8     105.1       3.1       2.3   2114.10
     .02      2.97      8.11      3.36      .050      .030      .050      .000   2113.60     78.00
 .008258      250.      240.      220.        20         8         0       .00    171.00    249.00
```

```
 SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
 Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
 TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
 SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


*SECNO 4.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      210.0     385.0  TYPE=      1  TARGET=      175.000
   4.000      3.62   2122.62   2122.62       .00   2123.35       .73      2.72       .00   2119.50
  1132.0     411.6     384.3     336.1      92.2      37.4      92.4       4.9       3.5   2119.50
     .04      4.47     10.28      3.64      .050      .030      .050      .000   2119.00    210.00
 .009464      305.      295.      345.        20        11         0       .00    156.02    366.02


*SECNO 5.000
3280 CROSS SECTION      5.00 EXTENDED       .16 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      330.0     496.0  TYPE=      1  TARGET=      166.000
   5.000      4.16   2128.16   2128.16       .00   2129.03       .87      3.13       .04   2126.00
  1538.0       6.6     913.7     617.7       2.9     100.8     147.4       6.5       4.6   2126.00
     .05      2.28      9.06      4.19      .050      .030      .050      .000   2124.00    335.92
 .010751      310.      305.      310.         6        11         0       .00    150.71    486.63


*SECNO 6.000
3280 CROSS SECTION      6.00 EXTENDED       .74 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      255.0     438.0  TYPE=      1  TARGET=      183.000
   6.000      6.04   2134.74   2134.74       .00   2135.60       .86      2.19       .00   2130.60
  1538.0     637.1     797.7     103.3     178.7      81.7      27.5       8.2       5.6   2130.70
     .06      3.56      9.76      3.75      .050      .030      .050      .000   2128.70    257.37
 .005941      265.      290.      270.        20        18         0       .00    180.63    438.00


*SECNO -3.000
START TRIB COMP
  -3.000     3.000  2116.503
```

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

280 CROSS SECTION -3.00 EXTENDED .50 FEET

7185 MINIMUM SPECIFIC ENERGY

470 ENCROACHMENT STATIONS= 78.0 249.0 TYPE= 1 TARGET= 171.000

-3.000	2.90	2116.50	2116.49	.00	2117.28	.77	1.65	-1.65	2114.00
1435.0	61.5	1020.1	353.4	20.7	125.8	105.1	9.7	6.6	2114.10
.07	2.97	8.11	3.36	.050	.030	.050	.000	2113.60	78.00
.008258	250.	240.	220.	0	14	0	.00	171.00	249.00

SECNO 4.100

685 20 TRIALS ATTEMPTED WSEL,CWSEL

3693 PROBABLE MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

470 ENCROACHMENT STATIONS= 80.0 210.0 TYPE= 1 TARGET= 130.000

4.100	2.60	2121.60	2121.60	.00	2122.02	.41	2.48	.04	2119.10
303.0	102.1	117.8	83.1	40.0	15.3	35.8	11.0	7.6	2119.00
.09	2.55	7.69	2.32	.050	.030	.050	.000	2119.00	110.18
.006913	305.	295.	345.	20	14	0	.00	99.82	210.00

SECNO 5.100

3265 DIVIDED FLOW

685 20 TRIALS ATTEMPTED WSEL,CWSEL

693 PROBABLE MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

470 ENCROACHMENT STATIONS= 90.0 330.0 TYPE= 1 TARGET= 240.000

5.100	2.44	2126.44	2126.44	.00	2126.91	.47	2.53	.02	2124.60
303.0	20.5	104.5	178.0	8.2	12.8	51.6	11.5	8.3	2124.00
.11	2.51	8.15	3.45	.050	.030	.050	.000	2124.00	109.64
.009904	310.	305.	310.	20	11	0	.00	87.48	243.72

SECNO 6.100

685 20 TRIALS ATTEMPTED WSEL,CWSEL

3693 PROBABLE MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

6.100	2.59	2131.29	2131.29	.00	2131.95	.66	2.52	.06	2128.70
303.0	83.4	165.3	54.4	23.8	19.9	19.8	12.0	8.7	2128.90
.12	3.50	8.30	2.75	.050	.030	.050	.000	2128.70	127.11
.008327	265.	290.	270.	20	8	0	.00	52.22	179.33

THIS RUN EXECUTED 07JUL94 11:14:09

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.0; February 1991
****

OTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

****

UMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	1.000	.00	.00	.00	2103.70	1435.00	2105.82	2105.82	2106.49	235.73	10.25	240.25	93.46
	2.000	310.00	.00	.00	2108.00	1435.00	2111.00	2111.00	2111.74	98.34	9.12	262.28	144.71
*	3.000	240.00	.00	.00	2113.60	1435.00	2116.50	2116.50	2117.28	82.58	8.11	251.57	157.91
	4.000	295.00	.00	.00	2119.00	1132.00	2122.62	2122.62	2123.35	94.64	10.28	221.97	116.36
*	5.000	305.00	.00	.00	2124.00	1538.00	2128.16	2128.16	2129.03	107.51	9.06	251.10	148.33
	6.000	290.00	.00	.00	2128.70	1538.00	2134.74	2134.74	2135.60	59.41	9.76	287.96	199.54
*	-3.000	240.00	.00	.00	2113.60	1435.00	2116.50	2116.49	2117.28	82.58	8.11	251.57	157.91
	4.100	295.00	.00	.00	2119.00	303.00	2121.60	2121.60	2122.02	69.13	7.69	91.15	36.44
*	5.100	305.00	.00	.00	2124.00	303.00	2126.44	2126.44	2126.91	99.04	8.15	72.63	30.45
	6.100	290.00	.00	.00	2128.70	303.00	2131.29	2131.29	2131.95	83.27	8.30	63.54	33.21

****

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	1.000	1435.00	2105.82	.00	.00	.00	197.06	.00
*	2.000	1435.00	2111.00	.00	5.18	.00	184.24	310.00
*	3.000	1435.00	2116.50	.00	5.50	.00	171.00	240.00
*	4.000	1132.00	2122.62	.00	6.11	.00	156.02	295.00
*	5.000	1538.00	2128.16	.00	5.55	.00	150.71	305.00
*	6.000	1538.00	2134.74	.00	6.57	.00	180.63	290.00
*	-3.000	1435.00	2116.50	.00	-18.23	.00	171.00	240.00
*	4.100	303.00	2121.60	.00	5.10	.00	99.82	295.00
*	5.100	303.00	2126.44	.00	4.83	.00	87.48	305.00
*	6.100	303.00	2131.29	.00	4.85	.00	52.22	290.00

SUMMARY OF ERRORS AND SPECIAL NOTES

```
CAUTION SECNO=      1.000  PROFILE=  1  CRITICAL DEPTH ASSUMED

CAUTION SECNO=      2.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      2.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=      3.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      3.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      3.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=      4.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      4.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      4.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=      5.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      5.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=      6.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      6.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      6.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=     -3.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=      4.100  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      4.100  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      4.100  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=      5.100  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      5.100  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      5.100  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=      6.100  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      6.100  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      6.100  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
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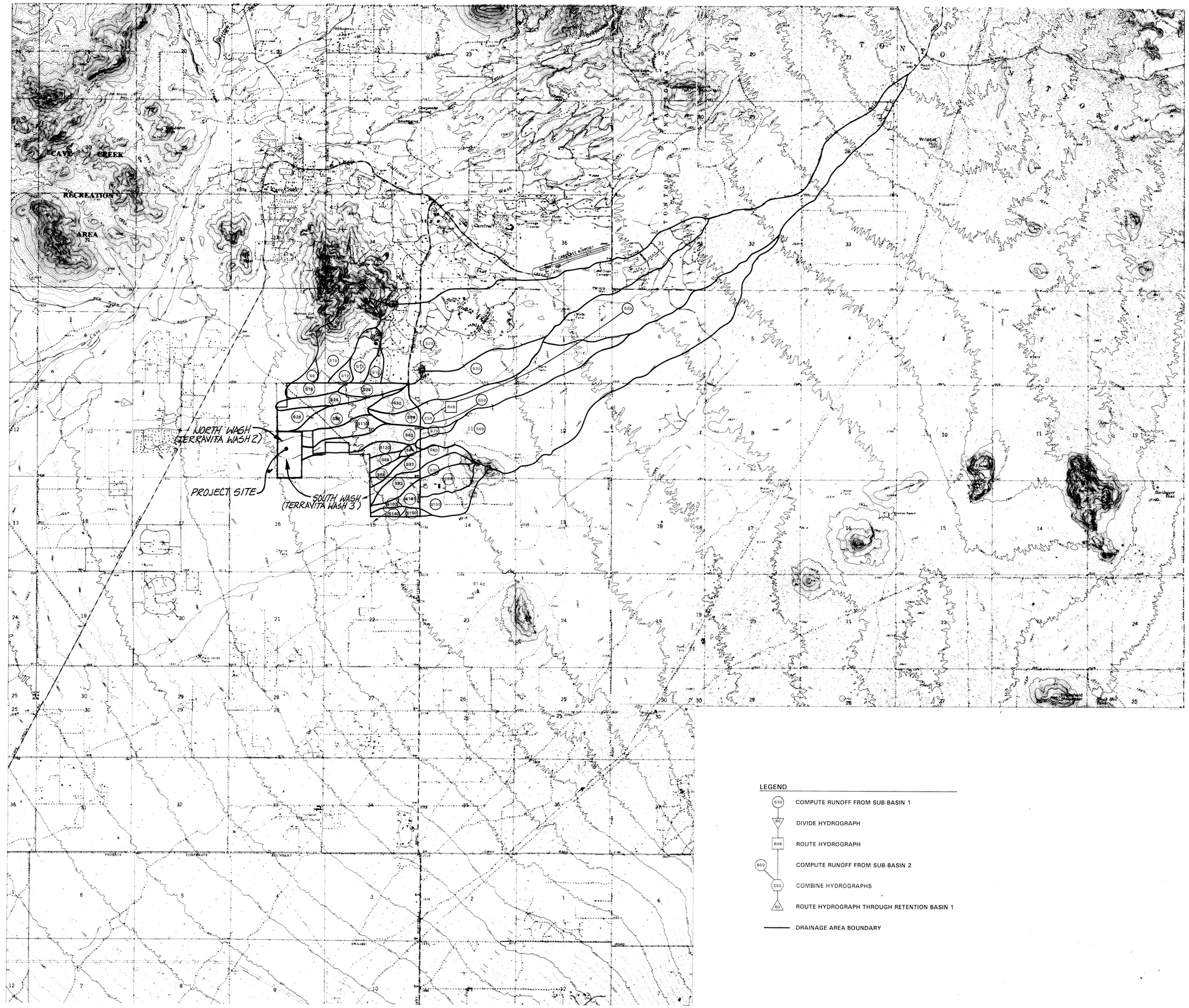


LEGEND

- B30 — COMPUTE RUNOFF FROM SUB-BASIN 1
- D0 — DIVIDE HYDROGRAPH
- R48 — ROUTE HYDROGRAPH
- B50 — COMPUTE RUNOFF FROM SUB-BASIN 2
- C55 — COMBINE HYDROGRAPHS
- R0 — ROUTE HYDROGRAPH THROUGH RETENTION BASIN 1
- DRAINAGE AREA BOUNDARY

FLOOD CONTROL DISTRICT
RECEIVED
JUL 22 1994
CH ENG | P.A.R.M.
DEP | ADMIN
ADMIN | PERSONNEL
FINANCE | E.I.S.
C.&O. | ENG.
ENGR | ENG.
REMARKS

LA BUENA VISTA

WATERSHED BOUNDARY MAP

EXISTING CONDITIONS &
HEC-1 SCHEMATIC

PLATE 1

JUL 12 1994

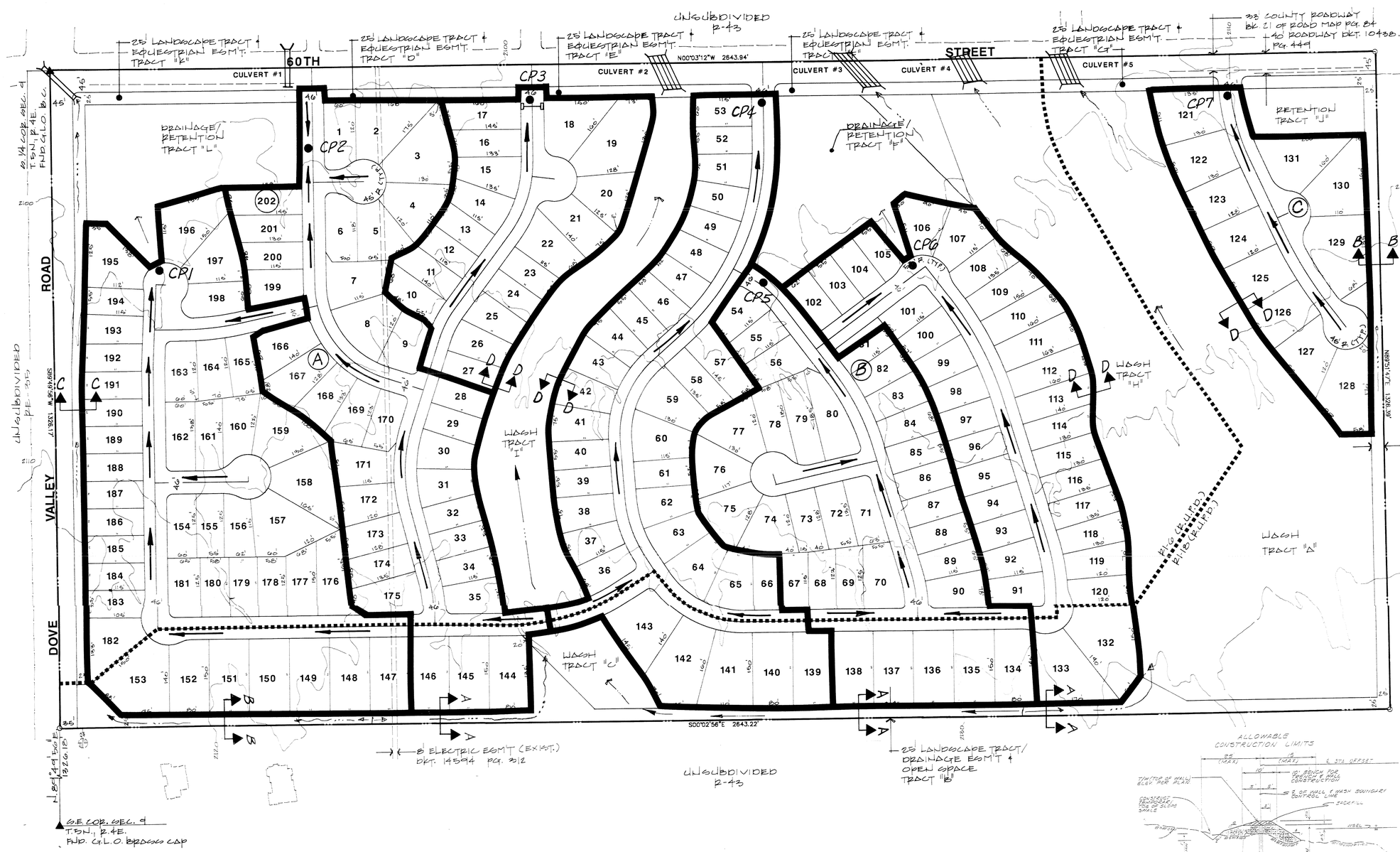
CVL
COE & VAN LOO
PLANNING · ENGINEERING
LANDSCAPE ARCHITECTURE

JOB # 94-0047-01

LA BUENA VISTA
60TH STREET AND DOVE VALLEY ROAD

PRELIMINARY DRAINAGE PLAN

PLATE 2



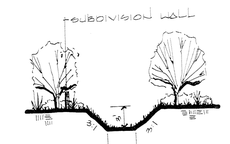
NOTE: SIZES AND LOCATIONS OF CULVERTS 1 THRU 5 UNDER 60TH STREET ARE SHOWN SCHEMATICALLY PER CONSTRUCTION PLANS BY RICK ENGINEERING COMPANY (6/23/94).

FLOOD CONTROL DISTRICT RECEIVED JUL 22 1994

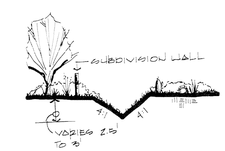
CH ENG.	P & PM
DEP	HYDRO
ADMIN	LMGT
FINANCE	FILE
C & O	
ENGR.	
REMARKS	

DEVELOPER:
U.S. HOMES
1400 E. SOUTHERN AVE., SUITE 700
TEMPE, ARIZONA 85282
(602) 838-4178

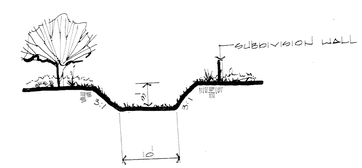
LAND PLANNER/ENGINEER:
COE AND VAN LOO
4550 N. 12TH STREET
PHOENIX, ARIZONA
(602) 264-6831



SECTION A-A

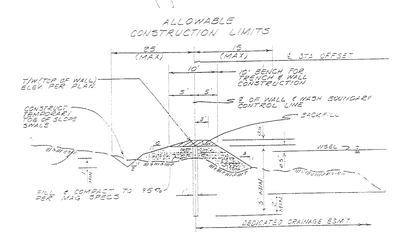


SECTION B-B



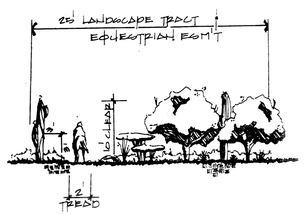
SECTION C-C

DRAINAGE EASEMENT SECTION

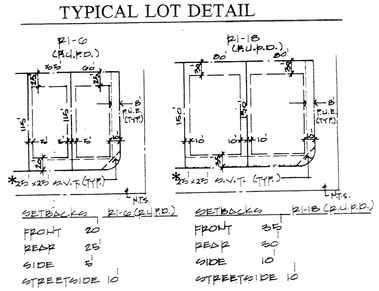


SECTION D-D
TYPICAL CUTOFF WALL DETAIL
NTS

EQUESTRIAN TRAIL EASEMENT DETAIL



TYPICAL LOT DETAIL



SITE SUMMARY:	R1-6 RUPD	R1-18 RUPD	TOTAL
EXISTING ZONING	RURAL-43	RURAL-43	
PROPOSED ZONING	R1-6 RUPD	R1-8 RUPD	
GROSS ACREAGE	56.22 AC.+/-	24.27 AC.+/-	80.49 AC.+/-
NET ACREAGE	46.47 AC.+/-	19.75 AC.+/-	66.22 AC.+/-
NET/NET ACREAGE	39.20 AC.+/-	11.67 AC.+/-	50.87 AC.+/-
YIELD	169 LOTS	33 LOTS	202 LOTS
DENSITY	3.0 DU./AC.+/-	1.4 DU./AC.+/-	2.5 DU./AC.+/-
MIN. LOT SIZE	55' X 115'	10,000 - 12,000 S.F.	
NET AREA OF R.O.W. (EXISTING & PROPOSED)	10.87 AC.+/-	2.90 AC.+/-	13.77 AC.+/-
AREA OF LANDSCAPE	13.86 AC.+/-	11.62 AC.+/-	25.49 AC.+/-
PARKING REQUIRED	338 SPACES	66 SPACES	404 SPACES
PARKING PROVIDED	338 SPACES	66 SPACES	404 SPACES
DWELLING TYPE	SINGLE FAMILY DETACHED		
PROPOSED NUMBER OF FAMILIES			606 +/-

LEGEND:

- EXISTING CONTOURS
- EXISTING WATER
- EXISTING SEWER
- PROPOSED WATER
- PROPOSED SEWER
- PROPOSED ZONING BOUNDARY LINE
- PROPOSED MANHOLE
- PROPOSED CLEANOUT
- FIRE HYDRANT
- SURFACE DRAINAGE
- SIGHT VISIBILITY TRIANGLE
- CATCH BASIN
- CULVERT
- SUB-BASIN BOUNDARY
- SUB-BASIN A
- RETENTION BASIN
- DIRECTION OF FLOW

NORTH

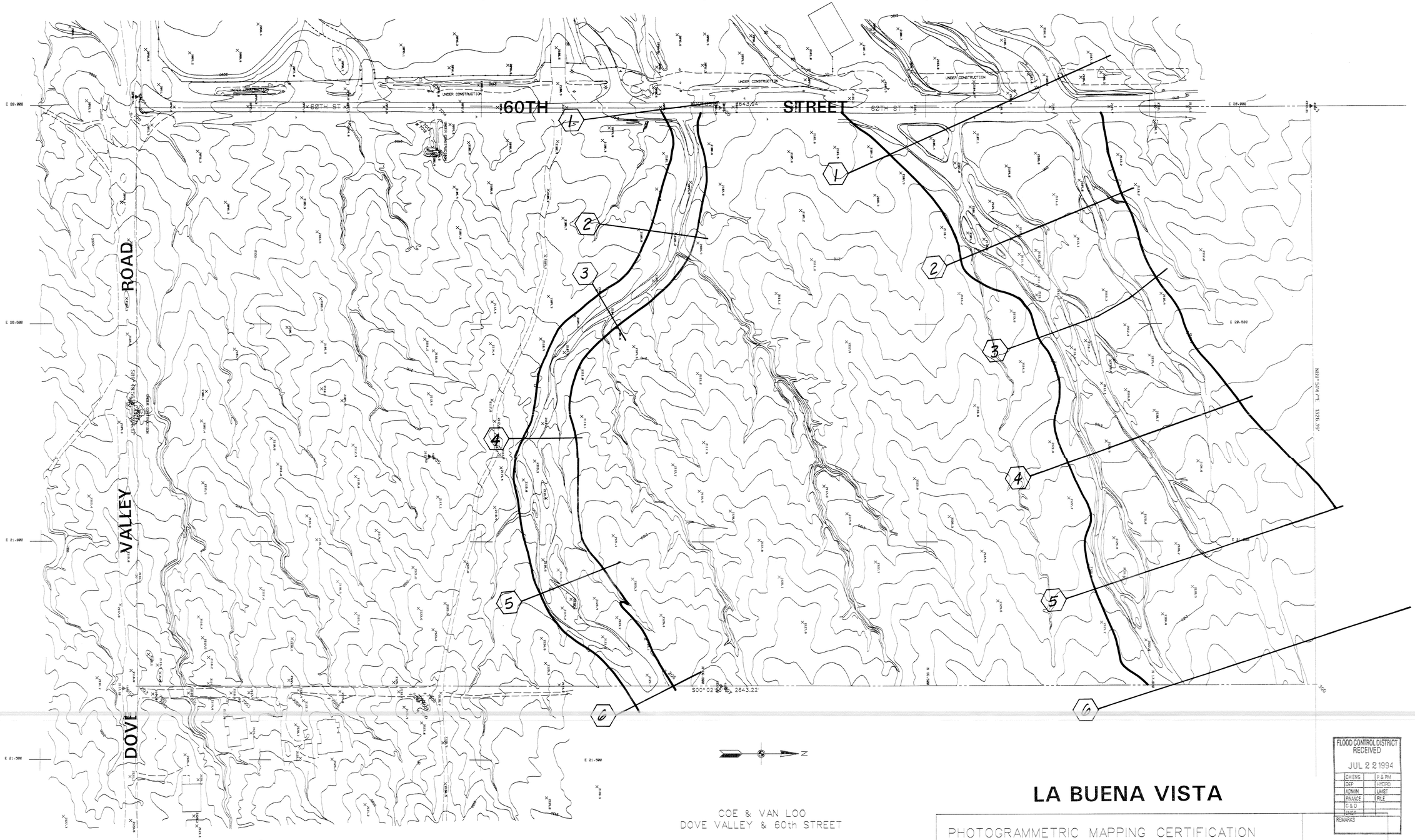
SCALE: 1"=100'

JUL 12 1994

PRELIMINARY
NOT FOR CONSTRUCTION

COE & VAN LOO
PLANNING · ENGINEERING
LANDSCAPE ARCHITECTURE

SHEEET: 2 OF 2
DATE: 07-06-94
CVL# 94-0047-01



COE & VAN LOO
DOVE VALLEY & 60th STREET

PLOT SCALE: 1" = 100'
CONTOUR INTERVAL = 2 FEET
PHOTO DATE: 3/15/94
APPROX PHOTO SCALE: 1" = 367'

SHEET 1 OF 1

LEGEND

100-YEAR FLOOD LIMIT

(2) CHANNEL SECTIONS FOR HEC-2 ANALYSIS

AERIAL MAPPING COMPANY, INC.
3141 WEST CLARENDON AVENUE (602)263-6738
PHOENIX, ARIZONA 85017 FAX (602)263-0165

LA BUENA VISTA

PHOTOGRAMMETRIC MAPPING CERTIFICATION

THIS IS TO CERTIFY THAT THIS DOCUMENT WAS PREPARED UNDER MY SUPERVISION UTILIZING FIELD CONTROL PROVIDED BY COE & VAN LOO, AND THAT THIS DOCUMENT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. THIS DOCUMENT IS AN INSTRUMENT OF PROFESSIONAL SERVICES ONLY. AERIAL MAPPING COMPANY, INC., MAKES NO WARRANTIES TO THIRD PARTIES.

AMC JN 94041

FLOOD CONTROL DISTRICT
RECEIVED
JUL 22 1994

CH ENG	P & PM
DEP	HYDRO
ADMIN	LMGT
FINANCE	FILE
O & O	
REMARKS	

FLOODPLAIN DELINEATION MAP & HEC-2 SECTIONS

JUL 12 1994

PLATE 3

JOB# 94004701