CAMELBACK RANCH
FLOODPLAIN AND INTERIOR DRAINAGE REPORT

June, 1988
Revised November, 1988

COE & VAN LOO
PLANNING • ENGINEERING
LANDSCAPE ARCHITECTURE
4550 NORTH 12TH STREET
PHOENIX, ARIZONA 85014
TELEPHONE (602) 264-6831

Property of
Flood Control District of MC Library
Please Return to
2801 W. Durango
Phoenix, AZ 85009

CAMELBACK RANCH
FLOODPLAIN AND INTERIOR DRAINAGE REPORT

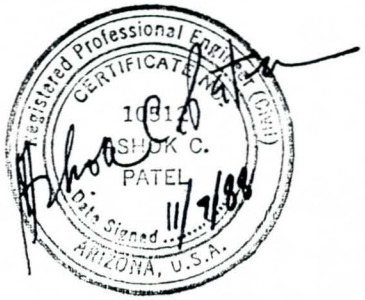
June, 1988
Revised November, 1988

Prepared For:

WILLDEN - RED RIVER JOINT VENTURE
4520 N. CENTRAL, #500
PHOENIX, AZ 85012

Prepared By:

Coe & Van Loo Consulting Engineers, Inc.
4550 North 12th Street
Phoenix, Arizona 85014
(602) 264-6831



CVL

CVL-4-0208

TABLE OF CONTENTS

		PAGE
1.0	**INTRODUCTION**	
	1.1 Objective	1
	1.2 Location	1
	1.3 General Background	3
2.0	**PROPOSED FLOOD CONTROL AND DRAINAGE IMPROVEMENTS**	3
3.0	**HYDROLOGY**	
	3.1 Agua Fria and New Rivers	4
	3.2 Interior Drainage Facilities	5
4.0	**HYDRAULIC ANALYSES-AGUA FRIA AND NEW RIVERS**	
	4.1 Existing Conditions	7
	4.2 Proposed Conditions	8
	4.3 Results	8
5.0	**OPERATION AND MAINTENANCE PLAN**	9
6.0	**GEOTECHNICAL INVESTIGATION**	11
7.0	**CONCLUSIONS**	12
8.0	**REFERENCES**	14

APPENDICES

APPENDIX I - Interior Drainage Analyses
APPENDIX II - Hydraulic Analyses
APPENDIX III - Geotechnical Investigation Report
APPENDIX IV - FEMA Correspondance CLOMR

FIGURES

EXHIBIT "A" - Camelback Ranch Flood Control Facilities Map Pocket

ATTACHMENTS

Camelback Ranch Levee, Channelization, and Retention Basin Plans
Operation and Maintenance Plan

Registered Professional Engineer (Civil)
CERTIFICATE
10512
ASHOK C.
PATEL
Date Signed 11/9/88
ARIZONA, U.S.A.

CVL

LIST OF PLATES AND TABLES

	PAGE
Plate 1 - Location Map	2
Plate 2 - Drainage Map	6
Table 1 - Agua Fria and New River Peak Discharges	4
Table 2 - Agua Fria and New Rivers: Water Surface Elevations	10

1.0 INTRODUCTION

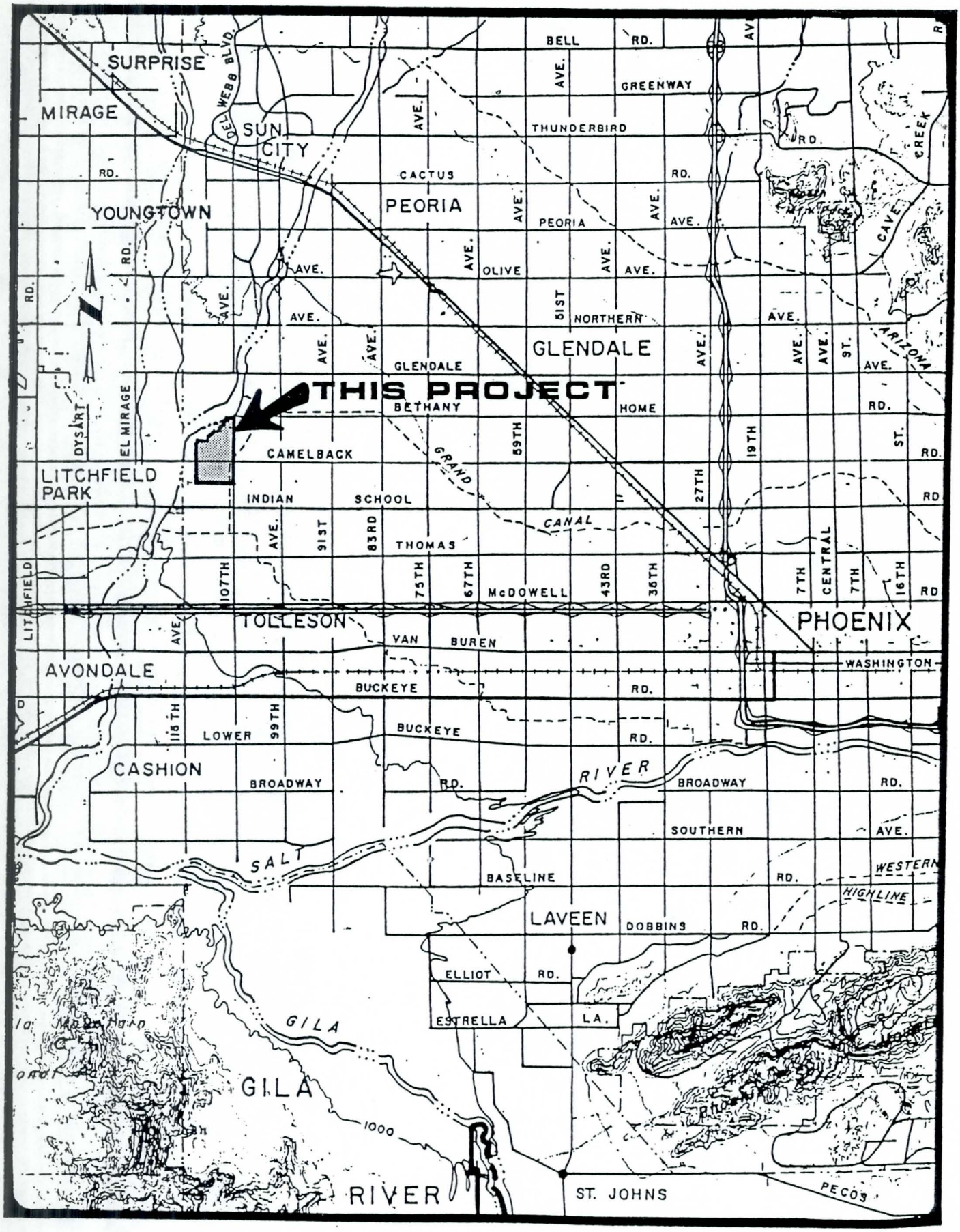
1.1 Objectives

The objective of this report is to provide the technical support information required for plan approval by the City of Phoenix, City of Glendale, and the Flood Control District of Maricopa County, for the "Camelback Ranch: Levee, Channelization, and Retention Basin Plans." This report provides the hydraulic, hydrologic, and geotechnical information for the proposed levee system.

The report and addendum, titled "Camelback Ranch: Floodplain Study and Conditional LOMR Request," were submitted to the Federal Emergency Management Agency (FEMA) in January and May of 1988, respectively. These reports were accompanied by the "Preliminary Levee Design Plans" for Camelback Ranch. The conditional letter of Map Revision (CLOMR) for the Camelback Ranch Project was obtained on August 16, 1988. A copy of the CLOMR is included in Appendix IV.

1.2 Location

The development, comprising of approximately 579 acres, is located within Sections 18 and 19, Township 2 North, Range 1 East of the Gila and Salt River Base and Meridian, Maricopa County, Arizona (See Plate 1). The site is bounded on the north by the Bethany Home Road Alignment (Extended) and on the south by Campbell Avenue. The Avenues of 107th and 113th border the East and West sides of the project, respectively. In addition to the aforementioned boundaries, the New River and the Agua Fria River border the property on the North and West sides, respectively.



VICINITY MAP

PLATE 1

1.3 General Background

The New River channel and watershed have been subject to major and relatively recent changes upstream of the site. In accordance with Flood Control Plan 5, proposed by the Corps of Engineers (COE) in 1975, Adobe Dam has been built on Skunk Creek (1982), a tributary to New River; the New River Dam has been built (1984); and the Arizona Canal Diversion Channel (ACDC) is currently under construction. In addition, the New River channel, which parallels the Northerly property line of Camelback Ranch, has recently been channelized by the City of Glendale. As a result of this channelization, the Flood Control District of Maricopa County (FCDMC) recently redefined the floodplains of the New River (Ref. 6).

The Corps of Engineers (COE) has also redefined the floodplain limits on the Agua Fria River, subsequent to the construction of Camelback Road bridge and the newly developed hydrology (Ref. 4). This data has been incorporated by FEMA in their floodplain maps (Ref. 4).

2.0 PROPOSED FLOOD CONTROL AND DRAINAGE IMPROVEMENTS

The proposed flood control improvements for Camelback Ranch are shown schematically in EXHIBIT "A" and include the following:

A) A soil cement levee along the Agua Fria River and a soil cement levee with channel improvements along the New River;

B) Interior drainage facilities that are comprised of a system of permanent retention basins and basin bleed-off systems.

The Flood Control District of Maricopa County is currently in the design phase of a New River channelization project that extends north

from approximately Bethany Home Road to Olive Avenue. At approximately Bethany Home Road, the FCDMC channelization project will tie into the proposed Camelback Ranch improvements and the existing Glendale Municipal Airport improvements. The FCDMC channelization project is scheduled to move into the construction phase in late 1988.

3.0 HYDROLOGY

3.1 Agua Fria and New Rivers

The peak discharges used in this study correspond to those used in the COE's study of the Agua Fria River (Ref. 4) and the recent FIS of the New River (Ref. 6). The following is a summary of the peak discharges as established by the COE, for recent studies of the Agua Fria and New Rivers, and adopted by FEMA for recent floodplain mapping.

TABLE 1: Agua Fria and New River Peak Discharges

	Peak Discharges (cfs)				
Location	10yr.	50yr.	100yr.	500yr.	SPF
Agua Fria River: Indian School to confluence with New River	23,000	69,000	95,000	184,000	142,000
Agua Fria River: U/S of New River Confluence	18,000	66,000	90,000	177,000	142,000
New River: U/S of Agua Fria River Confluence	12,500	29,000	39,000	70,000	69,000

The discharges listed in Table 1 are for post Flood Control Plan 5 conditions, as proposed by the COE. Flood Control Plan 5 includes the Adobe Dam, New River Dam, Cave Buttes Dam, and the Arizona Canal Diversion Channel (ACDC).

3.2 Interior Drainage Facilities

The elevated Camelback Road divides the project site into a north and a south parcel, with respect to drainage. Approximately 175 acres of off-site drainage area contributes to the retention facilities located in the north parcel south of Camelback Road, the RID Canal extends south along the east side of 107th Avenue (see Plate 2). In a drainage study prepared for the MCFD (Ref 7) it was estimated that the RID Canal has additional capacity for 150 cfs of storm runoff, in addition, the study concluded that the RID Canal prevents storm flows from crossing 107th Avenue (and entering the project site) during the 100 year event under present conditions. Therefore, Camelback Road and the RID Canal prevent offsite flows from entering the project site south of Camelback Road.

The proposed levee system will include interior drainage facilities with capacity for the 100-year 24-hour event, generated on both on-site and adjacent off-site drainage areas and one foot freeboard. The proposed drainage facilities have been conservatively designed for the worse case scenario; that is, the proposed interior drainage facilities will have capacity to drain the 100-year interior drainage event into the Agua Fria River, during a coincident 100-year flow event in the adjacent river.

The proposed interior drainage facility configuration for the project is shown schematically in EXHIBIT "A". As indicated in EXHIBIT "A", a lined channel will be constructed to collect off-site flows. This channel will be constructed as part of the onsite street improvements. Hydrologic and hydraulic analyses for the proposed interior drainage facilities are included as Appendix I.

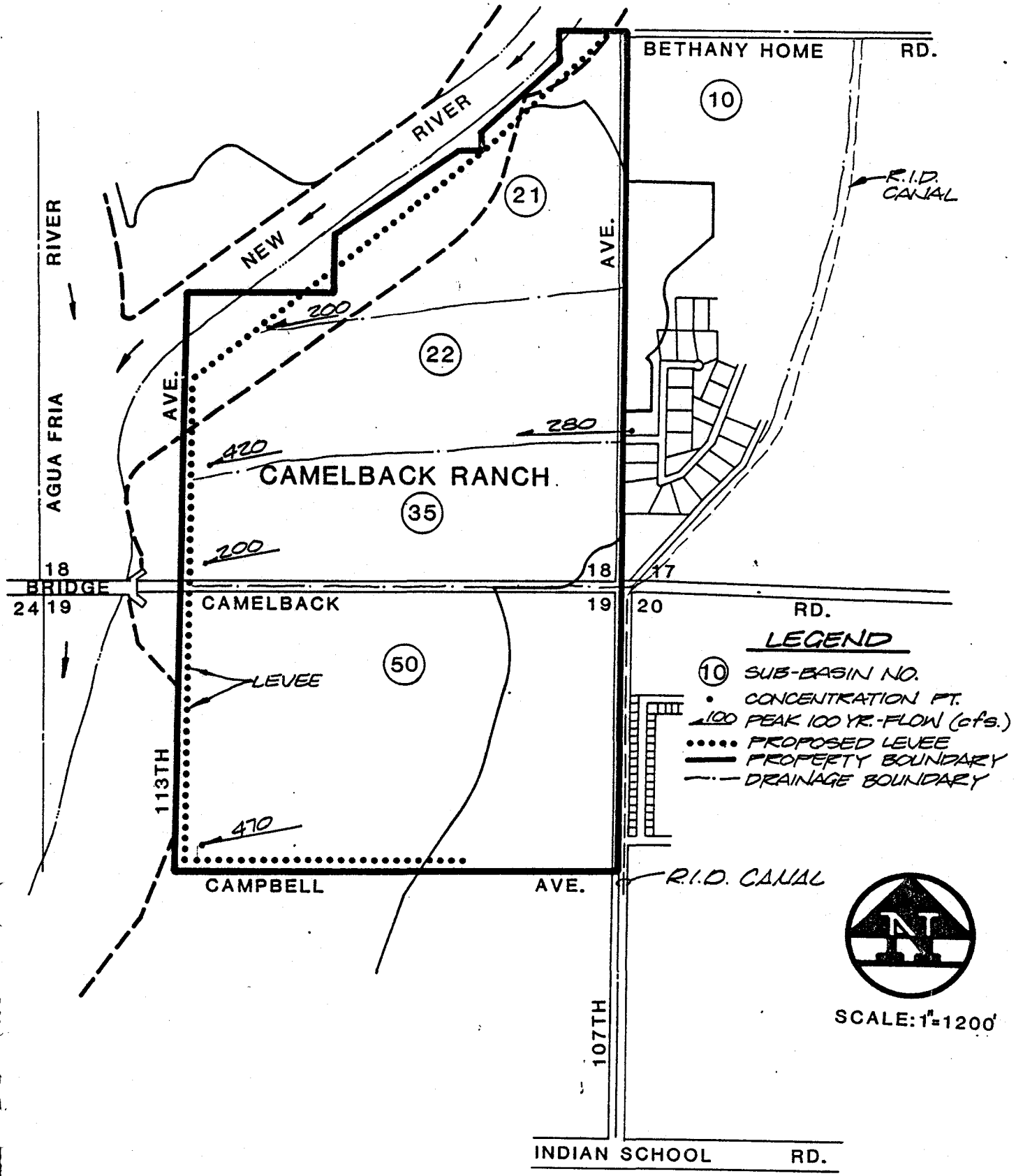


PLATE 2: DRAINAGE MAP

Rev. 9/88

The hydrologic computer model TR-20 (SCS) was used to evaluate off-site and on-site flows corresponding to the 100 year - 24 hour precipitation event. The model was also used to evaluate the retention basin system. The results of the TR-20 model are summarized in Plate 2 and given in Appendix I.

The hydraulic computer model WSPG (Los Angeles County Flood Control District) was used to model the detention basin bleed-off pipe systems. The results of the WSPG model were used to develop the detention basin storage-discharge curves used in the TR-20 model (See Appendix I).

The proposed detention basin system involves gravity bleed-off lines for the basins north of Camelback Road and a pump station for draining the south basin. The gravity bleed-off line for the Basins #1 & #2 does not have a closure, since the inlet invert is set above the SPF water surface elevation at the outlet. However, the gravity bleed-off line for Basin #3 includes a check valve (flapgate) at the outlet, since the inlet invert is set at only the 100 year water surface elevation at the outlet. In addition, the pump station discharge line from the south Basin (#4) include in line check valves (See Levee/Channelization Plans - Attachments).

4.0 HYDRAULIC ANALYSES - AGUA FRIA AND NEW RIVER

4.1 Existing Conditions

The HEC-2 computer model was used to compute water surface profiles for the Agua Fria and New Rivers, for both existing and proposed conditions. As discussed in Section 3.1, the computed water

surface profiles are based on peak discharges recently established by the COE and approved by FEMA.

The cross sectional and topographic data used in this study are based on the data used in the New River FIS (Ref. 6) and the COE floodplain delineation study for the Agua Fria River (Ref. 4). The limits of the hydraulic analyses presented in this study are as follows:

A) The Agua Fria River from downstream of Indian School Road (Section 8.327) to upstream of the New River Confluence (Section 10.250);

B) The New River from the Agua Fria confluence (Section 9.718) to upstream of Glendale Avenue (Section 120.0).

The 10-, 50- and 100-year water surface profiles for existing conditions are given in Appendix II.

4.2 Proposed Conditions

The major flood control improvements proposed as part of Camelback Ranch include a soil cement levee and New River channel improvements. The proposed channel improvements are a mirror image of the existing Glendale Airport channel improvements, as indicated in the Levee, Channelization, and Retention Basin Plans.

The proposed flood control improvements have been modeled by modifying HEC-2 cross sectional data to reflect the proposed improvements. The 10-, 50-, 100-, 500-year and SPF water surface profiles for proposed conditions are given in Appendix II.

4.3 Results

Computer model HEC-2 was used to compute water surface profiles for the Agua Fria and New Rivers. The HEC-2 computed water surface profiles for existing and proposed conditions are given in Appendix

II. Table 2 summarizes the computed water surfaces and the proposed top of levee elevation. In addition, the plans for the levee and channel improvements include the water surface profiles for the SPF and 100 year event.

More specifically, Table 2 summarizes the 100 year and SPF water surface profiles for existing and proposed conditions. The results listed in Table 2 indicate the following:

a. The proposed levee system does not raise the floodway water surface profile at any location; that is, the proposed levee system does not encroach on the effective floodway.

b. The proposed New River improvements significantly lower floodplain and floodway water surface profiles.

c. Along the Agua Fria River, the proposed improvements raise computed floodplain water elevations a maximum of 0.4' or approximately 5 inches.

Across from the Camelback Ranch project site, a gravel mining operation is currently operating on the west overbank of Agua Fria River. Their permanent facilities are located outside of the floodplain and should not be impacted by minor changes in the 100 year water surface profile. More over, the proposed improvements do not significantly influence computed water velocities; therefore, the potential for erosion along the west bank should not be influenced by the proposed Camelback Ranch improvements.

5.0 OPERATION AND MAINTENANCE PLAN

In accordance with section 65.10(b)(7) of the NFIP regulations (ref. 2), an Operation and Maintenance Plan has been developed for the

TABLE 2: **Agua Fria and New River: Water Surface Elevations** - 100 Year Event

Sec. No.	Location	Existing Conditions Floodplain WS Elev.	Existing Conditions Floodway WS Elev.	Proposed Conditions Floodplain WS Elev.	Proposed Conditions Floodway WS Elev.	Proposed Top of Bank Elev.
8.327	Agua Fria River	1013.1	1013.1	1013.1	1013.1	---
8.444	Near Indian School Rd	14.2	14.1	14.2	14.1	---
8.556		14.9	14.9	14.9	14.9	---
8.657		15.8	15.8	15.8	15.8	---
8.805		17.5	17.7	17.5	17.7	---
8.938		18.8	19.3	18.8	19.3	---
9.071	D/S Limit of site	20.1	20.8	20.3	20.8	24.6
9.198		21.6	22.2	22.0	22.2	26.3
9.266		22.6	23.1	22.9	23.0	27.3
9.374		24.1	24.3	24.2	24.2	29.2
9.384	Camelback Road Bridge	24.3	24.5	24.4	24.5	29.5
9.453		25.5	25.6	25.6	25.5	30.6
9.518		26.5	26.4	26.6	26.4	31.6
9.628		27.7	27.9	27.8	27.9	32.9
9.718	Confluence	29.2	29.5	29.2	29.5	34.7
9.759	U/S of Confluence	31.6	32.2	31.6	32.2	---
9.884		33.8	34.7	33.7	34.7	---
10.009		35.0	35.9	35.0	35.9	---
	New River					
13.0	Beginning of Channelization	31.1	32.0	29.7	29.9	35.4
20.0		32.5	33.4	31.8	31.8	37.6
26.8		33.9	34.6	33.1	33.2	38.8
32.6		35.3	36.0	34.3	34.4	39.6
38.0		37.2	37.3	35.4	35.5	41.1
45.0		39.1	39.1	36.9	37.0	42.8
51.7		40.2	40.2	38.1	38.2	44.1
54.0	U/S Limit of Site	40.4	40.5	38.6	38.6	44.5
59.0	Bethany Home Road	40.9	40.9	39.6	39.7	---
63.0		41.3	41.3	40.3	40.4	---
70.5		42.3	42.3	42.2	42.2	---
77.0		46.9	46.9	46.9	46.9	---

* Critical WS Elev.

Camelback Ranch Flood Control System. The Operation and Maintenance Plan specifies the operation and maintenance activities, the scheduling and frequency of their performance, and the agencies responsible for their performance. The Operation and Maintenance Plan is an attachment and bound under separate cover.

In accordance with NFIP regulations, all operation and maintenance will be under the jurisdiction of the Flood Control District of Maricopa County (an agency created by State law) and the City of Phoenix (a community participating in the NFIP). The Operation and Maintenance Plan specifies the agency responsible for the various components of the Camelback Ranch Flood Control System.

6.0 GEOTECHNICAL INVESTIGATION

The proposed levee system is protected by 8-foot thick soil cement bank protection, except along Campbell Road. The portion of the proposed levee system adjacent to Campbell Road is an earthen embankment without soil cement, since this portion of the levee is in a dead water area and is not subject to high velocities.

Along the Agua Fria River, the proposed levee system is located on the east overbank outside of the designated floodway. This portion of the levee will only be impacted by a relatively high magnitude flow event corresponding to releases from the Lake Pleasant Reservoir located approximately 20 miles upstream of the project site.

Along New River, the proposed improvements include widening the existing main channel from approximately 400 feet to approximately 800 feet and construction of the soil cement levee. The proposed improvements significantly reduce flow depths and velocities.

The mass of soil cement bank protection and relatively low permeability of soil cement bank protection enhance the stability of the proposed levee system. In addition, the levee system proposed as part of this project is consistent in design with the existing and future soil cement bank/levee projects (by the corps of Engineers and the FCDMC) upstream and downstream of the project site. Immediately upstream of the project site, the FCDMC is currently in the design phase of the New River channelization project involving soil cement bank protection. Approximately 0.5 miles downstream of the project site, several miles of Agua Fria River have been channelized using soil cement bank protection.

Included as part of this report is a "Geotechnical Investigation Report" (Appendix III). The geotechnical report includes engineering analyses that evaluate embankment/foundation stability and the potential for settlement of the proposed levee system. The analyses presented in the "Geotechnical Investigation Report" are in accordance with Section 65.10 (b)(4) and (b)(5) of the NFIP regulations (Ref. 2).

7.0 CONCLUSIONS

Based upon the results of the study and the Levee, Channelization and Retention Plans, it can be concluded that:

A) The proposed levee system and New River channel improvements can remove the Camelback Ranch development from the 100-year event floodplains, of both the Agua Fria and New Rivers.

B) The proposed improvements do not adversely impact the 100-year floodway (or base flood) water surface profile.

C) The hydraulic computations performed in this study are in accordance with the FEMA guidelines and specifications (Ref. 3).

D) The proposed levee system satisfies the FEMA and U.S. Corps of Engineers freeboard requirements, by providing a minimum of 3 feet of freeboard for the Standard Project Flood.

E) The proposed interior drainage facilities meet or exceed City of Phoenix and FEMA criteria (Ref. 2).

For construction to begin, local approval of the construction plans (attachments) and the CLOMR (received in August 1988) are required. Following construction, the following information will be submitted to FEMA to obtain the final LOMR:

a. Operation and Maintenance Plan;

b. Final Levee/Channelization Plans;

c. Certified "As-Built" Plans;

d. Final HEC-2 Water Surface Profiles for "As-Built" conditions.

This report and the associated plans describe in detail the proposed levee system, New River channelization, and the interior drainage system. In conclusion, this report provides the technical information required to evaluate and approve the "Camelback Ranch: Levee, Channelization and Retention Basin Plans" for construction.

8.0 REFERENCES

1. Federal Emergency Management Agency, "A Levee Policy for the National Flood Insurance Program", October, 1982.
2. Federal Emergency Management Agency, "National Flood Insurance Program and Related Regulations", June, 1987.
3. Federal Emergency Management Agency, "Flood Insurance Study: Guidelines and Specifications for Study Contractors (FEMA37)", September 1985.
4. Federal Emergency Management Agency, "Flood Insurance Study, Agua Fria River Below Waddell Dam", Revised Preliminary, September, 1987.
5. City of Phoenix, "Floodplain Regulations", Chapter 32B, Updated October, 1986.
6. Flood Control District of Maricopa County "Flood Insurance Study, New River below Skunk Creek, Maricopa County, Arizona", Preliminary Report December 30, 1986 (Approved by FEMA November 1987 - see Appendix A).
7. Dooley-Jones & Associates, Inc., "Drainage Study and Conceptual Design, Vicinity of 107th Avenue, RID Canal and Bethany Home Road, FCD 84-32", Flood Control District of Maricopa County, August 14, 1985.

APPENDIX I

INTERIOR DRAINAGE ANALYSES

COE & VAN LOO
PLANNING • ENGINEERING
LANDSCAPE ARCHITECTURE

Project Camelback Ranch
Project No. 1122-03
Sheet No. A of —
Calculated by DWD Date 5/88
Checked by _____ Date _____

Appendix I Contains

a) Sub-basin map + characteristics

b) storage v.s. discharge table and a description of bleedoff system for each of the 4 Retention Basins;

c) TR-20 model for the 100year-24hour precip. event under proposed conditions

d) Capacity calculations for Bleedoff Lines, pump station & Outfall channel

NOTE:
See the Camelback Ranch: Levee/Channelization Plans for the locations of the Detention Basins

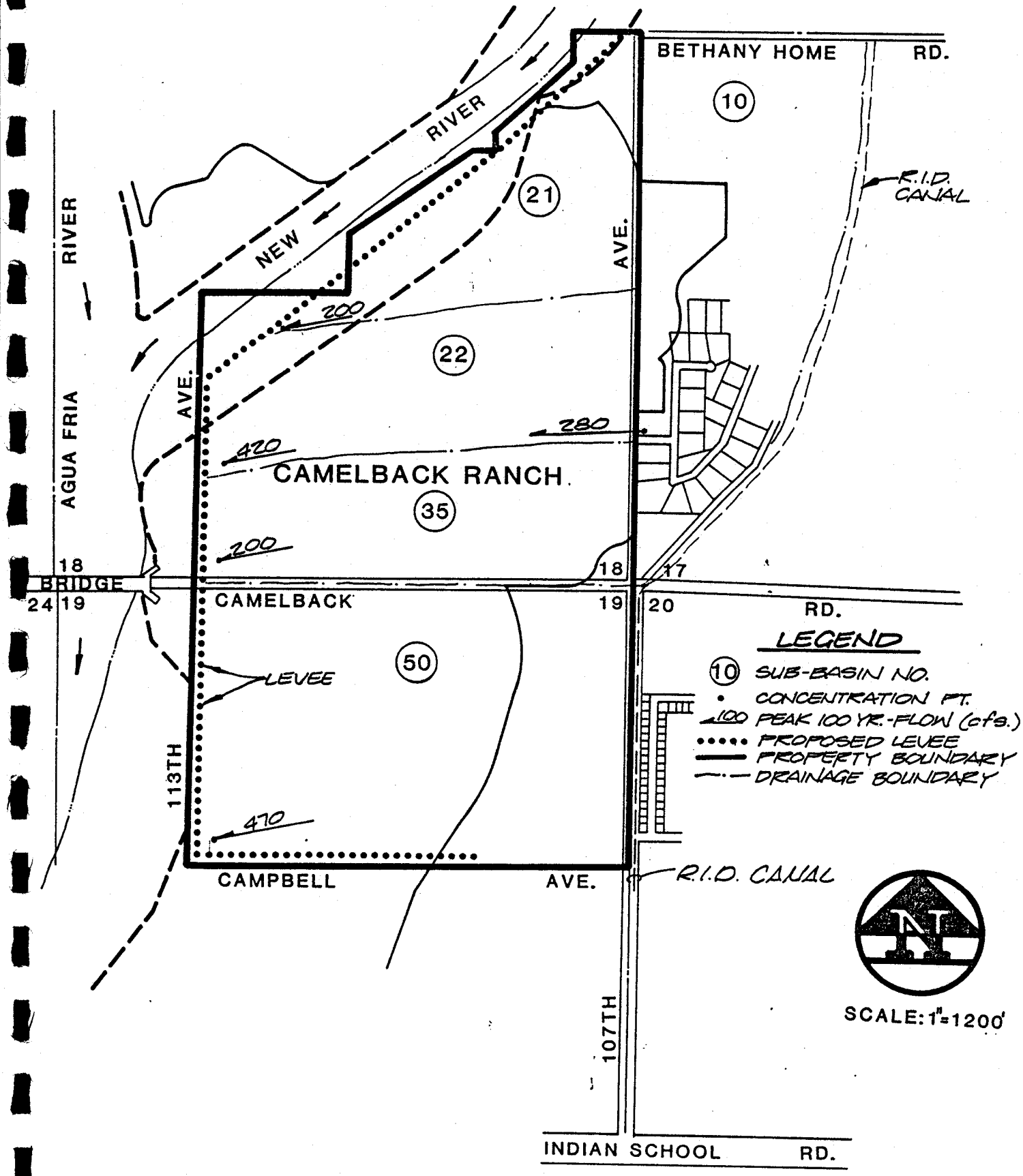


PLATE 2: DRAINAGE MAP

Rev. 9/88

CVL

CO & VAN LOO
PLANNING • ENGINEERING
LANDSCAPE ARCHITECTURE

Project Camelback Ranch
Project No. 1122-03
Sheet No. 1 of
Calculated by DWD Date 3/8/88
Checked by Date

• Assumed Curve Number Values based on Land Use or Zoning

Zoning	Soil Type	CN
Commercial	B	92
Open Space	B	72 (30% pavement)
R-2	B	84
R1-6	B	84
R3A	B	85
R1-8	B	82
R1-10	B	81
OFF Site Rural 43	B	77

CVL
COX & VAN LOO
PLANNING • ENGINEERING
LANDSCAPE ARCHITECTURE

Project Camelback Ranch
Project No. 1122-03
Sheet No. 2 of
Calculated by DWD Date 3/8/88
Checked by Date

Sub-basin Characteristics - for Post Development Conds.

Subbasin 10

A = 0.307 sq mi say 0.31 sq mi
CN = 77
T_c = 0.63 hrs

Sub-basin 21

A = 136 Ac = .21 sq mi

$T_c = \frac{4500'}{2.5 fps} = 30 min = 0.5 hrs$

Curve No. Data

Ac	CN	Zoning
34.1 Ac	81	R1-10
27.8 Ac	82	R1-8
74 Ac	72	Park
136 Ac	76	

Sub-basin 22

A = 100 Ac = 0.156 say .16 sq mi

T_c = 0.44 hrs

Curve No Data

Ac	CN	Zoning
25.8 Ac	84	R1-6
26.2 Ac	82	R1-8
21. Ac	84	R1-6
27. Ac	72	Park
3	98	Channel
100 Ac	81	

CVL
COE & VAN LOO
PLANNING • ENGINEERING
LANDSCAPE ARCHITECTURE

Project Camelback Ranch
Project No. 1122-03
Sheet No. 3 of
Calculated by DWD Date 3/8/88
Checked by Date

Sub-basin 35

A = 0.159 sq say 0.16

T_c = 0.45 hrs

AC	CN	Zoning
13.1	85	R-3A
13.1	92	Comm
7.2	92	off/com
21.4	84	R-2
21.3	84	R16
26	72	Park
102.	82.7	
	Say 83	

Sub-basin 50

A = 240Ac = 0.38 sq mi

T_c = 0.56 hrs

AC	CN	Zoning	
88.6	84	R1-6	0.45
80.4	84	R-2	0.55
10.	92	Church	0.90
18.1	92	Comm	0.90
10.7	72	Park	0.20
10.8	72	Open Space	0.20
12	85	R-3A	0.65
8.8	98	Pavement	0.95
239.4Ac	84.4		0.542
	Say 85		

CVL
COE & VAN LOO
PLANNING • ENGINEERING
LANDSCAPE ARCHITECTURE

Project Camelback Ranch
Project No. 1122-03
Sheet No. 1 of
Calculated by DWD Date 6/88
Checked by Date

Basin #1 - Storage Discharge Data

Elev	Area (Ac)	Depth (ft)	Vol. (Acft)	Cum. Vol.	Q (cfs)
1022.8	0	0	—	0	0
1023.0	0.30	0.2/2	0.03	0.03	2
23.5	1.78	0.25	0.45	0.48	4
24.0	5.16	0.25	1.29	1.77	9
24.5	7.85	0.25	1.96	3.73	14
25.0	8.95	0.25	2.23	5.96	18+134 = 152
26.0	9.91	1.0	9.91	15.87	24+354 = 378

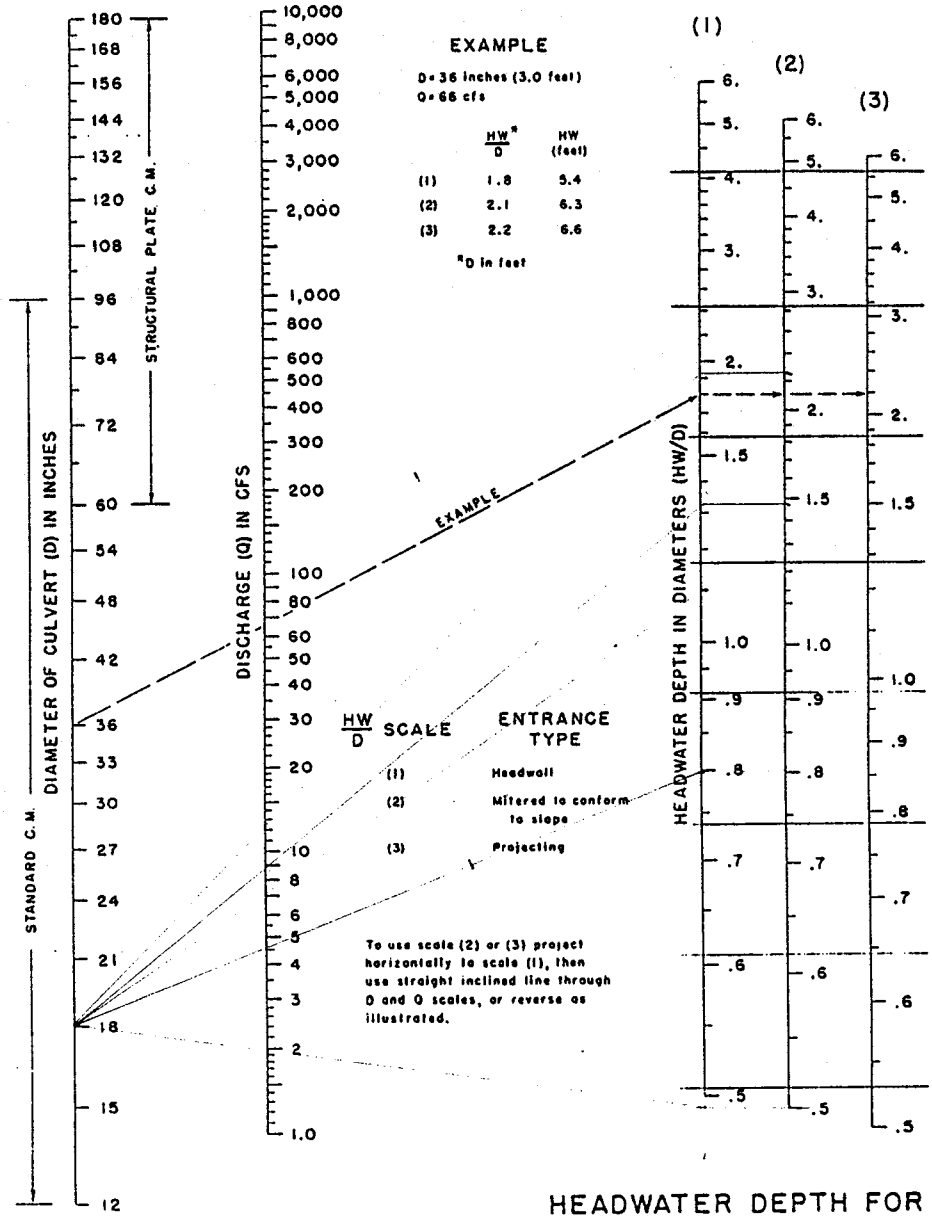
- Wier calculations: L = 140'
  C = 2.7
  Crest elev. 24.5 : $Q = CLD^{1.5}$ (Broad Crested Wier)
  where D = depth of flow
- Pipe: inlet control (assumed)
  : 2 x 18" CMP
  : U/S INV. = 22.8

CVL
COE & VAN LOO
PLANNING • ENGINEERING
LANDSCAPE ARCHITECTURE

Project Camelback Ranch
Project No. 1122-03
Sheet No. 1.1 of
Calculated by DWD Date 6/88
Checked by Date

Basin #1: Twin 18" CMP

CHART 5



Hydraulic Engr. Circular No. 5
U.S. Depart. Transportation
BUREAU OF PUBLIC ROADS JAN. 1963

HEADWATER DEPTH FOR
C. M. PIPE CULVERTS
WITH INLET CONTROL

4550 NORTH 12TH STREET • PHOENIX, ARIZONA 85014 • PHONE (602) 264-6831

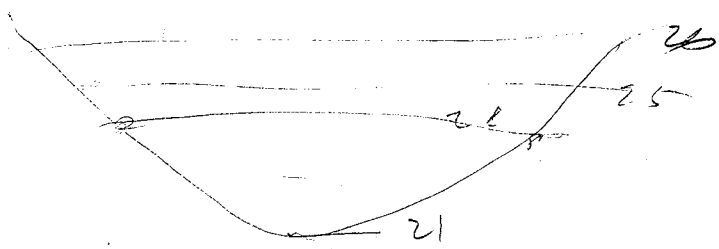
CVL FORM 114

CVL
COLE & VAN LOO
PLANNING • ENGINEERING
LANDSCAPE ARCHITECTURE

Project Camelback Ranch
Project No. 1122-03
Sheet No. 2 of
Calculated by DWD Date 6/88
Checked by Date

Basin #2 – Storage Discharge Data

Elev.	Area (Ac)	Depth (ft)	Vol (Acft)	Cum. Vol (Acft)	Q (36" Bleed-off Line) (cfs)
1021.0	0	0	–	0	0
1021.5	2.1	0.25	0.53	0.53	3.5
1022.0	8.1	0.25	2.03	2.55	7.
1022.5	15.6	0.25	3.90	6.45	14.
1023	18.5	0.25	4.63	11.08	20.
1024	18.6	1.	18.6	29.70	25.
1025	18.7	1.	18.7	48.4	28.
1026	18.8	1.	18.8	67.2	30.



COE & VAN LOO
PLANNING • ENGINEERING
LANDSCAPE ARCHITECTURE

Project Camelback Ranch
Project No. 1122-03
Sheet No. 3 of
Calculated by DWD Date 6/88
Checked by Date

Basin #3 - Storage Discharge Data

Elev	Area (Ac)	Depth (ft)	Vol (Acft)	Cum. Vol. Acft	Q (cfs) (24" Bleedoff line)
1020.1	0	0	0	0	0
22.0	7.0	1.27	5.5		
	7.0	0.5	3.5	9.0	7.1
23.0	7.0	1	7.0	16.0	8.1
24.0	7.3	1	7.3	23.3	9.5

F0515P
WATER SURFACE PROFILE LISTING
CAMELBACK RANCH: 36" BLEEDOFF LINE FOR NORTH BASIN(S)
100 YEAR EVENT WSEL AT OUTLET IS 19.8
MAY 1988 (SD36A)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
1617.69	17.85	2.020	19.869	5.0	0.99	0.015	19.884	0.00	0.700		3.00	0.00	0.00	0	0.00
55.72	0.00154					.000080	0.00			0.851			0.00		
1673.41	17.93	1.937	19.872	5.0	1.04	0.017	19.889	0.00	0.700		3.00	0.00	0.00	0	0.00
52.56	0.00154					.000090	0.00			0.851			0.00		
1725.97	18.02	1.859	19.875	5.0	1.09	0.018	19.893	0.00	0.700		3.00	0.00	0.00	0	0.00
49.39	0.00154					.000102	0.01			0.851			0.00		
1775.36	18.09	1.786	19.879	5.0	1.14	0.020	19.899	0.00	0.700		3.00	0.00	0.00	0	0.00
46.93	0.00154					.000116	0.01			0.851			0.00		
1822.29	18.16	1.717	19.882	5.0	1.19	0.022	19.904	0.00	0.700		3.00	0.00	0.00	0	0.00
44.46	0.00154					.000131	0.01			0.851			0.00		
1866.75	18.23	1.652	19.886	5.0	1.25	0.024	19.910	0.00	0.700		3.00	0.00	0.00	0	0.00
42.71	0.00154					.000148	0.01			0.851			0.00		
1909.46	18.30	1.590	19.889	5.0	1.31	0.027	19.916	0.00	0.700		3.00	0.00	0.00	0	0.00
41.69	0.00154					.000169	0.01			0.851			0.00		
1951.15	18.36	1.530	19.894	5.0	1.38	0.030	19.924	0.00	0.700		3.00	0.00	0.00	0	0.00
39.23	0.00154					.000191	0.01			0.851			0.00		
1990.38	18.42	1.474	19.898	5.0	1.45	0.032	19.930	0.00	0.700		3.00	0.00	0.00	0	0.00
37.51	0.00154					.000217	0.01			0.851			0.00		
2027.89	18.48	1.421	19.903	5.0	1.52	0.036	19.939	0.00	0.700		3.00	0.00	0.00	0	0.00
37.35	0.00154					.000246	0.01			0.851			0.00		
2065.24	18.54	1.369	19.909	5.0	1.59	0.039	19.948	0.00	0.700		3.00	0.00	0.00	0	0.00
35.69	0.00154					.000280	0.01			0.851			0.00		

F0515P
WATER SURFACE PROFILE LISTING
CAMELBACK RANCH: 36" BLEEDOFF LINE FOR NORTH EASIN(S)
100 YEAR EVENT WSEL AT OUTLET IS 19.8
MAY 1988 (SD36A)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZP		
2100.93	18.60	1.320	19.915	5.0	1.67	0.043	19.958	0.00	0.700		3.00	0.00	0.00	0	0.00
34.87	0.00154					.000318	0.01			0.851			0.00		
2135.80	18.65	1.273	19.922	5.0	1.75	0.048	19.970	0.00	0.700		3.00	0.00	0.00	0	0.00
34.10	0.00154					.000363	0.01			0.851			0.00		
2169.90	18.70	1.228	19.929	5.0	1.83	0.052	19.981	0.00	0.700		3.00	0.00	0.00	0	0.00
33.45	0.00154					.000413	0.01			0.851			0.00		
2203.35	18.75	1.185	19.938	5.0	1.92	0.058	19.996	0.00	0.700		3.00	0.00	0.00	0	0.00
32.88	0.00154					.000471	0.02			0.851			0.00		
2236.23	18.80	1.144	19.948	5.0	2.02	0.063	20.011	0.00	0.700		3.00	0.00	0.00	0	0.00
33.48	0.00154					.000537	0.02			0.851			0.00		
2269.71	18.86	1.104	19.959	5.0	2.12	0.070	20.029	0.00	0.700		3.00	0.00	0.00	0	0.00
33.37	0.00154					.000613	0.02			0.851			0.00		
2303.08	18.91	1.066	19.973	5.0	2.22	0.077	20.050	0.00	0.700		3.00	0.00	0.00	0	0.00
34.76	0.00154					.000699	0.02			0.851			0.00		
2337.84	18.96	1.029	19.989	5.0	2.33	0.084	20.073	0.00	0.700		3.00	0.00	0.00	0	0.00
35.64	0.00154					.000797	0.03			0.851			0.00		
2373.48	19.02	0.994	20.009	5.0	2.44	0.093	20.102	0.00	0.700		3.00	0.00	0.00	0	0.00
39.09	0.00154					.000910	0.04			0.851			0.00		
2412.57	19.08	0.960	20.036	5.0	2.56	0.102	20.138	0.00	0.700		3.00	0.00	0.00	0	0.00
43.30	0.00154					.001039	0.04			0.851			0.00		
2455.87	19.14	0.928	20.071	5.0	2.69	0.112	20.183	0.00	0.700		3.00	0.00	0.00	0	0.00
58.37	0.00154					.001186	0.07			0.851			0.00		

F0E15P
WATER SURFACE PROFILE LISTING
CAMELBACK RANCH: 36" BLEEDOFF LINE FOR NORTH BASIN(S)
100 YEAR EVENT WSEL AT OUTLET IS 19.8
MAY 1988 (SD36A)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF		NORM DEPTH			ZR		
2514.24	19.23	0.896	20.129	5.0	2.82	0.123	20.252	0.00	0.700	3.00	0.00	0.00	0	0.00
94.19	0.00154					.001355	0.13		0.851			0.00		
2608.43	19.38	0.866	20.244	5.0	2.96	0.136	20.380	0.00	0.700	3.00	0.00	0.00	0	0.00
179.93	0.00154					.001498	0.27		0.851			0.00		
2788.36	19.66	0.851	20.507	5.0	3.03	0.143	20.650	0.00	0.700	3.00	0.00	0.00	0	0.00
871.64	0.00154					.001551	1.35		0.851			0.00		
3660.00	21.00	0.851	21.851	5.0	3.03	0.143	21.994	0.00	0.700	3.00	0.00	0.00	0	0.00
WALL ENTRANCE												0.00		
3660.00	21.00	0.852	21.852	5.0	3.02	0.142	21.994	0.00	0.700	3.00	0.00	0.00	0	0.00

F2515P
WATER SURFACE PROFILE LISTING
CAMELBACK RANCH: 36" BLEEDOFF LINE FOR NORTH BASIN(S)
100 YEAR EVENT WSEL AT OUTLET IS 19.8
MAY 1988 (SD36A)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF		NORM DEPTH			ZR		
100.00	15.50	4.300	19.800	7.0	0.99	0.015	19.815	0.00	0.832	3.00	0.00	0.00	0	0.00
WALL EXIT												0.00		
100.00	15.50	4.301	19.801	7.0	0.99	0.015	19.816	0.00	0.832	3.00	0.00	0.00	0	0.00
50.00	0.00160					.000094	0.00		1.004			0.00		
150.00	15.58	4.226	19.806	7.0	0.99	0.015	19.821	0.00	0.832	3.00	0.00	0.00	0	0.00
10.00	0.00200					.000094	0.00		0.950			0.00		
160.00	15.60	4.209	19.809	7.0	0.99	0.015	19.824	0.00	0.832	3.00	0.00	0.00	0	0.00
835.14	0.00154					.000093	0.08		1.014			0.00		
995.14	16.89	3.000	19.889	7.0	0.99	0.015	19.904	0.00	0.832	3.00	0.00	0.00	0	0.00
189.85	0.00154					.000087	0.02		1.014			0.00		
1184.99	17.18	2.721	19.903	7.0	1.04	0.017	19.920	0.00	0.832	3.00	0.00	0.00	0	0.00
109.27	0.00154					.000085	0.01		1.014			0.00		
1294.26	17.35	2.560	19.910	7.0	1.09	0.018	19.928	0.00	0.832	3.00	0.00	0.00	0	0.00
90.39	0.00154					.000092	0.01		1.014			0.00		
1384.65	17.49	2.427	19.917	7.0	1.14	0.020	19.937	0.00	0.832	3.00	0.00	0.00	0	0.00
79.74	0.00154					.000101	0.01		1.014			0.00		
1464.39	17.61	2.310	19.923	7.0	1.20	0.022	19.945	0.00	0.832	3.00	0.00	0.00	0	0.00
71.84	0.00154					.000112	0.01		1.014			0.00		
1536.23	17.72	2.205	19.929	7.0	1.26	0.025	19.954	0.00	0.832	3.00	0.00	0.00	0	0.00
65.98	0.00154					.000125	0.01		1.014			0.00		
1602.21	17.83	2.109	19.934	7.0	1.32	0.027	19.961	0.00	0.832	3.00	0.00	0.00	0	0.00
61.53	0.00154					.000140	0.01		1.014			0.00		

F2515P
WATER SURFACE PROFILE LISTING
CAMELBACK RANCH: 36" BLEEDOFF LINE FOR NORTH BASIN(S)
100 YEAR EVENT WSEL AT OUTLET IS 19.8
MAY 1989 (SD36A)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF		NORM DEPTH			ZR		
1663.74	17.92	2.020	19.940	7.0	1.38	0.030	19.970	0.00	0.832	3.00	0.00	0.00	0	0.00
57.78	0.00154					.000157	0.01		1.014			0.00		
1721.52	18.01	1.937	19.946	7.0	1.45	0.033	19.979	0.00	0.832	3.00	0.00	0.00	0	0.00
54.74	0.00154					.000178	0.01		1.014			0.00		
1776.26	18.09	1.859	19.953	7.0	1.52	0.036	19.989	0.00	0.832	3.00	0.00	0.00	0	0.00
51.70	0.00154					.000200	0.01		1.014			0.00		
1827.96	18.17	1.786	19.960	7.0	1.59	0.039	19.999	0.00	0.832	3.00	0.00	0.00	0	0.00
49.41	0.00154					.000227	0.01		1.014			0.00		
1877.37	18.25	1.717	19.967	7.0	1.67	0.043	20.010	0.00	0.832	3.00	0.00	0.00	0	0.00
47.15	0.00154					.000256	0.01		1.014			0.00		
1924.52	18.32	1.652	19.975	7.0	1.75	0.048	20.023	0.00	0.832	3.00	0.00	0.00	0	0.00
45.69	0.00154					.000290	0.01		1.014			0.00		
1970.21	18.39	1.590	19.983	7.0	1.84	0.053	20.036	0.00	0.832	3.00	0.00	0.00	0	0.00
45.11	0.00154					.000329	0.01		1.014			0.00		
2015.32	18.46	1.530	19.993	7.0	1.93	0.058	20.051	0.00	0.832	3.00	0.00	0.00	0	0.00
42.95	0.00154					.000374	0.02		1.014			0.00		
2058.27	18.53	1.474	20.003	7.0	2.02	0.064	20.067	0.00	0.832	3.00	0.00	0.00	0	0.00
41.71	0.00154					.000425	0.02		1.014			0.00		
2099.98	18.59	1.421	20.014	7.0	2.12	0.070	20.084	0.00	0.832	3.00	0.00	0.00	0	0.00
42.45	0.00154					.000483	0.02		1.014			0.00		
2142.43	18.66	1.369	20.028	7.0	2.23	0.077	20.105	0.00	0.832	3.00	0.00	0.00	0	0.00
41.56	0.00154					.000549	0.02		1.014			0.00		

F0515P
WATER SURFACE PROFILE LISTING
CAMELBACK RANCH: 36" BLEEDOFF LINE FOR NORTH BASIN(S)
100 YEAR EVENT WSEL AT OUTLET IS 19.8
MAY 1983 (SD36A)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
2183.99	18.72	1.320	20.043	7.0	2.33	0.085	20.128	0.00	0.832		3.00	0.00	0.00	0	0.00
41.97	0.00154					.000625	0.03			1.014			0.00		
2225.96	18.79	1.273	20.061	7.0	2.45	0.093	20.154	0.00	0.832		3.00	0.00	0.00	0	0.00
42.91	0.00154					.000711	0.03			1.014			0.00		
2268.87	18.85	1.228	20.082	7.0	2.57	0.102	20.184	0.00	0.832		3.00	0.00	0.00	0	0.00
44.71	0.00154					.000810	0.04			1.014			0.00		
2313.58	18.92	1.185	20.108	7.0	2.69	0.113	20.221	0.00	0.832		3.00	0.00	0.00	0	0.00
48.00	0.00154					.000924	0.04			1.014			0.00		
2361.58	19.00	1.144	20.141	7.0	2.83	0.124	20.265	0.00	0.832		3.00	0.00	0.00	0	0.00
56.31	0.00154					.001053	0.06			1.014			0.00		
2417.89	19.08	1.104	20.188	7.0	2.96	0.136	20.324	0.00	0.832		3.00	0.00	0.00	0	0.00
71.16	0.00154					.001200	0.09			1.014			0.00		
2489.05	19.19	1.066	20.260	7.0	3.11	0.150	20.410	0.00	0.832		3.00	0.00	0.00	0	0.00
126.76	0.00154					.001369	0.17			1.014			0.00		
2615.81	19.39	1.029	20.418	7.0	3.26	0.165	20.583	0.00	0.832		3.00	0.00	0.00	0	0.00
201.20	0.00154					.001503	0.30			1.014			0.00		
2817.01	19.70	1.014	20.714	7.0	3.33	0.172	20.886	0.00	0.832		3.00	0.00	0.00	0	0.00
842.99	0.00154					.001548	1.30			1.014			0.00		
3660.00	21.00	1.014	22.014	7.0	3.33	0.172	22.186	0.00	0.832		3.00	0.00	0.00	0	0.00
WALL ENTRANCE													0.00		
3660.00	21.00	1.015	22.015	7.0	3.33	0.172	22.187	0.00	0.832		3.00	0.00	0.00	0	0.00

F0515P
WATER SURFACE PROFILE LISTING
CAMELBACK RANCH: 36" BLEEDOFF LINE FOR NORTH BASIN(S)
100 YEAR EVENT WSEL AT OUTLET IS 19.8
MAY 1988 (SD36A)

STATION / L/ELEM	INVERT ELEV / SO	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD / SF AVE	ENERGY GRD.EL. / HF	SUPER ELEV	CRITICAL DEPTH / NORM DEPTH	HGT/ DIA	BASE/ IC NO.	ZL / ZR	NO PIER	AVBPR
100.00	15.50	4.300	19.800	10.0	1.41	0.031	19.831	0.00	1.000	3.00	0.00	0.00	0	0.00
WALL EXIT												0.00		
100.00	15.53	4.301	19.801	10.0	1.41	0.031	19.832	0.00	1.000	3.00	0.00	0.00	0	0.00
50.00	0.00160					.000192	0.01		1.216			0.00		
150.00	15.58	4.231	19.811	10.0	1.41	0.031	19.842	0.00	1.000	3.00	0.00	0.00	0	0.00
10.00	0.00200					.000192	0.00		1.144			0.00		
160.00	15.60	4.217	19.817	10.0	1.41	0.031	19.848	0.00	1.000	3.00	0.00	0.00	0	0.00
902.79	0.00154					.000190	0.17		1.230			0.00		
1062.79	16.99	3.000	19.993	10.0	1.41	0.031	20.024	0.00	1.000	3.00	0.00	0.00	0	0.00
201.32	0.00154					.000178	0.04		1.230			0.00		
1264.11	17.30	2.721	20.025	10.0	1.48	0.034	20.059	0.00	1.000	3.00	0.00	0.00	0	0.00
115.06	0.00154					.000174	0.02		1.230			0.00		
1379.17	17.48	2.560	20.041	10.0	1.56	0.038	20.079	0.00	1.000	3.00	0.00	0.00	0	0.00
95.36	0.00154					.000188	0.02		1.230			0.00		
1474.53	17.63	2.427	20.055	10.0	1.63	0.041	20.096	0.00	1.000	3.00	0.00	0.00	0	0.00
84.45	0.00154					.000207	0.02		1.230			0.00		
1558.98	17.76	2.310	20.069	10.0	1.71	0.045	20.114	0.00	1.000	3.00	0.00	0.00	0	0.00
76.45	0.00154					.000229	0.02		1.230			0.00		
1635.43	17.88	2.205	20.082	10.0	1.80	0.050	20.132	0.00	1.000	3.00	0.00	0.00	0	0.00
70.69	0.00154					.000255	0.02		1.230			0.00		
1706.12	17.99	2.109	20.095	10.0	1.88	0.055	20.150	0.00	1.000	3.00	0.00	0.00	0	0.00
66.46	0.00154					.000286	0.02		1.230			0.00		

FC515P
WATER SURFACE PROFILE LISTING
CAMELBACK RANCH: 36" BLEEDOFF LINE FOR NORTH BASIN(S)
100 YEAR EVENT WSEL AT OUTLET IS 19.8
MAY 1988 (SD36A)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
1772.58	18.09	2.020	20.108	10.0	1.97	0.061	20.169	0.00	1.000		3.00	0.00	0.00	0	0.00
63.01	0.00154					.000322	0.02			1.230			0.00		
1835.59	18.18	1.937	20.122	10.0	2.07	0.067	20.189	0.00	1.000		3.00	0.00	0.00	0	0.00
69.44	0.00154					.000362	0.02			1.230			0.00		
1896.03	18.28	1.859	20.138	10.0	2.17	0.073	20.211	0.00	1.000		3.00	0.00	0.00	0	0.00
57.92	0.00154					.000409	0.02			1.230			0.00		
1953.95	18.37	1.786	20.154	10.0	2.28	0.081	20.235	0.00	1.000		3.00	0.00	0.00	0	0.00
56.39	0.00154					.000462	0.03			1.230			0.00		
2010.34	18.45	1.717	20.172	10.0	2.39	0.089	20.261	0.00	1.000		3.00	0.00	0.00	0	0.00
55.06	0.00154					.000523	0.03			1.230			0.00		
2065.40	18.54	1.652	20.192	10.0	2.51	0.098	20.290	0.00	1.000		3.00	0.00	0.00	0	0.00
55.00	0.00154					.000593	0.03			1.230			0.00		
2120.40	18.62	1.590	20.215	10.0	2.63	0.107	20.322	0.00	1.000		3.00	0.00	0.00	0	0.00
56.59	0.00154					.000672	0.04			1.230			0.00		
2176.99	18.71	1.530	20.242	10.0	2.76	0.118	20.360	0.00	1.000		3.00	0.00	0.00	0	0.00
56.67	0.00154					.000764	0.04			1.230			0.00		
2233.66	18.80	1.474	20.274	10.0	2.89	0.130	20.404	0.00	1.000		3.00	0.00	0.00	0	0.00
59.20	0.00154					.000867	0.05			1.230			0.00		
2292.86	18.89	1.421	20.312	10.0	3.03	0.143	20.455	0.00	1.000		3.00	0.00	0.00	0	0.00
67.65	0.00154					.000985	0.07			1.230			0.00		
2360.51	18.99	1.369	20.364	10.0	3.18	0.157	20.521	0.00	1.000		3.00	0.00	0.00	0	0.00
78.82	0.00154					.001120	0.09			1.230			0.00		

Oxford
Oxford
Oxford
Oxford
Oxford

FC515P
WATER SURFACE PROFILE LISTING
CAMELBACK RANCH: 36" BLEEDOFF LINE FOR NORTH BASIN(S)
100 YEAR EVENT WSEL AT OUTLET IS 19.8
MAY 1988 . (SD36A)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
2439.33	19.12	1.320	20.437	10.0	3.34	0.173	20.610	0.00	1.000		3.00	0.00	0.00	0	0.00
110.98	0.00154					.001275	0.14			1.230			0.00		
2550.31	19.29	1.273	20.561	10.0	3.50	0.190	20.751	0.00	1.000		3.00	0.00	0.00	0	0.00
262.00	0.00154					.001449	0.38			1.230			0.00		
2812.31	19.69	1.230	20.923	10.0	3.66	0.209	21.132	0.00	1.000		3.00	0.00	0.00	0	0.00
847.69	0.00154					.001540	1.31			1.230			0.00		
3660.00	21.00	1.230	22.230	10.0	3.66	0.209	22.439	0.00	1.000		3.00	0.00	0.00	0	0.00
WALL ENTRANCE													0.00		
3660.00	21.00	1.231	22.231	10.0	3.66	0.208	22.439	0.00	1.000		3.00	0.00	0.00	0	0.00

F0515P
WATER SURFACE PROFILE LISTING
CAMELBACK RANCH: 36" BLEEDOFF LINE FOR NORTH BASIN(S)
100 YEAR EVENT WSEL AT OUTLET IS 19.8
MAY 1988 (SD36A)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
100.00	15.50	4.300	19.800	12.0	1.70	0.045	19.845	0.00	1.100		3.00	0.00	0.00	0	0.00
WALL EXIT													0.00		
100.00	15.50	4.301	19.801	12.0	1.70	0.045	19.846	0.00	1.100		3.00	0.00	0.00	0	0.00
50.00	0.00160					.000276	0.01			1.346			0.00		
150.00	15.58	4.235	19.815	12.0	1.70	0.045	19.860	0.00	1.100		3.00	0.00	0.00	0	0.00
10.00	0.00200					.000276	0.00			1.265			0.00		
160.00	15.60	4.224	19.824	12.0	1.70	0.045	19.869	0.00	1.100		3.00	0.00	0.00	0	0.00
969.73	0.00154					.000274	0.27			1.360			0.00		
1129.73	17.10	3.000	20.096	12.0	1.70	0.045	20.141	0.00	1.100		3.00	0.00	0.00	0	0.00
212.52	0.00154					.000256	0.05			1.360			0.00		
1342.25	17.42	2.721	20.145	12.0	1.78	0.049	20.194	0.00	1.100		3.00	0.00	0.00	0	0.00
120.68	0.00154					.000249	0.03			1.360			0.00		
1462.93	17.61	2.560	20.170	12.0	1.87	0.054	20.224	0.00	1.100		3.00	0.00	0.00	0	0.00
100.24	0.00154					.000270	0.03			1.360			0.00		
1563.17	17.77	2.427	20.192	12.0	1.96	0.060	20.252	0.00	1.100		3.00	0.00	0.00	0	0.00
89.15	0.00154					.000297	0.03			1.360			0.00		
1652.32	17.90	2.310	20.213	12.0	2.05	0.066	20.279	0.00	1.100		3.00	0.00	0.00	0	0.00
81.17	0.00154					.000330	0.03			1.360			0.00		
1733.49	18.03	2.205	20.233	12.0	2.15	0.072	20.305	0.00	1.100		3.00	0.00	0.00	0	0.00
75.58	0.00154					.000369	0.03			1.360			0.00		
1809.07	18.14	2.109	20.254	12.0	2.26	0.079	20.333	0.00	1.100		3.00	0.00	0.00	0	0.00
71.73	0.00154					.000412	0.03			1.360			0.00		

WATER SURFACE PROFILE LISTING
CAMELBACK RANCH: 36" BLEEDOFF LINE FOR NORTH EASIN(S)
100 YEAR EVENT WSEL AT OUTLET IS 19.8
MAY 1988 (SD36A)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
1880.80	18.26	2.020	20.275	12.0	2.37	0.087	20.362	0.00	1.100		3.00	0.00	0.00	0	0.00
68.82	0.00154					.000463	0.03			1.360			0.00		
1949.62	18.36	1.937	20.298	12.0	2.49	0.096	20.394	0.00	1.100		3.00	0.00	0.00	0	0.00
67.01	0.00154					.000522	0.03			1.360			0.00		
2016.63	18.46	1.859	20.324	12.0	2.61	0.106	20.430	0.00	1.100		3.00	0.00	0.00	0	0.00
65.47	0.00154					.000589	0.04			1.360			0.00		
2082.10	18.57	1.786	20.352	12.0	2.73	0.116	20.468	0.00	1.100		3.00	0.00	0.00	0	0.00
65.43	0.00154					.000666	0.04			1.360			0.00		
2147.53	18.67	1.717	20.384	12.0	2.87	0.128	20.512	0.00	1.100		3.00	0.00	0.00	0	0.00
66.18	0.00154					.000754	0.05			1.360			0.00		
2213.71	18.77	1.652	20.421	12.0	3.01	0.140	20.561	0.00	1.100		3.00	0.00	0.00	0	0.00
69.60	0.00154					.000854	0.06			1.360			0.00		
2283.31	18.88	1.590	20.466	12.0	3.15	0.155	20.621	0.00	1.100		3.00	0.00	0.00	0	0.00
77.51	0.00154					.000968	0.08			1.360			0.00		
2360.82	19.00	1.530	20.526	12.0	3.31	0.170	20.696	0.00	1.100		3.00	0.00	0.00	0	0.00
87.81	0.00154					.001099	0.10			1.360			0.00		
2448.63	19.13	1.474	20.605	12.0	3.47	0.187	20.792	0.00	1.100		3.00	0.00	0.00	0	0.00
116.49	0.00154					.001248	0.15			1.360			0.00		
2565.12	19.31	1.421	20.732	12.0	3.64	0.206	20.938	0.00	1.100		3.00	0.00	0.00	0	0.00
253.63	0.00154					.001419	0.36			1.360			0.00		
2818.75	19.70	1.369	21.071	12.0	3.82	0.226	21.297	0.00	1.100		3.00	0.00	0.00	0	0.00
341.58	0.00154					.001529	0.52			1.360			0.00		

Oxford
Oxford
Oxford
Oxford
Oxford
Oxford

FC515P
WATER SURFACE PROFILE LISTING
CAMELBACK RANCH: 36" BLEEDOFF LINE FOR NORTH BASIN(S)
100 YEAR EVENT WSEL AT OUTLET IS 19.8
MAY 1988 (SD36A)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF		NORM DEPTH			ZR		
3160.33	20.23	1.360	21.590	12.0	3.85	0.230	21.820	0.00	1.100	3.00	0.00	0.00	0	0.00
499.67	0.00154					.001548	0.77		1.360			0.00		
3660.00	21.00	1.360	22.360	12.0	3.85	0.230	22.590	0.00	1.100	3.00	0.00	0.00	0	0.00
WALL ENTRANCE												0.00		
3660.00	21.00	1.361	22.361	12.0	3.85	0.230	22.591	0.00	1.100	3.00	0.00	0.00	0	0.00

F0515P
WATER SURFACE PROFILE LISTING
CAMELBACK RANCH: 36" BLEEDOFF LINE FOR NORTH BASIN(S)
100 YEAR EVENT WSEL AT OUTLET IS 19.8
MAY 1989 (SD36A)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
100.00	15.50	4.300	19.800	15.0	2.12	0.073	19.870	0.00	1.235		3.00	0.00	0.00	0	0.00
WALL EXIT													0.00		
100.00	15.50	4.301	19.801	15.0	2.12	0.070	19.871	0.00	1.235		3.00	0.00	0.00	0	0.00
50.00	0.00160					.000431	0.02			1.532			0.00		
150.00	15.58	4.243	19.823	15.0	2.12	0.070	19.893	0.00	1.235		3.00	0.00	0.00	0	0.00
10.00	0.00200					.000431	0.00			1.435			0.00		
160.00	15.60	4.237	19.837	15.0	2.12	0.070	19.907	0.00	1.235		3.00	0.00	0.00	0	0.00
1120.18	0.00154					.000428	0.48			1.550			0.00		
1280.18	17.33	3.000	20.328	15.0	2.12	0.070	20.398	0.00	1.235		3.00	0.00	0.00	0	0.00
237.14	0.00154					.000400	0.09			1.550			0.00		
1517.32	17.69	2.721	20.415	15.0	2.23	0.077	20.492	0.00	1.235		3.00	0.00	0.00	0	0.00
132.98	0.00154					.000399	0.05			1.550			0.00		
1650.30	17.90	2.560	20.460	15.0	2.33	0.085	20.545	0.00	1.235		3.00	0.00	0.00	0	0.00
111.13	0.00154					.000422	0.05			1.550			0.00		
1761.43	18.07	2.427	20.498	15.0	2.45	0.093	20.591	0.00	1.235		3.00	0.00	0.00	0	0.00
99.87	0.00154					.000464	0.05			1.550			0.00		
1861.30	18.22	2.310	20.535	15.0	2.57	0.102	20.637	0.00	1.235		3.00	0.00	0.00	0	0.00
92.24	0.00154					.000515	0.05			1.550			0.00		
1953.54	18.37	2.205	20.572	15.0	2.69	0.113	20.685	0.00	1.235		3.00	0.00	0.00	0	0.00
87.59	0.00154					.000575	0.05			1.550			0.00		
2041.13	18.50	2.109	20.612	15.0	2.82	0.124	20.736	0.00	1.235		3.00	0.00	0.00	0	0.00
85.29	0.00154					.000645	0.06			1.550			0.00		

F6515P
WATER SURFACE PROFILE LISTING
CAMELBACK RANCH: 36" BLEEDOFF LINE FOR NORTH BASIN(S)
100 YEAR EVENT WSEL AT OUTLET IS 19.8
MAY 1988 (SD36A)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
2126.42	18.63	2.020	20.654	15.0	2.96	0.136	20.790	0.00	1.235		3.00	0.00	0.00	0	0.00
84.75	0.00154					.000724	0.06			1.550			0.00		
2211.17	18.77	1.937	20.702	15.0	3.11	0.150	20.852	0.00	1.235		3.00	0.00	0.00	0	0.00
86.66	0.00154					.000816	0.07			1.550			0.00		
2297.83	18.90	1.859	20.758	15.0	3.26	0.165	20.923	0.00	1.235		3.00	0.00	0.00	0	0.00
90.80	0.00154					.000921	0.08			1.550			0.00		
2388.63	19.04	1.786	20.825	15.0	3.42	0.181	21.006	0.00	1.235		3.00	0.00	0.00	0	0.00
101.22	0.00154					.001040	0.11			1.550			0.00		
2489.85	19.19	1.717	20.912	15.0	3.58	0.199	21.111	0.00	1.235		3.00	0.00	0.00	0	0.00
123.30	0.00154					.001177	0.15			1.550			0.00		
2613.15	19.38	1.652	21.037	15.0	3.76	0.219	21.256	0.00	1.235		3.00	0.00	0.00	0	0.00
192.01	0.00154					.001335	0.26			1.550			0.00		
2805.16	19.68	1.590	21.271	15.0	3.94	0.241	21.512	0.00	1.235		3.00	0.00	0.00	0	0.00
384.28	0.00154					.001480	0.57			1.550			0.00		
3189.44	20.27	1.550	21.824	15.0	4.07	0.257	22.081	0.00	1.235		3.00	0.00	0.00	0	0.00
470.56	0.00154					.001543	0.73			1.550			0.00		
3660.00	21.00	1.550	22.550	15.0	4.07	0.257	22.807	0.00	1.235		3.00	0.00	0.00	0	0.00
WALL ENTRANCE													0.00		
3660.00	21.00	1.551	22.551	15.0	4.07	0.257	22.808	0.00	1.235		3.00	0.00	0.00	0	0.00

F0515P
WATER SURFACE PROFILE LISTING
CAMELBACK RANCH: 36" BLEEDOFF LINE FOR NORTH BASIN(S)
100 YEAR EVENT WSEL AT OUTLET IS 19.8
MAY 1988 (SD36A)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
100.00	15.50	4.300	19.800	17.0	2.40	0.090	19.890	0.00	1.318		3.00	0.00	0.00	0	0.00
WALL EXIT													0.00		
100.00	15.50	4.301	19.801	17.0	2.40	0.090	19.891	0.00	1.318		3.00	0.00	0.00	0	0.00
50.00	0.00160					.000554	0.03			1.653			0.00		
150.00	15.58	4.249	19.829	17.0	2.40	0.090	19.919	0.00	1.318		3.00	0.00	0.00	0	0.00
10.00	0.00200					.000554	0.01			1.545			0.00		
160.00	15.60	4.247	19.847	17.0	2.40	0.090	19.937	0.00	1.318		3.00	0.00	0.00	0	0.00
1273.40	0.00154					.000549	0.70			1.672			0.00		
1433.40	17.57	3.000	20.565	17.0	2.40	0.090	20.655	0.00	1.318		3.00	0.00	0.00	0	0.00
261.47	0.00154					.000514	0.13			1.672			0.00		
1694.87	17.97	2.721	20.689	17.0	2.52	0.099	20.788	0.00	1.318		3.00	0.00	0.00	0	0.00
145.05	0.00154					.000501	0.07			1.672			0.00		
1839.92	18.19	2.560	20.752	17.0	2.65	0.109	20.861	0.00	1.318		3.00	0.00	0.00	0	0.00
122.07	0.00154					.000542	0.07			1.672			0.00		
1961.99	18.38	2.427	20.807	17.0	2.77	0.120	20.927	0.00	1.318		3.00	0.00	0.00	0	0.00
111.02	0.00154					.000597	0.07			1.672			0.00		
2073.01	18.55	2.310	20.862	17.0	2.91	0.131	20.993	0.00	1.318		3.00	0.00	0.00	0	0.00
104.30	0.00154					.000662	0.07			1.672			0.00		
2177.31	18.71	2.205	20.918	17.0	3.05	0.145	21.063	0.00	1.318		3.00	0.00	0.00	0	0.00
101.43	0.00154					.000739	0.08			1.672			0.00		
2278.74	18.87	2.109	20.978	17.0	3.20	0.159	21.137	0.00	1.318		3.00	0.00	0.00	0	0.00
102.25	0.00154					.000828	0.08			1.672			0.00		

Oxford
Oxford
Oxford
Oxford
Oxford

FC515P
WATER SURFACE PROFILE LISTING
CAMELBACK RANCH: 36" BLEEDOFF LINE FOR NORTH BASIN(S)
100 YEAR EVENT WSEL AT OUTLET IS 19.8
MAY 1988 (SD36A)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
2380.99	19.03	2.020	21.047	17.0	3.36	0.175	21.222	0.00	1.318		3.00	0.00	0.00	0	0.00
106.94	0.00154					.000931	0.10			1.672			0.00		
2487.93	19.19	1.937	21.129	17.0	3.52	0.193	21.322	0.00	1.318		3.00	0.00	0.00	0	0.00
118.67	0.00154					.001048	0.12			1.672			0.00		
2606.60	19.37	1.859	21.234	17.0	3.69	0.212	21.446	0.00	1.318		3.00	0.00	0.00	0	0.00
143.74	0.00154					.001183	0.17			1.672			0.00		
2750.34	19.60	1.786	21.383	17.0	3.87	0.233	21.616	0.00	1.318		3.00	0.00	0.00	0	0.00
221.28	0.00154					.001337	0.30			1.672			0.00		
2971.62	19.94	1.717	21.655	17.0	4.06	0.256	21.911	0.00	1.318		3.00	0.00	0.00	0	0.00
452.57	0.00154					.001482	0.67			1.672			0.00		
3424.19	20.64	1.672	22.309	17.0	4.20	0.274	22.583	0.00	1.318		3.00	0.00	0.00	0	0.00
235.81	0.00154					.001545	0.36			1.672			0.00		
3660.00	21.00	1.672	22.672	17.0	4.20	0.274	22.946	0.00	1.318		3.00	0.00	0.00	0	0.00
WALL ENTRANCE													0.00		
3660.00	21.00	1.673	22.673	17.0	4.20	0.273	22.946	0.00	1.318		3.00	0.00	0.00	0	0.00

F0515P
WATER SURFACE PROFILE LISTING
CAMELBACK RANCH: 36" BLEEDOFF LINE FOR NORTH BASIN(S)
100 YEAR EVENT WSEL AT OUTLET IS 19.8
MAY 1988 (SD36A)

STATION / L/ELEM	INVERT ELEV / SO	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD / SF AVE	ENERGY GRD.EL. / HF	SUPER ELEV	CRITICAL DEPTH / NORM DEPTH	HGT/ DIA	BASE/ ID NO.	ZL / ZR	NO PIER	AVBFR
100.00	15.50	4.300	19.800	20.0	2.83	0.124	19.924	0.00	1.435	3.00	0.00	0.00	0	0.00
WALL EXIT												0.00		
100.00	15.50	4.301	19.801	20.0	2.83	0.124	19.925	0.00	1.435	3.00	0.00	0.00	0	0.00
50.00	0.00160					.000766	0.04		1.834			0.00		
150.00	15.58	4.259	19.839	20.0	2.83	0.124	19.963	0.00	1.435	3.00	0.00	0.00	0	0.00
10.00	0.00200					.000766	0.01		1.707			0.00		
160.00	15.60	4.265	19.865	20.0	2.83	0.124	19.989	0.00	1.435	3.00	0.00	0.00	0	0.00
1658.08	0.00154					.000760	1.26		1.857			0.00		
1818.08	18.16	3.000	21.158	20.0	2.83	0.124	21.282	0.00	1.435	3.00	0.00	0.00	0	0.00
319.52	0.00154					.000712	0.23		1.857			0.00		
2137.60	18.65	2.721	21.372	20.0	2.97	0.137	21.509	0.00	1.435	3.00	0.00	0.00	0	0.00
173.44	0.00154					.000693	0.12		1.857			0.00		
2311.04	18.92	2.560	21.479	20.0	3.11	0.150	21.629	0.00	1.435	3.00	0.00	0.00	0	0.00
148.91	0.00154					.000751	0.11		1.857			0.00		
2459.95	19.15	2.427	21.576	20.0	3.26	0.165	21.741	0.00	1.435	3.00	0.00	0.00	0	0.00
140.12	0.00154					.000827	0.12		1.857			0.00		
2600.07	19.37	2.310	21.675	20.0	3.42	0.182	21.857	0.00	1.435	3.00	0.00	0.00	0	0.00
138.60	0.00154					.000917	0.13		1.857			0.00		
2738.67	19.58	2.205	21.784	20.0	3.59	0.200	21.984	0.00	1.435	3.00	0.00	0.00	0	0.00
146.14	0.00154					.001023	0.15		1.857			0.00		
2884.81	19.80	2.109	21.913	20.0	3.77	0.220	22.133	0.00	1.435	3.00	0.00	0.00	0	0.00
168.82	0.00154					.001146	0.19		1.857			0.00		

Oxford

Oxford

Oxford

Oxford

Oxford

Oxford

F0515F
WATER SURFACE PROFILE LISTING
CAMELBACK RANCH: 36" BLEEDOFF LINE FOR NORTH BASIN(S)
100 YEAR EVENT WSEL AT OUTLET IS 19.8
MAY 1988 (SD36A)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF		NORM DEPTH			ZR		
3053.63	20.07	2.023	22.085	20.0	3.95	0.242	22.327	0.00	1.435	3.00	0.00	0.00	0	0.00
230.44	0.00154					.001288	0.30		1.857			0.00		
3284.07	20.42	1.937	22.357	20.0	4.14	0.266	22.623	0.00	1.435	3.00	0.00	0.00	0	0.00
375.93	0.00154					.001432	0.54		1.857			0.00		
3660.00	21.00	1.875	22.875	20.0	4.30	0.287	23.162	0.00	1.435	3.00	0.00	0.00	0	0.00
WALL ENTRANCE												0.00		
3660.00	21.00	1.876	22.876	20.0	4.30	0.287	23.163	0.00	1.435	3.00	0.00	0.00	0	0.00

F0515P
WATER SURFACE PROFILE LISTING
CAMELBACK RANCH: 36" BLEEDOFF LINE FOR NORTH EASIN(S)
100 YEAR EVENT WSEL AT OUTLET IS 19.8
MAY 1988 (SD36A)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
100.00	15.50	4.300	19.800	22.0	3.11	0.150	19.950	0.00	1.509		3.00	0.00	0.00	0	0.00
WALL EXIT													0.00		
100.00	15.50	4.301	19.801	22.0	3.11	0.150	19.951	0.00	1.509		3.00	0.00	0.00	0	0.00
50.00	0.00160					.000927	0.05			1.960			0.00		
150.00	15.58	4.267	19.847	22.0	3.11	0.150	19.997	0.00	1.509		3.00	0.00	0.00	0	0.00
10.00	0.00200					.000927	0.01			1.815			0.00		
160.00	15.60	4.278	19.878	22.0	3.11	0.150	20.028	0.00	1.509		3.00	0.00	0.00	0	0.00
2134.14	0.00154					.000920	1.96			1.983			0.00		
2294.14	18.89	3.300	21.893	22.0	3.11	0.150	22.043	0.00	1.509		3.00	0.00	0.00	0	0.00
385.83	0.00154					.000862	0.33			1.983			0.00		
2679.97	19.49	2.721	22.209	22.0	3.26	0.165	22.374	0.00	1.509		3.00	0.00	0.00	0	0.00
205.25	0.00154					.000839	0.17			1.983			0.00		
2885.22	19.81	2.560	22.365	22.0	3.42	0.182	22.547	0.00	1.509		3.00	0.00	0.00	0	0.00
180.94	0.00154					.000908	0.16			1.983			0.00		
3066.16	20.08	2.427	22.511	22.0	3.59	0.200	22.711	0.00	1.509		3.00	0.00	0.00	0	0.00
178.46	0.00154					.000999	0.18			1.983			0.00		
3244.62	20.36	2.310	22.670	22.0	3.77	0.220	22.890	0.00	1.509		3.00	0.00	0.00	0	0.00
191.31	0.00154					.001109	0.21			1.983			0.00		
3435.93	20.65	2.205	22.860	22.0	3.95	0.242	23.102	0.00	1.509		3.00	0.00	0.00	0	0.00
224.07	0.00154					.001235	0.28			1.983			0.00		
3660.00	21.00	2.113	23.113	22.0	4.13	0.265	23.378	0.00	1.509		3.00	0.00	0.00	0	0.00
WALL ENTRANCE													0.00		

WATER SURFACE PROFILE LISTING
CAMELBACK RANCH: 36" BLEEDOFF LINE FOR NORTH EASIN(S)
100 YEAR EVENT WSEL AT OUTLET IS 19.8
MAY 1988 (SD36A)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF		NORM DEPTH			ZR		
3660.00	21.00	2.114	23.114	22.0	4.13	0.265	23.379	0.00	1.509	3.00	0.00	0.00	0	0.00

F0515P
WATER SURFACE PROFILE LISTING
CAMELBACK RANCH: 36" BLEEDOFF LINE FOR NORTH BASIN(S)
100 YEAR EVENT WSEL AT OUTLET IS 19.8
MAY 1988 (SD36A)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
100.00	15.50	4.300	19.800	25.0	3.54	0.194	19.994	0.00	1.613		3.00	0.00	0.00	0	0.00
WALL EXIT													0.00		
100.00	15.50	4.301	19.801	25.0	3.54	0.194	19.995	0.00	1.613		3.00	0.00	0.00	0	0.00
50.00	0.00160					.001197	0.06			2.153			0.00		
150.00	15.58	4.281	19.861	25.0	3.54	0.194	20.055	0.00	1.613		3.00	0.00	0.00	0	0.00
10.00	0.00200					.001197	0.01			1.980			0.00		
160.00	15.60	4.300	19.900	25.0	3.54	0.194	20.094	0.00	1.613		3.00	0.00	0.00	0	0.00
3500.00	0.00154					.001197	4.19			2.185			0.00		
WALL ENTRANCE													0.00		
3660.00	21.00	3.168	24.168	25.0	3.54	0.194	24.362	0.00	1.613		3.00	0.00	0.00	0	0.00

F0515P
WATER SURFACE PROFILE LISTING
CAMELBACK RANCH: 36" BLEEDOFF LINE FOR NORTH BASIN(S)
100 YEAR EVENT WSEL AT OUTLET IS 19.8
MAY 1988 (SD36A)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF		NORM DEPTH			ZR		
100.00	15.50	4.300	19.800	35.0	4.95	0.381	20.181	0.00	1.923	3.00	0.00	0.00	0	0.00
WALL EXIT												0.00		
100.00	15.50	4.301	19.801	35.0	4.95	0.381	20.182	0.00	1.923	3.00	0.00	0.00	0	0.00
50.00	0.00169					.002346	0.12		3.000			0.00		
150.00	15.58	4.338	19.918	35.0	4.95	0.381	20.299	0.00	1.923	3.00	0.00	0.00	0	0.00
10.00	0.00200					.002346	0.02		3.000			0.00		
160.00	15.60	4.396	19.996	35.0	4.95	0.381	20.377	0.00	1.923	3.00	0.00	0.00	0	0.00
3500.00	0.00154					.002346	8.21		3.000			0.00		
WALL ENTRANCE												0.00		
3660.00	21.00	7.360	28.360	35.0	4.95	0.381	28.741	0.00	1.923	3.00	0.00	0.00	0	0.00

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

CAMELBACK RANCH - 36"/24" BLEEDOFF PIPE SYSTEM

HEADING LINE NO 2 IS -

100YEAR WSEL AT OUTLET IS 19.8

HEADING LINE NO 3 IS -

MAY 1988 (SD24A)

WSPG: 24" STORM DRAIN SYSTEM

Basin #3

WATER SURFACE PROFILE - ELEMENT CARD LISTING

```
ELEMENT NO   1 IS A SYSTEM OUTLET        *          *      *
                    U/S DATA   STATION    INVERT   SECT                                W S ELEV
                               100.00     15.50    1                                    19.80

ELEMENT NO   2 IS A  WALL  EXIT                          *
                    U/S DATA   STATION    INVERT   SECT
                               100.00     15.50    1

ELEMENT NO   3 IS A REACH                *          *      *
                    U/S DATA   STATION    INVERT   SECT          N                      RADIUS  ANGLE  ANG PT  MAN H
                               140.00     15.58    1          0.012                      0.00    0.00   0.00     0

ELEMENT NO   4 IS A JUNCTION             *          *      *      *          *          *          *
                    U/S DATA   STATION    INVERT   SECT LAT-1 LAT-2   N      Q3      Q4    INVERT-3 INVERT-4  PHI 3   PHI 4
                               140.00     15.58    1     2     0  0.012   16.0     0.0    16.08    0.00    45.00    0.00
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING

ELEMENT NO   5 IS A TRANSITION           *          *      *
                    U/S DATA   STATION    INVERT   SECT          N
                               145.00     16.09    2          0.012

ELEMENT NO   6 IS A REACH                *          *      *
                    U/S DATA   STATION    INVERT   SECT          N                      RADIUS  ANGLE  ANG PT  MAN H
                               150.00     16.10    2          0.012                      0.00    45.00   0.00     0

ELEMENT NO   7 IS A REACH                *          *      *
                    U/S DATA   STATION    INVERT   SECT          N                      RADIUS  ANGLE  ANG PT  MAN H
                               2760.00    21.00    2          0.012                      0.00    0.00    0.00     8

ELEMENT NO   8 IS A  WALL  ENTRANCE                      *
                    U/S DATA   STATION    INVERT   SECT         FP
                               2760.00    21.00    2          0.500

ELEMENT NO   9 IS A SYSTEM HEADWORKS                     *                    *
                    U/S DATA   STATION    INVERT   SECT                                W S ELEV
                               2760.00    21.00    2                                    0.00
NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING
```

F0515P

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIERS	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	1	4			3.00														
CD	2	4			2.30														

Oxford Oxford Oxford Oxford Oxford

FC515P
WATER SURFACE PROFILE LISTING
CAMELBACK RANCH - 36"/24" BLEEDOFF PIPE SYSTEM
100YEAR WSEL AT OUTLET IS 19.8
MAY 1988 (SD24A)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
100.00	15.50	4.300	19.800	21.0	2.97	0.137	19.937	0.00	1.472		3.00	0.00	0.00	0	0.00
WALL EXIT													0.00		
100.00	15.50	4.301	19.801	21.0	2.97	0.137	19.938	0.00	1.472		3.00	0.00	0.00	0	0.00
40.00	0.00200					.000845	0.03			1.761			0.00		
140.00	15.58	4.255	19.835	21.0	2.97	0.137	19.972	0.00	1.472		3.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.000446	0.00						0.00		
140.00	15.58	4.384	19.964	5.0	0.71	0.008	19.972	0.00	0.700		3.00	0.00	0.00	0	0.00
TRANS STR	0.10200					.000232	0.00						0.00		
145.00	16.09	3.850	19.940	5.0	1.59	0.039	19.979	0.00	0.788		2.00	0.00	0.00	0	0.00
5.00	0.00200					.000416	0.00			0.950			0.00		
150.00	16.10	3.848	19.948	5.0	1.59	0.039	19.987	0.00	0.788		2.00	0.00	0.00	0	0.00
1270.07	0.00188					.000412	0.52			0.963			0.00		
1420.07	18.48	2.000	20.484	5.0	1.59	0.039	20.523	0.00	0.788		2.00	0.00	0.00	0	0.00
121.39	0.00188					.000386	0.05			0.963			0.00		
1541.46	18.71	1.814	20.526	5.0	1.67	0.043	20.569	0.00	0.788		2.00	0.00	0.00	0	0.00
69.11	0.00188					.000376	0.03			0.963			0.00		
1610.57	18.84	1.706	20.547	5.0	1.75	0.048	20.595	0.00	0.788		2.00	0.00	0.00	0	0.00
56.66	0.00188					.000407	0.02			0.963			0.00		
1667.23	18.95	1.618	20.566	5.0	1.84	0.052	20.618	0.00	0.788		2.00	0.00	0.00	0	0.00
50.95	0.00188					.000448	0.02			0.963			0.00		
1718.18	19.04	1.540	20.583	5.0	1.93	0.058	20.641	0.00	0.788		2.00	0.00	0.00	0	0.00
46.58	0.00188					.000498	0.02			0.963			0.00		

F0515P
WATER SURFACE PROFILE LISTING
CAMELBACK RANCH - 36"/24" BLEEDOFF PIPE SYSTEM
100YEAR WSEL AT OUTLET IS 19.8
MAY 1988 (SD24A)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF		NORM DEPTH			ZR		
1764.76	19.13	1.470	20.601	5.0	2.02	0.063	20.664	0.00	0.788	2.00	0.00	0.00	0	0.00
43.65	0.00188					.000556	0.02		0.963			0.00		
1808.41	19.21	1.406	20.619	5.0	2.12	0.070	20.689	0.00	0.788	2.00	0.00	0.00	0	0.00
42.28	0.00188					.000622	0.03		0.963			0.00		
1850.69	19.29	1.346	20.638	5.0	2.22	0.077	20.715	0.00	0.788	2.00	0.00	0.00	0	0.00
40.20	0.00188					.000699	0.03		0.963			0.00		
1890.89	19.37	1.291	20.659	5.0	2.33	0.084	20.743	0.00	0.788	2.00	0.00	0.00	0	0.00
40.00	0.00188					.000788	0.03		0.963			0.00		
1930.89	19.44	1.239	20.682	5.0	2.44	0.093	20.775	0.00	0.788	2.00	0.00	0.00	0	0.00
39.21	0.00188					.000889	0.03		0.963			0.00		
1970.10	19.52	1.191	20.707	5.0	2.56	0.102	20.809	0.00	0.788	2.00	0.00	0.00	0	0.00
41.06	0.00188					.001005	0.04		0.963			0.00		
2011.16	19.59	1.145	20.738	5.0	2.69	0.112	20.850	0.00	0.788	2.00	0.00	0.00	0	0.00
44.33	0.00188					.001137	0.05		0.963			0.00		
2055.49	19.68	1.101	20.778	5.0	2.82	0.123	20.901	0.00	0.788	2.00	0.00	0.00	0	0.00
48.71	0.00188					.001289	0.06		0.963			0.00		
2104.20	19.77	1.060	20.828	5.0	2.96	0.136	20.964	0.00	0.788	2.00	0.00	0.00	0	0.00
63.56	0.00188					.001461	0.09		0.963			0.00		
2167.76	19.89	1.020	20.907	5.0	3.10	0.149	21.056	0.00	0.788	2.00	0.00	0.00	0	0.00
101.03	0.00188					.001658	0.17		0.963			0.00		
2268.79	20.08	0.983	21.060	5.0	3.25	0.164	21.224	0.00	0.788	2.00	0.00	0.00	0	0.00
229.17	0.00188					.001828	0.42		0.963			0.00		

Oxford
Oxford
Oxford
Oxford
Oxford

WATER SURFACE PROFILE LISTING

CAMELBACK RANCH - 36"/24" BLEEDOFF PIPE SYSTEM
100YEAR WSEL AT OUTLET IS 19.8
MAY 1988 (SD24A)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF		NORM DEPTH			ZR		
2497.96	20.51	0.963	21.470	5.0	3.34	0.173	21.643	0.00	0.788	2.00	0.00	0.00	0	0.60
262.04	0.00188					.001893	0.50		0.963			0.00		
2760.00	21.00	0.963	21.963	5.0	3.34	0.173	22.136	0.00	0.788	2.00	0.00	0.00	0	0.00
WALL ENTRANCE												0.00		
2760.00	21.00	0.964	21.964	5.0	3.34	0.173	22.137	0.00	0.788	2.00	0.00	0.00	0	0.00

F0515P
WATER SURFACE PROFILE LISTING
CAMELBACK RANCH - 36"/24" BLEEDOFF PIPE SYSTEM
100YEAR WSEL AT OUTLET IS 19.8
MAY 1988 (SD24A)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBFR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
100.00	15.50	4.300	19.800	23.0	3.25	0.164	19.964	0.00	1.544		3.00	0.00	0.00	0	0.00
WALL EXIT													0.00		
100.00	15.50	4.301	19.801	23.0	3.25	0.164	19.965	0.00	1.544		3.00	0.00	0.00	0	0.00
40.00	0.00200					.001013	0.04			1.870			0.00		
140.00	15.58	4.262	19.842	23.0	3.25	0.164	20.006	0.00	1.544		3.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.000553	0.00						0.00		
140.00	15.58	4.411	19.991	7.0	0.99	0.015	20.006	0.00	0.832		3.00	0.00	0.00	0	0.00
TRANS STR	0.10200					.000455	0.00						0.00		
145.00	16.09	3.853	19.943	7.0	2.23	0.077	20.020	0.00	0.939		2.00	0.00	0.00	0	0.00
5.00	0.00200					.000816	0.00			1.160			0.00		
150.00	16.10	3.858	19.958	7.0	2.23	0.077	20.035	0.00	0.939		2.00	0.00	0.00	0	0.00
1771.04	0.00188					.000808	1.43			1.183			0.00		
1921.04	19.42	2.000	21.424	7.0	2.23	0.077	21.501	0.00	0.939		2.00	0.00	0.00	0	0.00
158.20	0.00188					.000757	0.12			1.183			0.00		
2079.24	19.72	1.814	21.535	7.0	2.34	0.085	21.620	0.00	0.939		2.00	0.00	0.00	0	0.00
87.41	0.00188					.000738	0.06			1.183			0.00		
2166.65	19.88	1.706	21.591	7.0	2.45	0.093	21.684	0.00	0.939		2.00	0.00	0.00	0	0.00
73.00	0.00188					.000800	0.06			1.183			0.00		
2239.65	20.02	1.618	21.640	7.0	2.57	0.103	21.743	0.00	0.939		2.00	0.00	0.00	0	0.00
67.93	0.00188					.000880	0.06			1.183			0.00		
2307.58	20.15	1.540	21.690	7.0	2.70	0.113	21.803	0.00	0.939		2.00	0.00	0.00	0	0.00
65.18	0.00188					.000976	0.06			1.183			0.00		

FC515P
WATER SURFACE PROFILE LISTING
CAMELBACK RANCH - 36"/24" BLEEDOFF PIPE SYSTEM
100YEAR WSEL AT OUTLET IS 19.8
MAY 1988 (SD24A)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF		NORM DEPTH			ZR		
2372.76	20.27	1.470	21.742	7.0	2.83	0.124	21.866	0.00	0.939	2.00	0.00	0.00	0	0.00
65.50	0.00188					.001089	0.07		1.183			0.00		
2438.26	20.39	1.406	21.801	7.0	2.97	0.137	21.938	0.00	0.939	2.00	0.00	0.00	0	0.00
70.57	0.00188					.001220	0.09		1.183			0.00		
2508.83	20.53	1.346	21.874	7.0	3.11	0.150	22.024	0.00	0.939	2.00	0.00	0.00	0	0.00
79.02	0.00188					.001371	0.11		1.183			0.00		
2587.85	20.68	1.291	21.967	7.0	3.26	0.165	22.132	0.00	0.939	2.00	0.00	0.00	0	0.00
106.59	0.00188					.001544	0.16		1.183			0.00		
2694.44	20.88	1.239	22.115	7.0	3.42	0.182	22.297	0.00	0.939	2.00	0.00	0.00	0	0.00
65.56	0.00188					.001679	0.11		1.183			0.00		
2760.00	21.00	1.219	22.219	7.0	3.49	0.189	22.408	0.00	0.939	2.00	0.00	0.00	0	0.00
WALL ENTRANCE												0.00		
2760.00	21.00	1.220	22.220	7.0	3.49	0.189	22.409	0.00	0.939	2.00	0.00	0.00	0	0.00

F0515P
WATER SURFACE PROFILE LISTING
CAMELBACK RANCH - 36"/24" BLEEDOFF PIPE SYSTEM
100YEAR WSEL AT OUTLET IS 19.8
MAY 1988 (SD24A)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVGPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
100.00	15.50	4.300	19.800	26.0	3.68	0.210	20.010	0.00	1.647		3.00	0.00	0.00	0	0.00
WALL EXIT													0.00		
100.00	15.50	4.301	19.801	26.0	3.68	0.210	20.011	0.00	1.647		3.00	0.00	0.00	0	0.00
40.00	0.00200					.001295	0.05			2.037			0.00		
140.00	15.58	4.273	19.853	26.0	3.68	0.210	20.063	0.00	1.647		3.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.000744	0.00						0.00		
140.00	15.58	4.452	20.032	10.0	1.41	0.031	20.063	0.00	1.000		3.00	0.00	0.00	0	0.00
TRANS STR	0.10200					.000928	0.00						0.00		
145.00	16.09	3.845	19.935	10.0	3.18	0.157	20.092	0.00	1.132		2.00	0.00	0.00	0	0.00
5.00	0.00200					.001665	0.01			1.500			0.00		
150.00	16.10	3.866	19.966	10.0	3.18	0.157	20.123	0.00	1.132		2.00	0.00	0.00	0	0.00
2610.00	0.00188					.001665	4.35			1.540			0.00		
WALL ENTRANCE													0.00		
2760.00	21.00	3.374	24.374	10.0	3.18	0.157	24.531	0.00	1.132		2.00	0.00	0.00	0	0.00

F0515P
WATER SURFACE PROFILE LISTING
CAMELBACK RANCH - 36"/24" BLEEDOFF PIPE SYSTEM
100YEAR WSEL AT OUTLET IS 19.8
MAY 1988 (SD24A)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVEPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
100.00	15.50	4.300	19.800	28.0	3.96	0.244	20.044	0.00	1.712		3.00	0.00	0.00	0	0.00
WALL EXIT													0.00		
100.00	15.50	4.301	19.801	28.0	3.96	0.244	20.045	0.00	1.712		3.00	0.00	0.00	0	0.00
40.00	0.00200					.001502	0.06			2.156			0.00		
140.00	15.58	4.281	19.861	28.0	3.96	0.244	20.105	0.00	1.712		3.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.000889	0.00						0.00		
140.00	15.58	4.480	20.060	12.0	1.70	0.045	20.105	0.00	1.100		3.00	0.00	0.00	0	0.00
TRANS STR	0.10200					.001337	0.01						0.00		
145.00	16.09	3.831	19.921	12.0	3.82	0.226	20.147	0.00	1.245		2.00	0.00	0.00	0	0.00
5.00	0.00200					.002398	0.01			2.000			0.00		
150.00	16.10	3.865	19.965	12.0	3.82	0.226	20.191	0.00	1.245		2.00	0.00	0.00	0	0.00
2610.00	0.00188					.002398	6.26			2.000			0.00		
WALL ENTRANCE													0.00		
2760.00	21.00	5.313	26.313	12.0	3.82	0.226	26.539	0.00	1.245		2.00	0.00	0.00	0	0.00

FC515P
WATER SURFACE PROFILE LISTING
CAMELBACK RANCH - 36"/24" BLEEDOFF PIPE SYSTEM
100YEAR WSEL AT OUTLET IS 19.8
MAY 1988 (SD24A)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBFR
L/ELEM	SO					SF AVE	HF		NORM DEPTH			ZR		
100.00	15.50	4.300	19.800	31.0	4.39	0.299	20.099	0.00	1.805	3.00	0.00	0.00	0	0.00
WALL EXIT												0.00		
100.00	15.50	4.301	19.801	31.0	4.39	0.299	20.100	0.00	1.805	3.00	0.00	0.00	0	0.00
40.00	0.00230					.001841	0.07		2.354			0.00		
140.00	15.58	4.295	19.875	31.0	4.39	0.299	20.174	0.00	1.805	3.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.001136	0.00					0.00		
140.00	15.58	4.499	20.079	15.0	2.12	0.070	20.149	0.00	1.235	3.00	0.00	0.00	0	0.00
TRANS STR	0.10200					.002088	0.01					0.00		
145.00	16.09	3.772	19.862	15.0	4.77	0.354	20.216	0.00	1.396	2.00	0.00	0.00	0	0.00
5.00	0.00200					.003746	0.02		2.000			0.00		
150.00	16.10	3.831	19.931	15.0	4.77	0.354	20.285	0.00	1.396	2.00	0.00	0.00	0	0.00
2610.00	0.00188					.003746	9.78		2.000			0.00		
WALL ENTRANCE												0.00		
2760.00	21.00	8.850	29.850	15.0	4.77	0.354	30.204	0.00	1.396	2.00	0.00	0.00	0	0.00

F0515P
WATER SURFACE PROFILE LISTING
CAMELBACK RANCH - 36"/24" BLEEDOFF PIPE SYSTEM
100YEAR WSEL AT OUTLET IS 19.8
MAY 1988 (SD24A)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVEPR
L/ELEM	SO					SF AVE	HF		NORM DEPTH			ZR		
100.00	15.50	4.300	19.800	33.0	4.67	0.338	20.138	0.00	1.865	3.00	0.00	0.00	0	0.00
WALL EXIT												0.00		
100.00	15.50	4.301	19.801	33.0	4.67	0.338	20.139	0.00	1.865	3.00	0.00	0.00	0	0.00
40.00	0.00200					.002086	0.08		2.520			0.00		
140.00	15.58	4.304	19.884	33.0	4.67	0.338	20.222	0.00	1.865	3.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.001320	0.00					0.00		
140.00	15.58	4.549	20.129	17.0	2.40	0.090	20.219	0.00	1.318	3.00	0.00	0.00	0	0.00
TRANS STR	0.10200					.002683	0.01					0.00		
145.00	16.09	3.760	19.850	17.0	5.41	0.455	20.305	0.00	1.486	2.00	0.00	0.00	0	0.00
5.00	0.00200					.004812	0.02		2.000			0.00		
150.00	16.10	3.838	19.938	17.0	5.41	0.455	20.393	0.00	1.486	2.00	0.00	0.00	0	0.00
2610.00	0.00188					.004812	12.56		2.000			0.00		
WALL ENTRANCE												0.00		
2760.00	21.00	11.679	32.679	17.0	5.41	0.455	33.134	0.00	1.486	2.00	0.00	0.00	0	0.00

F0515P
WATER SURFACE PROFILE LISTING
CAMELBACK RANCH - 36"/24" BLEEDOFF PIPE SYSTEM
100YEAR WSEL AT OUTLET IS 19.8
MAY 1988 (SD24A)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
100.00	15.50	4.300	19.800	36.0	5.09	0.403	20.203	0.00	1.951		3.00	0.00	0.00	0	0.00
WALL EXIT													0.00		
100.00	15.50	4.301	19.801	36.0	5.09	0.403	20.204	0.00	1.951		3.00	0.00	0.00	0	0.00
40.00	0.00200					.002482	0.10			3.000			0.00		
140.00	15.58	4.320	19.900	36.0	5.09	0.403	20.303	0.00	1.951		3.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.001624	0.00						0.00		
140.00	15.58	4.624	20.204	20.0	2.83	0.124	20.328	0.00	1.435		3.00	0.00	0.00	0	0.00
TRANS STR	0.10200					.003713	0.02						0.00		
145.00	16.09	3.729	19.819	20.0	6.37	0.629	20.448	0.00	1.606		2.00	0.00	0.00	0	0.00
5.00	0.00200					.006660	0.03			2.000			0.00		
150.00	16.10	3.841	19.941	20.0	6.37	0.629	20.570	0.00	1.606		2.00	0.00	0.00	0	0.00
2610.00	0.00188					.006660	17.38			2.000			0.00		
WALL ENTRANCE													0.00		
2760.00	21.00	16.575	37.575	20.0	6.37	0.629	38.204	0.00	1.606		2.00	0.00	0.00	0	0.00

CVL

CORE & VAN LOO
PLANNING • ENGINEERING
LANDSCAPE ARCHITECTURE

Project Camelback Ranch
Project No. 1122-03
Sheet No. 4 of
Calculated by DWD Date 6/88
Checked by Date

Basin #4:

Elev	Area (Ac.)	Depth (Average Ft.)	Vol. (Ac-ft)	Cum Vol (Ac-ft)	Q (Pump Station) (cfs)
09	0	0		0	0
09.6	1.79	0.28	0.50	0.50	16
11.5	2.14	1.9	4.1	4.6	16.2
11.7	2.16	0.2	0.43	5.0	
	1.85	0.1	0.19	5.2	16.3
12.5	4.3	0.8	3.4	8.6	16.5
13.3	4.5	0.8	3.6	12.2	
	2.8	0.6	1.7	13.9	
	2.8	0.35	0.98	14.9	16.75
15.0	10.2	1.7	17.3	32.2	17.0
15.6	10.8	0.6	6.5	38.7	
	4.4	0.3	1.3	40.0	17.5
16.0	15.0	0.4	6	46.0	17.7
16.5	15.0	0.5	7.5	53.5	17.75

0 TR-20 HYDROLOGY
PROGRAM DATE - FEB. 14, 1974 S/360
PASS= 1

EXECUTIVE CONTROL CARD OPERATION LIST

LISTING OF DATA IN CORE

TR-20: INTERIOR DRAINAGE

0 CAMELBACK RANCH(ID1122A5D)(3 PUMPS)

VELOCITY INCREMENT
CTABLE 0.2000

8	0.0000	0.0800	0.1800	0.2500	0.3200
	0.3700	0.4100	0.4500	0.4900	0.5100
	0.5400	0.5700	0.5900	0.6100	0.6300
8	0.6500	0.6600	0.6700	0.6900	0.7000
	0.7100	0.7200	0.7300	0.7400	0.7500
	0.7600	0.7700	0.7700	0.7800	0.7900
8	0.7900	0.8000	0.8100	0.8100	0.8200
8	0.8200	0.8300	0.8300	0.8400	0.8400
	0.8400	0.8500	0.8500	0.8600	0.8600
8	0.8600	0.8600	0.8700	0.8700	0.8700
8	0.8800	0.8800	0.8800	0.8900	0.8900
	0.8900	0.8900	0.8900	0.8900	0.9000
	0.9000	0.9000	0.9000	0.9000	0.9100
8	0.9100	0.9100	0.9100	0.9100	0.9100
	0.9200	0.9200	0.9200	0.9200	0.9200
8	0.9200	0.9200	0.9200	0.9300	0.9300

9 ENDTBL

STRUCT NO.
3 STRUCT 1

	ELEVATION	DISCHARGE	STORAGE
8	1022.8000	0.0000	0.0001
8	1023.0000	2.0000	0.0300
8	1023.5000	4.0000	4.0000
8	1024.0000	9.0000	1.7700
8	1024.5000	14.0000	3.7300
8	1025.0000	152.0000	5.9600
8	1026.0000	378.0000	15.9000

9 ENDTBL

STRUCT NO.
3 STRUCT 2

	ELEVATION	DISCHARGE	STORAGE
8	1021.0000	0.0000	0.0001
8	1021.5000	3.5000	0.5300
8	1022.0000	7.0000	2.6000
8	1022.5000	14.0000	6.5000
8	1023.0000	20.0000	11.1000
8	1024.0000	25.0000	29.7000

```
8                    1026.0000     30.0000     67.2000
9 ENDTBL

        STRUCT NO.
3 STRUCT       3

                     ELEVATION   DISCHARGE     STORAGE
8                    1020.1000      0.0000      0.0001
8                    1022.0000      7.1000      9.0000
8                    1023.0000      8.1000     16.0000
8                    1024.0000      9.5000     23.3000
9 ENDTBL

        STRUCT NO.
3 STRUCT       4

                     ELEVATION   DISCHARGE     STORAGE
8                    1009.0000      0.0000      0.0001
8                    1009.6000     16.0000      0.5000
8                    1011.5000     16.2000      4.6000
8                    1011.7000     16.3000      5.2000
8                    1012.5000     16.5000      8.6000
8                    1013.3000     16.7500     14.9000
8                    1015.0000     17.0000     32.2000
8                    1015.6000     17.5000     40.0000
8                    1016.0000     17.7000     46.0000
8                    1016.5000     17.7500     53.5000
9 ENDTBL

                 TIME INCREMENT
4 DIMHYD

8            0.0000      0.0300      0.1000      0.1900      0.3100
8            0.4700      0.6600      0.8200      0.9300      0.9900
8            1.0000      0.9900      0.9300      0.8600      0.7800
8            0.6800      0.5600      0.4600      0.3900      0.3300
8            0.2800      0.2410      0.2070      0.1740      0.1470
8            0.1260      0.1070      0.0910      0.0770      0.0660
8            0.0550      0.0470      0.0400      0.0340      0.0290
8            0.0250      0.0210      0.0180      0.0150      0.0130
8            0.0110      0.0090      0.0080      0.0070      0.0060
8            0.0050      0.0040      0.0030      0.0020      0.0010
8            0.0000      0.0000      0.0000      0.0000      0.0000
9 ENDTBL

COMPUTED PEAK K FACTOR =  484.00

                 TIME INCREMENT
5 RAINFL 4                0.5000

8            0.0000      0.0040      0.0080      0.0130      0.0180
8            0.0220      0.0260      0.0310      0.0350      0.0400
8            0.0440      0.0480      0.0530      0.0570      0.0620
8            0.0660      0.0710      0.0750      0.0800      0.0930
8            0.1070      0.1200      0.1400      0.1700      0.5000
```

```
8          0.9200     0.9240     0.9280     0.9330     0.9370
8          0.9420     0.9470     0.9510     0.9560     0.9600
8          0.9640     0.9690     0.9730     0.9780     0.9820
8          0.9870     0.9910     0.9950     1.0000     1.0000
ENDTBL
                STANDARD CONTROL INSTRUCTIONS


6 RUNOFF 1  10      5      0.3100     77.0000     0.63001 0 0 1 0 1
6 REACH  3  15   5  6   3600.0000      0.7500     0.00001 0 0 1 0 1
6 RUNOFF 1  22      5      0.1600     81.0000     0.44001 0 0 1 0 1
6 ADDHYD 4  25   5 6 7                                 1 1 0 1 0 1
6 RUNOFF 1  21      5      0.2100     76.0000     0.54001 0 0 1 0 1
6 RESVOR 2     1 5  6   1022.8000                       1 1 1 1 0 1
6 ADDHYD 4  23   6 7 4                                 1 0 0 1 0 1
6 RESVOR 2     2 4  5   1021.0000                       1 1 1 1 0 1
6 RUNOFF 1  35      7      0.1600     85.0000     0.45001 0 0 1 0 1
6 RESVOR 2     3 7  5   1020.1000                       1 1 1 1 0 1
6 RUNOFF 1  50      6      0.3800     85.0000     0.56001 0 0 1 0 1
6 RESVOR 2     4 6  5   1009.0000                       1 1 1 1 0 1
ENDATA


END OF LISTING
                                                                                    PASS=  1
EXECUTIVE CONTROL CARD          OPERATION  INCREM,    MAIN TIME INCREMENT=  0.20
EXECUTIVE CONTROL CARD          OPERATION  COMPUT,    FROM XSECTN/STRUCT  10/  0    TO XSECTN/STRUCT   0/  4
      STARTING TIME=  0.00    RAIN DEPTH=  4.00    RAIN DURATION=  1.00    RAIN TABLE NO.= 4    SOIL CONDITION= 2
      ALTERNATE NO.= 1        STORM NO.= 3


SUBROUTINE RUNOFF    CROSS SECTION  10
         AREA=   0.31    INPUT RUNOFF CURVE=  77.0    TIME OF CONCENTRATION=  0.63
         PEAK TIMES                PEAK DISCHARGES              PEAK ELEVATIONS
            12.62                       279.979                    (RUNOFF)
            16.64                         5.742                    (RUNOFF)
            17.99                         6.032                    (RUNOFF)
            19.16                         5.800                    (RUNOFF)
            20.66                         5.784                    (RUNOFF)
            21.65                         5.847                    (RUNOFF)
            22.65                         5.850                    (RUNOFF)
            24.00                         5.676                    (RUNOFF)
0        TOTAL WATER, IN INCHES ON DRAINAGE AREA=   1.8081       CFS-HRS=     361.74       ACRE-FT=     29.89


SUBROUTINE REACH     CROSS SECTION  15
         LENGTH=   3600.00    INPUT COEFFICIENT=  0.7500    INPUT ROUTINGS=  0.00
         AVERAGE WATER VELOCITY=   5.100      AVERAGE ROUTING COEFF= 0.7500      NUMBER OF ROUTINGS=  0.74
0        PEAK TIMES                PEAK DISCHARGES              PEAK ELEVATIONS
            12.80                       264.341                    (NULL)
            16.82                         5.678                    (NULL)
            18.16                         5.998                    (NULL)
            19.34                         5.725                    (NULL)
            20.86                         5.707                    (NULL)
            21.83                         5.772                    (NULL)
            22.84                         5.781                    (NULL)
            24.15                         5.567                    (NULL)
         TOTAL WATER, IN INCHES ON DRAINAGE AREA=   1.8075       CFS-HRS=     361.61       ACRE-FT=     29.88
```

SUBROUTINE RUNOFF CROSS SECTION 22
AREA= 0.16 INPUT RUNOFF CURVE= 81.0 TIME OF CONCENTRATION= 0.44

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
12.53	188.513	(RUNOFF)
14.54	9.351	(RUNOFF)
16.57	3.291	(RUNOFF)
17.92	3.413	(RUNOFF)
19.05	3.308	(RUNOFF)
20.57	3.325	(RUNOFF)
21.56	3.338	(RUNOFF)
22.56	3.342	(RUNOFF)
23.95	3.345	(RUNOFF)

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 2.1252 CFS-HRS= 219.44 ACRE-FT= 18.13

SUBROUTINE ADDHYD CROSS SECTION 25
INPUT HYDROGRAPHS= 5,6 OUTPUT HYDROGRAPH= 7

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
12.64	417.967	(NULL)
16.65	8.831	(NULL)
18.04	9.344	(NULL)
19.18	8.891	(NULL)
20.70	8.825	(NULL)
21.68	8.937	(NULL)
22.67	8.956	(NULL)
24.00	8.676	(NULL)

HYDROGRAPH, TZERO= 0.00 DELTA T= 0.20 DRAINAGE AREA= 0.47

TIME											
0.00	DISCHG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00	DISCHG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.00	DISCHG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6.00	DISCHG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8.00	DISCHG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10.00	DISCHG	0.00	0.00	0.00	0.02	0.19	0.52	1.08	1.99	7.07	48.15
12.00	DISCHG	130.72	233.40	338.56	415.80	382.34	286.83	189.18	116.58	76.17	53.10
14.00	DISCHG	39.74	32.24	28.48	26.84	25.98	25.39	23.37	18.92	14.54	11.21
16.00	DISCHG	9.31	8.56	8.58	8.82	8.74	8.42	8.26	8.49	8.85	9.16
18.00	DISCHG	9.34	9.25	8.83	8.44	8.44	8.73	8.89	8.66	8.31	8.01
20.00	DISCHG	7.83	7.93	8.36	8.79	8.79	8.51	8.36	8.60	8.91	8.87
22.00	DISCHG	8.56	8.40	8.63	8.93	8.89	8.58	8.23	7.99	7.91	8.22
24.00	DISCHG	8.68	8.19	6.11	3.80	2.00	0.97	0.45	0.21	0.09	0.04
26.00	DISCHG	0.00									

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 1.9156 CFS-HRS= 581.05 ACRE-FT= 48.02

SUBROUTINE RUNOFF CROSS SECTION 21
AREA= 0.21 INPUT RUNOFF CURVE= 76.0 TIME OF CONCENTRATION= 0.54

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
12.58	196.568	(RUNOFF)
14.51	11.062	(RUNOFF)
16.61	3.839	(RUNOFF)
17.95	4.024	(RUNOFF)
19.11	3.875	(RUNOFF)
20.62	3.889	(RUNOFF)
21.61	3.920	(RUNOFF)
22.61	3.940	(RUNOFF)
23.98	3.863	(RUNOFF)

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 1.7385 CFS-HRS= 235.62 ACRE-FT= 19.47

SUBROUTINE RESVOR STRUCTURE 1

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
12.80	157.552	1025.02
14.20	23.062	1024.53
14.80	24.538	1024.54
15.40	22.103	1024.53
24.06	3.805	1023.45

HYDROGRAPH, TZERO= 0.00 DELTA T= 0.20 DRAINAGE AREA= 0.21

TIME											
0.00	DISCHG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	ELEV	1022.80	1022.80	1022.80	1022.80	1022.80	1022.80	1022.80	1022.80	1022.80	1022.80
2.00	DISCHG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00	ELEV	1022.80	1022.80	1022.80	1022.80	1022.80	1022.80	1022.80	1022.80	1022.80	1022.80
4.00	DISCHG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.00	ELEV	1022.80	1022.80	1022.80	1022.80	1022.80	1022.80	1022.80	1022.80	1022.80	1022.80
6.00	DISCHG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6.00	ELEV	1022.80	1022.80	1022.80	1022.80	1022.80	1022.80	1022.80	1022.80	1022.80	1022.80
8.00	DISCHG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8.00	ELEV	1022.80	1022.80	1022.80	1022.80	1022.80	1022.80	1022.80	1022.80	1022.80	1022.80
10.00	DISCHG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	2.07
10.00	ELEV	1022.80	1022.80	1022.80	1022.80	1022.80	1022.80	1022.80	1022.80	1022.86	1023.02
12.00	DISCHG	2.41	3.17	49.13	139.08	157.55	138.79	90.06	55.40	35.23	24.08
12.00	ELEV	1023.10	1023.29	1024.63	1024.95	1025.02	1024.95	1024.78	1024.65	1024.58	1024.54
14.00	DISCHG	3.95	23.06	3.92	3.98	24.54	3.92	3.97	22.10	3.87	3.87
14.00	ELEV	1023.49	1024.53	1023.48	1023.49	1024.54	1023.48	1023.49	1024.53	1023.47	1023.47
16.00	DISCHG	3.87	3.87	3.86	3.86	3.86	3.86	3.86	3.85	3.85	3.85
16.00	ELEV	1023.47	1023.47	1023.47	1023.47	1023.47	1023.46	1023.46	1023.46	1023.46	1023.46
18.00	DISCHG	3.86	3.86	3.86	3.85	3.85	3.85	3.85	3.85	3.85	3.84
18.00	ELEV	1023.46	1023.46	1023.46	1023.46	1023.46	1023.46	1023.46	1023.46	1023.46	1023.46
20.00	DISCHG	3.84	3.83	3.83	3.83	3.83	3.83	3.83	3.82	3.82	3.82
20.00	ELEV	1023.46	1023.46	1023.46	1023.46	1023.46	1023.46	1023.46	1023.46	1023.46	1023.46
22.00	DISCHG	3.82	3.82	3.82	3.82	3.82	3.82	3.82	3.81	3.81	3.80
22.00	ELEV	1023.46	1023.46	1023.45	1023.45	1023.45	1023.45	1023.45	1023.45	1023.45	1023.45
24.00	DISCHG	3.80	3.80	3.79	3.77	3.75	3.72	3.69	3.66	3.63	3.60
24.00	ELEV	1023.45	1023.45	1023.45	1023.44	1023.44	1023.43	1023.42	1023.41	1023.41	1023.40
26.00	DISCHG	3.57	3.54	3.51	3.48	3.45	3.42	3.39	3.37	3.34	3.31
26.00	ELEV	1023.39	1023.38	1023.38	1023.37	1023.36	1023.36	1023.35	1023.34	1023.33	1023.33
28.00	DISCHG	3.28	3.26	3.23	3.20	3.17	3.15	3.12	3.10	3.07	3.05
28.00	ELEV	1023.32	1023.31	1023.31	1023.30	1023.29	1023.29	1023.28	1023.27	1023.27	1023.26
30.00	DISCHG	3.02	3.00	2.97	2.95	2.92	2.90	2.87	2.85	2.83	2.80
30.00	ELEV	1023.26	1023.25	1023.24	1023.24	1023.23	1023.22	1023.22	1023.21	1023.21	1023.20
32.00	DISCHG	2.78	2.76	2.73	2.71	2.69	2.67	2.64	2.62	2.60	2.58
32.00	ELEV	1023.19	1023.19	1023.18	1023.18	1023.17	1023.17	1023.16	1023.16	1023.15	1023.14
34.00	DISCHG	2.56	2.54	2.51	2.49	2.47	2.45	2.43	2.41	2.39	2.37
34.00	ELEV	1023.14	1023.13	1023.13	1023.12	1023.12	1023.11	1023.11	1023.10	1023.10	1023.09
36.00	DISCHG	2.35	2.33	2.31	2.29	2.28	2.26	2.24	2.22	2.20	2.18
36.00	ELEV	1023.09	1023.08	1023.08	1023.07	1023.07	1023.06	1023.06	1023.05	1023.05	1023.05
38.00	DISCHG	2.16	2.15	2.13	2.11	2.09	2.08	2.06	2.04	2.03	2.01
38.00	ELEV	1023.04	1023.04	1023.03	1023.03	1023.02	1023.02	1023.01	1023.01	1023.01	1023.00
40.00	DISCHG	1.28	0.37	0.11	0.03	0.01	0.00				
40.00	ELEV	1022.93	1022.84	1022.81	1022.80	1022.80	1022.80				

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 1.7583 CFS-HRS= 238.29 ACRE-FT= 19.69

SUBROUTINE ADDHYD CROSS SECTION 23

INPUT HYDROGRAPHS= 6,7 OUTPUT HYDROGRAPH= 4

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
12.68	570.777	(NULL)
14.17	55.769	(NULL)
14.80	50.523	(NULL)
15.38	41.302	(NULL)
16.65	12.694	(NULL)

19.18	12.740	(NULL)
20.70	12.655	(NULL)
21.68	12.762	(NULL)
22.68	12.775	(NULL)

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 1.8670 CFS-HRS= 819.34 ACRE-FT= 67.71

SUBROUTINE RESVOR STRUCTURE 2

SURFACE ELEVATION= 1021.00

0 PEAK TIMES PEAK DISCHARGES PEAK ELEVATIONS

15.53 27.778 1024.93

HYDROGRAPH, TZERO= 0.00 DELTA T= 0.20 DRAINAGE AREA= 0.68

TIME											
0.00	DISCHG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	ELEV	1021.00	1021.00	1021.00	1021.00	1021.00	1021.00	1021.00	1021.00	1021.00	1021.00
2.00	DISCHG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00	ELEV	1021.00	1021.00	1021.00	1021.00	1021.00	1021.00	1021.00	1021.00	1021.00	1021.00
4.00	DISCHG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.00	ELEV	1021.00	1021.00	1021.00	1021.00	1021.00	1021.00	1021.00	1021.00	1021.00	1021.00
6.00	DISCHG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6.00	ELEV	1021.00	1021.00	1021.00	1021.00	1021.00	1021.00	1021.00	1021.00	1021.00	1021.00
8.00	DISCHG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8.00	ELEV	1021.00	1021.00	1021.00	1021.00	1021.00	1021.00	1021.00	1021.00	1021.00	1021.00
10.00	DISCHG	0.00	0.00	0.00	0.00	0.01	0.05	0.13	0.27	0.74	3.54
10.00	ELEV	1021.00	1021.00	1021.00	1021.00	1021.00	1021.01	1021.02	1021.04	1021.11	1021.51
12.00	DISCHG	5.97	11.14	18.33	21.66	23.99	25.61	26.48	27.01	27.31	27.49
12.00	ELEV	1021.85	1022.30	1022.86	1023.33	1023.80	1024.20	1024.49	1024.67	1024.77	1024.83
14.00	DISCHG	27.57	27.63	27.68	27.69	27.72	27.75	27.75	27.77	27.78	27.75
14.00	ELEV	1024.86	1024.88	1024.89	1024.90	1024.91	1024.92	1024.92	1024.92	1024.93	1024.92
16.00	DISCHG	27.71	27.67	27.63	27.59	27.55	27.51	27.47	27.43	27.39	27.35
16.00	ELEV	1024.90	1024.89	1024.88	1024.86	1024.85	1024.84	1024.82	1024.81	1024.80	1024.78
18.00	DISCHG	27.31	27.28	27.24	27.20	27.16	27.12	27.08	27.05	27.01	26.97
18.00	ELEV	1024.77	1024.76	1024.75	1024.73	1024.72	1024.71	1024.69	1024.68	1024.67	1024.66
20.00	DISCHG	26.93	26.89	26.85	26.81	26.77	26.73	26.69	26.66	26.62	26.58
20.00	ELEV	1024.64	1024.63	1024.62	1024.60	1024.59	1024.58	1024.56	1024.55	1024.54	1024.53
22.00	DISCHG	26.54	26.51	26.47	26.43	26.40	26.36	26.32	26.28	26.25	26.21
22.00	ELEV	1024.51	1024.50	1024.49	1024.48	1024.47	1024.45	1024.44	1024.43	1024.42	1024.40
24.00	DISCHG	26.17	26.13	26.09	26.05	26.00	25.94	25.88	25.83	25.77	25.71
24.00	ELEV	1024.39	1024.38	1024.36	1024.35	1024.33	1024.31	1024.29	1024.28	1024.26	1024.24
26.00	DISCHG	25.65	25.59	25.53	25.48	25.42	25.36	25.30	25.24	25.19	25.13
26.00	ELEV	1024.22	1024.20	1024.18	1024.16	1024.14	1024.12	1024.10	1024.08	1024.06	1024.04
28.00	DISCHG	25.07	25.01	24.92	24.83	24.73	24.64	24.54	24.44	24.35	24.26
28.00	ELEV	1024.02	1024.00	1023.98	1023.97	1023.95	1023.93	1023.91	1023.89	1023.87	1023.85
30.00	DISCHG	24.16	24.07	23.97	23.88	23.79	23.70	23.60	23.51	23.42	23.33
30.00	ELEV	1023.83	1023.81	1023.79	1023.78	1023.76	1023.74	1023.72	1023.70	1023.68	1023.67
32.00	DISCHG	23.24	23.15	23.06	22.97	22.88	22.79	22.70	22.61	22.52	22.43
32.00	ELEV	1023.65	1023.63	1023.61	1023.59	1023.58	1023.56	1023.54	1023.52	1023.50	1023.49
34.00	DISCHG	22.34	22.26	22.17	22.08	21.99	21.91	21.82	21.74	21.65	21.56
34.00	ELEV	1023.47	1023.45	1023.43	1023.42	1023.40	1023.38	1023.36	1023.35	1023.33	1023.31
36.00	DISCHG	21.48	21.39	21.31	21.23	21.14	21.06	20.97	20.89	20.81	20.73
36.00	ELEV	1023.30	1023.28	1023.26	1023.24	1023.23	1023.21	1023.19	1023.18	1023.16	1023.15
38.00	DISCHG	20.64	20.56	20.48	20.40	20.32	20.24	20.16	20.08	19.98	19.60
38.00	ELEV	1023.13	1023.11	1023.10	1023.08	1023.06	1023.05	1023.03	1023.02	1023.00	1022.97
40.00	DISCHG	19.21	18.82	18.42	18.03	17.65	17.27	16.90	16.54	16.19	15.85
40.00	ELEV	1022.93	1022.90	1022.87	1022.84	1022.80	1022.77	1022.74	1022.71	1022.68	1022.65
42.00	DISCHG	15.51	15.18	14.85	14.54	14.23	13.89	13.49	13.09	12.71	12.34
42.00	ELEV	1022.63	1022.60	1022.57	1022.54	1022.52	1022.49	1022.46	1022.44	1022.41	1022.38
44.00	DISCHG	11.98	11.63	11.29	10.96	10.64	10.33	10.03	9.73	9.45	9.17
44.00	ELEV	1022.36	1022.33	1022.31	1022.28	1022.26	1022.24	1022.22	1022.20	1022.17	1022.16
46.00	DISCHG	8.90	8.64	8.39	8.15	7.91	7.68	7.45	7.23	7.02	6.83
46.00	ELEV	1022.14	1022.12	1022.10	1022.08	1022.06	1022.05	1022.03	1022.02	1022.00	1021.98

48.00	ELEV	1021.95	1021.92	1021.90	1021.87	1021.85	1021.82	1021.80	1021.78	1021.76	1021.74
50.00	DISCHG	5.02	4.88	4.75	4.62	4.49	4.37	4.25	4.13	4.01	3.90
50.00	ELEV	1021.72	1021.70	1021.68	1021.66	1021.64	1021.62	1021.61	1021.59	1021.57	1021.56
52.00	DISCHG	3.80	3.69	3.59	3.47	3.11	2.79	2.50	2.24	2.01	1.80
52.00	ELEV	1021.54	1021.53	1021.51	1021.49	1021.44	1021.40	1021.36	1021.32	1021.29	1021.26
54.00	DISCHG	1.61	1.45	1.30	1.16	1.04	0.93	0.84	0.75	0.67	0.60
54.00	ELEV	1021.23	1021.21	1021.19	1021.17	1021.15	1021.13	1021.12	1021.11	1021.10	1021.09
56.00	DISCHG	0.54	0.48	0.43	0.39	0.35	0.31	0.28	0.25	0.23	0.20
56.00	ELEV	1021.08	1021.07	1021.06	1021.06	1021.05	1021.04	1021.04	1021.04	1021.03	1021.03
58.00	DISCHG	0.18	0.16	0.15	0.13	0.12	0.10	0.09	0.08	0.08	0.07
58.00	ELEV	1021.03	1021.02	1021.02	1021.02	1021.02	1021.01	1021.01	1021.01	1021.01	1021.01

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 1.8590 CFS-HRS= 815.80 ACRE-FT= 67.42

SUBROUTINE RUNOFF CROSS SECTION 35

AREA= 0.16 INPUT RUNOFF CURVE= 85.0 TIME OF CONCENTRATION= 0.45

0 PEAK TIMES PEAK DISCHARGES PEAK ELEVATIONS

12.52	210.546	(RUNOFF)
14.54	10.038	(RUNOFF)
16.57	3.513	(RUNOFF)
17.92	3.644	(RUNOFF)
19.06	3.524	(RUNOFF)
20.57	3.540	(RUNOFF)
21.57	3.553	(RUNOFF)
22.57	3.558	(RUNOFF)
23.95	3.549	(RUNOFF)

0 TOTAL WATER, IN INCHES ON DRAINAGE AREA= 2.4586 CFS-HRS= 253.88 ACRE-FT= 20.98

SUBROUTINE RESVOR STRUCTURE 3

SURFACE ELEVATION= 1020.10

PEAK TIMES PEAK DISCHARGES PEAK ELEVATIONS

15.16	8.170	1023.05

0 TIME HYDROGRAPH, TZERO= 0.00 DELTA T= 0.20 DRAINAGE AREA= 0.16

0.00	DISCHG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	ELEV	1020.10	1020.10	1020.10	1020.10	1020.10	1020.10	1020.10	1020.10	1020.10	1020.10
2.00	DISCHG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00	ELEV	1020.10	1020.10	1020.10	1020.10	1020.10	1020.10	1020.10	1020.10	1020.10	1020.10
4.00	DISCHG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.00	ELEV	1020.10	1020.10	1020.10	1020.10	1020.10	1020.10	1020.10	1020.10	1020.10	1020.10
6.00	DISCHG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6.00	ELEV	1020.10	1020.10	1020.10	1020.10	1020.10	1020.10	1020.10	1020.10	1020.10	1020.10
8.00	DISCHG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8.00	ELEV	1020.10	1020.10	1020.10	1020.10	1020.10	1020.10	1020.10	1020.10	1020.10	1020.10
10.00	DISCHG	0.01	0.01	0.02	0.04	0.06	0.08	0.12	0.17	0.27	0.70
10.00	ELEV	1020.10	1020.10	1020.11	1020.11	1020.11	1020.12	1020.13	1020.14	1020.17	1020.29
12.00	DISCHG	1.83	3.66	5.97	7.35	7.73	7.94	8.03	8.08	8.11	8.13
12.00	ELEV	1020.59	1021.08	1021.70	1022.25	1022.63	1022.84	1022.93	1022.98	1023.01	1023.02
14.00	DISCHG	8.14	8.15	8.15	8.16	8.16	8.17	8.17	8.17	8.15	8.14
14.00	ELEV	1023.03	1023.03	1023.04	1023.04	1023.05	1023.05	1023.05	1023.05	1023.04	1023.03
16.00	DISCHG	8.12	8.11	8.09	8.08	8.07	8.06	8.05	8.04	8.03	8.02
16.00	ELEV	1023.02	1023.00	1022.99	1022.98	1022.97	1022.96	1022.95	1022.94	1022.93	1022.92
18.00	DISCHG	8.01	7.99	7.98	7.97	7.96	7.95	7.94	7.93	7.92	7.91
18.00	ELEV	1022.91	1022.89	1022.88	1022.87	1022.86	1022.85	1022.84	1022.83	1022.82	1022.81
20.00	DISCHG	7.89	7.88	7.87	7.86	7.85	7.84	7.83	7.82	7.81	7.80
20.00	ELEV	1022.79	1022.78	1022.77	1022.76	1022.75	1022.74	1022.73	1022.72	1022.71	1022.70
22.00	DISCHG	7.79	7.78	7.76	7.75	7.74	7.73	7.72	7.71	7.70	7.69
22.00	ELEV	1022.69	1022.68	1022.66	1022.65	1022.64	1022.63	1022.62	1022.61	1022.60	1022.59
24.00	DISCHG	7.68	7.67	7.66	7.64	7.62	7.60	7.59	7.57	7.55	7.53
24.00	ELEV	1022.58	1022.57	1022.56	1022.54	1022.52	1022.50	1022.49	1022.47	1022.45	1022.43

26.00	ELEV	1022.42	1022.40	1022.38	1022.36	1022.34	1022.33	1022.31	1022.29	1022.27	1022.26
28.00	DISCHG	7.34	7.32	7.31	7.29	7.27	7.25	7.24	7.22	7.20	7.19
28.00	ELEV	1022.24	1022.22	1022.21	1022.19	1022.17	1022.15	1022.14	1022.12	1022.10	1022.09
30.00	DISCHG	7.17	7.15	7.13	7.12	7.10	7.01	6.92	6.83	6.74	6.66
30.00	ELEV	1022.07	1022.05	1022.03	1022.02	1022.00	1021.98	1021.95	1021.93	1021.90	1021.88
32.00	DISCHG	6.57	6.49	6.40	6.32	6.24	6.16	6.08	6.00	5.92	5.84
32.00	ELEV	1021.86	1021.84	1021.81	1021.79	1021.77	1021.75	1021.73	1021.71	1021.68	1021.66
34.00	DISCHG	5.77	5.69	5.62	5.55	5.47	5.40	5.33	5.26	5.20	5.13
34.00	ELEV	1021.64	1021.62	1021.60	1021.58	1021.57	1021.55	1021.53	1021.51	1021.49	1021.47
36.00	DISCHG	5.06	5.00	4.93	4.87	4.81	4.74	4.68	4.62	4.56	4.50
36.00	ELEV	1021.45	1021.44	1021.42	1021.40	1021.39	1021.37	1021.35	1021.34	1021.32	1021.30
38.00	DISCHG	4.44	4.39	4.33	4.27	4.22	4.16	4.11	4.06	4.00	3.95
38.00	ELEV	1021.29	1021.27	1021.26	1021.24	1021.23	1021.21	1021.20	1021.19	1021.17	1021.16
40.00	DISCHG	3.90	3.85	3.80	3.75	3.70	3.65	3.61	3.56	3.51	3.47
40.00	ELEV	1021.14	1021.13	1021.12	1021.10	1021.09	1021.08	1021.07	1021.05	1021.04	1021.03
42.00	DISCHG	3.42	3.38	3.34	3.29	3.25	3.21	3.17	3.12	3.08	3.04
42.00	ELEV	1021.02	1021.00	1020.99	1020.98	1020.97	1020.96	1020.95	1020.94	1020.93	1020.91
44.00	DISCHG	3.01	2.97	2.93	2.89	2.85	2.82	2.78	2.74	2.71	2.67
44.00	ELEV	1020.90	1020.89	1020.88	1020.87	1020.86	1020.85	1020.84	1020.83	1020.82	1020.82
46.00	DISCHG	2.64	2.60	2.57	2.54	2.50	2.47	2.44	2.41	2.38	2.35
46.00	ELEV	1020.81	1020.80	1020.79	1020.78	1020.77	1020.76	1020.75	1020.74	1020.74	1020.73
48.00	DISCHG	2.32	2.29	2.26	2.23	2.20	2.17	2.14	2.11	2.09	2.06
48.00	ELEV	1020.72	1020.71	1020.70	1020.70	1020.69	1020.68	1020.67	1020.67	1020.66	1020.65
50.00	DISCHG	2.03	2.01	1.98	1.95	1.93	1.90	1.88	1.85	1.83	1.81
50.00	ELEV	1020.64	1020.64	1020.63	1020.62	1020.62	1020.61	1020.60	1020.60	1020.59	1020.58
52.00	DISCHG	1.78	1.76	1.74	1.72	1.69	1.67	1.65	1.63	1.61	1.59
52.00	ELEV	1020.58	1020.57	1020.56	1020.56	1020.55	1020.55	1020.54	1020.54	1020.53	1020.52
54.00	DISCHG	1.57	1.55	1.53	1.51	1.49	1.47	1.45	1.43	1.41	1.39
54.00	ELEV	1020.52	1020.51	1020.51	1020.50	1020.50	1020.49	1020.49	1020.48	1020.48	1020.47
56.00	DISCHG	1.37	1.36	1.34	1.32	1.30	1.29	1.27	1.25	1.24	1.22
56.00	ELEV	1020.47	1020.46	1020.46	1020.45	1020.45	1020.44	1020.44	1020.44	1020.43	1020.43
58.00	DISCHG	1.21	1.19	1.18	1.16	1.14	1.13	1.12	1.10	1.09	1.07
58.00	ELEV	1020.42	1020.42	1020.41	1020.41	1020.41	1020.40	1020.40	1020.39	1020.39	1020.39

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 2.2928 CFS-HRS= 236.76 ACRE-FT= 19.57

SUBROUTINE RUNOFF CROSS SECTION 50

AREA= 0.38 INPUT RUNOFF CURVE= 85.0 TIME OF CONCENTRATION= 0.56

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
12.55	470.587	(RUNOFF)
16.62	8.223	(RUNOFF)
17.95	8.589	(RUNOFF)
19.13	8.269	(RUNOFF)
20.63	8.237	(RUNOFF)
21.62	8.321	(RUNOFF)
22.62	8.303	(RUNOFF)
23.99	8.160	(RUNOFF)

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 2.4545 CFS-HRS= 601.95 ACRE-FT= 49.74

SUBROUTINE RESVOR STRUCTURE 4

SURFACE ELEVATION= 1009.00

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
15.31	17.379	1015.45

HYDROGRAPH, TZERO= 0.00 DELTA T= 0.20 DRAINAGE AREA= 0.38

TIME											
0.00	DISCHG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	ELEV	1009.00	1009.00	1009.00	1009.00	1009.00	1009.00	1009.00	1009.00	1009.00	1009.00
2.00	DISCHG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00	ELEV	1009.00	1009.00	1009.00	1009.00	1009.00	1009.00	1009.00	1009.00	1009.00	1009.00
4.00	DISCHG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

6.00	DISCHG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6.00	ELEV	1009.00	1009.00	1009.00	1009.00	1009.00	1009.00	1009.00	1009.00	1009.00	1009.00
8.00	DISCHG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.10
8.00	ELEV	1009.00	1009.00	1009.00	1009.00	1009.00	1009.00	1009.00	1009.00	1009.00	1009.00
10.00	DISCHG	0.32	0.66	1.09	1.57	2.19	3.07	4.29	5.99	9.93	16.03
10.00	ELEV	1009.01	1009.02	1009.04	1009.06	1009.08	1009.12	1009.16	1009.22	1009.37	1009.86
12.00	DISCHG	16.14	16.46	16.72	16.84	16.94	17.01	17.17	17.25	17.29	17.32
12.00	ELEV	1010.97	1012.34	1013.20	1013.92	1014.57	1015.01	1015.20	1015.30	1015.35	1015.38
14.00	DISCHG	17.34	17.35	17.35	17.36	17.37	17.37	17.38	17.38	17.37	17.36
14.00	ELEV	1015.40	1015.42	1015.42	1015.43	1015.44	1015.45	1015.45	1015.45	1015.45	1015.44
16.00	DISCHG	17.35	17.34	17.33	17.32	17.31	17.30	17.29	17.28	17.27	17.26
16.00	ELEV	1015.43	1015.41	1015.40	1015.39	1015.38	1015.36	1015.35	1015.34	1015.33	1015.32
18.00	DISCHG	17.25	17.25	17.24	17.23	17.22	17.21	17.20	17.19	17.18	17.17
18.00	ELEV	1015.31	1015.29	1015.28	1015.27	1015.26	1015.25	1015.24	1015.22	1015.21	1015.20
20.00	DISCHG	17.15	17.14	17.13	17.12	17.11	17.10	17.09	17.08	17.08	17.07
20.00	ELEV	1015.19	1015.17	1015.16	1015.15	1015.14	1015.13	1015.11	1015.10	1015.09	1015.08
22.00	DISCHG	17.06	17.05	17.04	17.03	17.02	17.01	17.00	17.00	16.99	16.99
22.00	ELEV	1015.07	1015.05	1015.04	1015.03	1015.02	1015.01	1015.00	1014.98	1014.96	1014.95
24.00	DISCHG	16.99	16.99	16.99	16.98	16.98	16.97	16.97	16.97	16.96	16.96
24.00	ELEV	1014.93	1014.92	1014.90	1014.88	1014.85	1014.82	1014.80	1014.77	1014.74	1014.72
26.00	DISCHG	16.95	16.95	16.95	16.94	16.94	16.93	16.93	16.93	16.92	16.92
26.00	ELEV	1014.69	1014.66	1014.63	1014.61	1014.58	1014.55	1014.52	1014.50	1014.47	1014.44
28.00	DISCHG	16.91	16.91	16.91	16.90	16.90	16.89	16.89	16.89	16.88	16.88
28.00	ELEV	1014.41	1014.39	1014.36	1014.33	1014.30	1014.28	1014.25	1014.22	1014.19	1014.17
30.00	DISCHG	16.87	16.87	16.87	16.86	16.86	16.85	16.85	16.85	16.84	16.84
30.00	ELEV	1014.14	1014.11	1014.08	1014.06	1014.03	1014.00	1013.97	1013.95	1013.92	1013.89
32.00	DISCHG	16.83	16.83	16.83	16.82	16.82	16.81	16.81	16.80	16.80	16.80
32.00	ELEV	1013.86	1013.84	1013.81	1013.78	1013.76	1013.73	1013.70	1013.67	1013.65	1013.62
34.00	DISCHG	16.79	16.79	16.78	16.78	16.78	16.77	16.77	16.76	16.76	16.76
34.00	ELEV	1013.59	1013.56	1013.54	1013.51	1013.48	1013.46	1013.43	1013.40	1013.37	1013.35
36.00	DISCHG	16.75	16.75	16.74	16.72	16.71	16.70	16.69	16.68	16.67	16.66
36.00	ELEV	1013.32	1013.29	1013.25	1013.22	1013.18	1013.15	1013.11	1013.08	1013.04	1013.01
38.00	DISCHG	16.65	16.64	16.63	16.62	16.60	16.59	16.58	16.57	16.56	16.55
38.00	ELEV	1012.97	1012.94	1012.90	1012.87	1012.83	1012.80	1012.76	1012.73	1012.70	1012.66
40.00	DISCHG	16.54	16.53	16.52	16.51	16.49	16.48	16.46	16.45	16.43	16.41
40.00	ELEV	1012.63	1012.59	1012.56	1012.52	1012.48	1012.41	1012.35	1012.28	1012.22	1012.16
42.00	DISCHG	16.40	16.38	16.37	16.35	16.33	16.32	16.30	16.26	16.22	16.19
42.00	ELEV	1012.09	1012.03	1011.97	1011.90	1011.84	1011.77	1011.71	1011.63	1011.54	1011.43
44.00	DISCHG	16.18	16.17	16.15	16.14	16.13	16.11	16.10	16.09	16.08	16.06
44.00	ELEV	1011.30	1011.18	1011.05	1010.93	1010.81	1010.68	1010.56	1010.44	1010.31	1010.19
46.00	DISCHG	16.05	16.04	16.02	16.01	14.76	8.58	4.99	2.90	1.69	0.98
46.00	ELEV	1010.07	1009.95	1009.82	1009.70	1009.55	1009.32	1009.19	1009.11	1009.06	1009.04
48.00	DISCHG	0.57	0.33	0.19	0.11	0.07	0.04	0.02	0.01	0.01	0.00
48.00	ELEV	1009.02	1009.01	1009.01	1009.00	1009.00	1009.00	1009.00	1009.00	1009.00	1009.00

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 2.4537 CFS-HRS= 601.74 ACRE-FT= 49.73

ENDCMP

1SUMMARY TABLE 1

^	ALT	STORM	ID	DA SQ-MI.	RAIN TBLE	AMC	DELTA-T HRS.	TZERO HRS.	PRECIP IN.	PRECIP DURATION	PEAK-Q CFS	PEAK-TIME	PEAK-ELEV	RUNOFF IN.	CSM
	1	3	10	0.31	4	2	0.20	0.00	4.00	24.00	279.98	12.62	0.00	1.81	903.16
	1	3	15	0.31	4	2	0.20	0.00	4.00	24.00	264.34	12.80	0.00	1.81	852.71
	1	3	22	0.16	4	2	0.20	0.00	4.00	24.00	188.51	12.53	0.00	2.13	1178.21
	1	3	25	0.47	4	2	0.20	0.00	4.00	24.00	417.97	12.64	0.00	1.92	889.29
	1	3	21	0.21	4	2	0.20	0.00	4.00	24.00	196.57	12.58	0.00	1.74	936.04
	1	3	-1	0.21	4	2	0.20	0.00	4.00	24.00	157.55	12.80	1025.02	1.76	750.25
	1	3	23	0.68	4	2	0.20	0.00	4.00	24.00	570.76	12.68	0.00	1.87	839.38
	1	3	-2	0.68	4	2	0.20	0.00	4.00	24.00	27.78	15.53	1024.93	1.86	40.85

1	3	-3	0.16	4	2	0.20	0.00	4.00	24.00	8.17	15.16	1023.05	2.29	51.06
1	3	50	0.38	4	2	0.20	0.00	4.00	24.00	470.59	12.55	0.00	2.45	1238.39
1	3	-4	0.38	4	2	0.20	0.00	4.00	24.00	17.38	15.31	1015.45	2.45	45.73

1SUMMARY TABLE 3

DISCHARGE,CFS

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
0XSEC/STRUC NO. -4										
ALTERNATE 1	17.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0XSEC/STRUC NO. -3										
ALTERNATE 1	8.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0XSEC/STRUC NO. -2										
ALTERNATE 1	27.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0XSEC/STRUC NO. -1										
ALTERNATE 1	157.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0XSEC/STRUC NO. 10										
ALTERNATE 1	279.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0XSEC/STRUC NO. 15										
ALTERNATE 1	264.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0XSEC/STRUC NO. 21										
ALTERNATE 1	196.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0XSEC/STRUC NO. 22										
ALTERNATE 1	188.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0XSEC/STRUC NO. 23										
ALTERNATE 1	570.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0XSEC/STRUC NO. 25										
ALTERNATE 1	417.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0XSEC/STRUC NO. 35										
ALTERNATE 1	210.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0XSEC/STRUC NO. 50										
ALTERNATE 1	470.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

ENDJOB CARD ENCOUNTERED. END OF JOB.
1END OF 1 JOBS IN THIS RUN

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

CAMELBACK RANCH: 36" BLEEDOFF LINE FOR NORTH BASIN(S)

HEADING LINE NO 2 IS -

100 YEAR EVENT WSEL AT OUTLET IS 19.8

HEADING LINE NO 3 IS -

MAY 1988 (SD36A)

WSPG: 36" STORM DRAIN SYSTEM

Basin #2

WATER SURFACE PROFILE - ELEMENT CARD LISTING

```
ELEMENT NO   1 IS A SYSTEM OUTLET      *          *      *
                    U/S DATA   STATION    INVERT   SECT                                W S ELEV
                                 100.00    15.50    2                                   19.80

ELEMENT NO   2 IS A  WALL  EXIT                          *
                    U/S DATA   STATION    INVERT   SECT
                                 100.00    15.50    2

ELEMENT NO   3 IS A REACH              *          *      *
                    U/S DATA   STATION    INVERT   SECT          N                      RADIUS  ANGLE  ANG PT  MAN H
                                 150.00    15.58    2          0.012                     0.00    0.00    0.00     0

ELEMENT NO   4 IS A REACH              *          *      *
                    U/S DATA   STATION    INVERT   SECT          N                      RADIUS  ANGLE  ANG PT  MAN H
                                 160.00    15.60    2          0.012                     0.00   45.00    0.00     0

ELEMENT NO   5 IS A REACH              *          *      *
                    U/S DATA   STATION    INVERT   SECT          N                      RADIUS  ANGLE  ANG PT  MAN H
                                3660.00    21.00    2          0.012                     0.00    0.00    0.00     8

ELEMENT NO   6 IS A  WALL  ENTRANCE                      *
                    U/S DATA   STATION    INVERT   SECT         FP
                                3660.00    21.00    2         0.500

ELEMENT NO   7 IS A SYSTEM HEADWORKS                     *                  *
                    U/S DATA   STATION    INVERT   SECT                                W S ELEV
                                3660.00    21.00    2                                    0.00
NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING
```

CARD CODE	SECT NO	CHN TYPE	NO OF PIERS	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	2	4			3.00														

F0515P
WATER SURFACE PROFILE LISTING
CAMELBACK RANCH: 36" BLEEDOFF LINE FOR NORTH BASIN(S)
100 YEAR EVENT WSEL AT OUTLET IS 19.8
MAY 1988 (SD36A)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH		HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
100.00	15.50	4.300	19.800	5.0	0.71	0.008	19.808	0.00	0.700		3.00	0.00	0.00	0	0.00
WALL EXIT													0.00		
100.00	15.50	4.301	19.801	5.0	0.71	0.008	19.809	0.00	0.700		3.00	0.00	0.00	0	0.00
50.00	0.00160					.000048	0.00			0.843			0.00		
150.00	15.58	4.223	19.803	5.0	0.71	0.008	19.811	0.00	0.700		3.00	0.00	0.00	0	0.00
10.00	0.00200					.000048	0.00			0.796			0.00		
160.00	15.60	4.205	19.805	5.0	0.71	0.008	19.813	0.00	0.700		3.00	0.00	0.00	0	0.00
806.42	0.00154					.000047	0.04			0.851			0.00		
966.42	16.84	3.000	19.844	5.0	0.71	0.008	19.852	0.00	0.700		3.00	0.00	0.00	0	0.00
184.93	0.00154					.000044	0.01			0.851			0.00		
1151.35	17.13	2.721	19.851	5.0	0.74	0.009	19.860	0.00	0.700		3.00	0.00	0.00	0	0.00
106.79	0.00154					.000043	0.00			0.851			0.00		
1258.14	17.29	2.560	19.854	5.0	0.78	0.009	19.863	0.00	0.700		3.00	0.00	0.00	0	0.00
88.27	0.00154					.000047	0.00			0.851			0.00		
1346.41	17.43	2.427	19.858	5.0	0.82	0.010	19.868	0.00	0.700		3.00	0.00	0.00	0	0.00
77.76	0.00154					.000051	0.00			0.851			0.00		
1424.17	17.55	2.310	19.861	5.0	0.86	0.011	19.872	0.00	0.700		3.00	0.00	0.00	0	0.00
69.91	0.00154					.000057	0.00			0.851			0.00		
1494.08	17.66	2.205	19.863	5.0	0.90	0.013	19.876	0.00	0.700		3.00	0.00	0.00	0	0.00
64.06	0.00154					.000064	0.00			0.851			0.00		
1558.14	17.76	2.109	19.866	5.0	0.94	0.014	19.880	0.00	0.700		3.00	0.00	0.00	0	0.00
59.55	0.00154					.000072	0.00			0.851			0.00		

AN WEST INC.
Consulting Engineers
Richmond, California
San Jose, California
Phoenix, Arizona

CAMELBACK RANCH
PUMP STATION
INLET CAPACITY CALCS

Proj. No. 4499-10 Sht. 1 of 1
Calc. By JMH Date
Chkd. By LLT Date

DESIGN FLOW = 7200 gpm

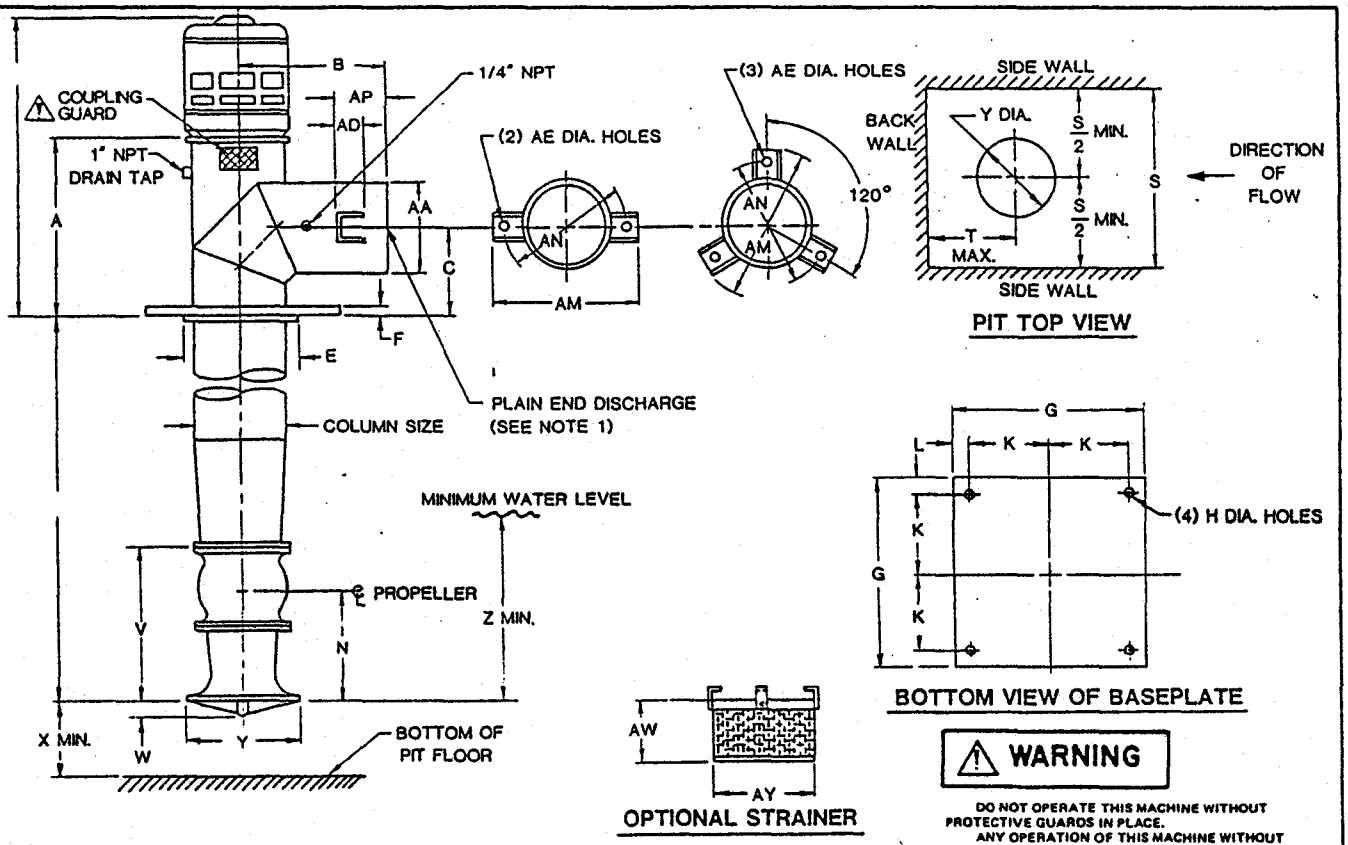
$$7200 \frac{gal}{min} \times \frac{1\ min}{60\ sec} \times \frac{1\ ft^3}{7.48\ gal} = 16.04\ cfs$$

DESIGN INLET FOR VELOCITY OF 0.25 fps

INLET AREA REQUIRED = $A = \frac{Q}{V} = \frac{16.04}{0.25} = 64.16$ SQ FT

100% CLOGGING FACTOR REQUIRES 125 SQ FT OPEN AREA

INLET STRUCTURE DESIGNED FOR GREATER THAN 100% CLOGGING FACTOR — 150 Square Feet
(25' x 6')



WARNING

DO NOT OPERATE THIS MACHINE WITHOUT PROTECTIVE GUARDS IN PLACE. ANY OPERATION OF THIS MACHINE WITHOUT PROTECTIVE GUARDS CAN RESULT IN SEVERE BODILY INJURY.

DISCHARGE HEAD DIMENSIONS

PUMP SIZE	COLUMN SIZE	A	B	C	E	F	G	H	K	L	AA	AD	AE	AM	AN	AP
10	10	30 1/2	19 3/4	14	14 3/4	3/4	25	7/8	10 1/2	2	10 3/4	3 1/2	7/8	19 1/8	16 7/8	8 1/2
10,12	12	34	21 3/4	17	17 5/8	1	28	7/8	12	2	12 3/4	3 1/2	7/8	21 1/8	18 7/8	8 1/2
12,14	14	38	23 3/4	19	21	1	32	7/8	14	2	14	3 1/2	7/8	22 3/8	20 1/8	8 1/2
14,16	16	41 1/2	28 3/4	22	20	1	36	1	16	2	16	3 1/2	7/8	24 3/8	22 1/8	11
16,20	20	49	32 3/4	26	24 1/4	1	48	1	22	2	20	3 1/2	7/8	28 1/2	26 1/4	11
20,24	24	54 1/2	37 3/4	30 1/2	28 1/2	1	48	1	22	2	24	5 1/2	1 3/8	34 1/4	31	12
24,30	30	66 1/2	45 3/4	37 1/2	34 1/2	1 1/4	55	1 1/8	25	2 1/2	30	5 1/2	1 3/8	40 1/4	37	12
30	36	75	51 3/4	44	40 1/2	1 1/4	67	1 1/8	31	2 1/2	36	5 1/2	1 3/8	46 1/4	43	12

PUMP DIMENSIONS

PUMP SIZE	N	S	T	V		W	X		Y	Z	STRAINER	
				1 STG.	2 STG.		WITHOUT STRAINER	WITH STRAINER			AW	AY
10	7 1/4	36	13 3/4	17 1/2	30 3/8	3	6	8	15 1/2	51	5	15 1/2
12	9	42	15 3/4	21 1/2	37	3 1/2	6	12	18	54	9	18
14	11	48	19 1/2	26	44 1/2	4	7	11	21	54	8	20 3/4
16	12	54 1/2	22 1/4	30	51 1/2	4 1/4	8	10	24 1/2	57	7	24
20	16	73	32 1/2	38 1/2	66	6	12	12	35	60	9	35
24	19	84	38	43 5/8	74 3/8	6 1/2	14	14	40	60	8	40
30	22	96	42	51 3/4	89	7 1/2	14	14	42	64	11	42

NOTE: 1 (2) LUGS ON 10" & 12", (3) LUGS ON OTHERS.

ER2-12874

REV.	DATE	ECN NO.
1	2/1/86	EC2-13179

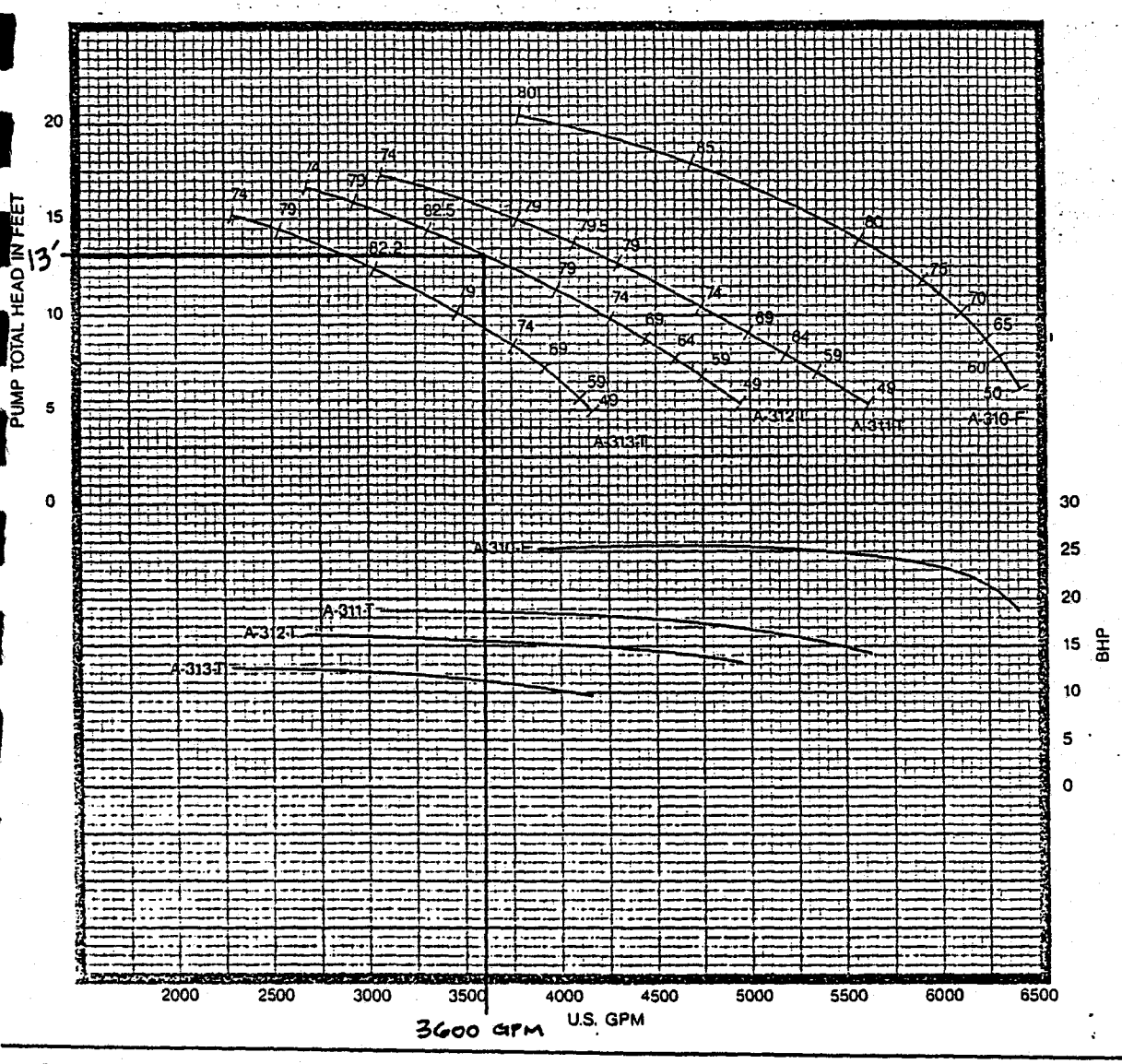
CUSTOMER | P.O.
JOB NAME
PUMP SIZE & MODEL | STAGES | GPM | TDH | RPM | ROT
MOTOR | HP | FRAME | PHASE | HERTZ | VOLTS | ENCL
CERTIFIED FOR | CERTIFIED BY | DATE

Fairbanks Morse Pump Corporation

SETTING PLAN
FIGURE 8312
PLAIN END
F DISCHARGE HEAD

SIZE C | DWG. NO. 24LYA2364S

DRAWN BY RCT | DATE 6-12-85 | CHECKED BY | DATE 6/12/85 | ENGINEERING APPROVAL | DATE 6/86 | MARKETING APPROVAL | DATE 6/85 | DRAWING NUMBER 24LYA2364S



14"
8312

880 RPM

1 STAGE

16" COLUMN

16" FABRICATED STEEL ELBOW

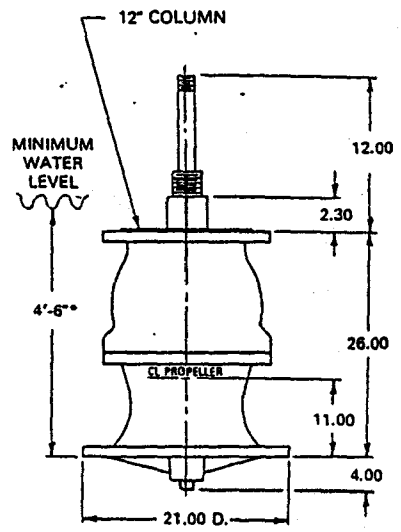
1-1/2" LINESHAFT

2-1/2" ENCLOSING TUBE

DATA	VALUE	
PUMP SHAFT DIAMETER	1.6875 IN.	
MAXIMUM SPHERE SIZE	2.25 IN.	
Kt (THRUST FACTOR)	46 LBS./FT.	
Ka (TOTAL ROTOR WEIGHT)	45 LBS.	
Ks (SETTING CONSTANT)	5.5 LBS./FT.	
WK²	7.1 LBS.-FT.²	
BOWL ASSEMBLY WEIGHT	425 LBS.	
EYE AREA: PROPELLER NO. A-310-F	92.0 SQ. IN.	4 VANE
PROPELLER NO. A-311-T	92.0 SQ. IN.	3 VANE
PROPELLER NO. A-312-T	92.0 SQ. IN.	3 VANE
PROPELLER NO. A-313-T	92.0 SQ. IN.	3 VANE
PROPELLER NO.		
PROPELLER NO.		

HYDRAULIC PERFORMANCE IS CONTINGENT ON FURNISHING THE PUMP WITH SPECIFIED AMOUNT OF CLEAR, FRESH, NON-AERATED WATER NOT TO EXCEED 85° F.

PUMP PERFORMANCE SHOWN IS BOWL ASSEMBLY WITH 10 FEET OF COLUMN INCLUDING A STANDARD ABOVE GROUND DISCHARGE ELBOW. ADDITIONAL COLUMN LOSSES SHOULD BE ADDED WHEN SETTINGS ARE DEEPER THAN 10 FEET AND/OR FOR OTHER DISCHARGE ARRANGEMENTS.



*This value is the minimum submergence required to prevent vortexing only. This value may need to be increased to provide adequate NPSHA.

CO & VAN LOO
PLAN NG • ENGINEERING
LANDSCAPE ARCHITECTURE

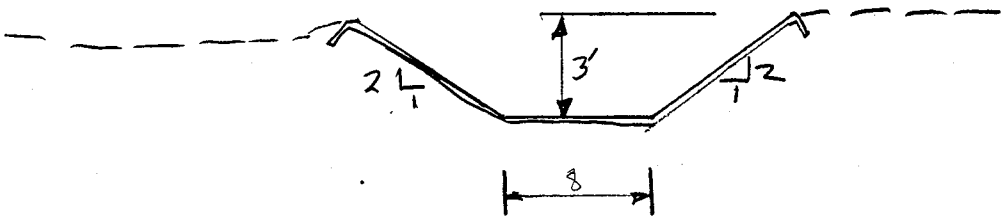
Project Camelback Ranch
Project No. 1122-03
Sheet No. 1 of 2
Calculated by DWD Date 6-/88
Checked by _____ Date _____

Outfall Channel @ SW Corner of Project Site:
STA 75+12

- Peak Discharge from Basin #2: 30 cfs
- " " " " #3: 9.5 cfs
- " " " Pump Station: 18 cf

Total 57.5 say 60 cfs

- Lining: Gunite 4" thick → n ≅ 0.02
- Channel Slope: S = 0.002, Length = 1100'
- Channel Configuration:



4550 NORTH 12TH STREET • PHOENIX, ARIZONA 85014 • PHONE (602) 264-6831

CVL
COX & VAN LOO
PLANNING • ENGINEERING
LANDSCAPE ARCHITECTURE

Project Camelback Ranch
Project No. 1122-03
Sheet No. 2 of 2
Calculated by DWD Date 6/88
Checked by _____ Date _____

Outfall Channel - @ STA 75+12

TRAPEZOIDAL CHANNEL ANALYSIS
NORMAL DEPTH COMPUTATION

June 15, 1988
CAMELBACK RANCH 1122-030
OFF-SITE CHANNEL @ SW CORNER OF SITE

PROGRAM INPUT DATA:

DESCRIPTION	VALUE
Flow Rate (cubic feet per second).....	60.0
Channel Bottom Slope (feet per foot).....	0.0020
Manning's Roughness Coefficient (n-value).....	0.0200
Channel Side Slope - Left Side (horizontal/vertical)....	2.00
Channel Side Slope - Right Side (horizontal/vertical)...	2.00
Channel Bottom Width (feet).....	8.0

PROGRAM RESULTS:

DESCRIPTION	VALUE
Normal Depth (feet).....	1.51
Flow Velocity (feet per second).....	3.60
Froude Number (Flow is Sub-Critical).....	0.583
Velocity Head (feet).....	0.20
Energy Head (feet).....	1.71
Cross-Sectional Area of Flow (square feet).....	16.66
Top Width of Flow (feet).....	14.05

APPENDIX II

HYDRAULIC ANALYSES

```
*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED MARCH 1982                               *
*                                                   *
*  RUN DATE TUE, JAN 15 1988 TIME 18:04:26          *
*****************************************************
```


```
*************************************
*  U.S. ARMY CORPS OF ENGINEERS     *
*  THE HYDROLOGIC ENGINEERING CENTER *
*  609 SECOND STREET, SUITE D       *
*  DAVIS, CALIFORNIA 95616          *
*  (916) 440-2105 (FTS) 448-2105    *
*************************************
```


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

AGUA FRIA RIVER - EXISTING CONDITIONS

```
                                                                                                THIS RUN EXECUTED 19 JAN 88 18:04:29
**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAR  1982
  ERROR CORR -  01,02,03,04,05
  MODIFICATION -  50,51,52,53,54,55
**************************************************

C
T1      CAMELBACK RANCH -  AGUA FRIA RIVER
T2      DESIGN CONDITIONS - FROM D/S OF INDIAN SCHOOL RD. TO BETFANY HOME RD.
T3      EXISTING COND.              10 YEAR EVENT (AFR1122E5B)

J1  ICHECK     INQ       NINV      IDIR      STRT     METRIC    IVINS      Q        WSEL      FQ

       0.        2.        0.        0.  0.000000     0.00      0.0       0.  1006.410    0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH      FN      ALLDC     IBW      CHNIM     ITRACE

      1.000     0.000    -1.000    10.000    67.670    0.000    -1.000    0.000    0.000     0.000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38.000    43.000     1.000     2.000     8.000    42.000    25.000    3.000    26.000    53.000

      4.000    54.000    35.000     0.000     0.000     0.000     0.000    0.000     0.000     0.000

GT      5.000  22800.000  68000.000  93000.000  93000.000  182000.000      0.000     0.000     0.000     0.000
NC      0.045      0.045      0.035      0.100      0.300      0.000      0.000     0.000     0.000     0.000
ET      0.000      0.000      0.000      7.170      9.100      0.000   8550.000 12200.000  8565.000 11870.000
X1      8.153     55.000   9880.000  10500.000    280.000    280.000    280.000     0.000     0.000     0.000
X4      2.000   1010.000   6870.000   1010.100   6700.000      0.000      0.000     0.000     0.000     0.000
GR   1010.300   6500.000   1008.600   7830.000   1008.000   7250.000   1007.200  7440.000  1007.800  7550.000
GR   1006.500   7600.000   1006.100   7950.000   1006.200   8240.000   1006.100  8380.000  1007.500  8390.000
GR   1006.200   8410.000   1006.200   8630.000   1006.000   8830.000   1008.000  8890.000  1116.000  8940.000
GR   1010.000   8990.000   1008.000   9020.000   1009.200   9060.000   1008.000  9160.000  1007.800  9200.000
GR   1006.000   9320.000   1006.000   9860.000   1012.000   9870.000   1012.800  9880.000  1012.000  9890.000
GR   1000.000   9940.000    998.000  10070.000    997.800  10090.000    998.000 10110.000    998.000 10340.000
GR    998.400  10400.000   1000.000  10450.000   1010.000  10485.000   1012.000 10490.000  1013.500 10500.000
GR   1012.000  10530.000   1010.000  10550.000   1010.000  11060.000   1111.600 11100.000  1010.000 11150.000
GR   1010.000  11250.000   1009.600  11370.000   1008.000  11560.000   1008.000 11710.000  1007.000 11890.000
GR   1007.000  12070.000   1006.400  12230.000   1008.000  12380.000   1007.800 12570.000  1007.000 12780.000
GR   1007.800  13000.000   1008.000  13160.000   1010.000  13165.000   1010.000 13210.000  1016.000 13280.000

NC      0.045      0.045      0.035      0.300      0.500      0.000      0.000     0.000     0.000     0.000
ET      0.000      0.000      0.000      7.100      9.100      0.000    920.000  1175.000   920.000  1175.000
X1      8.240     52.000   9825.000  10750.000    460.000    400.000    460.000     0.000     0.000     0.000
X4      1.000   1009.000   6740.000      0.000      0.000      0.000      0.000     0.000     0.000     0.000
GR   1010.000   6450.000   1008.000   6880.000   1007.100   7180.000   1007.000  7450.000  1007.200  7830.000
GR   1007.100   8120.000   1007.100   8430.000   1007.700   8560.000   1008.000  8580.000  1007.600  8700.000
GR   1006.000   8780.000   1006.000   9100.000   1008.000   9130.000   1010.000  9140.000  1010.000  9210.000
GR   1010.300   9230.000   1010.000   9250.000   1008.000   9280.000   1008.000  9410.000  1004.000  9450.000
```

	GR	1002.000	9570.000	1002.000	9710.000	1002.000	9790.000	1010.000	9810.000	1012.000	9815.000
1	GR	1014.000	9825.000	1012.000	9835.000	1002.000	9850.000	1000.700	9940.000	1000.000	10000.000
2	GR	998.700	10110.000	998.200	10200.000	998.400	10350.000	1000.000	10500.000	1002.000	10570.000
3	GR	1003.000	10640.000	1004.000	10690.000	1014.000	10715.000	1014.400	10750.000	1014.400	11070.000
4	GR	1016.000	11400.000	1010.000	11440.000	1010.000	11520.000	1013.000	11540.000	1020.000	11541.000
5	GR	1020.000	11659.000	1013.000	11660.000	1013.000	11690.000	1010.000	11760.000	1008.000	11920.000
6	GR	1008.000	13300.000	1016.000	13340.000	0.000	0.000	0.000	0.000	0.000	0.000
7											
8	GT	5.000	23000.000	69000.000	95000.000	95000.000	184000.000	0.000	0.000	0.000	0.000
9	ET	0.000	0.000	0.000	0.000	5.100	0.000	0.000	0.000	9945.000	11548.000
10	X1	8.312	39.000	9945.000	11548.000	500.000	250.000	380.000	0.000	0.000	0.000
11	X3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12	GR	1020.000	3800.000	1016.000	4550.000	1016.000	5720.000	1014.000	6350.000	1014.000	6400.000
13	GR	1015.100	6950.000	1014.400	7150.000	1014.000	7730.000	1013.900	8070.000	1014.000	8450.000
14	GR	1016.000	8760.000	1016.000	9200.000	1020.000	9750.000	1020.000	9945.000	1014.000	9945.000
15	GR	1004.000	10000.000	1002.000	10030.000	1000.000	10050.000	1000.000	10180.000	998.600	10240.000
16	GR	1000.000	10290.000	1000.000	10580.000	1002.000	10620.000	1004.000	10720.000	1004.000	10860.000
17	GR	1006.000	10890.000	1007.600	11040.000	1006.000	11115.000	1006.000	11540.000	1014.000	11548.000
18	GR	1020.000	11548.000	1016.000	12120.000	1016.000	12250.000	1015.100	12370.000	1015.500	12930.000
19	GR	1017.000	13200.000	1017.500	13530.000	1018.000	13650.000	1020.000	13920.000	0.000	0.000
20											
21	ET	0.000	0.000	0.000	0.000	9.100	0.000	0.000	0.000	9945.000	11548.000
22	X1	8.313	95.000	9945.000	11548.000	1.000	1.000	1.000	0.000	0.000	0.000
23	X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	1012.000	1015.100	0.000
24	ET	3.000	9945.000	1020.000	1014.400	11115.000	1020.000	1014.400	11548.000	1020.000	1014.400
25	GR	1020.000	3800.000	1016.000	4580.000	1016.000	5720.000	1014.000	6270.000	1012.000	6590.000
26	GR	1013.000	6980.000	1014.400	7160.000	1014.000	7830.000	1013.900	8100.000	1014.000	8430.000
27	GR	1016.000	8900.000	1016.000	9160.000	1019.000	9450.000	1015.000	9470.000	1019.400	9550.000
28	GR	1019.500	9945.000	1014.400	9945.000	1004.000	10000.000	1002.000	10033.000	1014.400	10033.000
29	GR	1014.400	10035.000	1002.000	10035.000	1000.000	10050.000	1000.000	10123.000	1014.400	10123.000
30	GR	1014.400	10125.000	1000.000	10125.000	1000.000	10180.000	998.700	10213.000	1014.400	10213.000
31	GR	1014.400	10215.000	998.700	10215.000	998.600	10240.000	1000.000	10290.000	1000.000	10303.000
32	GR	1014.400	10303.000	1014.400	10305.000	1000.000	10305.000	1000.000	10393.000	1014.400	10393.000
33	GR	1014.400	10395.000	1000.000	10395.000	1000.000	10483.000	1014.400	10483.000	1014.400	10485.000
34	GR	1000.000	10485.000	1000.000	10573.000	1014.400	10573.000	1014.400	10575.000	1000.000	10575.000
35	GR	1002.000	10620.000	1002.800	10663.000	1014.400	10663.000	1014.400	10665.000	1002.800	10665.000
36	GR	1004.000	10720.000	1004.000	10753.000	1014.400	10753.000	1014.400	10755.000	1004.000	10755.000
37	GR	1004.000	10843.000	1014.400	10843.000	1014.400	10845.000	1004.000	10845.000	1004.000	10860.000
38	GR	1006.000	10890.000	1006.400	10933.000	1014.400	10933.000	1014.400	10935.000	1006.400	10935.000
39	GR	1007.600	11023.000	1014.400	11023.000	1014.400	11025.000	1007.600	11025.000	1006.000	11113.000
40	GR	1014.400	11115.000	1006.000	11115.000	1006.000	11203.000	1014.400	11203.000	1006.000	11205.000
41	GR	1006.000	11293.000	1014.400	11293.000	1006.000	11295.000	1006.000	11383.000	1014.400	11383.000
42	GR	1006.000	11385.000	1006.000	11473.000	1014.400	11473.000	1006.000	11475.000	1006.000	11540.000
43	GR	1020.000	11548.000	1016.000	12270.000	1015.100	12400.000	1015.500	12950.000	1017.000	13230.000
44											
45	ET	0.000	0.000	0.000	7.100	9.100	0.000	0.000	11116.000	9945.000	11548.000
46	X1	8.327	95.000	9945.000	11548.000	78.000	78.000	78.000	0.000	0.000	0.000
47	X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	1012.000	1015.100	0.000
48	ET	-4.000	9944.000	1020.000	1013.500	9945.000	1023.500	1014.400	11112.000	1023.500	1014.400
49	ET	0.000	11548.000	1023.500	1014.400	0.000	0.000	0.000	0.000	0.000	0.000
50	GR	1021.400	3100.000	1020.000	3850.000	1018.000	4580.000	1016.000	5720.000	1014.000	6270.000
51	GR	1012.000	6590.000	1014.400	7200.000	1014.000	7780.000	1013.900	8120.000	1014.000	8420.000
52	GR	1016.000	8790.000	1017.000	9020.000	1018.000	9220.000	1015.400	9570.000	1020.000	9740.000
53	GR	1020.000	9944.000	1014.500	9945.000	1002.000	10000.000	1002.000	10032.000	1014.400	10032.000
54											
55											
56											
57											

ER	1014.400	10036.000	1002.000	10036.000	1000.000	10122.000	1014.400	10122.000	1014.400	10126.000
ER	1000.000	10126.000	1000.000	10212.000	1014.400	10212.000	1014.400	10216.000	1000.000	10216.000
ER	1009.500	10250.000	1000.000	10302.000	1014.400	10302.000	1014.400	10306.000	1000.000	10306.000
ER	1000.000	10392.000	1014.400	10392.000	1014.400	10396.000	1000.000	10396.000	1000.000	10482.000
ER	1014.400	10482.000	1014.400	10486.000	1000.000	10486.000	1000.000	10572.000	1014.400	10572.000
ER	1014.400	10576.000	1000.000	10576.000	1002.000	10630.000	1002.400	10662.000	1014.400	10662.000
ER	1014.400	10666.000	1002.400	10666.000	1004.000	10752.000	1014.400	10752.000	1014.400	10756.000
ER	1004.000	10756.000	1005.300	10842.000	1014.400	10842.000	1014.400	10846.000	1005.300	10846.000
ER	1006.200	10932.000	1014.400	10932.000	1014.400	10936.000	1006.200	10936.000	1007.000	11022.000
ER	1014.400	11022.000	1014.400	11026.000	1007.000	11026.000	1007.000	11112.000	1014.400	11112.000
ER	1014.400	11116.000	1007.000	11116.000	1007.000	11202.000	1014.400	11202.000	1014.400	11206.000
ER	1007.000	11206.000	1007.500	11292.000	1014.400	11292.000	1014.400	11296.000	1007.500	11296.000
ER	1006.200	11382.000	1014.400	11382.000	1014.400	11386.000	1006.200	11386.000	1006.500	11472.000
ER	1014.400	11472.000	1014.400	11476.000	1006.500	11476.000	1006.000	11490.000	1006.000	11530.000
ER	1020.000	11548.000	1016.000	12270.000	1015.100	12400.000	1015.500	12950.000	1017.000	13230.000
ET	0.000	0.000	0.000	0.000	5.100	0.000	0.000	0.000	9945.000	11548.000
X1	8.327	39.000	9945.000	11548.000	1.000	1.000	1.000	0.000	0.000	0.000
ER	1020.000	3700.000	1018.000	4500.000	1017.000	4880.000	1016.500	5100.000	1016.500	5300.000
ER	1016.000	5700.000	1014.000	6400.000	1014.000	6800.000	1014.400	7200.000	1014.000	7800.000
ER	1013.900	8130.000	1014.000	8470.000	1016.000	8800.000	1017.000	9030.000	1018.000	9250.000
ER	1020.000	9945.000	1006.000	9945.000	1002.000	10000.000	1000.000	10210.000	995.500	10260.000
ER	1000.000	10300.000	1000.000	10590.000	1002.000	10630.000	1004.000	10760.000	1005.000	10810.000
ER	1006.000	10910.000	1007.100	11115.000	1009.000	11460.000	1006.000	11500.000	1006.000	11530.000
ER	1020.000	11548.000	1018.000	12140.000	1016.000	12270.000	1015.100	12400.000	1015.500	12950.000
ER	1017.000	13250.000	1017.500	13550.000	1018.000	13750.000	1020.000	13970.000	0.000	0.000
ET	0.000	0.000	0.000	7.100	9.100	0.000	9090.000	12800.000	9090.000	11820.000
X1	8.444	57.000	9090.000	11110.000	1020.000	1440.000	615.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ER	1018.700	4650.000	1017.000	5000.000	1016.500	5300.000	1016.500	5540.000	1017.000	5880.000
ER	1016.500	6050.000	1015.700	6180.000	1015.000	6450.000	1013.000	6740.000	1011.700	7000.000
ER	1015.500	7080.000	1014.800	7470.000	1012.000	7870.000	1010.000	7980.000	1012.400	8350.000
ER	1012.100	8650.000	1012.100	9000.000	1012.200	9090.000	1006.600	9160.000	1008.000	9250.000
ER	1006.000	9270.000	1006.000	10000.000	1006.000	10275.000	1007.000	10390.000	1006.000	10580.000
ER	1006.600	10680.000	1006.000	10760.000	1006.000	10855.000	1006.000	11095.000	1010.000	11100.000
ER	1012.000	11110.000	1012.000	11160.000	1010.000	11170.000	1010.000	11215.000	1012.000	11235.000
ER	1010.600	11440.000	1010.000	11590.000	1008.000	11710.000	1006.000	11810.000	1010.000	11820.000
ER	1011.000	11950.000	1012.000	12160.000	1012.500	12300.000	1012.300	12540.000	1012.000	12610.000
ER	1012.000	12900.000	1014.000	13000.000	1016.000	13130.000	1018.000	13060.000	1021.000	13100.000
ER	1018.000	13150.000	1016.400	13320.000	1017.100	13550.000	1020.500	13630.000	1020.000	13680.000
ER	1022.000	13840.000	1023.500	13920.000	0.000	0.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	7.100	9.100	0.000	8700.000	0.000	8880.000	11930.000
X1	8.556	50.000	9105.000	11185.000	445.000	1235.000	595.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ER	1018.700	4750.000	1018.000	5010.000	1016.000	6145.000	1014.000	6940.000	1013.000	7000.000
ER	1011.300	7210.000	1009.700	7300.000	1013.800	7385.000	1011.000	7570.000	1012.000	7870.000
ER	1012.100	8890.000	1012.000	9098.000	1010.500	9105.000	1010.000	9120.000	1008.000	9270.000
ER	1007.000	9430.000	1008.000	9580.000	1006.000	9650.000	1004.000	9680.000	1006.000	9800.000
ER	1006.300	10000.000	1008.000	10040.000	1011.700	10060.000	1006.000	10080.000	1008.000	10090.000
ER	1010.000	10120.000	1009.200	10210.000	1010.000	10280.000	1010.000	10445.000	1008.000	10500.000
ER	1009.000	10570.000	1007.000	10740.000	1008.000	11030.000	1010.200	11185.000	1010.000	11380.000
ER	1012.000	11500.000	1011.600	11720.000	1010.000	11910.000	1012.000	11920.000	1012.000	11990.000

GR	1010.000	12030.000	1010.000	12090.000	1012.000	12120.000	1014.000	12250.000	1014.500	12590.000
GR	1013.500	12770.000	1014.000	12920.000	1019.800	13140.000	1016.000	13230.000	1020.000	13340.000
ET	0.000	0.000	0.000	7.100	9.100	0.000	8200.000	0.000	8630.000	11990.000
X1	8.657	42.000	9025.000	11005.000	540.000	555.000	530.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	1018.000	5440.000	1016.000	6435.000	1014.000	7110.000	1012.300	7410.000	1012.000	7445.000
GR	1011.200	7500.000	1012.000	7605.000	1012.200	8150.000	1014.000	8220.000	1012.500	8350.000
GR	1014.000	8590.000	1014.000	8820.000	1013.300	8870.000	1014.000	8990.000	1012.000	9005.000
GR	1011.600	9070.000	1010.000	9190.000	1005.000	9270.000	1012.000	9360.000	1009.600	9550.000
GR	1010.600	9650.000	1010.000	9960.000	1008.600	10000.000	1008.000	10400.000	1006.800	10460.000
GR	1008.000	10500.000	1010.000	10540.000	1012.000	11005.000	1012.000	11080.000	1010.000	11160.000
GR	1012.000	11520.000	1014.000	11570.000	1014.000	11890.000	1015.000	11950.000	1014.000	12110.000
GR	1012.000	12190.000	1014.000	12300.000	1016.000	12310.000	1016.400	12580.000	1017.000	12800.000
GR	1018.000	12980.000	1020.000	13005.000	0.000	0.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	7.100	9.100	0.000	7350.000	0.000	8450.000	11640.000
X1	8.805	47.000	8845.000	11405.000	805.000	880.000	785.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	1020.000	5010.000	1019.300	5170.000	1019.300	5560.000	1016.000	5770.000	1016.000	6870.000
GR	1014.000	7440.000	1013.000	7570.000	1014.000	7720.000	1013.000	7750.000	1014.000	7760.000
GR	1013.800	8050.000	1014.000	8260.000	1015.700	8520.000	1016.200	8845.000	1011.100	9000.000
GR	1012.000	9550.000	1013.700	9790.000	1010.800	10100.000	1012.000	10300.000	1011.900	10600.000
GR	1009.900	10950.000	1012.000	11240.000	1015.000	11405.000	1014.000	11530.000	1012.000	11560.000
GR	1014.000	11650.000	1016.600	12110.000	1016.000	12260.000	1020.000	12270.000	1018.000	12280.000
GR	1016.000	12510.000	1020.000	12580.000	1016.000	12630.000	1016.000	12840.000	1016.000	12930.000
GR	1016.000	13150.000	1020.000	13310.000	1020.000	13860.000	1015.000	13960.000	1020.000	14060.000
GR	1024.000	14610.000	1025.700	14670.000	1026.000	14720.000	1015.000	14770.000	1028.000	14820.000
GR	1025.700	14910.000	1028.000	15100.000	0.000	0.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	7.100	9.100	0.000	0.000	12600.000	8315.000	11645.000
X1	8.938	52.000	9650.000	11420.000	700.000	700.000	700.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	1022.500	5330.000	1020.000	5430.000	1019.000	6050.000	1016.900	6460.000	1016.000	7280.000
GR	1014.000	7780.000	1014.000	8000.000	1014.600	8050.000	1016.000	8700.000	1016.000	8701.000
GR	1017.700	8830.000	1016.000	9090.000	1014.000	9170.000	1012.000	9210.000	1010.800	9300.000
GR	1012.000	9350.000	1013.000	9450.000	1014.000	9520.000	1014.000	9650.000	1013.800	9770.000
GR	1013.200	9950.000	1013.800	9970.000	1013.700	10720.000	1013.000	10735.000	1013.700	10760.000
GR	1013.700	11030.000	1012.900	11130.000	1012.000	11200.000	1012.000	11330.000	1011.000	11360.000
GR	1014.000	11420.000	1016.000	11430.000	1017.400	11545.000	1017.600	11840.000	1018.500	11950.000
GR	1016.000	12030.000	1017.000	12090.000	1016.000	12160.000	1017.300	12250.000	1012.000	12340.000
GR	1018.000	12460.000	1020.000	12570.000	1019.900	12700.000	1020.000	13060.000	1020.400	13390.000
GR	1019.600	13620.000	1020.000	13700.000	1022.000	14410.000	1026.000	14450.000	1026.300	14520.000
GR	1027.000	14810.000	1027.500	14930.000	0.000	0.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	7.100	9.100	0.000	6800.000	12000.000	8300.000	11575.000
X1	9.071	40.000	8990.000	11280.000	800.000	550.000	700.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	1023.800	5665.000	1022.000	5760.000	1020.000	6250.000	1016.500	6890.000	1017.000	7030.000
GR	1017.300	7480.000	1016.400	8350.000	1018.000	8555.000	1015.000	8990.000	1018.000	9000.000
GR	1016.800	9150.000	1016.000	9290.000	1014.600	9400.000	1014.800	9498.000	1014.400	9500.000
GR	1014.400	11268.000	1016.000	11280.000	1018.700	11400.000	1016.000	11530.000	1016.000	11560.000
GR	1016.000	11575.000	1018.100	11575.000	1018.500	11660.000	1017.000	11770.000	1020.000	11820.000
GR	1019.000	11860.000	1019.600	11960.000	1016.000	12200.000	1016.000	12370.000	1018.000	12500.000

ER	1016.000	12620.000	1020.000	12700.000	1022.000	12820.000	1020.000	13080.000	1022.000	13730.000
ER	1021.000	14000.000	1022.000	14560.000	1022.700	14660.000	1024.000	14800.000	1025.300	14960.000
ET	0.000	0.000	0.000	7.100	5.100	0.000	7900.000	11400.000	8510.000	11200.000
X1	9.198	41.000	9320.000	11040.000	750.000	650.000	670.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ER	1026.000	5220.000	1024.000	5520.000	1023.300	5730.000	1022.700	5940.000	1022.000	6050.000
ER	1021.300	6250.000	1020.000	6580.000	1018.300	6750.000	1018.000	7230.000	1017.500	7290.000
ER	1017.800	7400.000	1018.000	8230.000	1019.000	8550.000	1018.200	8700.000	1020.000	9030.000
ER	1020.300	9060.000	1020.000	9075.000	1018.000	9100.000	1018.000	9250.000	1018.000	9320.000
ER	1015.600	9330.000	1015.600	11025.000	1020.000	11940.000	1020.700	11150.000	1018.000	11370.000
ER	1020.000	11390.000	1020.000	11620.000	1018.500	11670.000	1120.000	11700.000	1020.000	11860.000
ER	1021.000	11940.000	1020.000	11990.000	1017.600	12010.000	1020.000	12030.000	1020.600	12120.000
ER	1018.000	12250.000	1020.600	12390.000	1020.000	12480.000	1020.000	12800.000	1021.600	13440.000
ER	1022.000	14670.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.045	0.045	0.035	0.300	0.500	0.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	7.100	5.100	0.000	8650.000	11020.000	8650.000	11010.000
X1	9.266	29.000	9250.000	11010.000	500.000	350.000	360.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ER	1030.000	4850.000	1028.000	5220.000	1026.000	5580.000	1024.000	5740.000	1023.500	5800.000
ER	1022.000	5970.000	1022.300	6100.000	1021.500	6150.000	1021.000	6500.000	1020.000	6870.000
ER	1019.000	7380.000	1018.300	7770.000	1019.300	8200.000	1020.000	8660.000	1020.400	8700.000
ER	1020.000	8720.000	1018.000	8750.000	1018.000	8830.000	1019.500	8550.000	1020.000	9080.000
ER	1019.700	9130.000	1020.000	9235.000	1021.200	9250.000	1015.700	9280.000	1015.700	10940.000
ER	1118.000	10946.000	1020.000	10985.000	1028.500	11010.000	1028.500	11020.000	0.000	0.000
ET	0.000	0.000	0.000	0.000	9.100	0.000	0.000	0.000	9345.000	11065.000
X1	9.374	4.000	9345.000	11065.000	700.000	300.000	570.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	1031.000	1031.000	0.000
ER	1028.500	9345.000	1017.400	9378.000	1017.400	11032.000	1028.500	11065.000	0.000	0.000
SB	1.100	1.560	2.700	0.000	1660.000	84.000	15642.000	3.000	1017.500	1017.400
ET	0.000	0.000	0.000	0.000	9.110	0.000	0.000	0.000	9345.000	11065.000
X1	9.384	4.000	9344.000	11066.000	56.000	56.000	56.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	1027.200	1027.000	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	1034.200	1027.000	0.000
ET	-13.000	9344.000	1034.200	0.000	9345.000	1037.000	1027.200	11066.000	1037.000	1027.200
ET	0.000	11066.000	1034.200	0.000	11440.000	1030.500	0.000	11840.000	1026.200	0.000
ET	0.000	12840.000	1027.000	0.000	12940.000	1027.000	0.000	13540.000	1027.600	0.000
ET	0.000	14140.000	1027.000	0.000	14740.000	1027.600	0.000	15440.000	1027.100	0.000
ET	0.000	16240.000	1031.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ER	1030.500	9344.000	1017.500	9378.000	1017.500	11032.000	1028.500	11066.000	0.000	0.000
NC	0.045	0.045	0.035	0.100	0.300	0.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	7.100	9.100	0.000	9060.000	0.000	9260.000	11000.000
X1	9.453	5.000	9260.000	11000.000	365.000	365.000	365.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ER	1022.900	9060.000	1022.500	9260.000	1018.300	9272.000	1018.300	10970.000	1028.500	11000.000

AC	0.045	0.045	0.035	0.200	0.400	0.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	7.100	9.100	0.000	8730.000	11470.000	9346.000	11143.000
X1	9.518	50.000	9345.000	11142.000	340.000	340.000	340.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	1030.000	5000.000	1026.000	5280.000	1026.000	5470.000	1025.400	6170.000	1025.800	6210.000
GR	1025.800	6500.000	1025.500	6880.000	1024.800	7570.000	1024.300	8200.000	1024.000	8530.000
GR	1023.700	8780.000	1024.000	8870.000	1026.000	8875.000	1026.000	8900.000	1024.000	8910.000
GR	1024.400	8911.000	1024.000	9050.000	1022.000	9090.000	1021.400	9110.000	1022.000	9130.000
GR	1022.500	9230.000	1023.800	9345.000	1019.100	9360.000	1019.100	11130.000	1022.700	11142.000
GR	1022.000	11200.000	1021.000	11210.000	1022.000	11220.000	1022.200	11400.000	1024.000	11620.000
GR	1022.000	11810.000	1020.000	11910.000	1020.000	11960.000	1023.200	12170.000	1023.600	12430.000
GR	1019.000	12575.000	1020.000	12610.000	1020.000	12550.000	1022.000	12960.000	1022.000	13020.000
GR	1020.000	13065.000	1022.000	13080.000	1023.800	13950.000	1023.600	14360.000	1023.800	14680.000
GR	1024.000	14850.000	1024.500	15140.000	1028.500	15300.000	1026.500	15350.000	1030.000	15470.000
AC	0.045	0.045	0.035	0.100	0.300	0.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	7.100	9.100	0.000	8130.000	12130.000	9379.000	11701.000
X1	9.628	57.000	9380.000	11700.000	580.000	700.000	580.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	1031.000	5190.000	1029.500	5280.000	1028.000	5370.000	1027.700	5580.000	1027.500	6160.000
GR	1027.000	6730.000	1026.000	7000.000	1025.700	7120.000	1025.700	7520.000	1027.000	7670.000
GR	1025.300	8000.000	1027.000	8200.000	1026.700	8580.000	1026.700	8780.000	1025.500	8910.000
GR	1024.000	9380.000	1020.000	9430.000	1019.000	9500.000	1020.000	9570.000	1021.000	10000.000
GR	1021.000	10170.000	1020.000	10450.000	1018.000	10460.000	1020.000	10540.000	1022.000	10590.000
GR	1024.000	10640.000	1025.000	10730.000	1024.000	10815.000	1023.200	10850.000	1024.000	10880.000
GR	1025.700	11160.000	1024.000	11560.000	1024.000	11600.000	1026.000	11640.000	1026.000	11700.000
GR	1024.000	11840.000	1024.000	11900.000	1025.000	12000.000	1024.800	12330.000	1024.000	12385.000
GR	1021.000	12410.000	1021.000	12460.000	1022.000	12500.000	1023.400	12580.000	1022.000	12650.000
GR	1022.900	12670.000	1024.000	12690.000	1024.000	13250.000	1024.700	13680.000	1024.900	13880.000
GR	1026.000	14280.000	1026.000	14770.000	1026.700	14960.000	1027.000	15210.000	1028.000	15260.000
GR	1030.200	15300.000	1031.000	15330.000	0.000	0.000	0.000	0.000	0.000	0.000
GT	5.000	23000.000	69000.000	95000.000	55000.000	184000.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	7.100	9.100	0.000	0.000	12400.000	9300.000	12000.000
X1	9.718	79.000	9300.000	11640.000	900.000	490.000	475.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	1033.000	7540.000	1032.000	7550.000	1030.000	7650.000	1029.500	7830.000	1029.500	8000.000
GR	1028.900	8200.000	1028.000	8350.000	1027.400	8540.000	1027.000	8800.000	1027.000	8930.000
GR	1027.000	8931.000	1027.000	8932.000	1027.000	9080.000	1027.700	9150.000	1026.000	9220.000
GR	1025.300	9240.000	1026.000	9260.000	1027.000	9300.000	1026.000	9315.000	1020.000	9335.000
GR	1020.000	9445.000	1022.000	9450.000	1022.000	9560.000	1020.000	9615.000	1019.200	9640.000
GR	1020.000	9650.000	1022.000	9665.000	1023.000	9675.000	1022.000	9685.000	1021.700	9860.000
GR	1020.000	10000.000	1020.000	10050.000	1022.000	10200.000	1022.300	10300.000	1022.000	10390.000
GR	1022.000	10480.000	1026.000	10520.000	1026.000	10600.000	1027.500	10720.000	1026.000	10965.000
GR	1024.000	10975.000	1026.000	11000.000	1026.300	11130.000	1026.000	11260.000	1026.000	11370.000
GR	1028.000	11440.000	1025.200	11470.000	1028.000	11500.000	1026.400	11640.000	1024.000	11800.000
GR	1024.000	11830.000	1026.000	11920.000	1026.000	11950.000	1025.600	12070.000	1024.000	12140.000
GR	1024.500	12210.000	1024.000	12270.000	1022.000	12280.000	1020.400	12320.000	1022.000	12360.000
GR	1024.000	12435.000	1026.000	12480.000	1026.000	12565.000	1024.000	12600.000	1024.000	12650.000
GR	1026.000	12720.000	1025.000	12820.000	1026.000	12900.000	1024.000	12960.000	1026.000	13000.000
GR	1027.000	13070.000	1026.000	13135.000	1026.000	13580.000	1025.800	14080.000	1026.000	14550.000
GR	1026.500	15000.000	1027.300	15150.000	1030.000	15250.000	1030.500	15270.000	0.000	0.000

NC	0.045	0.045	0.030	0.190	0.300	0.000	0.000	0.000	0.000	0.000
NH	7.000	0.045	8250.000	0.100	5000.000	0.050	9375.000	0.035	10588.000	0.042
NH	11887.000	0.070	13862.000	0.040	16843.000	0.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	0.000	9.100	0.000	0.000	0.000	9375.000	13500.000
X1	9.759	75.000	9375.000	10588.000	800.000	800.000	800.000	0.000	0.000	0.000
GR	1034.000	7500.000	1033.000	8250.000	1030.000	5000.000	1030.000	9300.000	1029.800	9375.000
GR	1025.900	9350.000	1025.500	9582.000	1028.100	9591.000	1028.500	9716.000	1029.300	9770.000
GR	1027.400	9829.000	1026.300	9845.000	1025.700	9884.000	1024.300	9897.000	1024.300	9951.000
GR	1024.900	9960.000	1025.500	10000.000	1025.900	10034.000	1026.700	10313.000	1026.300	10562.000
GR	1031.100	10588.000	1031.000	10755.000	1030.600	10808.000	1030.300	11193.000	1029.000	11366.000
GR	1029.800	11505.000	1027.900	11585.000	1025.400	11596.000	1027.800	11625.000	1029.100	11645.000
GR	1029.000	11788.000	1027.100	11834.000	1028.300	11823.000	1028.300	11887.000	1025.500	11905.000
GR	1025.500	11929.000	1028.100	11978.000	1028.600	12047.000	1031.300	12080.000	1030.300	12200.000
GR	1030.300	12383.000	1029.400	12800.000	1028.500	12817.000	1028.500	12843.000	1030.300	12861.000
GR	1030.300	12912.000	1028.300	12924.000	1030.700	12938.000	1029.500	13062.000	1031.700	13077.000
GR	1030.200	13101.000	1031.800	13162.000	1031.700	13190.000	1029.500	13337.000	1029.500	13638.000
GR	1027.900	14289.000	1029.800	15224.000	1029.800	15249.000	1030.700	15266.000	1030.700	15288.000
GR	1029.800	15306.000	1031.900	15318.000	1028.700	15327.000	1032.500	15335.000	1032.700	15369.000
GR	1030.700	15380.000	1032.700	15528.000	1036.200	15854.000	1036.100	16206.000	1034.500	16345.000
GR	1033.700	16405.000	1032.500	16426.000	1033.500	16505.000	1035.100	16816.000	1035.900	16843.000
GT	5.000	18000.000	66000.000	90000.000	90000.000	177000.000	0.000	0.000	0.000	0.000
NH	6.000	0.042	9580.000	0.035	10504.000	0.042	11382.000	0.070	12834.000	0.050
NH	14172.000	0.040	16855.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	0.000	9.100	0.000	0.000	0.000	9580.000	14300.000
X1	9.884	54.000	9580.000	10504.000	700.000	540.000	660.000	0.000	0.000	0.000
GR	1034.000	9050.000	1031.800	9580.000	1027.300	9602.000	1025.700	9661.000	1025.400	9852.000
GR	1025.400	9873.000	1027.400	9915.000	1027.400	10000.000	1028.500	10446.000	1028.500	10491.000
GR	1031.900	10504.000	1031.400	10933.000	1030.500	11154.000	1028.900	11169.000	1030.500	11178.000
GR	1029.500	11382.000	1027.000	11395.000	1029.800	11410.000	1029.800	11598.000	1030.700	11637.000
GR	1032.700	11680.000	1031.000	12186.000	1031.700	12268.000	1029.800	12604.000	1031.100	12632.000
GR	1031.900	12834.000	1031.500	13045.000	1030.600	13469.000	1030.100	14172.000	1028.700	14185.000
GR	1029.400	14367.000	1030.600	14835.000	1031.400	15043.000	1032.300	15059.000	1030.600	15073.000
GR	1031.500	15085.000	1031.100	15105.000	1031.100	15122.000	1033.300	15134.000	1029.800	15145.000
GR	1032.300	15152.000	1032.300	15184.000	1030.700	15210.000	1031.000	15358.000	1031.400	15479.000
GR	1033.100	15531.000	1031.900	15759.000	1031.500	15796.000	1031.000	15834.000	1030.700	15959.000
GR	1032.100	16313.000	1034.100	16597.000	1036.100	16806.000	1036.200	16855.000	0.000	0.000
NH	6.000	0.042	9655.000	0.035	10361.000	0.042	11060.000	0.070	12228.000	0.050
NH	13856.000	0.040	16472.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	0.000	9.100	0.000	0.000	0.000	9650.000	14500.000
X1	10.009	50.000	9655.000	10361.000	580.000	550.000	660.000	0.000	0.000	0.000
GR	1035.000	9050.000	1034.000	9150.000	1033.300	9500.000	1033.300	9655.000	1027.000	9691.000
GR	1027.000	9900.000	1030.600	10231.000	1030.600	10336.000	1032.900	10361.000	1032.500	10704.000
GR	1032.100	11045.000	1028.500	11060.000	1031.400	11080.000	1031.400	11561.000	1032.900	11587.000
GR	1032.900	12098.000	1031.300	12110.000	1032.100	12153.000	1032.100	12198.000	1030.700	12211.000
GR	1032.700	12228.000	1032.100	12516.000	1031.900	12548.000	1033.300	12560.000	1033.300	12832.000
GR	1031.100	12860.000	1031.100	12926.000	1030.100	13018.000	1031.500	13047.000	1031.500	13260.000
GR	1031.800	13429.000	1031.000	13562.000	1032.700	13787.000	1033.100	13802.000	1031.400	13823.000
GR	1030.600	13856.000	1030.600	13997.000	1031.300	14018.000	1031.400	14825.000	1032.500	14840.000
GR	1031.800	14854.000	1032.700	14868.000	1032.500	14896.000	1031.400	14906.000	1031.700	14928.000
GR	1031.300	14953.000	1030.700	15067.000	1031.700	16032.000	1035.700	16326.000	1037.800	16472.000

1	CT	5.000	18100.000	66200.000	90260.000	90260.000	177000.000	0.000	0.000	0.000	0.000
2	NH	6.000	0.042	9591.000	0.035	10465.000	0.042	11306.000	0.070	12174.000	0.050
3	NH	13666.000	0.040	15792.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4	ET	0.000	0.000	0.000	0.000	9.100	0.000	0.000	0.000	9591.000	15550.000
5	X1	10.130	56.000	9591.000	10465.000	550.000	550.000	640.000	0.000	0.000	0.000
6	GR	1036.500	9100.000	1032.900	9300.000	1033.900	9591.000	1031.900	9650.000	1030.600	9749.000
7	GR	1029.100	9763.000	1027.700	10040.000	1027.300	10157.000	1030.300	10178.000	1030.300	10219.000
8	GR	1033.100	10277.000	1032.900	10377.000	1034.700	10465.000	1034.300	10870.000	1033.100	11182.000
9	GR	1033.100	11306.000	1033.100	11333.000	1031.500	11352.000	1031.500	11368.000	1033.800	11385.000
10	GR	1033.800	11595.000	1034.500	11665.000	1033.700	12007.000	1033.900	12065.000	1034.700	12174.000
11	GR	1037.100	12183.000	1033.900	12195.000	1035.000	12326.000	1034.200	12424.000	1034.200	12704.000
12	GR	1032.100	12725.000	1032.100	12980.000	1032.500	13036.000	1032.200	13262.000	1031.400	13303.000
13	GR	1033.100	13350.000	1032.300	13550.000	1035.100	13614.000	1035.400	13633.000	1034.300	13646.000
14	GR	1033.700	13665.000	1031.400	13686.000	1031.500	13793.000	1032.900	13982.000	1033.300	14240.000
15	GR	1033.800	14597.000	1033.800	14637.000	1032.600	14615.000	1033.900	14636.000	1033.500	14657.000
16	GR	1032.500	14680.000	1032.100	14693.000	1032.600	14726.000	1034.100	15163.000	1036.200	15609.000
17	GR	1037.000	15793.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
18											
19	CT	5.000	18100.000	66200.000	90510.000	90510.000	177000.000	0.000	0.000	0.000	0.000
20	NH	6.000	0.042	9460.000	0.035	10445.000	0.042	11451.000	0.070	11921.000	0.050
21	NH	13598.000	0.040	15348.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
22	ET	0.000	0.000	0.000	0.000	9.100	0.000	0.000	0.000	9400.000	12800.000
23	X1	10.250	54.000	9460.000	10445.000	610.000	560.000	630.000	0.000	0.000	0.000
24	GR	1038.400	9050.000	1036.800	9100.000	1036.300	9460.000	1034.200	9511.000	1032.300	9522.000
25	GR	1031.500	9666.000	1032.600	9723.000	1032.100	9896.000	1030.700	9940.000	1027.300	10202.000
26	GR	1031.000	10418.000	1035.400	10445.000	1035.800	10925.000	1035.100	11325.000	1035.100	11451.000
27	GR	1033.300	11462.000	1035.800	11485.000	1035.700	11495.000	1033.800	11504.000	1033.100	11523.000
28	GR	1035.700	11575.000	1035.700	11710.000	1035.700	11921.000	1041.500	11941.000	1034.700	11967.000
29	GR	1035.300	12083.000	1036.100	12481.000	1036.100	12619.000	1033.500	12647.000	1033.400	12725.000
30	GR	1034.100	12820.000	1034.100	13028.000	1032.700	13045.000	1033.900	13103.000	1033.800	13315.000
31	GR	1034.700	13585.000	1035.900	13598.000	1035.500	13612.000	1032.900	13643.000	1032.900	13726.000
32	GR	1034.100	13740.000	1035.000	13985.000	1035.000	14368.000	1034.100	14386.000	1035.100	14404.000
33	GR	1035.100	14426.000	1034.100	14440.000	1034.700	14454.000	1035.000	14524.000	1035.700	14738.000
34	GR	1037.400	14965.000	1038.100	15121.000	1038.700	15310.000	1039.500	15348.000	0.000	0.000
35	EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

THIS RUN EXECUTED 19 JAN 88 18:05:26.

```
*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAR  1982
  ERROR CORR -  01,02,03,04,05
  MODIFICATION -  50,51,52,53,54,55
*************************************************
```

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

EXISTING COND.
SUMMARY PRINTOUT

SECNO	Q	CWSEL	CRIWS	DEPTH	ELMIN	AREA	EG	VCH	SSTA	TOPWID	ENDST	XLCH
8.153	22800.00	1006.41	1002.33	8.61	997.80	4741.01	1006.84	5.31	7678.75	2269.76	12230.94	0.00
8.153	68000.00	1009.40	1008.13	11.60	997.80	16546.50	1009.97	7.33	6938.57	5170.56	13163.50	0.00
8.153	93000.00	1010.73	1009.09	12.93	997.80	14850.56	1011.78	9.59	8550.00	3378.97	12200.00	0.00
8.153	93000.00	1011.65	1009.10	13.85	997.80	16320.51	1012.49	8.61	8565.00	3052.51	11870.00	0.00
8.153	182000.00	1012.24	1010.82	14.44	997.80	34133.22	1013.00	9.76	6500.00	6503.54	13236.13	0.00
8.240	22800.00	1007.08	1002.76	8.88	998.20	8092.27	1007.22	3.22	7150.36	2082.60	10697.70	460.00
8.240	68000.00	1010.22	1005.44	12.02	998.20	22957.18	1010.45	4.75	6450.00	5511.95	13311.08	460.00
8.240	93000.00	1011.85	1006.63	13.65	998.20	14661.28	1012.56	7.26	9200.00	1649.81	11750.00	460.00
8.240	93000.00	1012.46	1006.62	14.26	998.20	15676.56	1013.98	6.82	9200.00	1666.76	11750.00	460.00
8.240	182000.00	1013.21	1010.23	15.01	998.20	40828.07	1013.67	7.15	6450.00	6042.65	13326.05	460.00
8.312	23000.00	1007.31	1003.61	8.71	998.60	6126.83	1007.53	3.75	9981.81	1518.30	11541.31	380.00
8.312	69000.00	1010.35	1007.27	11.75	998.60	10560.08	1011.01	6.30	9964.85	1579.54	11544.39	380.00
8.312	95000.00	1012.34	1008.18	13.74	998.60	14051.77	1013.05	6.76	9954.13	1592.21	11546.34	380.00
8.312	95000.00	1012.86	1008.26	14.26	998.60	14884.28	1013.49	6.38	9951.26	1595.60	11546.86	380.00
8.312	184000.00	1012.97	1010.96	14.37	998.60	15077.42	1015.29	12.20	9950.59	1596.39	11546.98	380.00
8.313	23000.00	1007.30	1003.64	8.70	998.60	6005.56	1007.53	3.83	9982.51	1488.31	11540.75	1.00
8.313	69000.00	1010.38	1007.29	11.78	998.60	10728.85	1011.02	6.43	9966.23	1547.49	11542.51	1.00
8.313	95000.00	1012.33	1008.24	13.73	998.60	13788.46	1013.07	6.90	6536.58	1744.86	11543.62	1.00
8.313	95000.00	1012.85	1008.24	14.25	998.60	14575.19	1013.51	6.52	9953.16	1564.92	11543.92	1.00
8.313	184000.00	1012.92	1010.98	14.32	998.60	14910.62	1015.35	12.51	6442.51	2072.38	11543.96	1.00
8.327	23000.00	1007.39	1004.26	7.39	1000.00	5078.21	1007.71	4.53	9976.24	1324.98	11531.80	78.00
8.327	69000.00	1010.49	1008.01	10.49	1000.00	9630.10	1011.29	7.17	9962.63	1505.15	11535.78	78.00
8.327	95000.00	1012.21	1009.02	12.21	1000.00	10208.51	1013.56	9.31	6556.25	1196.28	11112.00	78.00
8.327	95000.00	1012.92	1009.00	12.92	1000.00	13301.38	1013.71	7.14	9951.95	1518.95	11538.90	78.00
8.327	184000.00	1013.25	1011.74	13.25	1000.00	14123.60	1015.98	13.29	6390.11	2038.24	11539.32	78.00

SECNO	Q	CWSEL	CRIWS	DEPTH	ELMIN	AREA	EG	VCH	SSTA	TCPWID	ENDST	XLCH
8.327	23000.00	1007.50	1003.84	8.00	995.50	5899.06	1007.74	3.50	9945.00	1295.07	11531.93	1.00
8.327	69000.00	1010.70	1007.34	11.20	995.50	10767.68	1011.34	6.41	9945.00	1591.05	11536.05	1.00
8.327	95000.00	1013.11	1008.65	13.61	995.50	14595.55	1012.77	6.51	9945.00	1594.14	11539.14	1.00
8.327	95000.00	1013.09	1008.66	13.59	995.50	14575.56	1012.75	6.52	9945.00	1594.12	11539.12	1.00
8.327	184000.00	1014.32	1011.33	14.82	995.50	17080.55	1016.23	11.10	6285.97	3647.97	11540.70	1.00
8.444	23000.00	1008.65	1007.93	2.65	1006.00	4571.77	1009.05	5.03	9134.37	1562.26	11096.63	615.00
8.444	69000.00	1012.06	1009.69	6.06	1006.00	13030.72	1012.54	5.72	9091.80	3389.67	12902.79	615.00
8.444	95000.00	1014.20	1010.49	8.20	1006.00	20509.08	1014.59	5.25	9090.00	3710.00	12800.00	615.00
8.444	95000.00	1014.14	1010.49	8.14	1006.00	18384.03	1014.59	5.57	9090.00	2730.00	11820.00	615.00
8.444	184000.00	1017.28	1013.11	11.28	1006.00	46446.44	1017.63	5.50	4948.41	8428.95	13554.30	615.00
8.556	23000.00	1010.70	1009.16	6.70	1004.00	5585.73	1010.94	3.96	7243.87	2556.44	12100.47	595.00
8.556	69000.00	1013.29	1011.19	9.29	1004.00	16222.17	1013.67	5.27	6982.57	5177.09	12203.88	595.00
8.556	95000.00	1014.94	1012.02	10.94	1004.00	20300.79	1015.36	5.50	8700.00	4255.79	12955.79	595.00
8.556	95000.00	1014.94	1011.96	10.94	1004.00	18179.67	1015.42	5.78	8880.00	3050.00	11930.00	595.00
8.556	184000.00	1017.80	1013.90	13.80	1004.00	46180.10	1018.13	5.46	5119.64	8037.23	13279.69	595.00
8.657	23000.00	1012.23	1011.40	5.43	1006.80	5304.28	1012.56	4.70	7416.36	3276.87	12202.56	530.00
8.657	69000.00	1014.37	1013.21	7.57	1006.80	13857.33	1014.86	6.12	6984.95	5178.42	12301.85	530.00
8.657	95000.00	1015.75	1013.90	8.95	1006.80	17242.52	1016.32	6.55	8200.00	4108.74	12308.74	530.00
8.657	95000.00	1015.82	1013.81	9.02	1006.80	15745.68	1016.46	6.81	8630.00	3360.00	11990.00	530.00
8.657	184000.00	1018.28	1015.37	11.48	1006.80	38158.68	1018.74	6.47	5440.00	7510.99	12983.49	530.00
8.805	23000.00	1014.59	1013.28	4.69	1009.90	6407.42	1014.79	3.59	8893.80	2488.89	11382.69	785.00
8.805	69000.00	1016.45	1015.01	6.55	1009.90	16282.57	1016.80	5.11	6620.58	6181.91	13168.14	785.00
8.805	95000.00	1017.54	1015.54	7.64	1009.90	21714.50	1017.91	5.31	7350.00	5719.15	13211.69	785.00
8.805	95000.00	1017.72	1015.52	7.82	1009.90	15994.28	1018.30	6.26	8450.00	3190.00	11640.00	785.00
8.805	184000.00	1019.46	1017.07	9.56	1009.90	37898.26	1019.93	6.37	5134.58	8229.96	14772.53	785.00
8.938	23000.00	1015.58	1014.74	4.98	1011.00	7508.18	1016.12	3.33	7284.36	3894.03	12419.65	700.00
8.938	69000.00	1017.91	1016.10	7.11	1010.80	17280.05	1018.20	5.06	6497.49	5869.47	12458.17	700.00
8.938	95000.00	1018.78	1016.69	7.98	1010.80	22608.43	1019.11	5.46	6141.03	6361.76	12502.79	700.00
8.938	95000.00	1019.20	1017.03	8.50	1010.80	16778.57	1019.84	6.46	8315.00	3330.00	11645.00	700.00
8.938	184000.00	1020.65	1018.25	9.85	1010.80	36463.54	1021.14	6.87	5404.12	8525.60	13929.72	700.00
9.071	23000.00	1017.36	1016.08	2.96	1014.40	5883.17	1017.59	3.91	9080.62	2197.23	11277.85	700.00
9.071	69000.00	1019.28	1018.00	4.88	1014.40	17243.76	1019.61	5.09	6558.82	6058.34	12685.52	700.00
9.071	95000.00	1020.11	1018.58	5.71	1014.40	19895.55	1020.55	5.50	6800.00	5200.00	12000.00	700.00
9.071	95000.00	1020.77	1018.59	6.37	1014.40	16942.16	1021.32	6.16	8300.00	3275.00	11575.00	700.00
9.071	184000.00	1021.97	1019.82	7.57	1014.40	36358.54	1022.49	6.79	5767.13	8753.75	14543.71	700.00
9.198	23000.00	1018.76	1017.38	3.16	1015.60	6900.18	1018.98	3.34	6704.35	3519.28	11035.76	670.00
9.198	69000.00	1020.65	1019.35	5.05	1015.60	16397.15	1021.04	5.73	6418.43	6385.40	13054.59	670.00
9.198	95000.00	1021.62	1020.15	6.02	1015.60	15420.29	1022.34	7.41	7900.00	3500.00	11400.00	670.00
9.198	95000.00	1022.15	1020.24	6.55	1015.60	14253.68	1022.94	7.47	8510.00	2690.00	11200.00	670.00
9.198	184000.00	1023.28	1021.46	7.68	1015.60	36884.72	1023.82	7.33	5740.42	8746.22	14670.00	670.00

SECNO	G	CWSEL	CRIWS	DEPTH	ELMIN	AREA	EG	VCH	SSTA	TCPWID	ENDST	XLCH
9.266	23000.00	1019.36	1017.51	3.66	1015.70	6104.26	1019.58	3.77	9260.06	1680.15	10940.21	360.00
9.266	69000.00	1021.40	1019.45	5.70	1015.70	15130.25	1021.85	5.82	6216.85	4728.17	10989.13	360.00
9.266	95000.00	1022.56	1021.21	6.86	1015.70	13429.40	1023.41	7.63	8650.09	2298.54	10992.52	360.00
9.266	95000.00	1023.07	1021.23	7.37	1015.70	14587.15	1023.79	7.04	8650.00	2300.65	10994.00	360.00
9.266	184000.00	1024.62	1022.26	8.32	1015.70	28280.66	1024.88	8.61	5738.10	5215.82	10996.83	360.00
9.374	23000.00	1020.40	1019.21	3.00	1017.40	4580.56	1020.73	4.62	9369.10	1671.81	11040.90	570.00
9.374	69000.00	1022.66	1021.16	5.26	1017.40	8777.32	1023.62	7.86	9362.37	1685.26	11047.63	570.00
9.374	95000.00	1024.07	1022.05	6.67	1017.40	11161.46	1025.19	8.51	9358.18	1693.65	11051.82	570.00
9.374	95000.00	1024.27	1022.05	6.87	1017.40	11506.14	1025.33	8.26	9357.57	1694.86	11052.43	570.00
9.374	184000.00	1025.27	1024.62	7.87	1017.40	13198.49	1026.29	13.54	9354.61	1700.79	11055.39	570.00
9.384	23000.00	1020.45	0.00	2.95	1017.50	4911.91	1020.80	4.68	9370.27	1670.86	11041.13	56.00
9.384	69000.00	1022.50	0.00	5.40	1017.50	9020.15	1023.81	7.65	9363.87	1684.83	11048.70	56.00
9.384	95000.00	1024.24	0.00	6.84	1017.50	11445.64	1025.41	8.30	9360.11	1693.03	11053.14	56.00
9.384	95000.00	1024.51	0.00	7.01	1017.50	11734.10	1025.53	8.10	9359.67	1694.00	11053.67	56.00
9.384	184000.00	1026.18	0.00	8.68	1017.50	14574.54	1028.65	12.62	9355.29	1703.54	11058.83	56.00
9.453	23000.00	1021.44	1020.08	3.14	1018.30	5359.46	1021.73	4.29	9263.03	1716.20	10979.23	365.00
9.453	69000.00	1024.18	1022.00	5.88	1018.30	10368.09	1024.89	6.79	9060.00	1927.28	10987.28	365.00
9.453	95000.00	1025.51	1022.92	7.21	1018.30	12948.12	1026.38	7.53	9060.00	1931.21	10991.21	365.00
9.453	95000.00	1025.56	1022.87	7.26	1018.30	12450.68	1026.46	7.63	9260.00	1731.33	10991.33	365.00
9.453	184000.00	1028.48	1025.41	10.18	1018.30	18698.70	1030.04	10.14	9060.00	1939.95	10999.95	365.00
9.518	23000.00	1022.28	1020.83	3.10	1019.10	5525.67	1022.47	4.16	9350.09	1790.25	11140.35	340.00
9.518	69000.00	1025.25	1022.71	6.15	1019.10	23703.17	1025.44	4.10	7126.63	8012.74	15169.99	340.00
9.518	95000.00	1026.50	1023.86	7.40	1019.10	16606.21	1027.08	6.38	8700.00	2770.00	11470.00	340.00
9.518	95000.00	1026.41	1023.54	7.31	1019.10	13095.27	1027.23	7.26	9346.00	1797.00	11143.00	340.00
9.518	184000.00	1030.43	1025.06	11.43	1019.00	75153.35	1030.55	3.62	5000.00	10470.00	15470.00	340.00
9.628	23000.00	1023.68	1022.59	5.68	1018.00	4053.91	1024.18	5.67	9381.61	1289.07	10867.89	580.00
9.628	69000.00	1025.70	1025.19	7.70	1018.00	8122.32	1026.90	8.85	7115.69	3283.67	11634.22	580.00
9.628	95000.00	1027.66	1026.28	9.66	1018.00	15574.08	1028.33	6.91	8100.00	4030.00	12130.00	580.00
9.628	95000.00	1027.86	1026.13	9.86	1018.00	12615.77	1028.74	7.53	9370.00	2322.00	11701.00	580.00
9.628	184000.00	1030.63	1027.29	12.63	1018.00	56416.22	1030.84	4.55	5190.00	10140.00	15330.00	580.00
9.718	23000.00	1025.26	1023.75	6.06	1019.20	4486.06	1025.67	5.13	9317.47	1217.13	10990.73	475.00
9.718	69000.00	1028.23	1026.59	9.03	1019.20	20212.32	1028.45	4.36	8313.58	6821.37	15184.02	475.00
9.718	95000.00	1029.15	1027.24	9.95	1019.20	17375.03	1029.67	6.20	8117.25	4240.16	12360.01	475.00
9.718	95000.00	1029.48	1027.58	10.28	1019.20	14355.63	1030.18	6.87	9300.00	2700.00	12000.00	475.00
9.718	184000.00	1031.03	1028.23	11.83	1019.20	40813.45	1031.40	5.80	7598.48	7671.52	15270.00	475.00
* 9.759	23000.00	1028.70	1028.70	4.40	1024.30	3305.88	1029.64	8.07	9375.23	2239.30	15327.00	800.00
* 9.759	69000.00	1030.69	1030.69	6.39	1024.30	11316.54	1031.55	8.85	8828.65	6014.37	15331.18	800.00
9.759	95000.00	1031.60	1031.17	7.30	1024.30	17186.22	1032.30	8.39	8600.82	6755.97	15446.36	800.00
9.759	95000.00	1032.15	1031.74	7.85	1024.30	13647.89	1032.27	9.77	9375.00	4125.00	13500.00	800.00
9.759	184000.00	1032.51	1032.43	8.21	1024.30	23546.06	1032.87	11.99	8372.01	7110.22	16426.94	800.00

SECNO	Q	CWSEL	CRIWS	DEPTH	ELMIN	AREA	EG	VCH	SSTA	TCPWIC	ENDST	XLCH
9.884	18000.00	1031.32	1029.53	5.92	1025.40	6575.84	1031.50	3.74	9582.31	4626.08	16117.55	660.00
9.884	66000.00	1033.22	1032.09	7.82	1025.40	19046.05	1033.54	5.55	9235.94	7236.65	16473.20	660.00
9.884	90000.00	1033.75	1032.56	8.35	1025.40	22883.13	1034.14	6.75	9105.95	7437.51	16547.46	660.00
9.884	90000.00	1034.69	1033.08	9.29	1025.40	21240.83	1035.13	6.84	9580.00	4720.00	14300.00	660.00
9.884	177000.00	1035.59	1033.80	10.19	1025.40	36876.28	1036.09	7.96	9050.00	7702.92	16752.92	660.00
10.009	18000.00	1032.28	1031.83	5.28	1027.00	6217.01	1032.53	4.76	9660.82	4727.59	16074.69	660.00
10.009	66000.00	1034.35	1033.30	7.35	1027.00	19504.41	1034.66	5.88	9110.91	7118.87	16229.78	660.00
10.009	90000.00	1035.04	1033.73	8.04	1027.00	24115.20	1035.34	6.38	9050.00	7227.06	16277.06	660.00
10.009	90000.00	1035.87	1034.30	8.87	1027.00	21205.59	1036.28	7.05	9650.00	4850.00	14500.00	660.00
10.009	177000.00	1036.86	1034.89	9.86	1027.00	37416.61	1037.29	7.67	9050.00	7256.47	16406.47	660.00
10.130	18100.00	1033.62	1032.19	6.32	1027.30	5292.18	1032.91	4.75	9255.78	3478.93	15024.97	640.00
10.130	66200.00	1035.61	1034.82	8.31	1027.30	16052.28	1036.33	6.79	9149.52	6320.81	15483.39	640.00
10.130	90260.00	1036.26	1035.18	8.96	1027.30	20209.08	1036.72	7.33	9113.50	6501.23	15622.11	640.00
10.130	90260.00	1037.02	1035.36	9.72	1027.30	23583.60	1037.34	6.09	9591.00	5958.28	15550.00	640.00
10.130	177000.00	1038.06	1036.59	10.76	1027.30	32160.83	1038.68	8.71	9100.00	6693.00	15793.00	640.00
10.250	18100.00	1034.77	1032.74	7.47	1027.30	5035.98	1035.03	4.26	9497.14	2279.81	14470.54	630.00
10.250	66200.00	1037.04	1036.09	9.74	1027.30	15268.26	1037.55	6.88	9092.44	5792.32	14917.18	630.00
10.250	90510.00	1037.71	1036.66	10.41	1027.30	19179.87	1038.28	7.58	9071.57	5934.92	15034.05	630.00
10.250	90510.00	1037.84	1037.25	10.54	1027.30	12756.59	1039.08	10.01	9400.00	3373.42	12800.00	630.00
10.250	177000.00	1039.53	1038.16	12.23	1027.30	30425.21	1040.30	9.22	9050.00	6283.71	15348.00	630.00

SUMMARY OF ERRORS AND SPECIAL NOTES

```
CALTION  SECNO=    9.384  PROFILE= 5  HYDRAULIC JUMP D.S.

CAUTION  SECNO=    9.759  PROFILE= 1  CRITICAL DEPTH ASSUMED
CALTION  SECNO=    9.759  PROFILE= 1  MINIMUM SPECIFIC ENERGY
CALTION  SECNO=    9.759  PROFILE= 2  CRITICAL DEPTH ASSUMED
CALTION  SECNO=    9.759  PROFILE= 2  MINIMUM SPECIFIC ENERGY
```

```
*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED MARCH 1982                               *
*                                                   *
*  RUN DATE SAT, JAN 16 1988 TIME 11:05:28          *
*****************************************************
```

```
*************************************
*  U.S. ARMY CORPS OF ENGINEERS     *
*  THE HYDROLOGIC ENGINEERING CENTER *
*  609 SECOND STREET, SUITE D       *
*  DAVIS, CALIFORNIA 95616          *
*  (916) 440-2105 (FTS) 448-2105    *
*************************************
```

```
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
```

NEW RIVER — EXISTING CONDITIONS

THIS RUN EXECUTED 16 JAN 88 11:05:29

```
**************************************************
HEC2 RELEASE DATED NOV 76 UPDATED MAR  1982
ERROR CORR -  01,02,03,04,05
MODIFICATION -  50,51,52,53,54,55
**************************************************

C
T1      CAMELBACK RANCH - NEW RIVER
T2      EXISTING CONDITIONS - AGUA FRIA RIVER TO GLENDALE AVE.
T3      EXISTING COND.              10 YEAR EVENT (NR1122E5A)

*1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0.       2.       0.       0.  0.001000      0.0       0.0       0.  1025.500     0.000

*2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IEW       CHNIM     ITRACE

     1.000     0.000    -1.000    10.000    67.670     0.000    -1.000     0.000     0.000     0.000

*3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.000    43.000     1.000     2.000     8.000    42.000    25.000     3.000    26.000    53.000


     4.000    54.000    39.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000


NC      0.045     0.045     0.035     0.100     0.300     0.000     0.000     0.000     0.000     0.000
GT      5.000 12500.000 29000.000 35000.000 35000.000 70000.000     0.000     0.000     0.000     0.000
        LAST AGUA FRIA X-SECT.  USED AS STARTING WSEL FOR NEW RIVER L/C
        PHASING AS REQUESTED PER DAVE JOHNSON OF MCFCD ON 10/20/86 FOR THEIR
        FIS STUDY.  FILE LNRSPFGS CONVERTED TO LNRMCFCD ON 10/21/86 FOR
        NEW RIVER FIS BASE.
*1      9.718    79.000  9300.000 11640.000   900.000   490.000   475.000     0.000     0.000     0.000
*3     10.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
GR   1033.000  7540.000  1032.000  7550.000  1030.000  7650.000  1029.500  7830.000  1029.500  8900.000
GR   1028.900  8200.000  1028.000  8350.000  1027.400  8540.000  1027.000  8800.000  1027.000  8930.000
GR   1027.000  8931.000  1027.000  8932.000  1027.000  9080.000  1027.700  9150.000  1026.000  9220.000
GR   1025.300  9240.000  1026.000  9260.000  1027.000  9300.000  1026.000  9315.000  1020.000  9335.000
GR   1020.000  9445.000  1022.000  9450.000  1022.000  9560.000  1020.000  9615.000  1019.200  9640.000
GR   1020.000  9650.000  1022.000  9665.000  1023.000  9675.000  1022.000  9685.000  1021.700  9860.000
GR   1020.500 10000.000  1020.500 10050.000  1022.000 10200.000  1022.300 10300.000  1022.000 10390.000
GR   1022.000 10480.000  1026.000 10520.000  1026.000 10600.000  1027.500 10720.000  1026.000 10965.000
GR   1024.000 10975.000  1026.000 11000.000  1026.300 11130.000  1026.000 11260.000  1026.000 11370.000
GR   1028.000 11440.000  1025.200 11470.000  1028.000 11500.000  1026.400 11640.000  1024.000 11800.000
GR   1024.000 11830.000  1026.000 11920.000  1026.000 11950.000  1025.600 12070.000  1024.000 12140.000
GR   1024.500 12210.000  1024.000 12270.000  1022.000 12280.000  1020.400 12320.000  1022.000 12360.000
GR   1024.000 12435.000  1026.000 12480.000  1026.000 12565.000  1024.000 12600.000  1024.000 12650.000
GR   1026.000 12720.000  1025.000 12820.000  1026.000 12900.000  1024.000 12960.000  1026.000 13000.000
GR   1027.000 13070.000  1026.000 13135.000  1026.000 13580.000  1025.800 14080.000  1026.000 14550.000
GR   1026.500 15000.000  1027.300 15150.000  1030.000 15250.000  1030.500 15270.000     0.000     0.000
```

```
ET      13.000      7.100      7.100      7.100      9.100      0.000   8600.000  11510.000   9050.000  10370.000
X1      10.000     24.000   9730.000  10260.000    700.000    700.000   1000.000      0.000      0.000      0.000
GR    1035.000   6900.000   1024.000   6950.000   1024.700   7370.000   1024.800   8000.000   1025.200   8430.000
GR    1026.000   8470.000   1027.100   8700.000   1026.300   9070.000   1028.000   9660.000   1028.300   9730.000
GR    1028.000   9800.000   1027.700   9890.000   1026.000   9940.000   1024.000   9960.000   1024.000  10050.000
GR    1026.000  10230.000   1026.000  10260.000   1028.000  10380.000   1025.800  10570.000   1028.500  10750.000
GR    1030.000  11000.000   1030.000  11500.000   1032.000  11510.000   1033.500  11630.000      0.000      0.000

ET      13.000      7.100      7.100      7.100      9.100      0.000   8600.000  11720.000   9050.000  10374.000
        AP PLAN STA. 15+30  CROSS SECTIONS 13.0 THRU 70.5 HAVE BEEN UPDATED
        PER GLENDALE AIRPORT CHANNEL PLANS AND HAVE BEEN ADJUSTED TO COE
        DATUM.  COE B.M.=1074.25  A.P. B.M.=1074.71.  A.P. CROSS SECTION
        DATA ADJUSTED -0.46 FT(USED -0.50).
X1      13.000     34.000   9846.000  10374.000    100.000    300.000    300.000      0.000      0.000      0.000
GR    1034.000   5200.000   1032.000   5345.000   1030.000   5430.000   1028.700   5460.000   1026.000   5770.000
GR    1024.500   6360.000   1025.400   6405.000   1025.300   7135.000   1025.500   8210.000   1027.000   8260.000
GR    1025.500   8290.000   1027.000   8580.000   1026.000   8605.000   1026.000   9115.000   1028.000   9360.000
GR    1030.000   9827.000   1030.000   9846.000   1029.000   9849.000   1029.000   9872.000   1029.800   9990.000
GR    1029.000   9914.000   1024.000   9930.000   1023.000   9955.000   1022.200   9960.000   1022.400  10000.000
GR    1022.500  10014.000   1022.800  10060.000   1023.400  10150.000   1024.900  10369.000   1027.500  10374.000
GR    1029.500  10414.000   1030.700  10800.000   1032.000  11300.000   1033.500  11720.000      0.000      0.000

ET      20.000      7.100      7.100      7.100      9.100      0.000   8800.000  11360.000   9100.000  10445.000
                AP PLAN STA. 22+30
X1      20.000     35.000   9630.000  10445.000    960.000    700.000    700.000      0.000      0.000      0.000
GR    1034.300   5570.000   1034.000   5730.000   1032.300   5765.000   1032.000   5880.000   1030.000   6095.000
GR    1028.000   6170.000   1026.000   6460.000   1025.700   7160.000   1027.200   7220.000   1027.400   7530.000
GR    1027.000   7610.000   1027.200   7630.000   1028.000   7870.000   1028.300   8750.000   1030.000   9460.000
GR    1031.300   9500.000   1032.000   9600.000   1033.000   9630.000   1032.000   9645.000   1030.000   9750.000
GR    1029.300   9890.000   1026.000   9905.000   1026.000   9910.000   1024.000   9960.000   1023.600  10025.000
GR    1024.500  10165.000   1025.500  10310.000   1025.500  10378.000   1024.500  10425.000   1028.500  10445.000
GR    1029.500  10457.000   1030.000  10690.000   1031.200  10500.000   1032.000  11060.000   1034.000  11360.000

ET      26.800      5.100      0.000      0.000   8790.000  10400.000      0.000      0.000      0.000      0.000
ET      26.800      0.000      7.100      7.100      9.100      0.000   8000.000  11740.000   9150.000  10400.000
                AP PLAN STA. 25+10
X1      26.800     37.000   9793.000  10400.000   1000.000    680.000    680.000      0.000      0.000      0.000
GR    1036.000   5980.000   1035.700   6080.000   1035.200   6235.000   1034.000   6400.000   1033.000   6480.000
GR    1032.000   6530.000   1030.000   6640.000   1030.200   6750.000   1030.000   7200.000   1030.000   7830.000
GR    1031.000   8160.000   1032.000   8660.000   1033.200   8700.000   1032.000   8740.000   1032.000   9520.000
GR    1033.000   9793.000   1032.500   9809.000   1031.500   9825.000   1030.500   9845.000   1029.500   9866.000
GR    1028.500   9886.000   1027.500   9908.000   1025.500   9946.000   1024.900   9957.000   1026.000  10044.000
GR    1026.500  10193.000   1027.500  10342.000   1027.600  10362.000   1029.500  10366.000   1030.500  10381.000
GR    1031.500  10400.000   1033.200  10540.000   1033.400  10710.000   1033.600  10895.000   1033.800  11090.000
GR    1034.000  11260.000   1035.300  11740.000      0.000      0.000      0.000      0.000      0.000      0.000

ET      32.600      5.100      0.000      0.000   9420.000  10233.000      0.000      0.000      0.000      0.000
ET      32.600      0.000      7.100      7.100      9.100      0.000   8500.000  10233.000   9000.000  10233.000
```

AP PLAN STA. 35+40

X1	32.600	48.000	9565.000	10233.000	660.000	580.000	580.000	0.000	0.000	0.000
GR	1038.000	6020.000	1037.800	6155.000	1036.000	6300.000	1035.000	6650.000	1034.000	6760.000
GR	1032.300	6930.000	1032.000	7035.000	1032.000	7190.000	1032.000	7800.000	1033.000	7830.000
GR	1034.000	7860.000	1034.200	8080.000	1035.000	8500.000	1035.000	8670.000	1035.700	8695.000
GR	1035.000	8730.000	1034.300	8970.000	1034.500	9480.000	1035.100	9532.000	1035.300	9547.000
GR	1034.500	9550.000	1034.500	9558.000	1034.500	9565.000	1033.500	9644.000	1032.500	9670.000
GR	1031.500	9691.000	1030.500	9711.000	1029.500	9722.000	1028.500	9747.000	1027.500	9774.000
GR	1026.500	9794.000	1026.200	9800.000	1026.500	9847.000	1027.500	9997.000	1028.500	10147.000
GR	1027.500	10207.000	1028.500	10209.000	1032.500	10217.000	1036.500	10225.000	1040.500	10233.000
GR	1041.200	10320.000	1041.800	10520.000	1042.300	10670.000	1043.200	10975.000	1043.800	11160.000
GR	1044.000	11480.000	1044.500	11750.000	1045.000	11920.000	0.000	0.000	0.000	0.000
ET	38.000	5.100	0.000	0.000	5420.000	10073.000	0.000	0.000	0.000	0.000
ET	38.000	0.000	7.100	7.100	9.100	0.000	8900.000	10073.000	8900.000	10073.000

AP PLAN STA. 40+30

X1	38.000	40.000	9420.000	10072.600	440.000	500.000	540.000	0.000	0.000	0.000
GR	1040.600	5895.000	1040.000	6065.000	1040.000	6067.000	1039.700	6275.000	1038.000	6368.000
GR	1038.000	6370.000	1036.000	6635.000	1034.000	6520.000	1033.800	7280.000	1034.000	7365.000
GR	1032.900	7385.000	1034.300	7660.000	1034.500	7940.000	1035.300	8245.000	1036.000	8640.000
GR	1035.500	9365.000	1035.600	9420.000	1034.500	9492.000	1033.500	9512.000	1032.500	9532.000
GR	1031.500	9552.000	1030.500	9572.000	1029.500	9592.000	1028.500	9612.000	1027.500	9632.000
GR	1027.200	9646.000	1028.000	9698.000	1029.000	9846.000	1030.000	9997.000	1030.400	10051.400
GR	1041.000	10072.600	1041.400	10160.000	1041.500	10165.000	1041.600	10190.000	1041.600	10200.000
GR	1041.700	10250.000	1044.200	10880.000	1044.400	10920.000	1045.700	11500.000	1045.900	11630.000
ET	45.000	5.100	5.100	0.000	5375.000	10136.000	0.000	0.000	0.000	0.000
ET	45.000	0.000	0.000	7.100	9.100	0.000	9150.000	10136.000	9150.000	10136.000

AP PLAN STA. 45+80

X1	45.000	44.000	9375.000	10135.800	440.000	680.000	700.000	0.000	0.000	0.000
GR	1042.000	5925.000	1042.200	6000.000	1042.300	6220.000	1042.000	6395.000	1042.000	6397.000
GR	1040.000	6425.000	1039.300	6530.000	1038.000	6575.000	1037.700	6730.000	1037.300	6925.000
GR	1036.000	6975.000	1035.700	7225.000	1034.600	7570.000	1034.700	8000.000	1035.500	8350.000
GR	1036.000	8510.000	1036.300	8850.000	1036.500	9060.000	1036.300	9255.000	1038.000	9368.000
GR	1038.700	9375.000	1038.000	9395.000	1036.800	9460.000	1036.000	9525.000	1036.300	9538.000
GR	1035.500	9558.000	1034.500	9578.000	1033.500	9598.000	1032.500	9618.000	1031.500	9638.000
GR	1030.500	9658.000	1029.500	9678.000	1028.500	9698.000	1028.300	9710.000	1028.500	9748.000
GR	1029.500	9888.000	1030.500	10047.000	1031.000	10115.400	1041.200	10135.800	1041.400	10252.000
GR	1041.500	10390.000	1041.900	10590.000	1042.200	10710.000	1043.100	11006.000	0.000	0.000
ET	51.700	7.100	7.100	7.100	9.100	0.000	9795.000	10599.000	9799.000	10599.000

AP PLAN STA. 53+70

X1	51.700	43.000	9800.000	10598.200	600.000	510.000	670.000	0.000	0.000	0.000
GR	1042.000	7015.000	1040.000	7060.000	1039.700	7175.000	1038.500	7270.000	1038.000	7320.000
GR	1037.700	7470.000	1036.000	7545.000	1035.200	7800.000	1035.000	8110.000	1034.800	8265.000
GR	1034.700	8480.000	1036.000	8820.000	1036.500	8860.000	1037.400	9090.000	1037.800	9510.000
GR	1038.000	9660.000	1039.100	9680.000	1038.000	9695.000	1038.000	9755.000	1040.000	9760.000
GR	1041.000	9765.000	1041.000	9770.000	1041.000	9780.000	1041.000	9790.000	1041.000	9800.000
GR	1040.000	9820.000	1044.500	9832.000	1044.500	9840.000	1034.500	9875.000	1030.000	9910.000
GR	1028.000	9915.000	1027.400	9970.000	1027.500	10000.000	1029.500	10090.000	1029.800	10172.000
GR	1030.500	10271.000	1031.500	10420.000	1032.500	10570.000	1032.600	10577.400	1043.000	10598.200
GR	1043.500	10675.000	1043.800	10685.000	1044.500	10705.000	0.000	0.000	0.000	0.000

ET	54.000	7.100	7.100	7.100	9.100	0.000	9854.000	10696.000	9854.000	10696.000
		AP PLAN STA. 55+65								
>1	54.000	55.000	9855.000	10695.000	270.000	200.000	230.000	0.000	0.000	0.000
ER	1045.000	5965.000	1045.600	6005.000	1045.700	6090.000	1045.300	6360.000	1044.000	6775.000
ER	1042.000	6900.000	1041.000	7020.000	1040.000	7125.000	1038.700	7230.000	1038.000	7385.000
ER	1036.800	7475.000	1037.300	7825.000	1036.300	8165.000	1036.400	8460.000	1036.400	8635.000
ER	1036.500	8790.000	1037.000	9055.000	1037.700	9260.000	1036.000	9540.000	1035.200	9635.000
ER	1038.000	9705.000	1034.000	9712.000	1033.300	9750.000	1034.000	9780.000	1036.000	9785.000
ER	1038.000	9805.000	1040.000	9810.000	1042.000	9815.000	1042.500	9835.000	1042.500	9855.000
ER	1036.000	9862.000	1034.000	9868.000	1032.000	9875.000	1030.000	9890.000	1028.000	9915.000
ER	1029.000	10000.000	1030.000	10035.000	1030.000	10115.000	1032.000	10140.000	1034.000	10160.000
ER	1033.500	10180.000	1032.500	10215.000	1031.500	10242.000	1030.500	10263.000	1030.200	10265.000
ER	1030.500	10311.000	1031.500	10455.000	1032.500	10610.000	1032.900	10674.400	1043.200	10695.000
ER	1044.100	11215.000	1044.200	11525.000	1044.500	11760.000	1045.000	11840.000	1046.000	13150.000
ET	59.000	0.000	0.000	7.100	9.100	0.000	9744.000	10701.000	9744.000	10701.000
		AP PLAN STA. 60+00								
>1	59.000	43.000	9745.000	10700.200	760.000	490.000	500.000	0.000	0.000	0.000
ER	1046.000	6900.000	1045.500	7000.000	1045.000	7100.000	1044.000	7305.000	1042.700	7410.000
ER	1042.000	7525.000	1041.700	7640.000	1041.500	7875.000	1041.000	8170.000	1041.500	8560.000
ER	1040.000	8720.000	1040.000	8800.000	1040.800	9085.000	1041.000	9500.000	1042.000	9585.000
ER	1044.000	9600.000	1042.000	5615.000	1040.300	5630.000	1044.000	9700.000	1044.000	9720.000
ER	1044.000	9745.000	1042.000	9765.000	1040.000	9770.000	1038.000	9800.000	1036.000	9805.000
ER	1034.000	9815.000	1032.000	9865.000	1030.700	9880.000	1032.000	9890.000	1034.000	9915.000
ER	1032.000	9945.000	1031.600	10000.000	1035.000	10204.000	1034.000	10224.000	1033.000	10245.000
ER	1032.000	10266.000	1031.100	10274.000	1031.500	10335.000	1032.500	10484.000	1033.500	10632.000
ER	1033.800	10679.400	1044.200	10700.200	1046.000	12750.000	0.000	0.000	0.000	0.000
ET	63.000	0.000	0.000	7.100	9.100	0.000	9669.000	10572.000	9669.000	10572.000
		AP PLAN STA. 63+00								
>1	63.000	37.000	9670.000	10571.600	460.000	380.000	400.000	0.000	0.000	0.000
ER	1050.000	6725.000	1049.000	6950.000	1048.000	7040.000	1047.200	7190.000	1046.000	7330.000
ER	1044.000	7710.000	1043.400	8020.000	1043.200	8470.000	1043.100	8630.000	1043.100	8865.000
ER	1043.300	9315.000	1043.300	9490.000	1042.000	9535.000	1042.000	9655.000	1043.500	9670.000
ER	1042.000	9685.000	1040.000	9715.000	1038.000	9760.000	1036.000	9780.000	1034.000	9845.000
ER	1034.000	9890.000	1032.700	9960.000	1032.900	10000.000	1032.000	10020.000	1032.300	10100.000
ER	1032.000	10120.000	1031.800	10130.000	1032.000	10140.000	1031.700	10145.000	1032.500	10266.000
ER	1033.500	10415.000	1034.400	10550.400	1045.000	10571.600	1045.500	11090.000	1046.000	11350.000
ER	1047.700	11390.000	1048.000	12390.000	0.000	0.000	0.000	0.000	0.000	0.000
ET	70.500	0.000	0.000	7.100	9.100	0.000	9579.000	10271.000	9579.000	10271.000
		AP PLAN STA. 70+50								
>1	70.500	40.000	9580.000	10270.000	710.000	700.000	750.000	0.000	0.000	0.000
ER	1049.800	7020.000	1048.000	7215.000	1047.700	7255.000	1046.000	7310.000	1045.800	7420.000
ER	1045.000	7825.000	1045.100	7985.000	1044.300	8190.000	1045.000	8520.000	1044.700	8790.000
ER	1045.200	9075.000	1044.600	9360.000	1044.000	9460.000	1043.000	9485.000	1042.000	9505.000
ER	1042.000	9550.000	1044.000	9565.000	1044.000	9570.000	1044.000	9580.000	1042.000	9595.000
ER	1040.700	9625.000	1041.800	9720.000	1040.000	9825.000	1038.000	9840.000	1035.500	9922.000
ER	1035.500	9994.000	1036.400	10000.000	1034.500	10055.000	1033.500	10122.000	1035.500	10147.000
ER	1033.500	10165.000	1034.500	10240.000	1046.500	10262.000	1047.500	10270.000	1046.000	10390.000
ER	1046.000	10490.000	1046.500	10560.000	1046.000	10600.000	1046.000	11300.000	1048.000	11700.000

```
ET      77.000       0.000       7.100       7.100       5.100       0.000    9775.000   10250.000    9775.000   10250.000
                AP PLAN STA. 74+16, END CHANNEL AT 107TH AVE.
                NORTH PROJECT X-77.0 USED AS NATURAL RIVER BED
X1      77.000      33.000    9776.000   10148.000     480.000     660.000     650.000       0.000       0.000       0.000
GR    1052.000    7105.000    1050.000    7110.000    1048.400    7205.000    1046.000    7500.000    1047.000    8115.000
GR    1047.300    8410.000    1047.200    8760.000    1046.000    9880.000    1045.700    9225.000    1045.500    9390.000
GR    1044.200    9548.000    1044.000    9648.000    1043.700    9748.000    1051.000    9776.000    1044.600    9807.000
GR    1042.300    9858.000    1042.200    9875.000    1043.400    9884.000    1042.300    9891.000    1042.800    9900.000
GR    1035.600    9921.000    1036.300    9956.000    1036.200   10000.000    1035.500   10048.000    1034.600   10078.000
GR    1035.700   10104.000    1044.700   10148.000    1044.500   10165.000    1046.200   10192.000    1046.100   10214.000
GR    1046.700   10236.000    1048.100   10248.000    1050.900   10285.000       0.000       0.000       0.000       0.000

ET      84.000       0.000       0.000       7.100       9.100       0.000    9844.000   10790.000    9844.000   10401.000
ET      84.000       0.000       0.000       0.000       0.000       9.100       0.000       0.000    7545.000   10790.000
X1      84.000      40.000    9845.000   10400.000     620.000     700.000     700.000       0.000       0.000       0.000
X3      10.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000
GR    1054.000    7475.000    1052.000    7490.000    1052.000    7520.000    1052.000    7545.000    1051.000    7570.000
GR    1050.000    7795.000    1048.500    7970.000    1048.400    8210.000    1046.200    8500.000    1048.200    8820.000
GR    1050.000    8950.000    1046.700    9320.000    1048.000    9480.000    1047.500    9630.000    1046.000    9740.000
GR    1046.000    9815.000    1052.000    9840.000    1053.500    9845.000    1052.000    9855.000    1046.100    9875.000
GR    1044.100    9880.000    1042.100    9905.000    1036.100    9915.000    1035.800    9970.000    1036.100    9998.000
GR    1038.100   10025.000    1038.100   10045.000    1040.100   10115.000    1042.100   10160.000    1042.100   10215.000
GR    1040.100   10230.000    1040.100   10360.000    1042.100   10370.000    1044.400   10400.000    1042.000   10415.000
GR    1042.000   10490.000    1044.000   10570.000    1048.000   10610.000    1050.000   10615.000    1050.000   10790.000

ET      88.700       0.000       0.000       7.100       9.100       0.000    9725.000   10980.000    9725.000   10301.000
                GRAVEL PIT, LOB BREAKOUT TO X95.5. D/S B.O. LIMITED IN Q TO X77
X1      88.700      47.000    9730.000   10300.000     520.000     430.000     470.000       0.000       0.000       0.000
X3       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000
GR    1054.000    6520.000    1052.000    6550.000    1052.000    6580.000    1052.000    7170.000    1052.000    7440.000
GR    1052.000    8650.000    1050.400    8770.000    1050.200    8910.000    1050.200    9080.000    1050.100    9250.000
GR    1050.000    9630.000    1050.000    9725.000    1052.000    9730.000    1050.000    9735.000    1036.200    9760.000
GR    1035.900    9765.000    1036.200    9770.000    1042.200    9810.000    1042.200    9910.000    1034.200    9930.000
GR    1036.200    9990.000    1036.200   10000.000    1036.200   10030.000    1034.200   10100.000    1034.200   10170.000
GR    1044.100   10220.000    1044.100   10220.000    1045.600   10300.000    1046.000   10310.000    1046.000   10360.000
GR    1048.000   10430.000    1050.000   10455.000    1052.300   10500.000    1052.000   10530.000    1050.000   10560.000
GR    1050.000   10610.000    1052.000   10615.000    1052.000   10650.000    1050.000   10700.000    1052.000   10710.000
GR    1052.000   10760.000    1050.000   10765.500    1050.000   10830.000    1050.900   10850.000    1051.100   10950.000
GR    1052.000   10980.000    1058.000   11030.000       0.000       0.000       0.000       0.000       0.000       0.000

ET      95.500       0.000       0.000       0.000       9.100       0.000       0.000       0.000    9499.000   10306.000
                GRAVEL PIT, LOB BREAKOUT TO X88.7.
X1      95.500      40.000    9500.000   10305.000     400.000     680.000     680.000       0.000       0.000       0.000
X3      10.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000
GR    1056.000    6420.000    1055.800    6575.000    1055.000    7030.000    1053.300    7530.000    1053.300    7540.000
GR    1052.000    7550.000    1052.000    7610.000    1052.000    7615.000    1052.000    8270.000    1052.000    8610.000
GR    1052.000    8855.000    1052.000    9140.000    1053.600    9340.000    1052.000    9470.000    1052.000    9500.000
GR    1050.000    9535.000    1050.000    9840.000    1048.100    9845.000    1046.100    9850.000    1044.200    9890.000
GR    1042.200    9905.000    1040.200    9915.000    1037.500    9960.000    1036.200   10000.000    1036.200   10085.000
GR    1034.200   10120.000    1034.200   10240.000    1036.200   10250.000    1038.200   10260.000    1038.200   10280.000
GR    1052.000   10305.000    1050.000   10310.000    1050.000   10330.000    1052.000   10420.000    1050.700   10580.000
GR    1051.000   10880.000    1052.000   10975.000    1052.100   11070.000    1054.000   11280.000    1064.000   11400.000
```

ET	100.700	0.000	0.000	0.000	9.100	0.000	0.000	0.000	9625.000	10191.000
X1	100.700	48.000	9630.000	10190.000	550.000	620.000	520.000	0.000	0.000	0.000
GR	1056.000	7400.000	1055.100	7450.000	1070.000	7451.000	1070.000	7600.000	1056.000	7601.000
GR	1055.000	7730.000	1070.000	7731.000	1070.000	8019.000	1054.500	8020.000	1054.300	8110.000
GR	1070.000	8111.000	1070.000	8130.000	1054.200	8140.000	1054.200	8210.000	1054.100	8450.000
GR	1054.200	8600.000	1054.100	8740.000	1053.600	9180.000	1054.000	9300.000	1054.500	9450.000
GR	1054.000	9570.000	1054.000	9630.000	1055.000	9630.000	1054.000	9645.000	1052.000	9670.000
GR	1051.000	9720.000	1052.000	9820.000	1052.000	9865.000	1050.000	9890.000	1042.300	9900.000
GR	1042.300	9960.000	1040.300	9970.000	1036.300	9980.000	1036.300	10070.000	1035.000	10100.000
GR	1036.300	10120.000	1038.300	10130.000	1040.300	10155.000	1052.000	10190.000	1052.000	10240.000
GR	1053.000	10270.000	1052.000	10300.000	1052.000	10380.000	1052.200	10430.000	1053.300	10570.000
GR	1053.700	10880.000	1054.000	11140.000	1062.000	11200.000	0.000	0.000	0.000	0.000
ET	107.000	0.000	0.000	0.000	9.100	0.000	0.000	0.000	9709.000	10256.000
X1	107.000	48.000	9710.000	10255.000	300.000	640.000	630.000	0.000	0.000	0.000
GR	1058.900	7275.000	1058.700	7480.000	1058.200	7715.000	1058.000	7750.000	1056.000	7810.000
GR	1070.000	7811.000	1070.000	7920.000	1055.300	7921.000	1055.100	8025.000	1055.000	8120.000
GR	1070.000	8121.000	1070.000	8194.000	1055.500	8195.000	1055.200	8330.000	1070.000	8331.000
GR	1070.000	8389.000	1055.300	8390.000	1055.100	8580.000	1054.200	8630.000	1054.400	8835.000
GR	1054.500	9105.000	1054.800	9370.000	1056.000	9490.000	1056.000	9620.000	1056.000	9710.000
GR	1052.000	9735.000	1040.100	9750.000	1039.600	9755.000	1040.100	9770.000	1040.100	9830.000
GR	1038.100	9835.000	1038.100	9960.000	1040.100	9985.000	1040.100	10110.000	1042.100	10130.000
GR	1042.100	10180.000	1045.100	10190.000	1045.100	10240.000	1054.000	10255.000	1055.000	10365.000
GR	1055.700	10460.000	1055.700	10550.000	1056.000	10735.000	1057.000	10740.000	1056.100	10755.000
GR	1056.200	10870.000	1056.000	10980.000	1060.000	11010.000	0.000	0.000	0.000	0.000
AC	0.045	0.045	0.035	0.300	0.500	0.000	0.000	0.000	0.000	0.000
ET	110.700	0.000	0.000	0.000	9.100	0.000	0.000	0.000	9734.000	10236.000
X1	110.700	42.000	9735.000	10235.000	600.000	300.000	370.000	0.000	0.000	0.000
GR	1060.000	7845.000	1060.000	7846.000	1058.000	7852.000	1058.000	7854.000	1057.700	8000.000
GR	1058.000	8145.000	1058.000	8150.000	1058.000	8200.000	1057.100	8540.000	1057.400	8810.000
GR	1056.600	8950.000	1056.100	9075.000	1056.000	9100.000	1055.600	9320.000	1055.400	9430.000
GR	1056.000	9495.000	1056.700	9525.000	1056.000	9540.000	1054.000	9545.000	1054.000	9690.000
GR	1055.600	9735.000	1054.000	9770.000	1042.200	9790.000	1041.500	9820.000	1042.200	9870.000
GR	1046.200	9880.000	1048.200	9910.000	1045.200	10000.000	1045.200	10120.000	1048.200	10160.000
GR	1047.000	10190.000	1048.200	10215.000	1056.000	10235.000	1054.000	10250.000	1054.000	10340.000
GR	1056.000	10345.000	1056.700	10500.000	1056.000	10590.000	1055.800	10670.000	1056.000	10770.000
GR	1058.000	10810.000	1060.000	10830.000	0.000	0.000	0.000	0.000	0.000	0.000
ET	117.200	0.000	0.000	0.000	9.100	0.000	0.000	0.000	9844.000	10196.000
	DOWNSTREAM SIDE GLENDALE AVE BRIDGE									
X1	117.200	33.000	9845.000	10195.000	800.000	400.000	650.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	1061.000	1061.000	0.000
GR	1066.000	7075.000	1064.000	7120.000	1062.000	8020.000	1060.000	8035.000	1060.000	8037.000
GR	1059.800	8280.000	1060.000	8340.000	1060.000	8360.000	1060.000	8380.000	1058.500	8500.000
GR	1058.700	8630.000	1057.900	8780.000	1057.900	9100.000	1058.400	9330.000	1058.000	9550.000
GR	1058.000	9730.000	1056.000	9845.000	1054.100	9855.000	1052.200	9885.000	1050.200	9910.000
GR	1048.200	9970.000	1046.400	10030.000	1046.400	10120.000	1048.200	10165.000	1056.000	10195.000
GR	1057.000	10260.000	1057.500	10460.000	1056.000	10550.000	1056.000	10940.000	1056.000	11415.000
GR	1058.000	11555.000	1060.000	11620.000	1062.000	11685.000	0.000	0.000	0.000	0.000

SB	0.900	1.560	2.900	0.000	352.000	15.000	5503.000	0.000	1046.500	1046.200
ET	118.000	0.000	0.000	0.000	9.110	0.000	0.000	0.000	9844.000	10196.000

UPSTREAM SIDE GLENDALE AVE BRIDGE-PERCHED. 2FT DEBRIS PER PIER.
1983 TOPO WITHIN 0.3FT OF BRIDGE PLAN DECK.USED PLANS MINUS 0.3FT

>1	118.000	33.000	9845.000	10195.000	80.000	80.000	80.000	0.000	0.000	0.000
>2	0.000	0.000	1.000	1063.100	1063.000	0.000	0.000	0.000	0.000	0.000
>3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	1063.500	1063.000	0.000
ET	18.000	8080.000	1064.500	0.000	8140.000	1063.900	0.000	8420.000	1063.600	0.000
ET	0.000	8720.000	1063.500	0.000	9000.000	1063.500	0.000	9230.000	1063.600	0.000
ET	0.000	9650.000	1064.000	0.000	9700.000	1064.500	0.000	9844.000	1066.100	0.000
ET	0.000	9845.000	1066.600	1063.100	10195.000	1068.600	1063.100	10196.000	1066.100	0.000
ET	0.000	10370.000	1064.000	0.000	10600.000	1063.300	0.000	11150.000	1063.000	0.000
ET	0.000	11195.000	1063.400	0.000	11480.000	1063.600	0.000	11515.000	1064.000	0.000
ER	1066.000	7865.000	1066.000	7866.000	1065.000	8030.000	1065.000	8031.000	1065.000	8032.000
ER	1064.000	8190.000	1062.900	8250.000	1062.000	8320.000	1060.100	8515.000	1060.000	9170.000
ER	1059.000	9290.000	1060.000	9710.000	1060.000	9835.000	1056.000	9845.000	1056.000	9860.000
ER	1049.900	9895.000	1047.900	9920.000	1047.400	10020.000	1047.900	10130.000	1049.900	10160.000
ER	1051.900	10175.000	1058.000	10195.000	1058.000	10210.000	1060.000	10220.000	1058.000	10730.000
ER	1057.400	11030.000	1057.400	11190.000	1058.000	11330.000	1060.000	11400.000	1062.000	11403.000
ER	1064.000	11415.000	1064.000	11450.000	1066.000	11485.000	0.000	0.000	0.000	0.000
ET	120.000	0.000	7.100	7.100	9.100	0.000	9550.000	10400.000	9799.000	10206.000
>1	120.000	40.000	9800.000	10205.000	200.000	130.000	200.000	0.000	0.000	0.000
>3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ER	1066.800	7650.000	1066.200	7795.000	1066.000	7840.000	1064.400	8070.000	1064.000	8160.000
ER	1062.000	8255.000	1061.300	8300.000	1060.300	8480.000	1060.200	8715.000	1065.900	8950.000
ER	1061.400	9100.000	1060.400	9200.000	1060.000	9220.000	1059.400	9260.000	1059.500	9360.000
ER	1058.400	9430.000	1059.800	9530.000	1058.000	9630.000	1058.000	9660.000	1058.600	9725.000
ER	1058.000	9760.000	1058.000	9780.000	1058.200	9800.000	1057.900	9820.000	1055.900	9825.000
ER	1051.900	9850.000	1049.900	9870.000	1045.900	9880.000	1045.900	10180.000	1058.000	10205.000
ER	1058.500	10270.000	1058.500	10330.000	1059.600	10350.000	1059.200	10400.000	1058.400	10700.000
ER	1058.000	11000.000	1056.700	11185.000	1056.700	11275.000	1060.000	11345.000	1066.000	11370.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

THIS RUN EXECUTED 16 JAN 88 11:06:09

```
*****************************************************
HEC2 RELEASE DATED NOV 76 UPDATED MAR  1982
ERROR CORR -  01,02,03,04,05
MODIFICATION -  50,51,52,53,54,55
*****************************************************
```

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

EXISTING COND.
SUMMARY PRINTOUT

	SECNO	Q	CWSEL	CRIWS	DEPTH	ELMIN	AREA	EG	VCH	SSTA	TOPWID	ENDST	XLCH
	9.718	12500.00	1024.57	1022.94	5.77	1019.20	4132.83	1025.11	3.02	9318.44	1208.15	10987.09	0.00
	9.718	29000.00	1026.89	1024.10	7.69	1019.20	11587.66	1027.01	3.09	9301.70	5410.01	15072.54	0.00
	9.718	39000.00	1027.47	1024.73	8.27	1019.20	15187.24	1027.59	3.24	8519.06	6470.44	15156.15	0.00
	9.718	35000.00	1027.47	1024.73	8.27	1019.20	15187.24	1027.59	3.24	8519.06	6470.44	15156.15	0.00
	9.718	70000.00	1028.73	1026.41	9.53	1019.20	23739.37	1028.90	3.78	8228.21	6551.31	15202.99	0.00
*	10.000	12500.00	1028.07	1028.07	4.07	1024.00	2268.11	1028.72	7.53	8600.00	1678.18	10387.04	1000.00
*	10.000	29000.00	1029.09	1029.09	5.09	1024.00	4190.57	1030.03	9.35	8600.00	2074.71	10848.18	1000.00
*	10.000	39000.00	1029.45	1029.45	5.45	1024.00	4968.20	1030.66	10.69	8600.00	2223.43	10908.54	1000.00
*	10.000	35000.00	1030.00	1030.00	6.00	1024.00	4218.61	1031.58	11.55	9050.00	1320.00	10370.00	1000.00
	10.000	70000.00	1030.11	1028.17	6.11	1024.00	15337.42	1030.46	5.47	6922.21	4578.36	11500.57	1000.00
	13.000	12500.00	1029.06	1026.68	6.86	1022.20	4740.82	1029.21	3.46	8600.00	1526.59	10405.30	300.00
	13.000	29000.00	1030.44	1028.21	8.24	1022.20	7244.25	1030.77	5.42	8600.00	2117.02	10717.02	300.00
	13.000	39000.00	1031.08	1029.07	8.88	1022.20	8676.48	1031.50	6.21	8600.00	2348.06	10948.06	300.00
	13.000	39000.00	1031.97	1029.69	9.77	1022.20	7048.77	1032.58	7.00	9050.00	1324.00	10374.00	300.00
	13.000	70000.00	1030.52	1027.93	8.32	1022.20	22626.11	1030.69	4.48	5407.72	5335.77	10743.48	300.00
	20.000	12500.00	1029.74	1027.25	6.14	1023.60	3120.81	1030.04	4.43	8800.00	1315.11	10567.49	700.00
	20.000	29000.00	1031.67	1029.90	8.07	1023.60	6543.16	1032.08	5.61	8800.00	2083.89	10993.67	700.00
	20.000	39000.00	1032.46	1030.69	8.86	1023.60	8285.63	1032.92	6.08	8800.00	2303.86	11128.36	700.00
	20.000	39000.00	1033.37	1030.66	9.77	1023.60	7192.77	1033.90	6.15	9100.00	1345.00	10445.00	700.00
	20.000	70000.00	1031.58	1029.71	7.98	1023.60	18251.11	1031.84	5.24	5924.83	4525.28	10976.59	700.00
	26.800	12500.00	1031.00	1029.24	6.10	1024.90	2244.34	1031.48	5.57	9835.10	555.31	10390.41	680.00
	26.800	29000.00	1033.12	1031.49	8.22	1024.90	5865.69	1033.74	6.90	8000.00	2528.09	10533.42	680.00
	26.800	39000.00	1033.93	1032.93	9.03	1024.90	8161.13	1034.54	7.14	8000.00	3200.43	11200.43	680.00
	26.800	39000.00	1034.58	1032.84	9.68	1024.90	5892.09	1035.45	7.50	9150.30	1250.00	10400.00	680.00
	26.800	70000.10	1033.43	1033.01	8.53	1024.90	11555.22	1034.33	9.75	6445.71	4290.72	10736.44	680.00

SECNO	Q	CWSEL	CRIWS	DEPTH	ELMIN	AREA	EE	VCH	SSTA	TOPWIC	ENDST	XLCH
32.600	12500.00	1032.40	1030.26	6.20	1026.20	2451.48	1032.80	5.10	9672.17	544.62	10216.79	580.00
32.600	29000.00	1034.60	1032.31	8.40	1026.20	4116.00	1035.49	7.61	8824.81	1355.39	10221.21	580.00
32.600	39000.00	1035.25	1033.34	9.05	1026.20	5090.06	1036.42	8.88	8500.00	1680.67	10222.50	580.00
32.600	39000.00	1036.03	1033.38	9.83	1026.20	5782.68	1036.99	7.72	9000.00	1224.06	10224.06	580.00
32.600	70000.00	1035.55	1035.32	9.75	1026.20	11645.20	1036.85	9.27	6318.10	3505.80	10223.90	580.00
38.000	12500.00	1033.52	1031.69	6.32	1027.20	2302.25	1033.98	5.43	9511.40	546.26	10057.66	540.00
38.000	29000.00	1036.23	1033.77	9.03	1027.20	4215.42	1037.06	7.32	8900.00	1163.06	10063.06	540.00
38.000	39000.00	1037.16	1034.82	9.96	1027.20	5284.44	1038.17	8.26	8900.00	1164.90	10064.90	540.00
38.000	39000.00	1037.22	1034.79	10.12	1027.20	5478.65	1038.26	8.01	8900.00	1165.23	10065.23	540.00
38.000	70000.00	1037.68	1036.75	10.48	1027.20	12771.68	1038.44	8.61	6412.38	3653.58	10065.96	540.00
45.000	12500.00	1034.56	1032.42	6.66	1028.30	2673.46	1035.30	4.68	9568.75	554.58	10123.33	700.00
45.000	29000.00	1038.03	1034.48	9.73	1028.30	4624.12	1038.64	6.27	9394.27	735.18	10129.45	700.00
45.000	39000.00	1039.08	1035.48	10.78	1028.30	5524.15	1039.81	6.96	9150.00	981.56	10131.56	700.00
45.000	39000.00	1039.10	1035.49	10.80	1028.30	5541.78	1039.82	6.94	9150.00	981.60	10131.60	700.00
45.000	70000.00	1039.21	1037.64	11.01	1028.30	15174.50	1039.78	6.83	6528.80	3603.21	10132.02	700.00
51.700	12500.00	1035.77	1032.33	8.37	1027.40	3871.52	1035.93	3.23	9870.58	713.15	10583.73	670.00
51.700	29000.00	1039.05	1033.97	11.65	1027.40	6241.68	1039.38	4.65	9859.09	731.20	10590.29	670.00
51.700	39000.00	1040.18	1034.80	12.78	1027.40	7077.68	1040.66	5.51	9816.33	741.62	10592.57	670.00
51.700	39000.00	1040.19	1034.80	12.79	1027.40	7085.08	1040.66	5.50	9816.13	741.90	10592.59	670.00
51.700	70000.00	1040.24	1037.34	12.84	1027.40	17015.43	1040.63	6.05	7054.56	3449.92	10592.68	670.00
54.000	12500.00	1035.52	1032.88	7.52	1028.00	3537.57	1036.08	3.17	9862.24	818.20	10680.44	230.00
54.000	29000.00	1039.25	1034.46	11.25	1028.00	6677.54	1039.54	4.34	9858.50	828.59	10687.09	230.00
54.000	39000.00	1040.44	1035.22	12.44	1028.00	7670.36	1040.84	5.08	9857.22	832.27	10689.49	230.00
54.000	39000.00	1040.45	1035.22	12.45	1028.00	7678.01	1040.85	5.08	9857.21	832.30	10689.50	230.00
54.000	70000.00	1040.47	1037.93	12.47	1028.00	16691.35	1040.90	6.13	7075.31	3568.24	10689.55	230.00
59.000	12500.00	1036.36	1034.54	5.66	1030.70	3173.12	1036.60	3.54	9804.10	880.41	10684.52	500.00
59.000	29000.00	1039.61	1035.95	8.91	1030.70	6072.15	1039.96	4.78	9775.91	915.11	10691.01	500.00
59.000	39000.00	1040.85	1036.70	10.15	1030.70	7215.55	1041.30	5.40	9767.88	925.61	10693.49	500.00
59.000	39000.00	1040.85	1036.70	10.15	1030.70	7222.80	1041.31	5.40	9767.86	925.64	10693.51	500.00
59.000	70000.00	1040.69	1038.55	9.99	1030.70	7245.56	1042.20	9.86	8645.80	1337.94	10693.19	500.00
63.000	12500.00	1036.99	1035.14	5.29	1031.70	2940.64	1037.27	4.25	9770.13	785.44	10555.57	400.00
63.000	29000.00	1040.01	1036.71	8.31	1031.70	5393.87	1040.46	5.38	9714.87	846.74	10561.62	400.00
63.000	39000.00	1041.25	1037.49	9.55	1031.70	6458.27	1041.82	6.04	9696.25	867.85	10564.10	400.00
63.000	39000.00	1041.26	1037.49	9.56	1031.70	6463.85	1041.82	6.03	9696.15	867.96	10564.11	400.00
63.000	70000.00	1042.05	1039.54	10.35	1031.70	7206.38	1043.56	9.73	9531.81	1005.82	10565.78	400.00
70.500	12500.00	1038.75	1038.20	5.25	1033.50	1473.21	1039.87	8.48	9834.36	413.44	10247.80	750.00
70.500	29000.00	1040.95	1040.68	7.45	1033.50	2425.40	1043.16	11.54	9619.29	509.18	10251.82	750.00
70.500	39000.00	1042.27	1042.08	8.77	1033.50	3237.55	1044.53	12.04	9592.94	661.32	10254.25	750.00
70.500	39000.00	1042.27	1042.08	8.77	1033.50	3239.13	1044.53	12.04	9592.92	661.33	10254.26	750.00
70.500	70000.00	1045.83	1045.83	12.33	1033.50	7862.14	1047.69	11.40	7402.33	2858.44	10260.78	750.00

SECNO	Q	CWSEL	CRIWS	DEPTH	ELMIN	AREA	EG	VCH	SSTA	TOPWID	ENDST	XLCH
77.000	12500.00	1042.44	1040.76	7.84	1034.60	1407.86	1043.66	8.88	9855.10	260.65	10136.91	650.00
77.000	29000.00	1045.77	1044.52	11.17	1034.60	2503.80	1047.89	11.68	9801.32	372.56	10174.29	650.00
77.000	39000.00	1046.88	1045.95	12.28	1034.60	2538.24	1049.71	13.52	9795.96	418.13	10237.54	650.00
77.000	39000.00	1046.88	1045.95	12.28	1034.60	2537.84	1049.71	13.52	9795.96	418.10	10237.53	650.00
* 77.000	70000.00	1049.14	1049.14	14.54	1034.60	10158.32	1050.62	11.93	7160.90	3084.76	10261.78	650.00
84.000	12500.00	1044.53	1042.13	9.13	1035.80	3106.55	1045.21	4.32	9877.91	701.43	10579.35	700.00
84.000	29000.00	1048.88	1044.49	13.08	1035.80	5971.12	1049.27	5.28	9865.58	746.62	10612.20	700.00
84.000	39000.00	1050.69	1045.17	14.89	1035.80	7445.44	1051.15	5.77	9859.45	530.54	10790.00	700.00
84.000	39000.00	1050.72	1045.28	14.92	1035.80	5781.52	1051.43	6.75	9859.33	541.67	10801.00	700.00
84.000	70000.00	1051.19	1047.45	15.39	1035.80	7918.12	1052.53	9.82	9857.75	532.25	10790.00	700.00
88.700	12500.00	1045.28	1039.31	11.18	1034.20	3670.62	1045.56	3.41	9743.36	545.28	10288.64	470.00
88.700	29000.00	1049.24	1042.52	15.04	1034.20	6193.21	1049.61	4.88	9736.37	709.18	10445.55	470.00
88.700	39000.00	1051.03	1043.63	16.83	1034.20	7653.44	1051.48	5.48	9732.41	999.72	10917.14	470.00
88.700	39000.00	1051.25	1043.65	17.15	1034.20	7028.74	1051.83	5.55	9731.62	569.38	10301.00	470.00
88.700	70000.00	1052.43	1046.81	18.23	1034.20	12482.01	1053.29	7.97	6543.60	4439.96	10983.56	470.00
95.500	12500.00	1045.68	1039.18	11.48	1034.20	3705.46	1045.86	3.37	9858.85	434.70	10293.55	680.00
95.500	29000.00	1049.59	1041.77	15.39	1034.20	5467.76	1050.03	5.30	9841.08	459.56	10300.64	680.00
95.500	39000.00	1051.52	1043.03	17.32	1034.20	6845.14	1052.03	5.70	9508.36	795.77	10304.13	680.00
95.500	39000.00	1051.87	1043.03	17.67	1034.20	7111.16	1052.33	5.48	9502.53	802.20	10304.74	680.00
95.500	70000.00	1053.33	1046.52	19.13	1034.20	12358.53	1054.14	7.59	7522.12	3627.12	11205.59	680.00
100.700	12500.00	1045.72	1041.91	10.72	1035.00	1970.48	1046.34	6.34	9895.56	275.65	10171.21	520.00
100.700	29000.00	1049.43	1045.51	14.43	1035.00	3025.44	1050.86	9.59	9890.73	291.60	10182.33	520.00
100.700	39000.00	1051.54	1047.09	16.54	1035.00	3683.53	1053.28	10.59	9692.92	399.15	10188.63	520.00
100.700	39000.00	1051.90	1047.09	16.90	1035.00	3833.19	1053.50	10.17	9675.49	456.83	10189.67	520.00
* 100.700	70000.00	1054.77	1054.77	19.77	1035.00	8006.23	1056.74	11.81	8019.98	3085.33	11145.75	520.00
107.000	12500.00	1046.80	1042.66	8.70	1038.10	3194.50	1047.04	3.91	9741.55	501.32	10242.87	630.00
107.000	29000.00	1051.24	1045.00	13.14	1038.10	5449.76	1051.68	5.32	9735.96	514.40	10250.35	630.00
107.000	39000.00	1053.66	1046.14	15.56	1038.10	6705.75	1054.18	5.82	9724.66	529.75	10254.42	630.00
107.000	39000.00	1053.87	1046.11	15.77	1038.10	6819.79	1054.38	5.72	9723.32	531.46	10254.78	630.00
107.000	70000.00	1057.00	1048.87	18.90	1038.10	12824.22	1057.79	7.47	7780.06	2562.04	10987.48	630.00
* 110.700	12500.00	1050.12	1050.12	8.62	1041.50	1301.04	1051.56	9.61	9776.57	443.36	10219.93	370.00
* 110.700	29000.00	1052.21	1052.21	10.71	1041.50	2236.86	1054.82	12.96	9773.03	452.26	10225.29	370.00
* 110.700	39000.00	1053.23	1053.23	11.73	1041.50	2698.53	1056.47	14.45	9771.31	456.59	10227.90	370.00
* 110.700	39000.00	1053.52	1053.52	12.02	1041.50	2830.18	1056.46	13.78	9770.82	457.81	10228.63	370.00
* 110.700	70000.00	1057.61	1057.61	16.11	1041.50	7757.39	1059.67	12.37	8345.56	2456.74	10802.29	370.00
117.200	12500.00	1054.14	1051.64	7.74	1046.40	1880.57	1054.82	6.65	9854.81	333.02	10187.83	650.00
117.200	29000.00	1057.17	1054.65	10.77	1046.40	2528.79	1058.70	9.90	9845.00	350.00	10195.00	650.00
117.200	39000.00	1058.53	1056.04	12.13	1046.40	3403.53	1060.57	11.46	9845.00	350.00	10195.00	650.00
117.200	39000.00	1058.28	1056.04	11.88	1046.40	3314.29	1060.43	11.77	9845.00	350.00	10195.00	650.00
* 117.200	70000.00	1061.06	1061.06	14.66	1046.40	15591.55	1061.70	8.40	8027.07	3627.30	11654.37	650.00

SECNO	Q	CWSEL	CRIWS	DEPTH	ELMIN	AREA	EG	VCH	SSTA	TOPWID	ENDST	XLCH
118.000	12500.00	1054.22	0.00	6.82	1047.40	1783.72	1054.98	7.01	9870.23	312.37	10182.60	80.00
118.000	29000.00	1057.43	0.00	10.03	1047.40	2836.56	1055.06	10.22	9849.24	343.90	10193.15	80.00
118.000	39000.00	1058.94	0.00	11.54	1047.40	3360.72	1061.03	11.60	9845.00	350.00	10195.00	80.00
118.000	39000.00	1058.74	0.00	11.34	1047.40	3290.71	1060.92	11.85	9845.00	350.00	10195.00	80.00
118.000	70000.00	1063.85	0.00	16.45	1047.40	17838.56	1064.31	7.13	8197.91	3216.22	11414.13	80.00
120.000	12500.00	1055.08	1049.63	9.18	1045.90	3028.46	1055.35	4.13	9830.12	368.85	10198.97	200.00
120.000	29000.00	1059.06	1052.42	13.16	1045.90	4828.97	1059.67	6.31	9571.12	769.06	10340.18	200.00
120.000	39000.00	1061.05	1053.79	15.15	1045.90	6495.28	1061.75	6.88	9550.00	850.00	10400.00	200.00
120.000	39000.00	1060.82	1053.78	14.92	1045.90	5279.78	1061.67	7.39	9799.00	407.00	10206.00	200.00
120.000	70000.00	1064.04	1057.13	18.14	1045.90	18696.69	1064.45	6.36	8150.34	2566.24	11361.85	200.00

SUMMARY OF ERRORS AND SPECIAL NOTES

```
CAUTION  SECNO=   10.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   10.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=   10.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   10.000  PROFILE= 2  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=   10.000  PROFILE= 3  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   10.000  PROFILE= 3  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=   10.000  PROFILE= 4  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   10.000  PROFILE= 4  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=   70.500  PROFILE= 5  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   70.500  PROFILE= 5  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=   77.000  PROFILE= 5  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   77.000  PROFILE= 5  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=  100.700  PROFILE= 5  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=  100.700  PROFILE= 5  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=  110.700  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=  110.700  PROFILE= 1  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=  110.700  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=  110.700  PROFILE= 2  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=  110.700  PROFILE= 3  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=  110.700  PROFILE= 3  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=  110.700  PROFILE= 4  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=  110.700  PROFILE= 4  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=  110.700  PROFILE= 5  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=  110.700  PROFILE= 5  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=  117.200  PROFILE= 5  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=  117.200  PROFILE= 5  MINIMUM SPECIFIC ENERGY
```

```
*************************************************
* WATER SURFACE PROFILES                        *
* VERSION OF NOVEMBER 1976                      *
* UPDATED MARCH 1982                            *
*                                               *
* RUN DATE SAT, MAR 05 1988 TIME 11:53:43       *
*************************************************
```

```
*************************************
* U.S. ARMY CORPS OF ENGINEERS      *
* THE HYDROLOGIC ENGINEERING CENTER *
* 609 SECOND STREET, SUITE D        *
* DAVIS, CALIFORNIA 95616           *
* (916) 440-2105 (FTS) 448-2105     *
*************************************
```

```
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
```

AGUA FRIA -PROPOSED CONDITIONS

THIS RUN EXECUTED 08 JUN 88 14:42:04

```
*****************************************
HEC2 RELEASE DATED NOV 76 UPDATED MAR 1982
ERROR CORR - 01,02,03,04,05
MODIFICATION - 50,51,52,53,54,55
*****************************************
```

T1 CAMELBACK RANCH - AGUA FRIA RIVER
T2 DESIGN CONDITIONS - FROM D/S OF INDIAN SCHOOL RD. TO BETHANY HOME RD.
T3 DESIGN COND. 10 YEAR EVENT (AFR1122D1D)

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	2.	0.	0.	0.000000	0.00	0.0	0.	1006.410	0.000

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1.000	0.000	-1.000	10.000	67.670	0.000	-1.000	0.000	0.000	0.000

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

38.000	43.000	1.000	2.000	8.000	42.000	25.000	3.000	26.000	53.000
4.000	54.000	39.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

QT	6.000	22800.000	68000.000	93000.000	93000.000	182000.000	142000.000	0.000	0.000	0.000
NC	0.045	0.045	0.035	0.100	0.300	0.000	0.000	0.000	0.000	0.000
T	0.000	0.000	0.000	7.100	9.100	7.100	8550.000	12200.000	8565.000	11870.000
1	8.153	55.000	9880.000	10500.000	280.000	280.000	280.000	0.000	0.000	0.000
X4	2.000	1010.000	6870.000	1010.100	6700.000	0.000	0.000	0.000	0.000	0.000
GR	1010.300	6500.000	1008.600	7030.000	1008.000	7250.000	1007.200	7440.000	1007.800	7550.000
GR	1006.500	7600.000	1006.100	7950.000	1006.200	8240.000	1006.100	8380.000	1007.500	8390.000
GR	1006.200	8410.000	1006.200	8630.000	1006.000	8830.000	1008.000	8890.000	1116.000	8940.000
R	1010.000	8990.000	1008.000	9020.000	1009.200	9060.000	1008.000	9160.000	1007.800	9200.000
R	1006.000	9320.000	1006.000	9860.000	1012.000	9870.000	1012.800	9880.000	1012.000	9890.000
GR	1000.000	9940.000	998.000	10070.000	997.800	10090.000	998.000	10110.000	998.000	10340.000
GR	998.400	10400.000	1000.000	10450.000	1010.000	10485.000	1012.000	10490.000	1013.500	10500.000
R	1012.000	10530.000	1010.000	10550.000	1010.000	11060.000	1111.600	11100.000	1010.000	11150.000
GR	1010.000	11250.000	1009.600	11370.000	1008.000	11560.000	1008.000	11710.000	1007.000	11890.000
GR	1007.000	12070.000	1006.400	12230.000	1008.000	12380.000	1007.800	12570.000	1007.000	12780.000
R	1007.800	13000.000	1008.000	13160.000	1010.000	13165.000	1010.000	13210.000	1016.000	13280.000
NC	0.045	0.045	0.035	0.300	0.500	0.000	0.000	0.000	0.000	0.000
T	0.000	0.000	0.000	7.100	9.100	7.100	9200.000	11750.000	9200.000	11750.000
1	8.240	52.000	9825.000	10750.000	460.000	400.000	460.000	0.000	0.000	0.000
X4	1.000	1009.000	6740.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	1010.000	6450.000	1008.000	6880.000	1007.100	7080.000	1007.000	7450.000	1007.200	7830.000
R	1007.100	8120.000	1007.100	8430.000	1007.700	8560.000	1008.000	8580.000	1007.600	8700.000
GR	1006.000	8780.000	1006.000	9100.000	1008.000	9130.000	1010.000	9140.000	1010.000	9210.000
GR	1010.300	9230.000	1010.000	9250.000	1008.000	9280.000	1008.000	9410.000	1004.000	9450.000

R	1002.000	9570.000	1002.000	9710.000	1002.000	9790.000	1010.000	9810.000	1012.000	9815.000
GR	1014.000	9825.000	1012.000	9835.000	1002.000	9850.000	1000.700	9940.000	1000.000	10000.000
GR	998.700	10110.000	998.200	10200.000	998.400	10350.000	1000.000	10500.000	1002.000	10570.000
R	1003.000	10640.000	1004.000	10690.000	1014.000	10715.000	1014.400	10750.000	1014.400	11070.000
GR	1016.000	11400.000	1010.000	11440.000	1010.000	11520.000	1013.000	11540.000	1020.000	11541.000
GR	1020.000	11659.000	1013.000	11660.000	1013.000	11690.000	1010.000	11700.000	1008.000	11920.000
R	1008.000	13300.000	1016.000	13340.000	0.000	0.000	0.000	0.000	0.000	0.000
QT	6.000	23000.000	69000.000	95000.000	95000.000	184000.000	142000.000	0.000	0.000	0.000
T	0.000	0.000	0.000	0.000	9.100	0.000	0.000	0.000	9945.000	11548.000
1	8.312	39.000	9945.000	11548.000	500.000	250.000	380.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	1020.000	3800.000	1018.000	4550.000	1016.000	5720.000	1014.000	6350.000	1014.000	6400.000
R	1015.100	6950.000	1014.400	7150.000	1014.000	7730.000	1013.900	8070.000	1014.000	8450.000
GR	1016.000	8760.000	1018.000	9200.000	1020.000	9750.000	1020.000	9945.000	1014.000	9945.000
GR	1004.000	10000.000	1002.000	10030.000	1000.000	10050.000	1000.000	10180.000	998.600	10240.000
R	1000.000	10290.000	1000.000	10580.000	1002.000	10620.000	1004.000	10720.000	1004.000	10860.000
GR	1006.000	10890.000	1007.600	11040.000	1006.000	11115.000	1006.000	11540.000	1014.000	11548.000
GR	1020.000	11548.000	1018.000	12120.000	1016.000	12250.000	1015.100	12370.000	1015.500	12930.000
R	1017.000	13200.000	1017.500	13530.000	1018.000	13650.000	1020.000	13920.000	0.000	0.000
ET	0.000	0.000	0.000	0.000	9.100	0.000	0.000	0.000	9945.000	11548.000
X1	8.313	95.000	9945.000	11548.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	1012.000	1015.100	0.000
BT	3.000	9945.000	1020.000	1014.400	11115.000	1020.000	1014.400	11548.000	1020.000	1014.400
GR	1020.000	3800.000	1018.000	4580.000	1016.000	5720.000	1014.000	6270.000	1012.000	6590.000
GR	1013.000	6980.000	1014.400	7160.000	1014.000	7830.000	1013.900	8100.000	1014.000	8430.000
GR	1016.000	8900.000	1018.000	9160.000	1019.000	9450.000	1019.000	9470.000	1019.400	9550.000
GR	1019.500	9945.000	1014.400	9945.000	1004.000	10000.000	1002.000	10033.000	1014.400	10033.000
GR	1014.400	10035.000	1002.000	10035.000	1000.000	10050.000	1000.000	10123.000	1014.400	10123.000
GR	1014.400	10125.000	1000.000	10125.000	1000.000	10180.000	998.700	10213.000	1014.400	10213.000
GR	1014.400	10215.000	998.700	10215.000	998.600	10240.000	1000.000	10290.000	1000.000	10303.000
GR	1014.400	10303.000	1014.400	10305.000	1000.000	10305.000	1000.000	10393.000	1014.400	10393.000
GR	1014.400	10395.000	1000.000	10395.000	1000.000	10483.000	1014.400	10483.000	1014.400	10485.000
GR	1000.000	10485.000	1000.000	10573.000	1014.400	10573.000	1014.400	10575.000	1000.000	10575.000
GR	1002.000	10620.000	1002.800	10663.000	1014.400	10663.000	1014.400	10665.000	1002.800	10665.000
GR	1004.000	10720.000	1004.000	10753.000	1014.400	10753.000	1014.400	10755.000	1004.000	10755.000
GR	1004.000	10843.000	1014.400	10843.000	1014.400	10845.000	1004.000	10845.000	1004.000	10860.000
GR	1006.000	10890.000	1006.400	10933.000	1014.400	10933.000	1014.400	10935.000	1006.400	10935.000
GR	1007.600	11023.000	1014.400	11023.000	1014.400	11025.000	1007.600	11025.000	1006.000	11113.000
GR	1014.400	11115.000	1006.000	11115.000	1006.000	11203.000	1014.400	11203.000	1006.000	11205.000
GR	1006.000	11293.000	1014.400	11293.000	1006.000	11295.000	1006.000	11383.000	1014.400	11383.000
GR	1006.000	11385.000	1006.000	11473.000	1014.400	11473.000	1006.000	11475.000	1006.000	11540.000
GR	1020.000	11548.000	1016.000	12270.000	1015.100	12400.000	1015.500	12950.000	1017.000	13230.000
ET	0.000	0.000	0.000	7.100	9.100	7.100	0.000	11116.000	9945.000	11548.000
1	8.327	95.000	9945.000	11548.000	78.000	78.000	78.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	1012.000	1015.100	0.000
BT	-4.000	9944.000	1020.000	1013.900	9945.000	1023.500	1014.400	11112.000	1023.500	1014.400
T	0.000	11548.000	1023.500	1014.400	0.000	0.000	0.000	0.000	0.000	0.000
GR	1021.400	3100.000	1020.000	3850.000	1018.000	4580.000	1016.000	5720.000	1014.000	6270.000
GR	1012.000	6590.000	1014.400	7200.000	1014.000	7780.000	1013.900	8120.000	1014.000	8420.000
GR	1016.000	8790.000	1017.000	9020.000	1018.000	9220.000	1019.400	9570.000	1020.000	9740.000
GR	1020.000	9944.000	1014.500	9945.000	1002.000	10000.000	1002.000	10032.000	1014.400	10032.000

R	1014.400	10036.000	1002.000	10036.000	1000.000	10122.000	1014.400	10122.000	1014.400	10126.000
GR	1000.000	10126.000	1000.000	10212.000	1014.400	10212.000	1014.400	10216.000	1000.000	10216.000
R	1009.500	10250.000	1000.000	10302.000	1014.400	10302.000	1014.400	10306.000	1000.000	10306.000
R	1000.000	10392.000	1014.400	10392.000	1014.400	10396.000	1000.000	10396.000	1000.000	10482.000
GR	1014.400	10482.000	1014.400	10486.000	1000.000	10486.000	1000.000	10572.000	1014.400	10572.000
GR	1014.400	10576.000	1000.000	10576.000	1002.000	10630.000	1002.400	10662.000	1014.400	10662.000
R	1014.400	10666.000	1002.400	10666.000	1004.000	10752.000	1014.400	10752.000	1014.400	10756.000
GR	1004.000	10756.000	1005.300	10842.000	1014.400	10842.000	1014.400	10846.000	1005.300	10846.000
GR	1006.200	10932.000	1014.400	10932.000	1014.400	10936.000	1006.200	10936.000	1007.000	11022.000
R	1014.400	11022.000	1014.400	11026.000	1007.000	11026.000	1007.000	11112.000	1014.400	11112.000
R	1014.400	11116.000	1007.000	11116.000	1007.000	11202.000	1014.400	11202.000	1014.400	11206.000
GR	1007.000	11206.000	1007.500	11292.000	1014.400	11292.000	1014.400	11296.000	1007.500	11296.000
R	1008.200	11382.000	1014.400	11382.000	1014.400	11386.000	1008.200	11386.000	1006.500	11472.000
R	1014.400	11472.000	1014.400	11476.000	1006.500	11476.000	1006.000	11490.000	1006.000	11530.000
GR	1020.000	11548.000	1016.000	12270.000	1015.100	12400.000	1015.500	12950.000	1017.000	13230.000
T	0.000	0.000	0.000	0.000	9.100	0.000	0.000	0.000	9945.000	11548.000
X1	8.327	39.000	9945.000	11548.000	1.000	1.000	1.000	0.000	0.000	0.000
GR	1020.000	3700.000	1018.000	4500.000	1017.000	4880.000	1016.500	5100.000	1016.500	5300.000
R	1016.000	5700.000	1014.000	6400.000	1014.000	6800.000	1014.400	7200.000	1014.000	7800.000
R	1013.900	8130.000	1014.000	8470.000	1016.000	8800.000	1017.000	9030.000	1018.000	9250.000
GR	1020.000	9945.000	1006.000	9945.000	1002.000	10000.000	1000.000	10210.000	999.500	10260.000
R	1000.000	10300.000	1000.000	10590.000	1002.000	10630.000	1004.000	10760.000	1005.000	10810.000
R	1006.000	10910.000	1007.100	11115.000	1009.000	11460.000	1006.000	11500.000	1006.000	11530.000
GR	1020.000	11548.000	1018.000	12140.000	1016.000	12270.000	1015.100	12400.000	1015.500	12950.000
GR	1017.000	13250.000	1017.500	13550.000	1018.000	13750.000	1020.000	13970.000	0.000	0.000
T	0.000	0.000	0.000	7.100	9.100	7.100	9090.000	12800.000	9090.000	11820.000
X1	8.444	57.000	9090.000	11110.000	1020.000	1440.000	615.000	0.000	0.000	0.000
3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R	1018.700	4690.000	1017.000	5000.000	1016.500	5300.000	1016.500	5540.000	1017.000	5880.000
GR	1016.500	6050.000	1015.700	6180.000	1015.000	6450.000	1013.000	6740.000	1011.700	7000.000
R	1015.500	7080.000	1014.800	7470.000	1012.000	7870.000	1010.000	7980.000	1012.400	8350.000
R	1012.100	8650.000	1012.100	9000.000	1012.200	9090.000	1006.600	9160.000	1008.000	9250.000
GR	1006.000	9270.000	1006.000	10000.000	1006.000	10275.000	1007.000	10390.000	1006.000	10580.000
GR	1006.600	10680.000	1006.000	10760.000	1006.000	10855.000	1008.000	11095.000	1010.000	11100.000
R	1012.000	11110.000	1012.000	11160.000	1010.000	11170.000	1010.000	11215.000	1012.000	11235.000
GR	1010.600	11440.000	1010.000	11590.000	1008.000	11710.000	1008.000	11810.000	1010.000	11820.000
GR	1011.000	11950.000	1012.000	12160.000	1012.500	12300.000	1012.300	12540.000	1012.000	12610.000
R	1012.000	12900.000	1014.000	13000.000	1016.000	13030.000	1018.000	13060.000	1021.000	13100.000
R	1018.000	13150.000	1016.400	13320.000	1017.100	13550.000	1020.500	13630.000	1020.000	13680.000
GR	1022.000	13840.000	1023.500	13920.000	0.000	0.000	0.000	0.000	0.000	0.000
T	0.000	0.000	0.000	7.100	9.100	7.100	8700.000	0.000	8880.000	11930.000
X1	8.556	50.000	9105.000	11185.000	445.000	1235.000	595.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R	1018.700	4750.000	1018.000	5010.000	1016.000	6145.000	1014.000	6940.000	1013.000	7000.000
GR	1011.300	7210.000	1009.700	7300.000	1013.800	7385.000	1011.000	7570.000	1012.000	7870.000
GR	1012.100	8890.000	1012.000	9098.000	1010.500	9105.000	1010.000	9120.000	1008.000	9270.000
R	1007.000	9430.000	1008.000	9580.000	1006.000	9650.000	1004.000	9680.000	1006.000	9800.000
R	1006.300	10000.000	1008.000	10040.000	1011.700	10060.000	1006.000	10080.000	1008.000	10090.000
GR	1010.000	10120.000	1009.200	10210.000	1010.000	10280.000	1010.000	10445.000	1008.000	10500.000
R	1009.000	10570.000	1007.000	10740.000	1008.000	11030.000	1010.200	11185.000	1010.000	11380.000
R	1012.000	11500.000	1011.600	11720.000	1010.000	11910.000	1012.000	11920.000	1012.000	11990.000

R	1010.000	12030.000	1010.000	12090.000	1012.000	12120.000	1014.000	12250.000	1014.500	12590.000
GR	1013.500	12770.000	1014.000	12920.000	1019.800	13140.000	1016.000	13230.000	1020.000	13340.000
T	0.000	0.000	0.000	7.100	9.100	7.100	8200.000	0.000	8630.000	11990.000
X1	8.657	42.000	9005.000	11005.000	540.000	555.000	530.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R	1018.000	5440.000	1016.000	6435.000	1014.000	7110.000	1012.300	7410.000	1012.000	7445.000
R	1011.200	7500.000	1012.000	7605.000	1012.200	8150.000	1014.000	8220.000	1012.500	8350.000
GR	1014.000	8590.000	1014.000	8820.000	1013.300	8870.000	1014.000	8990.000	1012.000	9005.000
R	1011.600	9070.000	1010.000	9190.000	1009.000	9270.000	1012.000	9360.000	1009.600	9500.000
R	1010.600	9690.000	1010.000	9960.000	1008.600	10000.000	1008.000	10400.000	1006.800	10460.000
GR	1008.000	10500.000	1010.000	10540.000	1012.000	11005.000	1012.000	11080.000	1010.000	11160.000
GR	1012.000	11520.000	1014.000	11570.000	1014.000	11890.000	1015.000	11950.000	1014.000	12110.000
R	1012.000	12190.000	1014.000	12300.000	1016.000	12310.000	1018.400	12580.000	1017.000	12800.000
GR	1018.000	12980.000	1020.000	13005.000	0.000	0.000	0.000	0.000	0.000	0.000
T	0.000	0.000	0.000	7.100	9.100	7.100	7350.000	0.000	8450.000	11640.000
1	8.805	47.000	8845.000	11405.000	805.000	880.000	785.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R	1020.000	5010.000	1019.300	5170.000	1019.300	5560.000	1018.000	5770.000	1016.000	6870.000
R	1014.000	7440.000	1013.000	7570.000	1014.000	7720.000	1013.000	7750.000	1014.000	7760.000
GR	1013.800	8050.000	1014.000	8260.000	1015.700	8520.000	1016.200	8845.000	1011.100	9000.000
GR	1012.000	9050.000	1013.700	9790.000	1010.800	10000.000	1012.000	10300.000	1011.900	10600.000
R	1009.900	10950.000	1012.000	11240.000	1015.000	11405.000	1014.000	11530.000	1012.000	11560.000
GR	1014.000	11650.000	1016.600	12110.000	1016.000	12260.000	1020.000	12270.000	1018.000	12280.000
GR	1016.000	12510.000	1020.000	12580.000	1016.000	12630.000	1016.000	12840.000	1016.000	12930.000
R	1016.000	13150.000	1020.000	13310.000	1020.000	13860.000	1019.000	13960.000	1020.000	14060.000
R	1024.000	14610.000	1025.700	14670.000	1026.000	14720.000	1019.000	14770.000	1028.000	14820.000
GR	1025.700	14910.000	1028.000	15100.000	0.000	0.000	0.000	0.000	0.000	0.000
T	0.000	7.100	7.100	7.100	9.100	7.100	7720.000	12600.000	8315.000	11645.000
X1	8.938	52.000	9650.000	11420.000	700.000	700.000	700.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R	1022.500	5330.000	1020.000	5430.000	1019.000	6050.000	1018.000	6460.000	1016.000	7280.000
GR	1014.000	7780.000	1014.000	8000.000	1014.600	8050.000	1016.000	8700.000	1016.000	8701.000
GR	1017.700	8830.000	1016.000	9090.000	1014.000	9170.000	1012.000	9210.000	1010.800	9300.000
R	1012.000	9350.000	1013.000	9450.000	1014.000	9520.000	1014.000	9650.000	1013.800	9770.000
R	1013.200	9900.000	1013.800	9970.000	1013.700	10720.000	1013.000	10735.000	1013.700	10760.000
GR	1013.700	11000.000	1012.900	11130.000	1012.000	11200.000	1012.000	11330.000	1011.000	11360.000
R	1014.000	11420.000	1016.000	11430.000	1017.400	11545.000	1017.600	11840.000	1018.500	11950.000
R	1016.000	12030.000	1017.000	12090.000	1016.000	12160.000	1017.300	12250.000	1012.000	12340.000
GR	1018.000	12460.000	1020.000	12570.000	1019.000	12700.000	1020.000	13060.000	1020.400	13390.000
GR	1019.600	13620.000	1020.000	13700.000	1022.000	14410.000	1026.000	14450.000	1026.300	14520.000
R	1027.000	14810.000	1027.500	14930.000	0.000	0.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	7.100	9.100	7.100	8290.000	12000.000	8300.000	11575.000
1	9.071	40.000	8290.000	11280.000	800.000	550.000	700.000	0.000	0.000	0.000
3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	1023.200	8283.000	1023.200	8288.000	1023.200	8289.000	1023.200	8290.000	1023.200	8293.000
R	1016.500	8300.000	1016.400	8350.000	1018.000	8955.000	1019.000	8990.000	1018.000	9000.000
R	1016.800	9150.000	1016.000	9290.000	1014.600	9400.000	1014.800	9498.000	1014.400	9500.000
GR	1014.400	11268.000	1018.000	11280.000	1018.700	11400.000	1018.000	11530.000	1016.000	11560.000
GR	1016.000	11575.000	1018.000	11575.000	1018.500	11660.000	1017.000	11770.000	1020.000	11820.000
R	1018.000	11860.000	1019.800	11960.000	1016.000	12200.000	1016.000	12370.000	1018.000	12500.000

R	1016.000	12620.000	1020.000	12700.000	1022.000	12820.000	1020.000	13080.000	1022.000	13730.000
GR	1021.000	14000.000	1022.000	14560.000	1022.700	14660.000	1024.000	14800.000	1025.300	14960.000
T	0.000	0.000	0.000	7.100	9.100	7.100	8504.000	11400.000	8510.000	11200.000
X1	9.198	31.000	8504.000	11040.000	750.000	650.000	670.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R	1024.600	8504.000	1018.900	8510.000	1019.000	8550.000	1018.200	8700.000	1020.000	9030.000
R	1020.300	9060.000	1020.000	9075.000	1018.000	9100.000	1018.000	9250.000	1018.000	9320.000
GR	1015.600	9330.000	1015.600	11025.000	1020.000	11040.000	1020.700	11150.000	1018.000	11370.000
R	1020.000	11390.000	1020.000	11620.000	1018.500	11670.000	1120.000	11700.000	1020.000	11860.000
R	1021.000	11940.000	1020.000	11990.000	1017.600	12010.000	1020.000	12030.000	1020.600	12120.000
GR	1018.000	12250.000	1020.600	12390.000	1020.000	12480.000	1020.000	12800.000	1021.600	13440.000
GR	1022.000	14670.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.045	0.045	0.035	0.300	0.500	0.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	7.100	9.100	7.100	8644.000	11020.000	8650.000	11010.000
X1	9.266	19.000	8644.000	11010.000	500.000	350.000	360.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	1025.600	8634.000	1025.600	8644.000	1020.000	8650.000	1020.000	8660.000	1020.400	8700.000
R	1020.000	8720.000	1018.000	8750.000	1018.000	8830.000	1019.500	8950.000	1020.000	9080.000
R	1019.700	9130.000	1020.000	9235.000	1021.200	9250.000	1015.700	9280.000	1015.700	10940.000
GR	1118.000	10946.000	1020.000	10985.000	1028.500	11010.000	1028.500	11020.000	0.000	0.000
T	0.000	0.000	0.000	0.000	9.100	0.000	0.000	0.000	9345.000	11065.000
X1	9.374	4.000	9345.000	11065.000	700.000	300.000	570.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	1031.000	1031.000	0.000
R	1028.500	9345.000	1017.400	9378.000	1017.400	11032.000	1028.500	11065.000	0.000	0.000
		Camelback Rd. Bridge								
SB	1.100	1.560	2.700	0.000	1660.000	84.000	15642.000	3.000	1017.500	1017.400
T	0.000	0.000	0.000	0.000	9.110	0.000	0.000	0.000	9345.000	11065.000
1	9.384	4.000	9344.000	11066.000	56.000	56.000	56.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	1027.200	1027.000	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	1034.200	1027.000	0.000
T	-13.000	9344.000	1034.200	0.000	9345.000	1037.000	1027.200	11066.000	1037.000	1027.200
BT	0.000	11066.000	1034.200	0.000	11440.000	1030.500	0.000	11840.000	1028.200	0.000
BT	0.000	12840.000	1027.000	0.000	12940.000	1027.000	0.000	13540.000	1027.600	0.000
T	0.000	14140.000	1027.000	0.000	14740.000	1027.600	0.000	15440.000	1027.100	0.000
T	0.000	16240.000	1031.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	1030.500	9344.000	1017.500	9378.000	1017.500	11032.000	1028.500	11066.000	0.000	0.000
C	0.045	0.045	0.035	0.100	0.300	0.000	0.000	0.000	0.000	0.000
ET	0.000	7.100	7.100	7.100	9.100	7.100	9060.000	11000.000	9260.000	11000.000
X1	9.453	5.000	9260.000	11000.000	365.000	365.000	365.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	1022.900	9060.000	1022.500	9260.000	1018.300	9272.000	1018.300	10970.000	1028.500	11000.000
2	0.045	0.045	0.035	0.200	0.400	0.000	0.000	0.000	0.000	0.000
T	0.000	0.000	0.000	7.100	9.100	7.100	8863.000	11470.000	9346.000	11143.000
X1	9.518	40.000	8863.000	11142.000	340.000	340.000	340.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R	1031.300	8863.000	1024.000	8870.000	1026.000	8875.000	1026.000	8900.000	1024.000	8910.000
GR	1024.400	8911.000	1024.000	9050.000	1022.000	9090.000	1021.400	9110.000	1022.000	9130.000
GR	1022.500	9230.000	1023.800	9345.000	1019.100	9360.000	1019.100	11130.000	1022.700	11142.000
R	1022.000	11200.000	1021.000	11210.000	1022.000	11220.000	1022.200	11400.000	1024.000	11620.000

GR	1022.000	11810.000	1020.000	11910.000	1020.000	11960.000	1023.200	12170.000	1023.600	12430.000
GR	1019.000	12575.000	1020.000	12610.000	1020.000	12950.000	1022.000	12960.000	1022.000	13020.000
GR	1020.000	13065.000	1022.000	13080.000	1023.800	13950.000	1023.600	14360.000	1023.800	14680.000
GR	1024.000	14850.000	1024.500	15140.000	1028.500	15300.000	1026.500	15350.000	1030.000	15470.000
NC	0.045	0.045	0.035	0.100	0.300	0.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	7.100	9.100	7.100	8864.000	12130.000	9379.000	11701.000
X1	9.628	47.000	8864.000	11700.000	580.000	700.000	580.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	1032.000	8853.000	1032.000	8855.000	1032.000	8864.000	1025.900	8870.000	1025.500	8910.000
GR	1024.000	9380.000	1020.000	9400.000	1019.000	9500.000	1020.000	9570.000	1021.000	10000.000
GR	1021.000	10170.000	1020.000	10450.000	1018.000	10460.000	1020.000	10540.000	1022.000	10590.000
GR	1024.000	10640.000	1025.000	10730.000	1024.000	10815.000	1023.200	10850.000	1024.000	10880.000
GR	1025.700	11160.000	1024.000	11560.000	1024.000	11600.000	1026.000	11640.000	1026.000	11700.000
GR	1024.000	11840.000	1024.000	11900.000	1025.000	12000.000	1024.800	12330.000	1024.000	12385.000
GR	1020.000	12410.000	1020.000	12460.000	1022.000	12500.000	1023.400	12580.000	1022.000	12650.000
GR	1022.000	12670.000	1024.000	12690.000	1024.000	13250.000	1024.700	13680.000	1024.900	13880.000
GR	1026.000	14280.000	1026.000	14770.000	1026.700	14960.000	1027.000	15210.000	1028.000	15260.000
GR	1030.200	15300.000	1030.000	15330.000	0.000	0.000	0.000	0.000	0.000	0.000
BT	6.000	23000.000	69000.000	95000.000	95000.000	184000.000	142000.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	7.100	9.100	7.100	8785.000	12400.000	9300.000	12000.000
X1	9.718	74.000	8785.000	11640.000	900.000	490.000	475.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	1032.200	8775.000	1032.200	8785.000	1027.000	8790.000	1027.000	8800.000	1027.000	8930.000
GR	1027.000	8931.000	1027.000	8932.000	1027.000	9080.000	1027.700	9150.000	1026.000	9220.000
GR	1025.300	9240.000	1026.000	9260.000	1027.000	9300.000	1026.000	9315.000	1020.000	9335.000
GR	1020.000	9445.000	1022.000	9450.000	1022.000	9560.000	1020.000	9615.000	1019.200	9640.000
GR	1020.000	9650.000	1022.000	9665.000	1023.000	9675.000	1022.000	9685.000	1021.700	9860.000
GR	1020.900	10000.000	1020.500	10050.000	1022.000	10200.000	1022.300	10300.000	1022.000	10390.000
GR	1022.000	10480.000	1026.000	10520.000	1026.000	10600.000	1027.500	10720.000	1026.000	10965.000
GR	1024.000	10975.000	1026.000	11000.000	1026.300	11130.000	1026.000	11260.000	1026.000	11370.000
GR	1028.000	11440.000	1029.200	11470.000	1028.000	11500.000	1026.400	11640.000	1024.000	11800.000
GR	1024.000	11830.000	1026.000	11920.000	1026.000	11950.000	1025.600	12070.000	1024.000	12140.000
GR	1024.500	12210.000	1024.000	12270.000	1022.000	12280.000	1020.400	12320.000	1022.000	12360.000
GR	1024.000	12435.000	1026.000	12480.000	1026.000	12565.000	1024.000	12600.000	1024.000	12650.000
GR	1026.000	12720.000	1025.000	12820.000	1026.000	12900.000	1024.000	12960.000	1026.000	13000.000
GR	1027.000	13070.000	1026.000	13135.000	1026.000	13580.000	1025.800	14080.000	1026.000	14550.000
GR	1026.500	15000.000	1027.300	15150.000	1030.000	15250.000	1030.500	15270.000	0.000	0.000
NC	0.045	0.045	0.030	0.100	0.300	0.000	0.000	0.000	0.000	0.000
NH	7.000	0.045	8250.000	0.100	9000.000	0.050	9375.000	0.035	10588.000	0.042
NH	11887.000	0.070	13062.000	0.040	16843.000	0.000	0.000	0.000	0.000	0.000
ET	0.000	7.100	7.100	7.100	9.100	7.100	8000.000	0.000	9375.000	13500.000
X1	9.759	75.000	9375.000	10588.000	800.000	800.000	800.000	0.000	0.000	0.000
GR	1034.000	7500.000	1033.000	8250.000	1030.000	9000.000	1030.000	9300.000	1029.800	9375.000
GR	1025.900	9390.000	1025.500	9582.000	1028.100	9591.000	1028.500	9716.000	1029.300	9770.000
GR	1027.400	9829.000	1026.300	9845.000	1025.700	9884.000	1024.300	9897.000	1024.300	9951.000
GR	1024.900	9960.000	1025.500	10000.000	1025.900	10034.000	1026.700	10313.000	1026.300	10562.000
GR	1031.100	10588.000	1031.000	10755.000	1030.600	10808.000	1030.300	11193.000	1029.000	11366.000
GR	1029.800	11505.000	1027.900	11585.000	1025.400	11596.000	1027.800	11629.000	1029.100	11645.000
GR	1029.000	11788.000	1027.100	11804.000	1028.300	11823.000	1028.300	11887.000	1025.500	11905.000
GR	1025.500	11929.000	1028.100	11978.000	1028.600	12047.000	1031.300	12080.000	1030.300	12200.000
GR	1030.300	12383.000	1029.400	12800.000	1028.500	12817.000	1028.500	12843.000	1030.300	12861.000

R	1030.300	12912.000	1028.300	12924.000	1030.700	12938.000	1029.500	13062.000	1031.700	13077.000
GR	1030.200	13101.000	1031.800	13162.000	1031.700	13190.000	1029.500	13337.000	1029.500	13638.000
GR	1027.900	14289.000	1029.800	15224.000	1029.800	15249.000	1030.700	15266.000	1030.700	15288.000
R	1029.800	15306.000	1031.900	15318.000	1028.700	15327.000	1032.500	15335.000	1032.700	15369.000
GR	1030.700	15380.000	1032.700	15528.000	1036.200	15854.000	1036.100	16206.000	1034.500	16345.000
GR	1033.700	16405.000	1032.500	16426.000	1033.500	16505.000	1035.100	16816.000	1035.900	16843.000
T	6.000	18000.000	66000.000	90000.000	90000.000	177000.000	142000.000	0.000	0.000	0.000
NH	6.000	0.042	9580.000	0.035	10504.000	0.042	11382.000	0.070	12834.000	0.050
H	14172.000	0.040	16855.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
T	0.000	0.000	0.000	0.000	9.100	0.000	0.000	0.000	9580.000	14300.000
X1	9.884	54.000	9580.000	10504.000	700.000	540.000	660.000	0.000	0.000	0.000
GR	1034.000	9050.000	1031.800	9580.000	1027.300	9602.000	1025.700	9661.000	1025.400	9852.000
R	1025.400	9873.000	1027.400	9915.000	1027.400	10000.000	1028.500	10446.000	1028.500	10491.000
GR	1031.900	10504.000	1031.400	10933.000	1030.500	11154.000	1028.900	11169.000	1030.500	11178.000
GR	1029.500	11382.000	1027.000	11395.000	1029.800	11410.000	1029.800	11598.000	1030.700	11637.000
R	1032.700	11680.000	1031.000	12186.000	1031.700	12268.000	1029.800	12604.000	1031.100	12632.000
GR	1031.900	12834.000	1031.500	13045.000	1030.600	13469.000	1030.100	14172.000	1028.700	14189.000
GR	1029.400	14367.000	1030.600	14839.000	1031.400	15043.000	1032.300	15059.000	1030.600	15073.000
R	1031.500	15085.000	1031.100	15109.000	1031.100	15122.000	1033.300	15134.000	1029.800	15145.000
R	1032.300	15152.000	1032.300	15184.000	1030.700	15210.000	1031.000	15358.000	1031.400	15479.000
GR	1033.100	15531.000	1031.900	15759.000	1031.500	15796.000	1031.000	15834.000	1030.700	15959.000
GR	1032.100	16313.000	1034.100	16597.000	1036.100	16806.000	1036.200	16855.000	0.000	0.000
NH	6.000	0.042	9655.000	0.035	10361.000	0.042	11060.000	0.070	12228.000	0.050
NH	13856.000	0.040	16472.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
T	0.000	0.000	0.000	0.000	9.100	0.000	0.000	0.000	9650.000	14500.000
1	10.009	50.000	9655.000	10361.000	580.000	550.000	660.000	0.000	0.000	0.000
GR	1035.000	9050.000	1034.000	9150.000	1033.300	9500.000	1033.300	9655.000	1027.000	9691.000
R	1027.000	9900.000	1030.600	10231.000	1030.600	10336.000	1032.900	10361.000	1032.500	10704.000
GR	1032.100	11045.000	1028.500	11060.000	1031.400	11080.000	1031.400	11561.000	1032.900	11587.000
GR	1032.900	12098.000	1031.300	12110.000	1032.100	12153.000	1032.100	12198.000	1030.700	12211.000
R	1032.700	12228.000	1032.100	12516.000	1031.900	12548.000	1033.300	12560.000	1033.300	12832.000
R	1031.100	12860.000	1031.100	12926.000	1030.100	13018.000	1031.500	13047.000	1031.500	13260.000
GR	1031.800	13429.000	1031.000	13562.000	1032.700	13787.000	1033.100	13802.000	1031.400	13823.000
GR	1030.600	13856.000	1030.600	13987.000	1031.300	14018.000	1031.400	14825.000	1032.500	14840.000
R	1031.800	14854.000	1032.700	14868.000	1032.500	14896.000	1031.400	14906.000	1031.700	14928.000
R	1031.300	14953.000	1030.700	15067.000	1031.700	16032.000	1035.700	16326.000	1037.800	16472.000
T	6.000	18100.000	66200.000	90260.000	90260.000	177000.000	142000.000	0.000	0.000	0.000
H	6.000	0.042	9591.000	0.035	10465.000	0.042	11306.000	0.070	12174.000	0.050
NH	13686.000	0.040	15793.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
T	0.000	0.000	0.000	0.000	9.100	0.000	0.000	0.000	9591.000	15550.000
1	10.130	56.000	9591.000	10465.000	550.000	550.000	640.000	0.000	0.000	0.000
GR	1036.500	9100.000	1032.900	9300.000	1033.900	9591.000	1031.000	9650.000	1030.600	9749.000
GR	1029.100	9763.000	1027.700	10040.000	1027.300	10157.000	1030.300	10178.000	1030.300	10219.000
R	1033.100	10277.000	1032.900	10377.000	1034.700	10465.000	1034.300	10870.000	1033.100	11182.000
R	1033.100	11306.000	1033.100	11333.000	1031.500	11352.000	1031.500	11368.000	1033.800	11385.000
GR	1033.800	11595.000	1034.500	11665.000	1033.700	12007.000	1033.900	12065.000	1034.700	12174.000
R	1037.100	12183.000	1033.900	12199.000	1035.000	12328.000	1034.200	12424.000	1034.200	12704.000
R	1032.100	12725.000	1032.100	12980.000	1032.500	13036.000	1032.200	13262.000	1031.400	13303.000
GR	1033.100	13350.000	1032.300	13550.000	1035.100	13614.000	1035.400	13633.000	1034.300	13646.000
R	1033.700	13665.000	1031.400	13686.000	1031.500	13793.000	1032.900	13982.000	1033.300	14240.000
R	1033.800	14597.000	1033.800	14607.000	1032.600	14619.000	1033.900	14636.000	1033.500	14657.000

GR	1032.500	14680.000	1033.100	14693.000	1032.600	14728.000	1034.100	15163.000	1036.200	15609.000
GR	1037.000	15793.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MT	6.000	18100.000	66200.000	90510.000	90510.000	177000.000	142000.000	0.000	0.000	0.000
NH	6.000	0.042	9460.000	0.035	10445.000	0.042	11451.000	0.070	11921.000	0.050
NH	13598.000	0.040	15348.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	0.000	9.100	0.000	0.000	0.000	9400.000	12800.000
X1	10.250	54.000	9460.000	10445.000	610.000	560.000	630.000	0.000	0.000	0.000
GR	1038.400	9050.000	1036.800	9100.000	1036.300	9460.000	1034.200	9511.000	1032.300	9522.000
GR	1031.500	9666.000	1032.600	9723.000	1032.100	9896.000	1030.700	9940.000	1027.300	10202.000
GR	1031.000	10418.000	1035.400	10445.000	1035.800	10925.000	1035.100	11325.000	1035.100	11451.000
GR	1033.300	11462.000	1035.800	11485.000	1035.700	11495.000	1033.800	11504.000	1033.100	11523.000
GR	1035.700	11575.000	1035.700	11710.000	1035.700	11921.000	1041.500	11941.000	1034.700	11967.000
GR	1035.300	12083.000	1036.100	12481.000	1036.100	12619.000	1033.500	12647.000	1033.400	12725.000
GR	1034.100	12820.000	1034.100	13028.000	1032.700	13045.000	1033.900	13103.000	1033.800	13315.000
GR	1034.700	13585.000	1035.900	13598.000	1035.900	13612.000	1032.900	13643.000	1032.900	13726.000
GR	1034.100	13740.000	1035.000	13885.000	1035.000	14368.000	1034.100	14386.000	1035.100	14404.000
GR	1035.100	14426.000	1034.100	14440.000	1034.700	14454.000	1035.000	14524.000	1035.700	14738.000
GR	1037.400	14965.000	1038.100	15121.000	1038.700	15310.000	1039.500	15348.000	0.000	0.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

THIS RUN EXECUTED 08 JUN 88 14:43:40

```
*****************************************
HEC2 RELEASE DATED NOV 76 UPDATED MAR 1982
ERROR CORR - 01,02,03,04,05
MODIFICATION - 50,51,52,53,54,55
*****************************************
```

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

ESIGN COND.

SUMMARY PRINTOUT

SECNO	Q	CWSEL	CRIWS	DEPTH	ELMIN	AREA	EG	VCH	SSTA	TOPWID	ENDST	XLCH
8.153	22800.00	1006.41	1002.33	8.61	997.80	4741.01	1006.84	5.31	7678.75	2269.76	12230.94	0.00
8.153	68000.00	1009.40	1008.13	11.60	997.80	16546.90	1009.97	7.33	6938.57	5170.56	13163.50	0.00
8.153	93000.00	1010.73	1009.09	12.93	997.80	14850.56	1011.78	9.59	8550.00	3378.97	12200.00	0.00
8.153	93000.00	1011.65	1009.10	13.85	997.80	16320.91	1012.49	8.61	8565.00	3052.51	11870.00	0.00
8.153	182000.00	1012.24	1011.88	14.44	997.80	19976.74	1014.37	14.30	8550.00	3417.40	12200.00	0.00
8.153	142000.00	1012.00	1010.06	14.20	997.80	32574.25	1012.52	8.03	6500.00	6487.90	13233.33	0.00
8.240	22800.00	1007.08	1002.76	8.88	998.20	8092.27	1007.22	3.22	7150.36	2082.60	10697.70	460.00
8.240	68000.00	1010.22	1005.44	12.02	998.20	22957.18	1010.45	4.75	6450.00	5911.95	13311.08	460.00
8.240	93000.00	1011.85	1006.63	13.65	998.20	14661.28	1012.56	7.26	9200.00	1649.81	11750.00	460.00
8.240	93000.00	1012.46	1006.62	14.26	998.20	15676.56	1013.08	6.82	9200.00	1666.76	11750.00	460.00
8.240	182000.00	1014.09	1010.10	15.89	998.20	18440.02	1015.82	11.43	9200.00	1739.44	11750.00	460.00
8.240	142000.00	1012.66	1009.19	14.46	998.20	37514.73	1013.00	6.11	6450.00	5995.88	13323.30	460.00
8.312	23000.00	1007.31	1003.61	8.71	998.60	6126.83	1007.53	3.75	9981.81	1518.30	11541.31	380.00
8.312	69000.00	1010.39	1007.27	11.79	998.60	10960.08	1011.01	6.30	9964.85	1579.54	11544.39	380.00
8.312	95000.00	1012.34	1008.18	13.74	998.60	14051.77	1013.05	6.76	9954.13	1592.21	11546.34	380.00
8.312	95000.00	1012.86	1008.26	14.26	998.60	14884.28	1013.49	6.38	9951.26	1595.60	11546.86	380.00
8.312	184000.00	1015.37	1010.88	16.77	998.60	21731.61	1016.74	9.51	5919.11	4756.70	12745.07	380.00
8.312	142000.00	1012.59	1009.68	13.99	998.60	14454.61	1014.09	9.82	9952.74	1593.85	11546.59	380.00
8.313	23000.00	1007.30	1003.64	8.70	998.60	6005.56	1007.53	3.83	9982.51	1488.31	11540.75	1.00
8.313	69000.00	1010.38	1007.29	11.78	998.60	10728.85	1011.02	6.43	9966.23	1547.49	11542.51	1.00
8.313	95000.00	1012.33	1008.24	13.73	998.60	13788.46	1013.07	6.90	6536.58	1744.86	11543.62	1.00
8.313	95000.00	1012.85	1008.24	14.25	998.60	14575.19	1013.51	6.52	9953.16	1564.92	11543.92	1.00
8.313	184000.00	1015.37	1010.98	16.77	998.60	21346.16	1016.75	9.82	5893.30	4868.94	12771.00	1.00
8.313	142000.00	1012.56	1009.77	13.96	998.60	14193.00	1014.13	10.06	6500.76	1869.56	11543.75	1.00
8.327	23000.00	1007.39	1004.26	7.39	1000.00	5078.21	1007.71	4.53	9976.24	1324.98	11531.80	78.00
8.327	69000.00	1010.49	1008.01	10.49	1000.00	9630.00	1011.29	7.17	9962.63	1505.15	11535.78	78.00
8.327	95000.00	1012.21	1009.02	12.21	1000.00	10208.91	1013.56	9.31	6556.25	1196.28	11112.00	78.00
8.327	95000.00	1012.92	1009.00	12.92	1000.00	13301.38	1013.71	7.14	9951.95	1518.95	11538.90	78.00
8.327	184000.00	1015.59	1012.57	15.59	1000.00	17358.06	1017.80	12.66	5833.10	4048.01	11112.00	78.00
8.327	142000.00	1012.76	1010.55	12.76	1000.00	13174.92	1014.59	10.87	6468.54	1832.44	11538.69	78.00

SECNO	Q	CWSEL	CRIWS	DEPTH	ELMIN	AREA	EG	VCH	SSTA	TOPWID	ENDST	XLCH
8.327	23000.00	1007.50	1003.84	8.00	999.50	5899.06	1007.74	3.90	9945.00	1295.07	11531.93	1.00
8.327	69000.00	1010.70	1007.34	11.20	999.50	10767.88	1011.34	6.41	9945.00	1591.05	11536.05	1.00
8.327	95000.00	1013.11	1008.65	13.61	999.50	14595.55	1013.77	6.51	9945.00	1594.14	11539.14	1.00
8.327	95000.00	1013.09	1008.66	13.59	999.50	14575.96	1013.75	6.52	9945.00	1594.12	11539.12	1.00
8.327	184000.00	1017.53	1011.33	18.03	999.50	34634.56	1018.25	7.31	4679.05	7458.00	13561.52	1.00
8.327	142000.00	1013.32	1010.14	13.82	999.50	14927.75	1014.72	9.51	9945.00	1594.41	11539.41	1.00
8.444	23000.00	1008.65	1007.93	2.65	1006.00	4571.77	1009.05	5.03	9134.37	1962.26	11096.63	615.00
8.444	69000.00	1012.06	1009.69	6.06	1006.00	13030.72	1012.54	5.72	9091.80	3389.67	12902.79	615.00
8.444	95000.00	1014.20	1010.49	8.20	1006.00	20909.08	1014.59	5.25	9090.00	3710.00	12800.00	615.00
8.444	95000.00	1014.14	1010.49	8.14	1006.00	18384.03	1014.59	5.57	9090.00	2730.00	11820.00	615.00
8.444	184000.00	1018.47	1012.88	12.47	1006.00	36716.87	1018.93	5.87	9090.00	3710.00	12800.00	615.00
8.444	142000.00	1015.65	1012.29	9.65	1006.00	34256.31	1016.02	5.56	6202.03	6822.61	13024.64	615.00
8.556	23000.00	1010.70	1009.16	6.70	1004.00	5985.73	1010.94	3.96	7243.87	2556.44	12100.47	595.00
8.556	69000.00	1013.29	1011.19	9.29	1004.00	16222.17	1013.67	5.27	6982.57	5177.09	12203.88	595.00
8.556	95000.00	1014.94	1012.02	10.94	1004.00	20300.79	1015.36	5.50	8700.00	4255.79	12955.79	595.00
8.556	95000.00	1014.94	1011.96	10.94	1004.00	18179.67	1015.42	5.78	8880.00	3050.00	11930.00	595.00
8.556	184000.00	1019.04	1013.99	15.04	1004.00	38271.58	1019.47	5.83	8700.00	4566.42	13313.49	595.00
8.556	142000.00	1016.30	1013.41	12.30	1004.00	34872.54	1016.65	5.47	5970.12	7053.20	13238.47	595.00
8.657	23000.00	1012.23	1011.40	5.43	1006.80	5304.28	1012.56	4.70	7418.36	3276.87	12202.56	530.00
8.657	69000.00	1014.37	1013.21	7.57	1006.80	13857.33	1014.86	6.12	6984.95	5178.42	12301.85	530.00
8.657	95000.00	1015.75	1013.90	8.95	1006.80	17242.52	1016.32	6.55	8200.00	4108.74	12308.74	530.00
8.657	95000.00	1015.82	1013.81	9.02	1006.80	15745.88	1016.46	6.81	8630.00	3360.00	11990.00	530.00
8.657	184000.00	1019.49	1015.72	12.69	1006.80	33998.83	1020.03	6.65	8200.00	4798.60	12998.60	530.00
8.657	142000.00	1016.92	1014.78	10.12	1006.80	28599.39	1017.41	6.51	5976.99	6436.58	12413.57	530.00
8.805	23000.00	1014.59	1013.28	4.69	1009.90	6407.42	1014.79	3.59	8893.80	2488.89	11382.69	785.00
8.805	69000.00	1016.45	1015.01	6.55	1009.90	16282.57	1016.80	5.11	6620.58	6181.91	13168.14	785.00
8.805	95000.00	1017.54	1015.54	7.64	1009.90	21714.50	1017.91	5.31	7350.00	5719.15	13211.69	785.00
8.805	95000.00	1017.72	1015.52	7.82	1009.90	15994.38	1018.30	6.26	8450.00	3190.00	11640.00	785.00
8.805	184000.00	1020.58	1017.10	10.68	1009.90	40180.98	1020.98	5.70	7350.00	6810.53	14778.80	785.00
8.805	142000.00	1018.39	1016.45	8.49	1009.90	29749.05	1018.86	6.18	5706.27	7479.30	13245.78	785.00
8.938	23000.00	1015.99	1014.74	4.99	1011.00	7554.88	1016.14	3.38	7720.00	3462.44	12419.80	700.00
8.938	69000.00	1017.93	1016.10	7.13	1010.80	15349.26	1018.29	5.40	7720.00	4648.57	12458.36	700.00
8.938	95000.00	1018.80	1016.72	8.00	1010.80	19530.91	1019.23	5.95	7720.00	4784.10	12504.10	700.00
8.938	95000.00	1019.30	1017.03	8.50	1010.80	16778.57	1019.84	6.46	8315.00	3330.00	11645.00	700.00
8.938	184000.00	1021.42	1018.39	10.62	1010.80	32217.94	1021.99	7.05	7720.00	4880.00	12600.00	700.00
8.938	142000.00	1019.74	1017.59	8.94	1010.80	29148.64	1020.19	6.46	5590.49	7397.23	13648.23	700.00
9.071	23000.00	1017.42	1016.08	3.02	1014.40	6279.66	1017.63	3.66	8299.04	2643.60	11278.08	700.00
9.071	69000.00	1019.46	1018.00	5.06	1014.40	14794.94	1019.84	5.10	8296.90	4355.20	12689.28	700.00
9.071	95000.00	1020.34	1018.53	5.94	1014.40	16297.13	1020.90	6.13	8295.99	3704.01	12000.00	700.00
9.071	95000.00	1020.81	1018.51	6.41	1014.40	16999.32	1021.30	5.72	8300.00	3275.00	11575.00	700.00
9.071	184000.00	1022.68	1020.25	8.28	1014.40	24968.18	1023.57	7.81	8293.55	3706.45	12000.00	700.00
9.071	142000.00	1021.21	1019.33	6.81	1014.40	22867.59	1021.89	6.96	8295.08	5201.94	14117.42	700.00

SECNO	Q	CWSEL	CRIWS	DEPTH	ELMIN	AREA	EG	VCH	SSTA	TOPWID	ENDST	XLCH
9.198	23000.00	1018.93	1017.39	3.33	1015.60	5992.76	1019.16	3.84	8509.97	2230.44	11036.35	670.00
9.198	69000.00	1021.01	1019.95	5.41	1015.60	13162.75	1021.51	5.85	8507.78	4508.88	13204.30	670.00
9.198	95000.00	1022.00	1020.14	6.40	1015.60	14444.08	1022.70	6.79	8506.74	2893.26	11400.00	670.00
9.198	95000.00	1022.18	1020.13	6.58	1015.60	14326.83	1022.87	6.72	8510.00	2690.00	11200.00	670.00
9.198	184000.00	1024.30	1022.06	8.70	1015.60	21088.37	1025.53	9.04	8504.32	2895.68	11400.00	670.00
9.198	142000.00	1022.91	1021.35	7.31	1015.60	23488.96	1023.65	7.42	8505.78	5980.19	14670.00	670.00
9.266	23000.00	1019.57	1017.51	3.87	1015.70	6711.51	1019.75	3.43	8726.43	1923.51	10940.23	360.00
9.266	69000.00	1021.85	1019.46	6.15	1015.70	11811.37	1022.38	5.84	8648.01	2298.53	10990.45	360.00
9.266	95000.00	1022.89	1020.44	7.19	1015.70	14198.00	1023.59	6.69	8646.90	2303.17	10993.50	360.00
9.266	95000.00	1023.04	1020.44	7.34	1015.70	14535.53	1023.70	6.54	8650.00	2300.58	10993.94	360.00
9.266	184000.00	1025.28	1022.52	9.58	1015.70	19714.70	1026.63	9.33	8644.34	2313.85	11000.53	360.00
9.266	142000.00	1023.73	1021.60	8.03	1015.70	16126.88	1024.93	8.81	8646.01	2306.91	10995.96	360.00
9.374	23000.00	1020.48	1019.21	3.08	1017.40	5114.89	1020.79	4.50	9368.86	1672.29	11041.14	570.00
9.374	69000.00	1023.12	1021.16	5.72	1017.40	9552.29	1023.93	7.22	9361.00	1687.99	11049.00	570.00
9.374	95000.00	1024.17	1022.05	6.77	1017.40	11344.67	1025.26	8.37	9357.85	1694.29	11052.15	570.00
9.374	95000.00	1024.23	1022.05	6.83	1017.40	11455.74	1025.30	8.29	9357.66	1694.68	11052.34	570.00
9.374	184000.00	1026.77	1024.61	9.37	1017.40	15765.82	1028.89	11.67	9350.13	1709.74	11059.87	570.00
9.374	142000.00	1025.48	1023.47	8.08	1017.40	13562.14	1027.18	10.47	9353.97	1702.06	11056.03	570.00
9.384	23000.00	1020.53	0.00	3.03	1017.50	5044.34	1020.86	4.56	9370.07	1671.31	11041.38	56.00
9.384	69000.00	1023.29	0.00	5.79	1017.50	9677.43	1024.08	7.13	9362.85	1687.06	11049.91	56.00
9.384	95000.00	1024.42	0.00	6.92	1017.50	11590.65	1025.47	8.20	9359.89	1693.52	11053.40	56.00
9.384	95000.00	1024.48	0.00	6.98	1017.50	11676.73	1025.50	8.14	9359.76	1693.81	11053.56	56.00
9.384	184000.00	1027.32	0.00	9.82	1017.50	16526.94	1029.24	11.13	9352.30	1710.07	11062.37	56.00
9.384	142000.00	1026.07	0.00	8.57	1017.50	14393.57	1027.58	9.87	9355.57	1702.93	11058.51	56.00
9.453	23000.00	1021.45	1020.08	3.15	1018.30	5401.97	1021.74	4.26	9262.96	1716.35	10979.31	365.00
9.453	69000.00	1024.32	1021.99	6.02	1018.30	10645.20	1025.00	6.62	9060.00	1927.70	10987.70	365.00
9.453	95000.00	1025.55	1022.92	7.25	1018.30	13025.17	1026.41	7.48	9060.00	1931.33	10991.33	365.00
9.453	95000.00	1025.54	1022.87	7.24	1018.30	12428.77	1026.45	7.64	9260.00	1731.29	10991.29	365.00
9.453	184000.00	1028.86	1025.43	10.56	1018.30	19422.63	1030.30	9.76	9060.00	1940.00	11000.00	365.00
9.453	142000.00	1027.41	1024.33	9.11	1018.30	16624.98	1028.59	8.79	9060.00	1936.81	10996.81	365.00
9.518	23000.00	1022.22	1020.83	3.12	1019.10	5583.58	1022.49	4.12	9085.56	1879.15	11140.41	340.00
9.518	69000.00	1025.37	1022.70	6.27	1019.10	23054.08	1025.54	3.81	8868.63	6276.26	15174.64	340.00
9.518	95000.00	1026.58	1023.62	7.48	1019.10	16356.99	1027.12	6.02	8867.42	2602.58	11470.00	340.00
9.518	95000.00	1026.40	1023.54	7.30	1019.10	13059.50	1027.22	7.28	9346.00	1797.00	11143.00	340.00
9.518	184000.00	1030.21	1025.72	11.11	1019.10	25816.77	1031.02	7.39	8863.79	2606.21	11470.00	340.00
9.518	142000.00	1028.91	1024.36	9.81	1019.10	45831.17	1029.09	3.93	8865.09	6567.66	15432.75	340.00
9.628	23000.00	1023.71	1022.59	5.71	1018.00	4091.05	1024.20	5.62	9381.47	1292.27	10868.97	580.00
9.628	69000.00	1026.14	1025.25	8.14	1018.00	14095.51	1026.56	5.65	8869.77	5937.84	14807.60	580.00
9.628	95000.00	1027.75	1026.01	9.75	1018.00	15153.80	1028.39	6.51	8868.18	3261.82	12130.00	580.00
9.628	95000.00	1027.86	1026.13	9.86	1018.00	12615.91	1028.74	7.53	9379.00	2322.00	11701.00	580.00
9.628	184000.00	1031.15	1027.73	13.15	1018.00	26224.84	1031.94	7.28	8864.84	3265.16	12130.00	580.00
9.628	142000.00	1029.26	1026.39	11.26	1018.00	33781.07	1029.57	5.06	8866.69	6416.24	15282.93	580.00

SECNO	Q	CWSEL	CRIWS	DEPTH	ELMIN	AREA	EG	VCH	SSTA	TOPWID	ENDST	XLCH
9.718	23000.00	1025.26	1023.75	6.06	1019.20	4485.33	1025.67	5.13	9317.47	1217.11	10990.72	475.00
9.718	69000.00	1027.75	1026.54	8.55	1019.20	16876.52	1028.04	4.87	8789.28	6286.26	15166.55	475.00
9.718	95000.00	1029.16	1027.32	9.96	1019.20	16787.96	1029.67	5.89	8787.93	3609.78	12400.00	475.00
9.718	95000.00	1029.48	1027.58	10.28	1019.20	14357.59	1030.18	6.87	9300.00	2700.00	12000.00	475.00
9.718	184000.00	1032.09	1028.76	12.89	1019.20	27381.85	1032.80	7.03	8785.11	3614.89	12400.00	475.00
9.718	142000.00	1029.91	1027.59	10.71	1019.20	30736.73	1030.28	5.47	8787.20	6459.65	15246.85	475.00
9.759	23000.00	1028.70	1028.70	4.40	1024.30	3305.49	1029.64	8.07	9379.23	2239.10	15327.00	800.00
9.759	69000.00	1030.58	1030.53	6.28	1024.30	10704.58	1031.55	9.27	8854.29	5911.91	15330.96	800.00
9.759	95000.00	1031.63	1031.17	7.33	1024.30	17416.70	1032.32	8.29	8592.31	6771.91	15448.88	800.00
9.759	95000.00	1032.15	1031.74	7.85	1024.30	13647.26	1033.27	9.77	9375.00	4125.00	13500.00	800.00
9.759	184000.00	1033.95	1032.31	9.65	1024.30	34336.88	1034.56	8.23	8000.00	7849.51	16591.86	800.00
9.759	142000.00	1031.92	1031.92	7.62	1024.30	19373.74	1033.14	11.20	8520.85	6909.64	15470.03	800.00
9.884	18000.00	1031.32	1029.53	5.92	1025.40	6976.24	1031.50	3.74	9582.31	4626.30	16117.57	660.00
9.884	66000.00	1033.27	1032.10	7.87	1025.40	19342.44	1033.58	5.86	9226.08	7252.67	16479.01	660.00
9.884	90000.00	1033.74	1032.67	8.34	1025.40	22822.57	1034.14	6.77	9111.91	7434.39	16546.31	660.00
9.884	90000.00	1034.69	1033.08	9.29	1025.40	21240.68	1035.13	6.84	9580.00	4720.00	14300.00	660.00
9.884	177000.00	1035.48	1033.76	10.08	1025.40	35990.57	1036.01	8.17	9050.00	7690.89	16740.89	660.00
9.884	142000.00	1034.91	1033.35	9.51	1025.40	31647.90	1035.37	7.55	9050.00	7631.65	16681.65	660.00
10.009	18000.00	1032.28	1031.83	5.28	1027.00	6217.01	1032.53	4.76	9660.82	4727.99	16074.69	660.00
10.009	66000.00	1034.40	1033.30	7.40	1027.00	19601.33	1034.67	5.85	9109.55	7121.23	16230.78	660.00
10.009	90000.00	1035.04	1033.73	8.04	1027.00	24116.36	1035.34	6.38	9050.00	7227.03	16277.03	660.00
10.009	90000.00	1035.87	1034.30	8.87	1027.00	21210.51	1036.28	7.05	9650.00	4850.00	14500.00	660.00
10.009	177000.00	1036.82	1034.89	9.82	1027.00	37156.86	1037.26	7.74	9050.00	7354.02	16404.02	660.00
10.009	142000.00	1036.19	1034.47	9.19	1027.00	32495.75	1036.57	7.22	9050.00	7309.82	16359.82	660.00
10.130	18100.00	1033.62	1032.19	6.32	1027.30	5292.17	1033.91	4.75	9259.78	3478.93	15024.97	640.00
10.130	66200.00	1035.61	1034.82	8.31	1027.30	16059.07	1036.03	6.79	9149.47	6321.11	15483.62	640.00
10.130	90260.00	1036.26	1035.18	8.96	1027.30	20204.95	1036.72	7.33	9113.54	6501.04	15621.96	640.00
10.130	90260.00	1037.02	1035.36	9.72	1027.30	23583.84	1037.34	6.09	9591.00	5958.28	15550.00	640.00
10.130	177000.00	1038.05	1036.59	10.75	1027.30	32172.07	1038.66	8.70	9100.00	6693.00	15793.00	640.00
10.130	142000.00	1037.40	1036.12	10.10	1027.30	27779.82	1037.95	8.21	9100.00	6693.00	15793.00	640.00
10.250	18100.00	1034.77	1032.74	7.47	1027.30	5035.97	1035.03	4.26	9497.14	2279.81	14470.54	630.00
10.250	66200.00	1037.04	1036.09	9.74	1027.30	15267.96	1037.55	6.88	9092.44	5792.31	14917.17	630.00
10.250	90510.00	1037.71	1036.66	10.41	1027.30	19179.62	1038.28	7.58	9071.57	5934.91	15034.04	630.00
10.250	90510.00	1037.84	1037.25	10.54	1027.30	12756.62	1039.08	10.01	9400.00	3373.42	12800.00	630.00
10.250	177000.00	1039.52	1038.17	12.22	1027.30	30340.46	1040.29	9.25	9050.00	6283.61	15348.00	630.00
10.250	142000.00	1038.86	1037.57	11.56	1027.30	26225.74	1039.56	8.66	9050.00	6248.64	15317.80	630.00

SUMMARY OF ERRORS AND SPECIAL NOTES

```
CAUTION  SECNO=    9.759  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    9.759  PROFILE= 1  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    9.759  PROFILE= 6  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    9.759  PROFILE= 6  MINIMUM SPECIFIC ENERGY
```

```
*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED MARCH 1982                               *
*                                                   *
*  RUN DATE WED, JUN 08 1988 TIME 14:42:04          *
*****************************************************
```

```
*************************************
*  U.S. ARMY CORPS OF ENGINEERS     *
*  THE HYDROLOGIC ENGINEERING CENTER *
*  609 SECOND STREET, SUITE D       *
*  DAVIS, CALIFORNIA 95616          *
*  (916) 440-2105 (FTS) 448-2105    *
*************************************
```

```
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
```

NEW RIVER - PROPOSED CONDITIONS

THIS RUN EXECUTED 05 MAR 88 11:53:44

```
*****************************************
HEC2 RELEASE DATED NOV 76 UPDATED MAR 1982
ERROR CORR - 01,02,03,04,05
MODIFICATION - 50,51,52,53,54,55
*****************************************
```

T1 CAMELBACK RANCH - NEW RIVER W/ CHANNELIZATION ADJACENT TO SITE
DESIGN CONDITIONS - AGUA FRIA RIVER TO GLENDALE AVE.
DESIGN COND. 10 YEAR EVENT (NR1122D4A)

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	2.	0.	0.	0.001000	0.00	0.0	0.	1025.500	0.000

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1.000	0.000	-1.000	10.000	67.670	0.000	-1.000	0.000	0.000	0.000

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

38.000	43.000	1.000	2.000	8.000	42.000	25.000	3.000	26.000	53.000
4.000	54.000	39.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

NC	0.045	0.045	0.035	0.100	0.300	0.000	0.000	0.000	0.000	0.000
X	5.000	12500.000	29000.000	39000.000	39000.000	69000.000	0.000	0.000	0.000	0.000
T	0.000	0.000	0.000	7.100	9.100	0.000	8785.000	12400.000	9300.000	12000.000

LAST AGUA FRIA X-SECT. USED AS STARTING WSEL FOR NEW RIVER W/O
PHASING AS REQUESTED PER DAVE JOHNSON OF MCFCD ON 10/20/86 FOR THEIR
FIS STUDY. FILE LNRSPFQS CONVERTED TO LNRMCFCD ON 10/21/86 FOR
NEW RIVER FIS BASE.

X1	9.718	74.000	8785.000	11640.000	900.000	490.000	475.000	0.000	0.000	0.000
X	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	1032.200	8775.000	1032.200	8785.000	1027.000	8790.000	1027.000	8800.000	1027.000	8930.000
GR	1027.000	8931.000	1027.000	8932.000	1027.000	9080.000	1027.700	9150.000	1026.000	9220.000
GR	1025.300	9240.000	1026.000	9260.000	1027.000	9300.000	1026.000	9315.000	1020.000	9335.000
GR	1020.000	9445.000	1022.000	9450.000	1022.000	9560.000	1020.000	9615.000	1019.200	9640.000
GR	1020.000	9650.000	1022.000	9665.000	1023.000	9675.000	1022.000	9685.000	1021.700	9860.000
GR	1020.900	10000.000	1020.500	10050.000	1022.000	10200.000	1022.300	10300.000	1022.000	10390.000
GR	1022.000	10480.000	1026.000	10520.000	1026.000	10600.000	1027.500	10720.000	1026.000	10965.000
GR	1024.000	10975.000	1026.000	11000.000	1026.300	11130.000	1026.000	11260.000	1026.000	11370.000
GR	1028.000	11440.000	1029.200	11470.000	1028.000	11500.000	1026.400	11640.000	1024.000	11800.000
GR	1024.000	11830.000	1026.000	11920.000	1026.000	11950.000	1025.600	12070.000	1024.000	12140.000
GR	1024.500	12210.000	1024.000	12270.000	1022.000	12280.000	1020.400	12320.000	1022.000	12360.000
GR	1024.000	12435.000	1026.000	12480.000	1026.000	12565.000	1024.000	12600.000	1024.000	12650.000
GR	1026.000	12720.000	1025.000	12820.000	1026.000	12900.000	1024.000	12960.000	1026.000	13000.000
GR	1027.000	13070.000	1026.000	13135.000	1026.000	13580.000	1025.800	14080.000	1026.000	14550.000
GR	1026.500	15000.000	1027.300	15150.000	1030.000	15250.000	1030.500	15270.000	0.000	0.000

```
    13.000      7.100      7.100      7.100      9.100      7.100   9540.000  11720.000   9540.000  10374.000
      AP PLAN STA. 15+30  CROSS SECTIONS 13.0 THRU 70.5 HAVE BEEN UPDATED
      PER GLENDALE AIRPORT CHANNEL PLANS AND HAVE BEEN ADJUSTED TO COE
      DATUM.  COE B.M.=1074.25  A.P. B.M.=1074.71.  A.P. CROSS SECTION
      DATA ADJUSTED -0.46 FT(USED -0.50).
X1  13.000     14.000   9540.000  10374.000    800.000   2000.000   1300.000      0.000      0.000      0.000
R 1036.800   9538.000   1036.800   9540.000   1024.900   9552.000   1022.200   9960.000   1022.400  10000.000
R 1022.500  10014.000   1022.800  10060.000   1023.400  10150.000   1024.900  10269.000   1027.500  10374.000
GR 1029.500 10414.000   1030.700  10800.000   1032.000  11300.000   1033.500  11720.000      0.000      0.000

    20.000      7.100      7.100      7.100      9.100      7.100   9605.000  11360.000   9605.000  10445.000
              AP PLAN STA. 22+30
X1  20.000     15.000   9605.000  10445.000    960.000    700.000    700.000      0.000      0.000      0.000
R 1037.800   9603.000   1037.800   9604.000   1037.800   9605.000   1026.300   9616.000   1023.600  10025.000
GR 1024.500 10165.000   1025.500  10310.000   1025.500  10378.000   1024.500  10429.000   1028.500  10445.000
GR 1029.500 10457.000   1030.000  10690.000   1031.200  10900.000   1032.000  11060.000   1034.000  11360.000

    26.800      5.100      0.000      0.000   9537.000  10400.000      0.000      0.000      0.000      0.000
ET  26.800      0.000      7.100      7.100      9.100      7.100   9537.000  11740.000   9537.000  10400.000
              AP PLAN STA. 29+10
X1  26.800     17.000   9537.000  10400.000   1000.000    680.000    680.000      0.000      0.000      0.000
GR 1038.800   9534.000   1038.800   9537.000   1027.600   9548.000   1024.900   9957.000   1026.000  10044.000
R 1026.500  10193.000   1027.500  10342.000   1027.600  10362.000   1029.500  10366.000   1030.500  10381.000
R 1031.500  10400.000   1033.200  10540.000   1033.400  10710.000   1033.600  10895.000   1033.800  11090.000
GR 1034.000 11260.000   1035.300  11740.000      0.000      0.000      0.000      0.000      0.000      0.000

    32.600      5.100      0.000      0.000   9380.000  10233.000      0.000      0.000      0.000      0.000
ET  32.600      0.000      7.100      7.100      9.100      7.100   9380.000  10233.000   9380.000  10233.000
              AP PLAN STA. 35+40
X1  32.600     23.000   9380.000  10233.000    660.000    580.000    580.000      0.000      0.000      0.000
R 1039.800   9374.000   1039.800   9375.000   1039.800   9376.000   1039.800   9378.000   1039.800   9380.000
GR 1028.400   9391.000   1026.200   9800.000   1026.500   9847.000   1027.500   9997.000   1028.500  10147.000
R 1027.500  10207.000   1028.500  10209.000   1032.500  10217.000   1036.500  10225.000   1040.500  10233.000
R 1041.200  10320.000   1041.800  10520.000   1042.300  10670.000   1043.200  10975.000   1043.800  11160.000
GR 1044.000 11480.000   1044.500  11750.000   1045.000  11920.000      0.000      0.000      0.000      0.000

    38.000      5.100      0.000      0.000   9226.000  10073.000      0.000      0.000      0.000      0.000
ET  38.000      0.000      7.100      7.100      9.100      7.100   9226.000  10073.000   9226.000  10073.000
              AP PLAN STA. 40+30
X1  38.000     20.000   9226.000  10072.600    440.000    500.000    540.000      0.000      0.000      0.000
R 1041.100   9221.000   1041.100   9222.000   1041.100   9223.000   1041.100   9226.000   1029.900   9237.000
GR 1027.200   9646.000   1028.000   9698.000   1029.000   9846.000   1030.000   9997.000   1030.400  10051.400
R 1041.000  10072.600   1041.400  10160.000   1041.500  10165.000   1041.600  10190.000   1041.600  10200.000
R 1041.700  10250.000   1044.200  10880.000   1044.400  10920.000   1045.700  11500.000   1045.900  11630.000

    45.000      5.100      5.100      0.000   9290.000  10136.000      0.000      0.000      0.000      0.000
ET  45.000      0.000      0.000      7.100      9.100      7.100   9290.000  10136.000   9290.000  10136.000
              AP PLAN STA. 45+80
X1  45.000     14.000   9290.000  10135.800    440.000    680.000    700.000      0.000      0.000      0.000
R 1042.800   9285.000   1042.800   9290.000   1031.000   9302.000   1028.300   9710.000   1028.500   9748.000
R 1029.500   9888.000   1030.500  10047.000   1031.000  10115.400   1041.200  10135.800   1041.400  10252.000
GR 1041.500 10390.000   1041.900  10590.000   1042.200  10710.000   1043.100  11000.000      0.000      0.000
```

T	51.700	7.100	7.100	7.100	9.100	7.100	9722.000	10599.000	9722.000	10599.000
		AP PLAN STA. 53+70								
X1	51.700	13.000	9722.000	10598.200	600.000	510.000	670.000	0.000	0.000	0.000
GR	1044.300	9718.000	1044.300	9720.000	1044.300	9722.000	1032.900	9733.000	1030.200	10142.000
GR	1030.500	10271.000	1031.500	10420.000	1032.500	10570.000	1032.600	10577.400	1043.000	10598.200
GR	1043.500	10675.000	1043.800	10685.000	1044.500	10705.000	0.000	0.000	0.000	0.000
ET	54.000	7.100	7.100	7.100	9.100	7.100	9849.000	10696.000	9849.000	10696.000
		AP PLAN STA. 55+65								
X1	54.000	15.000	9849.000	10695.000	270.000	200.000	230.000	0.000	0.000	0.000
GR	1044.500	9844.000	1044.500	9848.000	1044.500	9849.000	1033.100	9860.000	1030.400	10269.000
GR	1030.500	10311.000	1031.500	10459.000	1032.500	10610.000	1032.900	10674.400	1043.200	10695.000
GR	1044.100	11215.000	1044.200	11525.000	1044.500	11780.000	1045.000	11840.000	1046.000	13150.000
ET	59.000	0.000	0.000	7.100	9.100	0.000	9744.000	10701.000	9744.000	10701.000
		AP PLAN STA. 60+00								
X1	59.000	43.000	9745.000	10700.200	760.000	490.000	500.000	0.000	0.000	0.000
GR	1046.000	6900.000	1045.500	7000.000	1045.000	7100.000	1044.000	7305.000	1042.700	7410.000
GR	1042.000	7525.000	1041.700	7640.000	1041.500	7875.000	1041.000	8170.000	1041.500	8560.000
GR	1040.000	8720.000	1040.000	8800.000	1040.800	9085.000	1041.000	9500.000	1042.000	9585.000
GR	1044.000	9600.000	1042.000	9615.000	1040.300	9630.000	1044.000	9700.000	1044.000	9720.000
GR	1044.000	9745.000	1042.000	9765.000	1040.000	9770.000	1038.000	9800.000	1036.000	9805.000
GR	1034.000	9815.000	1032.000	9865.000	1030.700	9880.000	1032.000	9890.000	1034.000	9915.000
GR	1032.000	9945.000	1031.600	10000.000	1035.000	10204.000	1034.000	10224.000	1033.000	10245.000
GR	1032.000	10266.000	1031.100	10274.000	1031.500	10335.000	1032.500	10484.000	1033.500	10632.000
GR	1033.800	10679.400	1044.200	10700.200	1046.000	12750.000	0.000	0.000	0.000	0.000
ET	63.000	0.000	0.000	7.100	9.100	0.000	9669.000	10572.000	9669.000	10572.000
		AP PLAN STA. 63+00								
X1	63.000	37.000	9670.000	10571.600	460.000	380.000	400.000	0.000	0.000	0.000
GR	1050.000	6725.000	1049.000	6950.000	1048.000	7040.000	1047.200	7190.000	1046.000	7330.000
GR	1044.000	7710.000	1043.400	8020.000	1043.200	8470.000	1043.100	8630.000	1043.100	8865.000
GR	1043.300	9315.000	1043.300	9490.000	1042.000	9535.000	1042.000	9655.000	1043.500	9670.000
GR	1042.000	9685.000	1040.000	9715.000	1038.000	9760.000	1036.000	9780.000	1034.000	9845.000
GR	1034.000	9890.000	1033.700	9960.000	1032.900	10000.000	1032.000	10020.000	1032.300	10100.000
GR	1032.000	10120.000	1031.800	10130.000	1032.000	10140.000	1031.700	10145.000	1032.500	10266.000
GR	1033.500	10415.000	1034.400	10550.400	1045.000	10571.600	1045.500	11090.000	1046.000	11350.000
GR	1047.700	11390.000	1048.000	12390.000	0.000	0.000	0.000	0.000	0.000	0.000
ET	70.500	0.000	0.000	7.100	9.100	0.000	9579.000	10271.000	9579.000	10271.000
		AP PLAN STA. 70+50								
X1	70.500	40.000	9580.000	10270.000	710.000	700.000	750.000	0.000	0.000	0.000
GR	1049.800	7020.000	1048.000	7215.000	1047.700	7255.000	1046.000	7310.000	1045.800	7420.000
GR	1045.000	7825.000	1045.100	7985.000	1044.300	8190.000	1045.000	8520.000	1044.700	8790.000
GR	1045.200	9075.000	1044.600	9360.000	1044.000	9460.000	1043.000	9485.000	1042.000	9505.000
GR	1042.000	9550.000	1044.000	9565.000	1044.000	9570.000	1044.000	9580.000	1042.000	9595.000
GR	1040.700	9625.000	1041.800	9720.000	1040.000	9825.000	1038.000	9840.000	1035.500	9922.000
GR	1035.500	9994.000	1036.400	10000.000	1034.500	10055.000	1033.500	10122.000	1035.500	10147.000
GR	1033.500	10165.000	1034.500	10240.000	1046.500	10262.000	1047.500	10270.000	1046.000	10390.000
GR	1046.000	10490.000	1046.500	10560.000	1046.000	10600.000	1046.000	11300.000	1048.000	11700.000

T	77.000	0.000	7.100	7.100	9.100	0.000	9775.000	10250.000	9775.000	10250.000
		AP PLAN STA. 74+16, END CHANNEL AT 107TH AVE.								
		NORTH PROJECT X-77.0 USED AS NATURAL RIVER BED								
X1	77.000	33.000	9776.000	10148.000	480.000	660.000	650.000	0.000	0.000	0.000
GR	1052.000	7105.000	1050.000	7110.000	1048.400	7205.000	1048.000	7500.000	1047.000	8115.000
GR	1047.300	8410.000	1047.200	8760.000	1046.000	9080.000	1045.700	9225.000	1045.500	9390.000
GR	1044.200	9548.000	1044.000	9648.000	1043.700	9748.000	1051.000	9776.000	1044.600	9807.000
GR	1042.300	9858.000	1042.200	9875.000	1043.400	9884.000	1042.300	9891.000	1042.800	9900.000
GR	1035.600	9921.000	1036.300	9956.000	1036.200	10000.000	1035.500	10048.000	1034.600	10078.000
GR	1035.700	10104.000	1044.700	10148.000	1044.500	10165.000	1048.200	10192.000	1046.100	10214.000
GR	1046.700	10236.000	1048.100	10248.000	1050.900	10285.000	0.000	0.000	0.000	0.000
ET	84.000	0.000	0.000	7.100	9.100	0.000	9844.000	10790.000	9844.000	10401.000
ET	84.000	0.000	0.000	0.000	0.000	9.100	0.000	0.000	7545.000	10790.000
X1	84.000	40.000	9845.000	10400.000	620.000	700.000	700.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	1054.000	7475.000	1052.000	7490.000	1052.000	7520.000	1052.000	7545.000	1051.000	7570.000
GR	1050.000	7795.000	1048.500	7970.000	1048.400	8210.000	1048.200	8500.000	1048.200	8820.000
GR	1050.000	8950.000	1048.700	9320.000	1048.000	9480.000	1047.500	9630.000	1046.000	9740.000
GR	1046.000	9815.000	1052.000	9840.000	1053.500	9845.000	1052.000	9855.000	1046.100	9875.000
GR	1044.100	9880.000	1042.100	9905.000	1036.100	9915.000	1035.800	9970.000	1036.100	9990.000
GR	1038.100	10025.000	1038.100	10045.000	1040.100	10115.000	1042.100	10160.000	1042.100	10215.000
GR	1040.100	10230.000	1040.100	10360.000	1042.100	10370.000	1044.400	10400.000	1042.000	10415.000
GR	1042.000	10490.000	1044.000	10570.000	1048.000	10610.000	1050.000	10615.000	1050.000	10790.000
ET	88.700	0.000	0.000	7.100	9.100	0.000	9729.000	10980.000	9729.000	10301.000
		GRAVEL PIT, LOB BREAKOUT TO X95.5. D/S B.O. LIMITED IN Q TO X77								
X1	88.700	47.000	9730.000	10300.000	520.000	430.000	470.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	1054.000	6520.000	1052.000	6550.000	1052.000	6580.000	1052.000	7170.000	1052.000	7440.000
GR	1052.000	8650.000	1050.400	8770.000	1050.200	8910.000	1050.200	9080.000	1050.100	9250.000
GR	1050.000	9630.000	1050.000	9725.000	1052.000	9730.000	1050.000	9735.000	1036.200	9760.000
GR	1035.900	9765.000	1036.200	9770.000	1042.200	9810.000	1042.200	9910.000	1034.200	9930.000
GR	1036.200	9990.000	1038.200	10000.000	1036.200	10030.000	1034.200	10100.000	1034.200	10170.000
GR	1044.100	10220.000	1044.100	10220.000	1045.600	10300.000	1046.000	10310.000	1046.000	10360.000
GR	1048.000	10430.000	1050.000	10455.000	1052.000	10500.000	1052.000	10530.000	1050.000	10560.000
GR	1050.000	10610.000	1052.000	10615.000	1052.000	10650.000	1050.000	10700.000	1052.000	10710.000
GR	1052.000	10760.000	1050.000	10765.000	1050.000	10830.000	1050.900	10850.000	1051.100	10950.000
GR	1052.000	10980.000	1058.000	11030.000	0.000	0.000	0.000	0.000	0.000	0.000
ET	95.500	0.000	0.000	0.000	9.100	0.000	0.000	0.000	9499.000	10306.000
		GRAVEL PIT, LOB BREAKOUT TO X88.7.								
X1	95.500	40.000	9500.000	10305.000	400.000	680.000	680.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	1056.000	6420.000	1055.800	6575.000	1055.000	7030.000	1053.300	7530.000	1053.300	7540.000
GR	1052.000	7550.000	1052.000	7610.000	1052.000	7615.000	1052.000	8270.000	1052.000	8610.000
GR	1052.000	8855.000	1052.000	9140.000	1053.600	9340.000	1052.000	9470.000	1052.000	9500.000
GR	1050.000	9535.000	1050.000	9840.000	1048.100	9845.000	1046.100	9850.000	1044.200	9890.000
GR	1042.200	9905.000	1040.200	9915.000	1037.500	9960.000	1036.200	10000.000	1036.200	10085.000
GR	1034.200	10120.000	1034.200	10240.000	1036.200	10250.000	1038.200	10260.000	1038.200	10280.000
GR	1052.000	10305.000	1050.000	10310.000	1050.000	10330.000	1052.000	10420.000	1050.700	10580.000
GR	1051.000	10880.000	1052.000	10975.000	1052.100	11070.000	1054.000	11280.000	1064.000	11400.000

T	100.700	0.000	0.000	0.000	9.100	0.000	0.000	0.000	9629.000	10191.000
X1	100.700	48.000	9630.000	10190.000	550.000	620.000	520.000	0.000	0.000	0.000
GR	1056.000	7400.000	1055.100	7450.000	1070.000	7451.000	1070.000	7600.000	1056.000	7601.000
GR	1055.000	7730.000	1070.000	7731.000	1070.000	8019.000	1054.500	8020.000	1054.300	8110.000
GR	1070.000	8111.000	1070.000	8139.000	1054.200	8140.000	1054.200	8210.000	1054.100	8450.000
GR	1054.200	8600.000	1054.100	8740.000	1053.600	9180.000	1054.000	9300.000	1054.500	9450.000
GR	1054.000	9570.000	1054.000	9600.000	1055.000	9630.000	1054.000	9645.000	1052.000	9670.000
GR	1051.000	9720.000	1052.000	9820.000	1052.000	9865.000	1050.000	9890.000	1042.300	9900.000
GR	1042.300	9960.000	1040.300	9970.000	1036.300	9980.000	1036.300	10070.000	1035.000	10100.000
GR	1036.300	10120.000	1038.300	10130.000	1040.300	10155.000	1052.000	10190.000	1052.000	10240.000
GR	1053.000	10270.000	1052.000	10300.000	1052.000	10380.000	1052.200	10430.000	1053.300	10570.000
GR	1053.700	10880.000	1054.000	11140.000	1062.000	11200.000	0.000	0.000	0.000	0.000
T	107.000	0.000	0.000	0.000	9.100	0.000	0.000	0.000	9709.000	10256.000
X1	107.000	48.000	9710.000	10255.000	300.000	640.000	630.000	0.000	0.000	0.000
GR	1058.900	7275.000	1058.700	7480.000	1058.200	7715.000	1058.000	7750.000	1056.000	7810.000
GR	1070.000	7811.000	1070.000	7920.000	1055.300	7921.000	1055.100	8025.000	1055.000	8120.000
GR	1070.000	8121.000	1070.000	8194.000	1055.500	8195.000	1055.200	8330.000	1070.000	8331.000
GR	1070.000	8389.000	1055.300	8390.000	1055.100	8580.000	1054.200	8630.000	1054.400	8835.000
GR	1054.500	9105.000	1054.800	9370.000	1056.000	9490.000	1056.000	9620.000	1056.000	9710.000
GR	1052.000	9735.000	1040.100	9750.000	1039.600	9755.000	1040.100	9770.000	1040.100	9830.000
GR	1038.100	9835.000	1038.100	9960.000	1040.100	9985.000	1040.100	10110.000	1042.100	10130.000
GR	1042.100	10180.000	1045.100	10190.000	1045.100	10240.000	1054.000	10255.000	1055.000	10365.000
GR	1055.700	10460.000	1055.700	10550.000	1056.000	10735.000	1057.000	10740.000	1056.100	10755.000
GR	1056.200	10870.000	1056.000	10980.000	1060.000	11010.000	0.000	0.000	0.000	0.000
C	0.045	0.045	0.035	0.300	0.500	0.000	0.000	0.000	0.000	0.000
T	110.700	0.000	0.000	0.000	9.100	0.000	0.000	0.000	9734.000	10236.000
X1	110.700	42.000	9735.000	10235.000	600.000	300.000	370.000	0.000	0.000	0.000
GR	1060.000	7845.000	1060.000	7846.000	1058.000	7852.000	1058.000	7854.000	1057.700	8000.000
GR	1058.000	8145.000	1058.000	8150.000	1058.000	8200.000	1057.100	8540.000	1057.400	8810.000
GR	1056.600	8950.000	1056.100	9075.000	1056.000	9100.000	1055.600	9320.000	1055.400	9430.000
GR	1056.000	9495.000	1056.700	9525.000	1056.000	9540.000	1054.000	9545.000	1054.000	9690.000
GR	1055.600	9735.000	1054.000	9770.000	1042.200	9790.000	1041.500	9820.000	1042.200	9870.000
GR	1046.200	9880.000	1048.200	9910.000	1049.200	10000.000	1049.200	10120.000	1048.200	10160.000
GR	1047.000	10190.000	1048.200	10215.000	1056.000	10235.000	1054.000	10250.000	1054.000	10340.000
GR	1056.000	10345.000	1056.700	10500.000	1056.000	10590.000	1055.800	10670.000	1056.000	10770.000
GR	1058.000	10810.000	1060.000	10830.000	0.000	0.000	0.000	0.000	0.000	0.000
T	117.200	0.000	0.000	0.000	9.100	0.000	0.000	0.000	9844.000	10196.000
	DOWNSTREAM SIDE GLENDALE AVE BRIDGE									
X1	117.200	33.000	9845.000	10195.000	800.000	400.000	650.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	1061.000	1061.000	0.000
GR	1066.000	7075.000	1064.000	7120.000	1062.000	8020.000	1060.000	8035.000	1060.000	8037.000
GR	1059.800	8280.000	1060.000	8340.000	1060.000	8360.000	1060.000	8380.000	1058.500	8500.000
GR	1058.700	8630.000	1057.900	8780.000	1057.900	9100.000	1058.400	9330.000	1058.000	9550.000
GR	1058.000	9730.000	1056.000	9845.000	1054.100	9855.000	1052.200	9885.000	1050.200	9910.000
GR	1048.200	9970.000	1046.400	10030.000	1046.400	10120.000	1048.200	10165.000	1056.000	10195.000
GR	1057.000	10260.000	1057.500	10460.000	1056.000	10550.000	1056.000	10940.000	1056.000	11415.000
GR	1058.000	11555.000	1060.000	11620.000	1062.000	11685.000	0.000	0.000	0.000	0.000

B	0.900	1.560	2.900	0.000	352.000	19.800	5503.000	0.000	1046.500	1046.200
ET	118.000	0.000	0.000	0.000	9.110	0.000	0.000	0.000	9844.000	10196.000

UPSTREAM SIDE GLENDALE AVE BRIDGE-PERCHED. 2FT DEBRIS PER PIER.
1983 TOPO WITHIN 0.3FT OF BRIDGE PLAN DECK.USED PLANS MINUS 0.3FT

X1	118.000	33.000	9845.000	10195.000	80.000	80.000	80.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	1063.100	1063.000	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	1063.500	1063.000	0.000
BT	-18.000	8080.000	1064.500	0.000	8140.000	1063.900	0.000	8420.000	1063.600	0.000
BT	0.000	8720.000	1063.500	0.000	9000.000	1063.500	0.000	9230.000	1063.600	0.000
BT	0.000	9650.000	1064.000	0.000	9700.000	1064.500	0.000	9844.000	1066.100	0.000
BT	0.000	9845.000	1068.600	1063.100	10195.000	1068.600	1063.100	10196.000	1066.100	0.000
BT	0.000	10370.000	1064.000	0.000	10600.000	1063.300	0.000	11150.000	1063.000	0.000
BT	0.000	11195.000	1063.400	0.000	11480.000	1063.600	0.000	11515.000	1064.000	0.000
GR	1066.000	7865.000	1066.000	7866.000	1065.000	8030.000	1065.000	8031.000	1065.000	8032.000
GR	1064.000	8190.000	1062.900	8250.000	1062.000	8320.000	1060.100	8515.000	1060.000	9170.000
GR	1059.000	9290.000	1060.000	9710.000	1060.000	9835.000	1058.000	9845.000	1056.000	9860.000
GR	1049.900	9895.000	1047.900	9920.000	1047.400	10020.000	1047.900	10130.000	1049.900	10160.000
GR	1051.900	10175.000	1058.000	10195.000	1058.000	10210.000	1060.000	10220.000	1058.000	10730.000
GR	1057.400	11030.000	1057.400	11190.000	1058.000	11330.000	1060.000	11400.000	1062.000	11403.000
GR	1064.000	11415.000	1064.000	11450.000	1066.000	11485.000	0.000	0.000	0.000	0.000

ET	120.000	0.000	7.100	7.100	9.100	0.000	9550.000	10400.000	9799.000	10206.000
X1	120.000	40.000	9800.000	10205.000	200.000	130.000	200.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	1066.800	7690.000	1066.200	7795.000	1066.000	7840.000	1064.400	8070.000	1064.000	8160.000
GR	1062.000	8255.000	1060.300	8300.000	1060.300	8480.000	1060.200	8715.000	1069.900	8950.000
GR	1061.400	9100.000	1060.400	9200.000	1060.000	9220.000	1059.400	9260.000	1059.500	9360.000
GR	1058.400	9430.000	1059.800	9530.000	1058.000	9630.000	1058.000	9660.000	1058.600	9725.000
GR	1058.000	9760.000	1058.000	9780.000	1058.200	9800.000	1057.900	9820.000	1055.900	9825.000
GR	1051.900	9850.000	1049.900	9870.000	1045.900	9880.000	1045.900	10180.000	1058.000	10205.000
GR	1058.500	10270.000	1058.500	10330.000	1059.600	10350.000	1059.200	10400.000	1058.400	10700.000
GR	1058.000	11000.000	1056.700	11185.000	1056.700	11275.000	1060.000	11345.000	1066.000	11370.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

THIS RUN EXECUTED 05 MAR 88 11:54:17

****
HEC2 RELEASE DATED NOV 76 UPDATED MAR 1982
ERROR CORR - 01,02,03,04,05
MODIFICATION - 50,51,52,53,54,55
****

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

DESIGN COND.
UMMARY PRINTOUT

SECNO	Q	CWSEL	CRIWS	DEPTH	ELMIN	AREA	EG	VCH	SSTA	TOPWID	ENDST	XLCH
9.718	12500.00	1024.97	1022.94	5.77	1019.20	4130.39	1025.11	3.03	9318.45	1208.09	10987.06	0.00
9.718	29000.00	1026.91	1024.10	7.71	1019.20	11808.31	1027.03	3.01	9182.44	5541.84	15077.28	0.00
9.718	39000.00	1028.03	1026.27	8.83	1019.20	12770.77	1028.18	3.17	8789.01	3552.61	12400.00	0.00
9.718	39000.00	1028.31	1024.69	9.11	1019.20	11212.85	1028.50	3.61	9300.00	2655.33	12000.00	0.00
9.718	69000.00	1028.75	1026.42	9.55	1019.20	23232.77	1028.90	3.53	8788.32	6392.75	15203.64	0.00
13.000	12500.00	1026.86	1025.55	4.66	1022.20	2523.98	1027.24	4.95	9550.03	797.89	10347.92	1300.00
13.000	29000.00	1028.76	1027.13	6.56	1022.20	4107.02	1029.54	7.08	9548.10	851.18	10399.28	1300.00
13.000	39000.00	1029.73	1027.89	7.53	1022.20	4950.79	1030.71	7.95	9547.13	942.13	10489.25	1300.00
13.000	39000.00	1029.93	1027.89	7.73	1022.20	5051.33	1030.85	7.72	9546.93	827.07	10374.00	1300.00
13.000	69000.00	1030.15	1029.86	7.95	1022.20	5370.26	1032.80	13.11	9546.71	1076.24	10622.95	1300.00
20.000	12500.00	1028.52	1026.77	4.92	1023.60	3016.89	1028.79	4.14	9613.88	831.38	10445.25	700.00
20.000	29000.00	1030.73	1028.22	7.13	1023.60	5145.40	1031.26	5.90	9611.77	1205.21	10816.97	700.00
20.000	39000.00	1031.78	1028.96	8.18	1023.60	6520.01	1032.42	6.53	9610.76	1405.50	11016.25	700.00
20.000	39000.00	1031.83	1028.95	8.23	1023.60	5770.66	1032.54	6.76	9610.71	834.29	10445.00	700.00
20.000	69000.00	1034.36	1031.15	10.76	1023.60	10663.00	1035.18	7.66	9608.29	1751.71	11360.00	700.00
26.800	12500.00	1029.79	1028.25	4.89	1024.90	2818.68	1030.09	4.43	9545.85	824.45	10370.30	680.00
26.800	29000.00	1032.04	1029.72	7.14	1024.90	4735.45	1032.63	6.14	9543.63	901.25	10444.88	680.00
26.800	39000.00	1033.06	1030.46	8.16	1024.90	5697.26	1033.81	6.94	9542.63	986.18	10528.82	680.00
26.800	39000.00	1033.19	1030.46	8.29	1024.90	5696.29	1033.92	6.85	9542.52	857.48	10400.00	680.00
26.800	69000.00	1035.49	1032.43	10.59	1024.90	9876.00	1036.49	8.32	9540.25	2199.75	11740.00	680.00
32.600	12500.00	1030.96	1029.29	4.76	1026.20	2941.40	1031.24	4.25	9388.53	825.38	10213.91	580.00
32.600	29000.00	1033.25	1030.74	7.05	1026.20	4849.18	1033.81	5.98	9386.31	832.20	10218.52	580.00
32.600	39000.00	1034.31	1031.48	8.11	1026.20	5723.05	1035.03	6.81	9385.30	835.31	10220.61	580.00
32.600	39000.00	1034.38	1031.48	8.18	1026.20	5781.29	1035.08	6.75	9385.23	835.52	10220.75	580.00
32.600	69000.00	1036.60	1033.39	10.40	1026.20	7655.52	1037.86	9.01	9383.08	842.14	10225.22	580.00

SECNO	Q	CWSEL	CRIWS	DEPTH	ELMIN	AREA	EG	VCH	SSTA	TOPWID	ENDST	XLCH
38.000	12500.00	1032.07	1030.68	4.87	1027.20	2692.32	1032.40	4.64	9234.87	819.86	10054.73	540.00
38.000	29000.00	1034.33	1032.14	7.13	1027.20	4555.65	1034.96	6.37	9232.65	826.61	10059.26	540.00
38.000	39000.00	1035.41	1032.88	8.21	1027.20	5453.72	1036.21	7.15	9231.58	829.84	10061.43	540.00
38.000	39000.00	1035.45	1032.88	8.25	1027.20	5483.54	1036.24	7.11	9231.55	829.95	10061.50	540.00
38.000	69000.00	1037.90	1034.79	10.70	1027.20	7523.45	1039.20	9.17	9229.15	837.25	10066.39	540.00
45.000	12500.00	1033.48	1031.56	5.18	1028.30	3131.30	1033.73	3.99	9299.48	820.88	10120.36	700.00
45.000	29000.00	1035.82	1033.03	7.52	1028.30	5057.66	1036.33	5.73	9297.10	827.93	10125.03	700.00
45.000	39000.00	1036.94	1033.77	8.64	1028.30	5993.65	1037.60	6.51	9295.96	831.33	10127.29	700.00
45.000	39000.00	1036.96	1033.77	8.66	1028.30	6004.68	1037.61	6.49	9295.94	831.37	10127.31	700.00
45.000	69000.00	1039.64	1035.67	11.34	1028.30	8250.39	1040.73	8.36	9293.21	839.48	10132.69	700.00
51.700	12500.00	1034.66	1033.24	4.46	1030.20	2788.31	1034.97	4.48	9731.31	850.20	10581.51	670.00
51.700	29000.00	1037.00	1034.66	6.80	1030.20	4789.13	1037.57	6.06	9729.05	857.15	10586.19	670.00
51.700	39000.00	1038.14	1035.38	7.94	1030.20	5770.09	1038.85	6.76	9727.94	860.54	10588.48	670.00
51.700	39000.00	1038.15	1035.38	7.95	1030.20	5772.64	1038.86	6.76	9727.94	860.54	10588.49	670.00
51.700	69000.00	1040.92	1037.24	10.72	1030.20	8185.42	1042.03	8.43	9725.25	868.82	10594.07	670.00
54.000	12500.00	1035.17	1033.59	4.77	1030.40	2856.84	1035.46	4.38	9858.01	820.93	10678.93	230.00
54.000	29000.00	1037.47	1035.05	7.07	1030.40	4751.56	1038.04	6.10	9855.79	827.74	10683.53	230.00
54.000	39000.00	1038.59	1035.79	8.19	1030.40	5679.89	1039.33	6.87	9854.71	831.06	10685.77	230.00
54.000	39000.00	1038.60	1035.79	8.20	1030.40	5685.04	1039.33	6.86	9854.70	831.08	10685.78	230.00
54.000	69000.00	1041.35	1037.69	10.95	1030.40	7991.38	1042.51	8.63	9852.04	839.27	10691.31	230.00
59.000	12500.00	1036.17	1034.51	5.47	1030.70	3005.24	1036.44	4.16	9804.58	879.56	10684.14	500.00
59.000	29000.00	1038.50	1035.95	7.80	1030.70	5068.11	1039.01	5.72	9792.54	896.26	10688.80	500.00
59.000	39000.00	1039.66	1036.66	8.96	1030.70	6119.93	1040.29	6.37	9775.12	915.99	10691.12	500.00
59.000	39000.00	1039.66	1036.66	8.96	1030.70	6123.39	1040.29	6.37	9775.07	916.06	10691.12	500.00
59.000	69000.00	1042.70	1038.52	12.00	1030.70	12455.74	1043.41	7.03	7409.72	3185.55	10697.21	500.00
63.000	12500.00	1036.90	1035.14	5.20	1031.70	2870.96	1037.19	4.35	9771.02	784.38	10555.40	400.00
63.000	29000.00	1039.21	1036.70	7.51	1031.70	4728.36	1039.80	6.13	9732.70	827.33	10560.03	400.00
63.000	39000.00	1040.36	1037.47	8.66	1031.70	5693.60	1041.09	6.85	9709.58	852.74	10562.32	400.00
63.000	39000.00	1040.36	1037.47	8.66	1031.70	5695.73	1041.09	6.85	9709.54	852.78	10562.33	400.00
63.000	69000.00	1043.09	1039.49	11.39	1031.70	8236.49	1044.21	8.51	9497.32	1062.22	10567.78	400.00
70.500	12500.00	1038.79	1038.20	5.29	1033.50	1488.12	1039.88	8.40	9834.09	413.78	10247.86	750.00
70.500	29000.00	1041.00	1040.68	7.50	1033.50	2461.03	1043.16	11.78	9617.87	519.61	10251.93	750.00
70.500	39000.00	1042.20	1042.08	8.70	1033.50	3191.31	1044.52	12.22	9593.47	660.66	10254.13	750.00
70.500	39000.00	1042.20	1042.08	8.70	1033.50	3191.12	1044.52	12.22	9593.47	660.66	10254.12	750.00
70.500	69000.00	1045.59	1045.59	12.09	1033.50	7181.50	1047.63	11.83	7527.01	2733.32	10260.33	750.00
77.000	12500.00	1042.41	1040.79	7.81	1034.60	1402.61	1043.64	8.91	9855.55	259.40	10136.81	650.00
77.000	29000.00	1045.75	1044.55	11.15	1034.60	2493.38	1047.88	11.72	9801.46	372.62	10174.08	650.00
77.000	39000.00	1046.94	1045.95	12.34	1034.60	2959.48	1049.72	13.44	9795.71	419.71	10237.98	650.00
77.000	39000.00	1046.94	1045.95	12.34	1034.60	2959.57	1049.72	13.44	9795.71	419.71	10237.98	650.00
77.000	69000.00	1049.07	1049.07	14.47	1034.60	9920.11	1050.58	12.00	7165.49	3078.48	10260.76	650.00

SECNO	Q	CWSEL	CRIWS	DEPTH	ELMIN	AREA	EG	VCH	SSTA	TOPWID	ENDST	XLCH
84.000	12500.00	1044.92	1042.13	9.12	1035.80	3100.15	1045.20	4.33	9877.94	701.31	10579.25	700.00
84.000	29000.00	1048.87	1044.49	13.07	1035.80	5968.75	1049.27	5.28	9865.59	746.60	10612.19	700.00
84.000	39000.00	1050.69	1045.17	14.89	1035.80	7452.77	1051.16	5.77	9859.44	930.56	10790.00	700.00
84.000	39000.00	1050.72	1045.28	14.92	1035.80	5782.69	1051.43	6.75	9859.32	541.68	10401.00	700.00
84.000	69000.00	1051.18	1047.38	15.38	1035.80	7906.55	1052.49	9.69	9857.79	932.21	10790.00	700.00
88.700	12500.00	1045.38	1039.31	11.18	1034.20	3667.02	1045.56	3.41	9743.37	544.92	10288.29	470.00
88.700	29000.00	1049.24	1042.52	15.04	1034.20	6191.39	1049.60	4.88	9736.37	709.14	10445.52	470.00
88.700	39000.00	1051.03	1043.64	16.83	1034.20	7656.25	1051.48	5.48	9732.41	1001.33	10918.55	470.00
88.700	39000.00	1051.35	1043.65	17.15	1034.20	7029.28	1051.83	5.55	9731.62	569.38	10301.00	470.00
88.700	69000.00	1052.37	1046.66	18.17	1034.20	12244.28	1053.23	7.92	6544.40	4438.71	10983.11	470.00
95.500	12500.00	1045.67	1039.18	11.47	1034.20	3702.84	1045.85	3.38	9858.98	434.56	10293.54	680.00
95.500	29000.00	1049.59	1041.77	15.39	1034.20	5466.70	1050.03	5.30	9841.08	459.55	10300.63	680.00
95.500	39000.00	1051.52	1043.03	17.32	1034.20	6847.20	1052.03	5.70	9508.31	795.82	10304.14	680.00
95.500	39000.00	1051.87	1043.03	17.67	1034.20	7111.92	1052.33	5.48	9502.52	802.22	10304.74	680.00
95.500	69000.00	1053.27	1046.38	19.07	1034.20	12145.63	1054.08	7.57	7540.25	3590.29	11199.07	680.00
100.700	12500.00	1045.71	1041.90	10.71	1035.00	1968.88	1046.34	6.35	9895.57	275.62	10171.19	520.00
100.700	29000.00	1049.43	1045.51	14.43	1035.00	3024.78	1050.86	9.59	9890.73	291.59	10182.33	520.00
100.700	39000.00	1051.54	1047.09	16.54	1035.00	3685.01	1053.28	10.58	9692.78	399.60	10188.64	520.00
100.700	39000.00	1051.90	1047.09	16.90	1035.00	3833.60	1053.50	10.17	9675.43	457.01	10189.67	520.00
100.700	69000.00	1054.72	1054.72	19.72	1035.00	7846.88	1056.68	11.77	8019.99	3082.61	11145.36	520.00
107.000	12500.00	1046.80	1042.66	8.70	1038.10	3192.70	1047.04	3.92	9741.56	501.30	10242.86	630.00
107.000	29000.00	1051.24	1045.00	13.14	1038.10	5449.06	1051.68	5.32	9735.96	514.39	10250.35	630.00
107.000	39000.00	1053.66	1046.14	15.56	1038.10	6706.63	1054.18	5.82	9724.65	529.77	10254.42	630.00
107.000	39000.00	1053.87	1046.11	15.77	1038.10	6820.10	1054.38	5.72	9723.32	531.46	10254.78	630.00
107.000	69000.00	1056.95	1048.79	18.85	1038.10	12670.61	1057.73	7.42	7781.62	2958.95	10987.10	630.00
110.700	12500.00	1050.12	1050.12	8.62	1041.50	1300.34	1051.56	9.61	9776.57	443.35	10219.93	370.00
110.700	29000.00	1052.21	1052.21	10.71	1041.50	2236.83	1054.82	12.96	9773.03	452.26	10225.29	370.00
110.700	39000.00	1053.23	1053.23	11.73	1041.50	2698.74	1056.47	14.45	9771.31	456.59	10227.89	370.00
110.700	39000.00	1053.52	1053.52	12.02	1041.50	2830.20	1056.46	13.78	9770.82	457.81	10228.63	370.00
110.700	69000.00	1057.53	1057.53	16.03	1041.50	7562.25	1059.61	12.39	8375.76	2424.93	10800.69	370.00
117.200	12500.00	1054.14	1051.64	7.74	1046.40	1881.34	1054.82	6.64	9854.80	333.03	10187.84	650.00
117.200	29000.00	1057.17	1054.65	10.77	1046.40	2928.81	1058.70	9.90	9845.00	350.00	10195.00	650.00
117.200	39000.00	1058.53	1056.04	12.13	1046.40	3403.67	1060.57	11.46	9845.00	350.00	10195.00	650.00
117.200	39000.00	1058.28	1056.04	11.88	1046.40	3314.28	1060.43	11.77	9845.00	350.00	10195.00	650.00
117.200	69000.00	1061.01	1061.01	14.61	1046.40	15340.20	1061.65	8.37	8027.40	3625.52	11652.92	650.00
118.000	12500.00	1054.22	0.00	6.82	1047.40	1784.05	1054.98	7.01	9870.22	312.38	10182.60	80.00
118.000	29000.00	1057.43	0.00	10.03	1047.40	2836.98	1059.06	10.22	9849.24	343.90	10193.15	80.00
118.000	39000.00	1058.94	0.00	11.54	1047.40	3360.83	1061.03	11.60	9845.00	350.00	10195.00	80.00
118.000	39000.00	1058.74	0.00	11.34	1047.40	3290.70	1060.92	11.85	9845.00	350.00	10195.00	80.00
118.000	69000.00	1063.78	0.00	16.38	1047.40	17624.13	1064.25	7.12	8201.56	3212.17	11413.73	80.00

SECNO	Q	CWSEL	CRIWS	DEPTH	ELMIN	AREA	EG	VCH	SSTA	TOPWID	ENDST	XLCH
120.000	12500.00	1055.08	1049.63	9.18	1045.90	3028.70	1055.35	4.13	9830.11	368.86	10198.97	200.00
120.000	29000.00	1059.06	1052.42	13.16	1045.90	4828.98	1059.67	6.31	9571.12	769.06	10340.18	200.00
120.000	39000.00	1061.05	1053.79	15.15	1045.90	6499.51	1061.75	6.88	9550.00	850.00	10400.00	200.00
120.000	39000.00	1060.82	1053.78	14.92	1045.90	5279.78	1061.67	7.39	9799.00	407.00	10206.00	200.00
120.000	69000.00	1063.97	1057.05	18.07	1045.90	18497.96	1064.38	6.34	8161.15	2952.34	11361.57	200.00

SUMMARY OF ERRORS AND SPECIAL NOTES

```
AUTION  SECNO=   70.500  PROFILE= 5  CRITICAL DEPTH ASSUMED
AUTION  SECNO=   70.500  PROFILE= 5  MINIMUM SPECIFIC ENERGY

UTION  SECNO=   77.000  PROFILE= 5  CRITICAL DEPTH ASSUMED
UTION  SECNO=   77.000  PROFILE= 5  MINIMUM SPECIFIC ENERGY

UTION  SECNO=  100.700  PROFILE= 5  CRITICAL DEPTH ASSUMED
UTION  SECNO=  100.700  PROFILE= 5  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=  110.700  PROFILE= 1  CRITICAL DEPTH ASSUMED
UTION  SECNO=  110.700  PROFILE= 1  MINIMUM SPECIFIC ENERGY
AUTION  SECNO=  110.700  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=  110.700  PROFILE= 2  MINIMUM SPECIFIC ENERGY
AUTION  SECNO=  110.700  PROFILE= 3  CRITICAL DEPTH ASSUMED
AUTION  SECNO=  110.700  PROFILE= 3  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=  110.700  PROFILE= 4  CRITICAL DEPTH ASSUMED
UTION  SECNO=  110.700  PROFILE= 4  MINIMUM SPECIFIC ENERGY
UTION  SECNO=  110.700  PROFILE= 5  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=  110.700  PROFILE= 5  MINIMUM SPECIFIC ENERGY

UTION  SECNO=  117.200  PROFILE= 5  CRITICAL DEPTH ASSUMED
AUTION  SECNO=  117.200  PROFILE= 5  MINIMUM SPECIFIC ENERGY
```

APPENDIX III

GEOTECHNICAL INVESTIGATION REPORT

CVL

GEOTECHNICAL INVESTIGATION REPORT

Camelback Ranch Levee Design

Agua Fria River & New River

113th Avenue & Camelback Road

Maricopa County, Arizona

COPY

SHB Job No. E88-36

Consulting Geotechnical Engineers

PHOENIX • ALBUQUERQUE • SANTA FE • SALT LAKE CITY • EL PASO • TUCSON

SERGENT, HAUSKINS & BECKWITH CONSULTING GEOTECHNICAL ENGINEERS

APPLIED SOIL MECHANICS • ENGINEERING GEOLOGY • MATERIALS ENGINEERING • HYDROLOGY

B. DWAINE SERGENT, P.E.
LAWRENCE A. HANSEN, PH.D., P.E.
RALPH E. WEEKS, P.G.
DARREL L. BUFFINGTON, P.E.
DONALD VAN BUSKIRK, P.G.
DALE V. BEDENKOP, P.E.
JOHN B. HAUSKINS, P.E.
MICHAEL L. RUCKER, P.E.
ROBERT W. CROSSLEY, P.E.
JONATHAN A. CRYSTAL, P.E.
PAUL V. SMITH, P.G.
NORMAN H. WETZ, P.E.
GEORGE H. BECKWITH, P.E.
ROBERT L. FREW
JAMES H. CLARY, C.P.G.
NICHOLAS T. KORECKI, P.E.
GERALD P. LINDSEY, P.G.
RONALD E. RAGER, P.G.
ROBERT D. BOOTH, P.E.
SUANG CHENG, P.E.
JAMES R. FAHY, P.E.
MICHAEL HULPKE, P.G.
DAVID E. PETERSON, P.G.
ALBERT C. RUCKMAN, P.E.
PAUL KAPLAN, P.E.

May 3, 1988

Coe and Van Loo
Consulting Engineers, Inc.
4550 North 12th Street
Phoenix, Arizona 85014

SHB Job No. E88-36

Attention: Ashok C. Patel, P.E., R.L.S.

Re: Camelback Ranch Levee Design
Agua Fria River & New River
113th Avenue & Camelback Road
Maricopa County, Arizona

Gentlemen:

Our Geotechnical Investigation Report on the referenced project is herewith submitted. The report includes results of test drilling and laboratory analysis, and recommended criteria for levee design and related earthwork.

Should any questions arise, please do not hesitate to contact us.

Respectfully submitted,
Sergent, Hauskins & Beckwith Engineers

By _____
Suang Cheng, P.E.

And _____
Norman H. Wetz, P.E.

Reviewed by _____
Lawrence A. Hansen, Ph.D., P.E.

COPY

Copies: Addressee (3)

REPLY TO: 3232 W. VIRGINIA, PHOENIX, ARIZONA 85009

PHOENIX (602) 272-6848 | TUCSON (602) 792-2779 | ALBUQUERQUE (505) 884-0950 | SANTA FE (505) 471-7836 | SALT LAKE CITY (801) 266-0720 | EL PASO (915) 564-1017

TABLE OF CONTENTS

Page

REPORT

Introduction 1

Proposed Construction. 1

Investigation. 2

Site Conditions & Geotechnical Profile 3

Discussion & Recommendations 5

References 15

APPENDIX A

Test Drilling Equipment & Procedures A-1

Unified Soil Classification System A-2

Terminology Used to Describe the Relative Density, Consistency or Firmness of Soils. . . . A-3

Site Plan. A-4

Logs of Test Borings A-5

APPENDIX B

Laboratory Testing Procedures. B-1

Laboratory Test Data B-2

Direct Shear Tests B-4

APPENDIX C

Figures 1 through 4. . . . . C-1

SHB Job No. E88-36

Registered Professional Engineer (Civil)
CERTIFICATE NO.
19360
SUANG S.
CHENG
Date Signed
ARIZONA, U.S.A.

COPY

SERGENT, HAUSKINS & BECKWITH

CONSULTING GEOTECHNICAL ENGINEERS
PHOENIX • TUCSON • ALBUQUERQUE • SANTA FE • SALT LAKE CITY • EL PASO

1. INTRODUCTION

This report is submitted pursuant to a geotechnical investigation made by this firm of the site of the proposed levee alignment for Camelback Ranch to be located south of New River and east of the Agua Fria River in Maricopa County, Arizona. The object of this investigation was to evaluate the physical properties of the subsoils underlying the site to provide recommendations for the design of the levees and related earthwork.

2. PROPOSED CONSTRUCTION

Preliminary details of the project were provided by Ashok C. Patel, P.E., R.L.S., and David W. Dust, P.E., of Coe and Van Loo Consulting Engineers, Inc. It is understood that about 13,000 linear feet of earthen levees are planned for the site. These dikes will provide flood protection from both the New River and the Agua Fria River. The existing channel of the New River will be widened to accept flood waters.

The levees will be about 8 to 10 feet in height. It is proposed that the river side of the embankment be protected against erosion with soil-cement that will extend about 6 to 8 feet below channel grade. Where stabilized levee embankments are planned, 2 1/2:1 (horizontal to

vertical) slopes are planned for the land side and about 1:1 slopes are planned for the river side. Where unprotected levee embankment sections are planned, the upstream and downstream slopes will both be 3:1.

A levee freeboard of 5 feet is anticipated for the 100-year flood. The 100-year flood will result in flows of about 95,000 cubic feet per second (cfs) in the Agua Fria River and 39,000 cfs in the New River. Stream flow velocities are estimated to be about 5 1/2 to 8 1/2 feet per second (fps) in the Agua Fria River and 6 to 7 1/2 fps in the New River. It is further understood that the duration of the 100-year flood in the New River will be less than six hours.

Should details involved in final design vary significantly from those outlined above, this firm should be notified for review and possible revision of recommendations.

3. INVESTIGATION

3.1 Subsurface Exploration

Twenty-two exploratory borings were drilled to depths of 11 to 26 feet below existing grade. All borings were drilled with our CME-55 drill rig advancing 6 5/8-inch O.D. hollow stem auger. Standard penetration testing

and open-end drive sampling were performed at selected intervals in the borings.

The results of the field investigation are presented in Appendix A, which includes a brief description of drilling and sampling equipment and procedures, a site plan showing the boring locations and logs of the test borings. The field investigation was supervised by Roman Y. Jauregui, staff engineer of this firm.

3.2 Laboratory Analysis

The moisture content and dry density of selected samples recovered were determined. The results of these tests are shown on the boring logs in Appendix A. Grain-size analysis, Atterberg limits and direct shear tests were performed on selected samples. The results of these tests are presented in Appendix B.

4. SITE CONDITIONS & GEOTECHNICAL PROFILE

4.1 Site Conditions

The general site area is relatively level and is currently farmland consisting of irrigated fields. No crops were planted at the time of our field investigation, but irrigation ditches are located along the fringes of the irrigated fields. The property does

include some undeveloped areas adjacent to the Agua Fria River and the New River. The land surface generally slopes toward the river channel in these areas and contains a light to moderate growth of grass, brush and some scattered trees. It appeared that some grading had taken place in the northeast portion of the property along the banks of the New River.

4.2 Geotechnical Profile

As indicated by the boring logs, the subsurface profile can generally be described as a two-strata system as follows:

A. From the surface to a depth of 2 to 5 feet, sandy silts and sandy clays of low plasticity were encountered. The plasticity index of these soils varied from 2 to 20. The soils are generally weakly cemented and soft to moderately firm at their present moisture contents.

B. Beneath Stratum A, silty to clayey sands and clean sands with some gravel were encountered to the full depth of the borings. These soils are medium dense to very dense and are generally weakly cemented.

4.3 Groundwater & Soil Moisture Conditions

No free groundwater was encountered in the borings. Soil moisture contents varied from 6 to 20 percent in Stratum A and from 2 to 11 percent in Stratum B.

5. DISCUSSION & RECOMMENDATIONS

5.1 Analysis of Results

As indicated by their index properties, the soils of Stratum A, particularly, are somewhat moisture sensitive. Assuming a volume change on wetting of 5 percent and a 5-foot depth of moisture sensitive soils, a settlement of 3.0 inches is calculated. It is likely that the variation in potential settlement on wetting is 1 to 4 inches, and that differential settlements of 2 to 3 inches could occur over relatively short distances. Because of the potential for settlement and differential settlement, it is recommended that the upper 4 to 5 feet of native soil be removed and recompacted to prevent damage to the proposed soil-cement erosion protection.

Most of the sampled materials are acceptable for use as backfill and soil-cement. Blending and mixing may be required depending on the exact gradation of material generated for embankments. Careful selection and some blending will be required for selection of soils to be used in soil-cement. It is anticipated that material can be mixed during grading operations, at the discretion of the representative of the geotechnical engineer, to provide high quality embankments. Site grading, embankment design and soil-cement design criteria are presented in the following sections.

5.2 Surface Treatment

It is recommended that all vegetation, debris and trash be removed from the site. At the discretion of the representative of the geotechnical engineer, surficial deposits of loose sand and finer grained materials should be overexcavated and removed for use elsewhere on the project site. It appears that 2 to 4 feet of Stratum A soils will require overexcavation.

The upper 6 inches of exposed native soils beneath cut surfaces should be scarified, brought to within 2 percent of the optimum moisture content and compacted to at least 95 percent of maximum dry density as determined by ASTM D698.

5.3 Embankment Fill

All fill required to raise the levee up to design elevation should be free of excessive vegetation, debris and other deleterious materials, and contain no particles larger than 6 inches in diameter. It appears that most of the on-site materials are acceptable for use as embankment fill.

All fill should be compacted to a minimum of 95 percent of maximum dry density as determined in accordance with ASTM D698. The moisture content during compaction

should be maintained within 2 percent of optimum moisture contents.

5.4 Typical Levee Sections

Embankment slopes of 1:1 for soil-cement treated slopes and 3:1 for unprotected upstream slopes are proposed. A 2 1/2:1 downstream slope is proposed for the soil-cement protected portions of the levees and a 3:1 downstream slope is proposed for unprotected portions of the levee. Three typical cross sections were developed for analysis. Figures 1, 2 and 3 in Appendix C illustrate typical levee sections along the New River, the Agua Fria River and the unprotected section, respectively. Shown on these figures are the proposed levee geometry, water surface elevations and freeboard, the assumed maximum phreatic surface that could develop in the levee and the extent of recommended overexcavation of native soils.

It is noted that the location of the phreatic surface within the levee was assumed, and is considered very conservative. Soil-cement typically has a very low coefficient of permeability relative to the native and embankment soils. Thus, seepage below the soil-cement is anticipated prior to seepage through the soil-cement section. The phreatic surface would develop laterally from the river and, considering 6-hour duration of the 100-year flood, would likely not fully develop as shown

in Figures 1, 2 and 3. Full development of the phreatic surface shown, considering the soils that will be utilized in construction, would likely require several days to develop.

5.5 Levee Stability

5.5.1 Analysis Procedure

The slope stability of the levee sections shown in Figures 1 through 3 were analyzed using the computer program STABL developed by Purdue University (Siegel, 1975a, 1975b; Lovell, Sharma and Carpenter, 1984)*. This program (up to and including version STABL4) considers a generalized shear surface utilizing a limiting equilibrium (simplified Janbu or simplified Bishop) method of slices. Irregular trial shear surfaces are generated and analyzed to determine the critical shear surface.

In the simplified Janbu procedure, parallel side shear forces are assumed, and vertical and horizontal force equilibrium of the individual slices are satisfied, but overall moment equilibrium and moment equilibrium of the individual slices are not satisfied. The computed factor of safety is conservative relative to more accurate methods satisfying complete equilibrium.

*References are listed at end of report.

5.5.2 Soil Parameters

Based on the direct shear test results and our general experience with similar soils, the soil strength parameters and unit weights listed in Table 1 were assumed for the analyses. Because of the predominantly granular nature of the soils, the soils were assumed to be cohesionless. The cohesion values assigned to the soil-cement are representative of uniaxial compressive strengths of this material.

5.5.3 Analysis Results

The pertinent results of the stability analyses are listed in Table 2, which presents minimum computed safety factors for both river and land side slopes for several conditions. Three conditions were considered, including end of construction without a phreatic surface, full development of the phreatic surface and sudden drawdown.

Of the three conditions assumed, sudden drawdown subsequent to development of a full phreatic surface results in the minimum computed safety factor for the river side of the embankment. Computed safety factors vary from 1.30 to 1.94 for the three levee sections analyzed, which exceed the recommended minimum of 1.2 for this condition. For all other conditions, computed safety factors exceeded 1.5, indicating the

TABLE 1

Soil Parameters Assumed for Stability Analyses

Material	Unit Weight Total (pcf)	Saturated (pcf)	Friction Angle (degrees)	Cohesion (psf)
Compact fill, dry	115	125	33	0
Compact fill, saturated	115	125	31	0
Native sand, dry	100	108	30	0
Native sand, saturated	100	108	28	0
Soil-cement, dry	130	142	0	5,000
Soil-cement, saturated	130	142	0	3,000

TABLE 2

Results of Stability Analyses

Typical Section	Condition	Slope	Factor of Safety
Figure 1	Case I	River side	3.71
	Case II	River side	1.94
	Case III	River side	2.71
	Case III	Land side	1.55
Figure 2	Case I	River side	3.56
	Case II	River side	1.84
	Case III	River side	2.53
	Case III	Land side	1.58
Figure 3	Case I	River side	1.91
	Case II	River side	1.30
	Case III	River side	1.80
	Case III	Land side	1.82

Note: Case I - End of construction.

Case II - Full phreatic surface subject to sudden drawdown.

Case III - Full phreatic surface at flood stage.

levees should not be subject to slope stability problems once constructed.

5.6 Settlement Analysis

The settlement of the Agua Fria levee section was estimated to determine if the potential settlement of the levees will impact the performance of the levees. The settlement estimate was based on the following assumptions or procedures:

- The depth to an incompressible layer is 30 feet.
- The average standard penetration test (SPT) blow count is 20 blows per foot.
- Deformation modulus is related to SPT blow count as described by Schmertman (Wrench and Nowatzki, 1986).
- Vertical stress due to embankment loading was determined using the influence chart of Osterberg (1957).
- Poisson's ratio for the foundation soils is 0.35.
- Since the finer grained material will be over-excavated, consolidation settlements are ignored.

The results of settlement analysis are shown as a settlement profile in Figure 4 in Appendix C.

A levee having a maximum height of 9 feet was assumed, resulting in a maximum embankment load of 1,125 pounds per square foot (psf). For this loading, a maximum

settlement of 0.28 inch occurring below the midpoint of the crest was computed. As shown on Figure 4, estimated maximum and differential settlements are anticipated to be small. It is further expected that the major component of the settlement will occur during construction, since the predominantly granular foundation soils are not subject to long-term consolidation settlements.

5.7 Erosion Protection

5.7.1 Protection Alternatives

Several alternatives for erosion protection are possible, including gabions, placed riprap and soil-cement. Gabions and riprap would require a graded rock-fill having a mean particle size in the range of 3 to 5 inches. Sources of a significant quantity of this type of aggregate within 5 miles of the project site are limited. Both the haul distance and the grading restriction increase the cost of these options. Placement of the rock-fill on a 2:1 or 3:1 slope would also be difficult, unless a large horizontal thickness were used. Considering the total length of the dike and the above factors, these alternatives are not recommended.

5.7.2 Soil-Cement

Soil-cement is recommended for erosion protection on

the river slope of the levees. The native soils of Stratum B typically contain 10 to 30 percent material finer than the no. 200 sieve, and have a maximum particle size of 1/2 inch or less. The soil-cement protection should be constructed in 6- to 8-inch lifts with a minimum horizontal width of 8 feet.

For estimating purposes, the cement content of soil-cement should be 12 percent. The exact cement content should be determined in accordance with ASTM D558, D559 and D560 using the on-site soil that will be used for the soil-cement treatment. Shrinkage cracks and some maintenance should be expected with soil-cement erosion protection.

5.8 Temporary Slopes During Construction

Temporary slopes during construction will depend upon the soils used to construct the levees and the native soils encountered during excavation. Soils with fines contents on the order of 20 percent or more probably will stand at a slope of 1:1. For the cleaner sands, a temporary allowable cut slope of 1 1/4:1 to 1 1/2:1 will be required to prevent slumping or sloughing of levee materials before the soil-cement section can be constructed. The construction of the soil-cement section, and estimates of the quantity of soil-cement required, should consider that temporary slopes of 1 1/4:1 to 1 1/2:1 may be required.

REFERENCES

Lovell, C.W., Sharma, S.S. and Carpenter, J.R., 1984, Slope Stability Analysis with STABL4, Summary Informational Report, Purdue University, Report JHRP-84-19, School of Civil Engineering, October.

Osterberg, J.O., 1957, Influence Value for Vertical Stresses in Semi-Infinite Mass Due to Embankment Loading, Proceedings of the 4th International Conference on Soil Mechanics and Foundation Engineering, Volume 1, London, August, pp. 393-394.

Siegel, R.A., 1975a, Computer Analysis of General Slope Stability Problems, Purdue University, Report JHRP-75-8, School of Civil Engineering, June.

Siegel, R.A., 1975b, STABL User Manual, Joint Highway Research Project No. 75-9, School of Civil Engineering, Purdue University, West Lafayette, Indiana, May.

Wrench, B.P., and Nowatzki, E.A., 1986, A Relationship Between Deformation Modulus and SPT N for Gravel, Proceedings of In Situ 1986, A Specialty Conference Sponsored by Geotechnical Engineering Division of ASCE, Publication No. 6, Virginia Tech., Blacksburg, Virginia, June, pp. 1163-1177.

APPENDIX A

TEST DRILLING EQUIPMENT & PROCEDURES

Drilling Equipment Truck-mounted CME-55 drill rigs powered with 4 or 6 cylinder Ford industrial engines are used in advancing test borings. The 4 cylinder and 6 cylinder engines are capable of delivering about 4,350 and 6,500 foot/pounds torque to the drill spindle, respectively. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock is performed with 6 1/2 O.D., 3 1/4 I.D. hollow stem auger or 4 1/2 inch continuous flight auger. Carbide insert teeth are normally used on the auger bits so they can often penetrate rock or very strongly cemented soils which require blasting or very heavy equipment for excavation. Where refusal is experienced in auger drilling, the holes are sometimes advanced with tricone gear bits and NX rods using water or air as a drilling fluid. Where auger and tricone gear bits cannot be used to advance the hole due to cobbles or caving conditions, the ODEX (overburden drilling with the eccentric method) is used. A percussion down-the-hole hammer underreams the hole and 5 inch steel casing is introduced into the hole during drilling. The drill bit is eccentric and can be removed from the center of the casing to allow sampling of the material below the bit penetration depth.

Sampling Procedures Dynamically driven tube samples are usually obtained at selected intervals in the borings by the ASTM D1586 procedure. In many cases, 2" O.D., 1 3/8" I.D. samplers are used to obtain the standard penetration resistance. "Undisturbed" samples of firmer soils are often obtained with 3" O.D. samplers lined with 2.42" I.D. brass rings. The driving energy is generally recorded as the number of blows of a 140 pound 30 inch free fall drop hammer required to advance the samplers in 6 inch increments. However, in stratified soils, driving resistance is sometimes recorded in 2 or 3 inch increments so that soil changes and the presence of scattered gravel or cemented layers can be readily detected and the realistic penetration values obtained for consideration in design. These values are expressed in blows per foot on the logs. "Undisturbed" sampling of softer soils is sometimes performed with thin walled Shelby tubes (ASTM D1587). Where samples of rock are required, they are obtained by NX diamond core drilling (ASTM D2113). Tube samples are labeled and placed in watertight containers to maintain field moisture contents for testing. When necessary for testing, larger bulk samples are taken from auger cuttings.

Continuous Penetration Tests Continuous penetration tests are performed by driving a 2" O.D. blunt nosed penetrometer adjacent to or in the bottom of borings. The penetrometer is attached to 1 5/8" O.D. drill rods to provide clearance to minimize side friction so that penetration values are as nearly as possible a measure of end resistance. Penetration values are recorded as the number of blows of a 140 pound 30 inch free fall drop hammer required to advance the penetrometer in one foot increments or less.

Boring Records Drilling operations are directed by our field engineer or geologist who examines soil recovery and prepares boring logs. Soils are visually classified in accordance with the Unified Soil Classification System (ASTM D2487) with appropriate group symbols being shown on the logs.

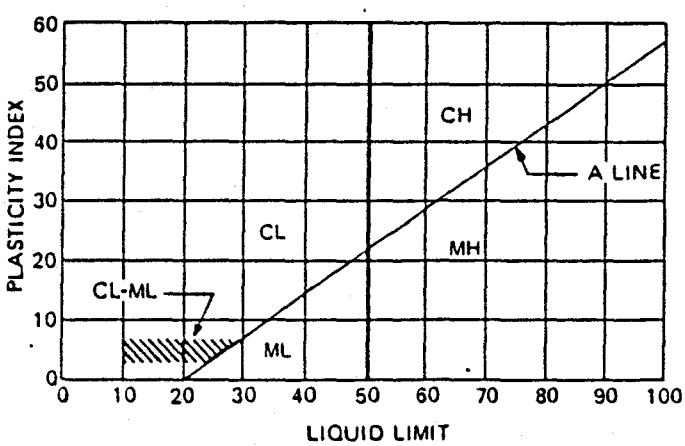
UNIFIED SOIL CLASSIFICATION SYSTEM

Soils are visually classified by the Unified Soil Classification system on the boring logs presented in this report. Grain-size analysis and Atterberg Limits Tests are often performed on selected samples to aid in classification. The classification system is briefly outlined on this chart. For a more detailed description of the system, see "The Unified Soil Classification System" Corp of Engineers, US Army Technical Memorandum No. 3-357 (Revised April 1960) or ASTM Designation: D2487-66T.

MAJOR DIVISIONS				GRAPHIC SYMBOL	GROUP SYMBOL	TYPICAL NAMES
COARSE-GRAINED SOILS (Less than 50% passes No. 200 sieve)	GRAVELS (50% or less of coarse fraction passes No. 4 sieve)	CLEAN GRAVELS (Less than 5% passes No. 200 sieve)			GW	Well graded gravels, gravel-sand mixtures, or sand-gravel-cobble mixtures.
					GP	Poorly graded gravels, gravel-sand mixtures, or sand-gravel-cobble mixtures.
		GRAVELS WITH FINES (More than 12% passes No. 200 sieve)	Limits plot below "A" line & hatched zone on plasticity chart		GM	Silty gravels, gravel-sand-silt mixtures.
			Limits plot above "A" line & hatched zone on plasticity chart		GC	Clayey gravels, gravel-sand-clay mixtures.
	SANDS (More than 50% of coarse fraction passes No. 4 sieve)	CLEAN SANDS (Less than 5% passes No. 200 seive)			SW	Well graded sands, gravelly sands.
					SP	Poorly graded sands, gravelly sands.
		SANDS WITH FINES (More than 12% passes No. 200 sieve)	Limits plot below "A" line & hatched zone on plasticity chart		SM	Silty sands, sand-silt mixtures.
			Limits plot above "A" line & hatched zone on plasticity chart		SC	Clayey sands, sand-clay mixtures.
FINE-GRAINED SOILS (50% or more passes No. 200 sieve)	SILTS (LIMITS PLOT BELOW "A" LINE & HATCHED ZONE ON PLASTICITY CHART)	SILTS OF LOW PLASTICITY (Liquid Limit Less Than 50)			ML	Inorganic silts, clayey silts with slight plasticity.
		SILTS OF HIGH PLASTICITY (Liquid Limit More Than 50)			MH	Inorganic silts, micaceous or diatomaceous silty soils, elastic silts.
	CLAYS (LIMITS PLOT ABOVE "A" LINE & HATCHED ZONE ON PLASTICITY CHART)	CLAYS OF LOW PLASTICITY (Liquid Limit Less Than 50)			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
		CLAYS OF HIGH PLASTICITY (Liquid Limit More Than 50)			CH	Inorganic clays of high plasticity, fat clays, sandy clays of high plasticity.

NOTE: Coarse grained soils with between 5% & 12% passing the No. 200 sieve and fine grained soils with limits plotting in the hatched zone on the plasticity chart to have double symbol.

PLASTICITY CHART



DEFINITIONS OF SOIL FRACTIONS

SOIL COMPONENT	PARTICLE SIZE RANGE
Cobbles	Above 3 in.
Gravel	3 in. to No. 4 sieve
Coarse gravel	3 in. to ¾ in.
Fine gravel	¾ in. to No. 4 sieve
Sand	No. 4 to No. 200
Coarse	No. 4 to No. 10
Medium	No. 10 to No. 40
Fine	No. 40 to No. 200
Fines (silt or clay)	Below No. 200 sieve

TERMINOLOGY USED TO DESCRIBE THE RELATIVE DENSITY, CONSISTENCY OR FIRMNESS OF SOILS

The terminology used on the boring logs to describe the relative density, consistency or firmness of soils relative to the standard penetration resistance is presented below. The standard penetration resistance (N) in blows per foot is obtained by the ASTM D1586 procedure using 2" O.D., 1 3/8" I.D. samplers.

1. Relative Density. Terms for description of relative density of cohesionless, uncemented sands and sand-gravel mixtures.

N	Relative Density
0-4	Very loose
5-10	Loose
11-30	Medium dense
31-50	Dense
50+	Very dense

2. Relative Consistency. Terms for description of clays which are saturated or near saturation.

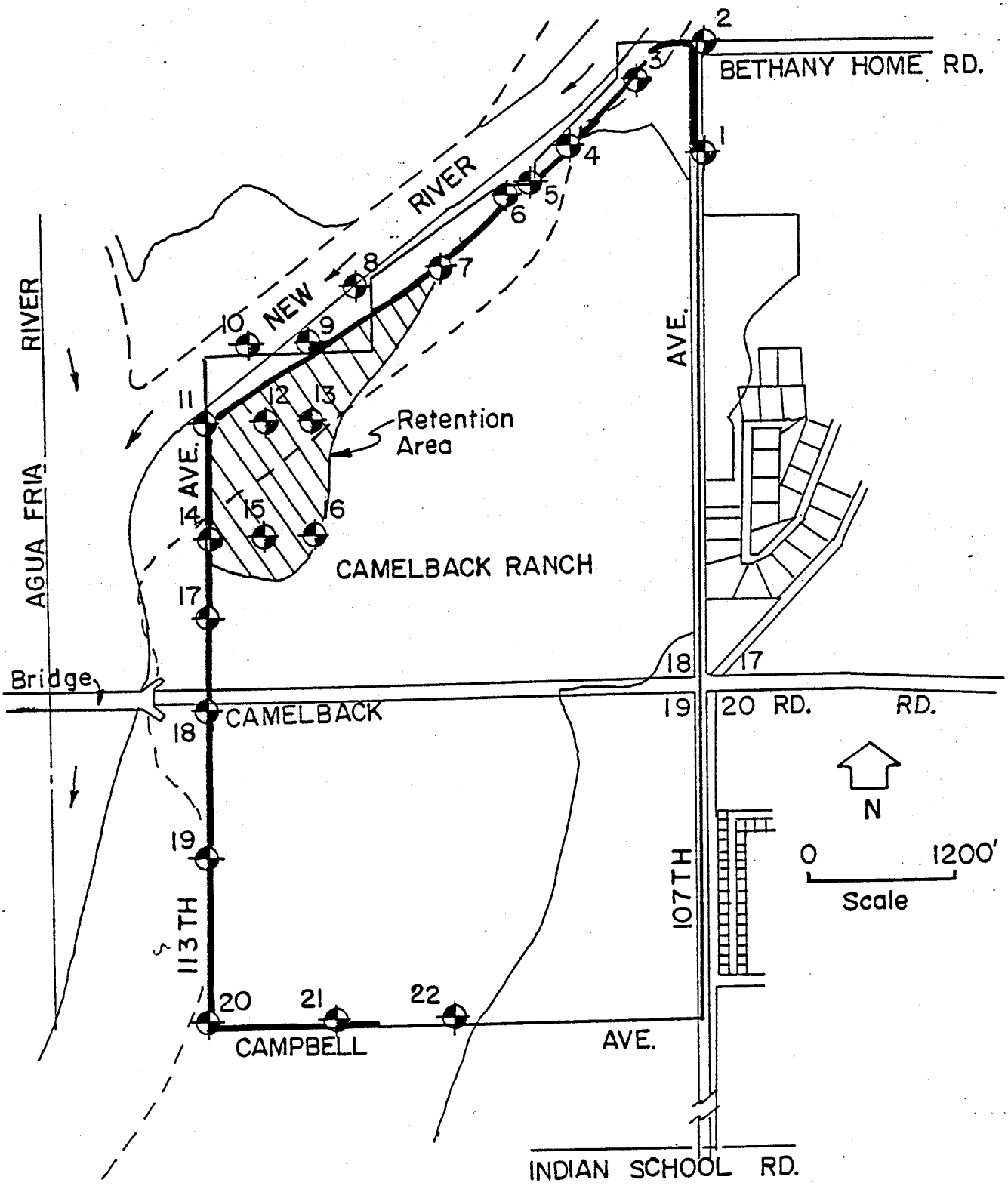
N	Relative Consistency	Remarks
0-2	Very soft	Easily penetrated several inches with fist.
3-4	Soft	Easily penetrated several inches with thumb.
5-8	Medium stiff	Can be penetrated several inches with thumb with moderate effort.
9-15	Stiff	Readily indented with thumb, but penetrated only with great effort.
16-30	Very stiff	Readily indented with thumbnail.
30+	Hard	Indented only with difficulty by thumbnail.

3. Relative Firmness. Terms for description of partially saturated and/or cemented soils which commonly occur in the Southwest including clays, cemented granular materials, silts and silty and clayey granular soils.

N	Relative Firmness
0-4	Very soft
5-8	Soft
9-15	Moderately firm
16-30	Firm
31-50	Very firm
50+	Hard

SITE PLAN

SHOWING LOCATIONS OF TEST BORINGS



Reference Drawing: "Camelback Ranch A.L.T.A." by Coe & Van Loo Consulting Engineers, Inc., dated 9/14/87

Camelback Ranch Levee Design
Agua Fria River & New River
113th Avenue & Camelback Road
Maricopa County, Arizona
SHB Job No. E88-36

SERGENT, HAUSKINS & BECKWITH
CONSULTING GEOTECHNICAL ENGINEERS
PHOENIX • TUCSON • ALBUQUERQUE • SANTA FE • SALT LAKE CITY • EL PASO

PROJECT Camelback Ranch Levee Design

JOB NO. E88-36 DATE 2-15-88

LOG OF TEST BORING NO. 1

RIG TYPE CME-55

BORING TYPE 6 5/8" Hollow Stem Auger

SURFACE ELEV. 1038'±

DATUM Plan & Profile

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			X	S	31			CL-	moist	SANDY SILT, some clay, low plasticity, brown
			X	S	17		14	ML	very firm to firm	
5			X	S	12				moist	SILTY SAND, predominantly fine to medium grained, subangular, nonplastic, brown
								SM	medium dense	
10			X	S	29 (no recovery)					note: some gravel at 8'
15										Stopped auger at 9'6" Stopped sampler at 11'

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

SERGENT, HAUSKINS & BECKWITH
CONSULTING GEOTECHNICAL ENGINEERS
PHOENIX · TUCSON · ALBUQUERQUE · SANTA FE · SALT LAKE CITY · EL PASO

PROJECT Camelback Ranch Levee Design

JOB NO. E88-36 DATE 2-15-88

LOG OF TEST BORING NO. 2

RIG TYPE CME-55

BORING TYPE 6 5/8" Hollow Stem Auger

SURFACE ELEV. 1041'±

DATUM Plan & Profile

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			X	S	18				moist firm to moderately firm	Man-made FILL CLAYEY SAND, considerable gravel, poorly graded, subangular, low plasticity to non-plastic, brown
			X	S	23			SC-SM		
5			X	S	13					
10			X	S	70			SP-SM	moist very dense to dense	SILTY SAND, predominantly fine to medium grained, subangular, nonplastic, brown note: considerable gravel from 11' to 14'
15			X	S	37					
20			X	S	50/6"			GP-GM	moist very dense	SILTY SAND & GRAVEL, poorly graded, subrounded, nonplastic, brown
25										Auger refused at 23' on gravel

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

SERGENT, HAUSKINS & BECKWITH
CONSULTING GEOTECHNICAL ENGINEERS
PHOENIX · TUCSON · ALBUQUERQUE · SANTA FE · SALT LAKE CITY · EL PASO

PROJECT Camelback Ranch Levee Design

JOB NO. E88-36 DATE 2-15-88

LOG OF TEST BORING NO. 3

RIG TYPE CME-55

BORING TYPE 6 5/8" Hollow Stem Auger

SURFACE ELEV. 1044'±

DATUM Plan & Profile

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				S	6		5		moist to dry	SILTY SAND, trace of gravel, predominantly fine to medium grained, subangular, nonplastic, brown
				A			5		very loose to dense	
				S	3		4			
5				S	4 (no recovery)					note: trace of cobbles from 21'6" to 23'
10				S	18		1	SM		
15				S	13		7			
20				U	48	104	3			
25				S	50/3½"		12	SC	moist hard	CLAYEY SAND, trace of gravel, predominantly fine to medium grained, subangular to subrounded, weakly to moderately lime cemented, low plasticity, reddish brown
30										Auger refused at 25'6" on gravel & cobbles

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

SERGENT, HAUSKINS & BECKWITH
CONSULTING GEOTECHNICAL ENGINEERS
PHOENIX · TUCSON · ALBUQUERQUE · SANTA FE · SALT LAKE CITY · EL PASO

PROJECT Camelback Ranch Levee Design

JOB NO. E88-36 DATE 2-15-88

LOG OF TEST BORING NO. 4

RIG TYPE CME-55

BORING TYPE 6 5/8" Hollow Stem Auger

SURFACE ELEV. 1039'±

DATUM Plan & Profile

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				S	25				slightly moist	SANDY SILT, low plasticity to nonplastic, brown
				A			6	ML	firm	
				S	17					
5				U	10	87	10		slightly moist	SANDY CLAY, low plasticity, brown
								CL	soft	
								SP-	slightly moist	SAND, considerable gravel, some silt, predominantly fine to medium grained, subangular, nonplastic, brown
10				S	17			SM	medium dense	
15										Stopped auger at 9'6" Stopped sampler at 11'

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

SERGENT, HAUSKINS & BECKWITH

CONSULTING GEOTECHNICAL ENGINEERS
PHOENIX · TUCSON · ALBUQUERQUE · SANTA FE · SALT LAKE CITY · EL PASO

PROJECT Camelback Ranch Levee Design

JOB NO. E88-36 DATE 2-15-88

LOG OF TEST BORING NO. 5

RIG TYPE CME-55

BORING TYPE 6 5/8" Hollow Stem Auger

SURFACE ELEV. 1036.5'±

DATUM Plan & Profile

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			X	S	13				moist	SILTY SAND, predominantly fine grained, low plasticity to non-plastic, brown
			X	S	14		11		moderately firm	
			X	A				SM		
5			X	U	16					note: some clay below 4'
10			X	S	20				moist medium dense to very dense	SAND, some silt & gravel, predominantly fine to medium grained, sub-angular, nonplastic, light brown
								SP-SM		
15			X	S	33					
20			X	S	50/2"					
25										Stopped auger at 19'6" Sampler refused at 20'2"

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

SERGENT, HAUSKINS & BECKWITH
CONSULTING GEOTECHNICAL ENGINEERS
PHOENIX • TUCSON • ALBUQUERQUE • SANTA FE • SALT LAKE CITY • EL PASO

PROJECT Camelback Ranch Levee Design

JOB NO. E88-36 DATE 2-15-88

LOG OF TEST BORING NO. 6

RIG TYPE CME-55

BORING TYPE 6 5/8" Hollow Stem Auger

SURFACE ELEV. 1035'±

DATUM Plan & Profile

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			X	S	27			CL	moist firm	SANDY CLAY, low plasticity, brown
			X	S	10		4			
5			X	S	6			SW-SM	moist loose	SAND, considerable silt, well graded, subangular, nonplastic, brown
10			X	S	17			SM-SC	moist firm	SILTY SAND, some clay & gravel, predominantly fine to medium grained, subangular, weakly lime cemented, low plasticity, brown
15										Stopped auger at 9'6" Stopped sampler at 11'

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

SERGENT, HAUSKINS & BECKWITH

CONSULTING GEOTECHNICAL ENGINEERS
PHOENIX • TUCSON • ALBUQUERQUE • SANTA FE • SALT LAKE CITY • EL PASO

PROJECT Camelback Ranch Levee Design

JOB NO. E88-36 DATE 2-15-88

LOG OF TEST BORING NO. 7

RIG TYPE CME-55
BORING TYPE 6 5/8" Hollow Stem Auger
SURFACE ELEV. 1033.5'±
DATUM Plan & Profile

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				S	26		8	ML	moist	SANDY SILT, some clay, weakly lime cemented, low plasticity, brown
				A					firm	
				S	17		4	SM		
5				U	8	92	4		slightly moist	SILTY SAND, predominantly fine grained, subangular, weakly lime cemented, nonplastic, brown
								SP-SC	firm	
10				S	30		3		slightly moist	SAND, some clay, predominantly medium grained, subangular to subrounded, nonplastic, brown
								SP-SM	very loose	
15				S	31 (no recovery)				moist to slightly moist	SAND, some gravel & silt, predominantly fine to medium grained, subangular to subrounded, nonplastic, brown
20				S	50/2" (no recovery)				medium dense to very dense	

Stopped auger at 19'6"
Sampler refused at 19'8"

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

SERGENT, HAUSKINS & BECKWITH
CONSULTING GEOTECHNICAL ENGINEERS
PHOENIX • TUCSON • ALBUQUERQUE • SANTA FE • SALT LAKE CITY • EL PASO

PROJECT Camelback Ranch Levee Design

JOB NO. E88-36 DATE 2-15-88

LOG OF TEST BORING NO. 8

RIG TYPE CME-55

BORING TYPE 6 5/8" Hollow Stem Auger

SURFACE ELEV. 1033'±

DATUM Plan & Profile

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			X	S	9		14		moist	SANDY SILT, low plasticity, brown
			X	S	6			ML	soft to moderately firm	
5			X	S	11					
			X	A			6		moist	SILTY SAND, trace of gravel, predominantly fine to medium grained, subangular, nonplastic, light brown
								SM	loose to medium dense	
10			X	U	16					
15										Stopped auger at 9'6" Stopped sampler at 10'6"

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

SERGENT, HAUSKINS & BECKWITH
CONSULTING GEOTECHNICAL ENGINEERS
PHOENIX · TUCSON · ALBUQUERQUE · SANTA FE · SALT LAKE CITY · EL PASO

PROJECT Camelback Ranch Levee Design

JOB NO. E88-36 DATE 2-16-88

LOG OF TEST BORING NO. 9

RIG TYPE CME-55
BORING TYPE 6 5/8" Hollow Stem Auger
SURFACE ELEV. 1030.5'±
DATUM Plan & Profile

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			X	S	35			GL	moist very firm to firm	SANDY CLAY, low plasticity, brown
			X	S	20		9			
5			X	S	15				moist medium dense to very dense	SAND, some silt, trace of gravel, predominantly fine to medium grained, subangular, nonplastic, brown
10			X	S	20			SP-SM		
15			X	S	58					
20			X	S	50/5"			SC	moist hard	CLAYEY SAND, considerable gravel, predominantly fine to medium grained, subangular, weakly lime cemented, low plasticity, reddish brown
25										Stopped auger at 19'6" Sampler refused at 20'5"

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

SERGENT, HAUSKINS & BECKWITH
CONSULTING GEOTECHNICAL ENGINEERS
PHOENIX · TUCSON · ALBUQUERQUE · SANTA FE · SALT LAKE CITY · EL PASO

PROJECT Camelback Ranch Levee Design

JOB NO. E88-36 DATE 2-16-88

LOG OF TEST BORING NO. 10

RIG TYPE CME-55

BORING TYPE 6 5/8" Hollow Stem Auger

SURFACE ELEV. 1030'±

DATUM Plan & Profile

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				S A	9		5	SM	slightly moist	SILTY SAND, predominantly fine to medium grained, subangular, nonplastic, brown
				S	17		2		moderately firm	
5				S	20		2	SP-SM	slightly moist medium dense	SAND, trace of silt & gravel, predominantly fine to medium grained, subangular, nonplastic, brown
10				S	22					
15										Stopped auger at 9'6" Stopped sampler at 11'

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

SERGENT, HAUSKINS & BECKWITH
CONSULTING GEOTECHNICAL ENGINEERS
PHOENIX · TUCSON · ALBUQUERQUE · SANTA FE · SALT LAKE CITY · EL PASO

PROJECT Camelback Ranch Levee Design

JOB NO. E88-36 DATE 2-16-88

LOG OF TEST BORING NO. 11

RIG TYPE CME-55
BORING TYPE 6 5/8" Hollow Stem Auger
SURFACE ELEV. 1028'±
DATUM Plan & Profile

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			X	S	7		4	SM	slightly moist soft	SILTY SAND, predominantly fine grained, subangular, nonplastic, brown
			X	S	10		3			
5			X	S	10		3		moist loose to medium dense	SAND, trace of silt & fine grained gravel, predominantly fine to medium grained, subangular, nonplastic, light brown
								SP-SM		
10			X	U	19 (no recovery)					
								SW-SM	moist very dense	SAND, considerable gravel, trace of silt, well graded, subangular, nonplastic, light brown
15			X	S	50/6"		3			
20										Auger refused at 16' on gravel

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

SERGENT, HAUSKINS & BECKWITH
CONSULTING GEOTECHNICAL ENGINEERS
PHOENIX · TUCSON · ALBUQUERQUE · SANTA FE · SALT LAKE CITY · EL PASO

PROJECT Camelback Ranch Levee Design

JOB NO. E88-36 DATE 2-16-88

LOG OF TEST BORING NO. 12

RIG TYPE CME-55

BORING TYPE 6 5/8" Hollow Stem Auger

SURFACE ELEV. 1027.5'±

DATUM Plan & Profile

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			X	S A	11		11	SM	moist moderately firm	SILTY SAND, predominantly fine to medium grained, subangular, nonplastic, brown
			X	S	31					
5			X	S	7			SP-SM	moist loose to dense	SAND, some silt, predominantly medium to fine grained, subangular, nonplastic, light brown
10			X	S	17					note: trace of gravel at 9'
15										Stopped auger at 9'6" Stopped sampler at 11'

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

SERGENT, HAUSKINS & BECKWITH
CONSULTING GEOTECHNICAL ENGINEERS
PHOENIX · TUCSON · ALBUQUERQUE · SANTA FE · SALT LAKE CITY · EL PASO

PROJECT Camelback Ranch Levee Design

JOB NO. E88-36 DATE 2-16-88

LOG OF TEST BORING NO. 13

RIG TYPE CME-55

BORING TYPE 6 5/8" Hollow Stem Auger

SURFACE ELEV. 1028'±

DATUM Plan & Profile

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			X	S	11			CL	moist medium firm	SANDY CLAY, low plasticity, brown
			X	S	4		7		moist very loose to medium dense	SILTY SAND, predominantly fine to medium grained, subangular, nonplastic, light brown
5			X	S	8			SM		
10			X	S	13					
15										Stopped auger at 9'6" Stopped sampler at 11'

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

SERGENT, HAUSKINS & BECKWITH
CONSULTING GEOTECHNICAL ENGINEERS
PHOENIX · TUCSON · ALBUQUERQUE · SANTA FE · SALT LAKE CITY · EL PASO

PROJECT Camelback Ranch Levee Design

JOB NO. E88-36 DATE 2-16-88

LOG OF TEST BORING NO. 14

RIG TYPE CME-55

BORING TYPE 6 5/8" Hollow Stem Auger

SURFACE ELEV. 1025.5'+

DATUM Plan & Profile

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			X	S	6				moist	SANDY CLAY, low plasticity, dark brown
			X	S	4		16	CL	very soft to firm	
5			X	U	36	91	16			
									moist	SAND, trace of silt & gravel, predominantly fine to medium grained, subangular, nonplastic, light brown
10			X	S	8				loose to very dense	
								SP-SM		note: considerable gravel from 12'6" to 20'
15			X	S	50/6"					
20			X	S	40					
25										Stopped auger at 19'6" Stopped sampler at 21'

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

SERGENT, HAUSKINS & BECKWITH
CONSULTING GEOTECHNICAL ENGINEERS
PHOENIX · TUCSON · ALBUQUERQUE · SANTA FE · SALT LAKE CITY · EL PASO

PROJECT Camelback Ranch Levee Design

JOB NO. E88-36 DATE 2-16-88

LOG OF TEST BORING NO. 15

RIG TYPE CME-55

BORING TYPE 6 5/8" Hollow Stem Auger

SURFACE ELEV. 1026'±

DATUM Plan & Profile

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				S	7				moist	SANDY CLAY, low plasticity, dark brown
				A			17	CL	soft to moderately firm	
				S	14					
5				S	8				moist	SAND, trace of silt, predominantly fine to medium grained, subangular, nonplastic, light brown
								SP-SM	loose to medium dense	
10				S	17					note: trace of gravel at 7'6"
15										Stopped auger at 9'6" Stopped sampler at 11'

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

SERGENT, HAUSKINS & BECKWITH

CONSULTING GEOTECHNICAL ENGINEERS
PHOENIX · TUCSON · ALBUQUERQUE · SANTA FE · SALT LAKE CITY · EL PASO

PROJECT Camelback Ranch Levee Design

JOB NO. E88-36 DATE 2-16-88

LOG OF TEST BORING NO. 16

RIG TYPE CME-55

BORING TYPE 6 5/8" Hollow Stem Auger

SURFACE ELEV. 1026'±

DATUM Plan & Profile

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				S	18				moist	SANDY CLAY, weakly lime cemented, low plasticity, dark brown
				A				CL	firm to moderately firm	
				S	10					
5				S	7		7		moist	SILTY SAND, trace of gravel, predominantly fine to medium grained, subangular, nonplastic, light brown
								SM	loose to dense	
10				S	37					note: considerable gravel at 8'
15										Stopped auger at 9'6" Stopped sampler at 11'

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

SERGENT, HAUSKINS & BECKWITH
CONSULTING GEOTECHNICAL ENGINEERS
PHOENIX · TUCSON · ALBUQUERQUE · SANTA FE · SALT LAKE CITY · EL PASO

PROJECT Camelback Ranch Levee Design

JOB NO. E88-36 DATE 2-16-88

LOG OF TEST BORING NO. 17

RIG TYPE CME-55
BORING TYPE 6 5/8" Hollow Stem Auger
SURFACE ELEV. 1024.5'±
DATUM Plan & Profile

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			X	S	6			SM-	moist	SILTY SAND, some clay, predominantly fine grained, subangular, nonplastic, brown
			X	S	7		13	SC	loose	
5			X	S	13				moist medium dense to very dense	SAND, trace of silt, predominantly fine to medium grained, subangular, nonplastic, light brown
10			X	S	54			SP		note: some gravel at 8' & considerable gravel at 12'6"
15			X	S	32					
20										Auger refused at 16' on gravel

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

SERGENT, HAUSKINS & BECKWITH
CONSULTING GEOTECHNICAL ENGINEERS
PHOENIX · TUCSON · ALBUQUERQUE · SANTA FE · SALT LAKE CITY · EL PASO

PROJECT Camelback Ranch Levee Design

JOB NO. E88-36 DATE 2-17-88

LOG OF TEST BORING NO. 18

RIG TYPE CME-55

BORING TYPE 6 5/8" Hollow Stem Auger

SURFACE ELEV. 1022'±

DATUM Plan & Profile

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			X	S	28		8	SM-SC	slightly moist	SILTY SAND, trace of clay, predominantly fine grained, subangular, weakly lime cemented, low plasticity to nonplastic, brown
			X	S	10		8		firm	
5			X	S	12		4	SM		
10			X	S	16		6		moist medium dense	SILTY SAND, predominantly fine grained, subangular, nonplastic, brown
								SP-SM	moist medium dense to very dense	SAND, some silt, trace of gravel, predominantly fine to medium grained, subangular, nonplastic, light reddish brown
15			X	S	43		6			
20				S	50/3½" (no recovery)					note: considerable gravel from 16' to 20'

Stopped auger at 19'6"
Sampler refused at 19'9½"

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

SERGENT, HAUSKINS & BECKWITH
CONSULTING GEOTECHNICAL ENGINEERS
PHOENIX · TUCSON · ALBUQUERQUE · SANTA FE · SALT LAKE CITY · EL PASO

PROJECT Camelback Ranch Levee Design

JOB NO. E88-36 DATE 2-17-88

LOG OF TEST BORING NO. 19

RIG TYPE CME-55

BORING TYPE 6 5/8" Hollow Stem Auger

SURFACE ELEV. 1019'±

DATUM Plan & Profile

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			X	S	19			CL	moist	SANDY CLAY, weakly lime cemented, low plasticity, brown
			X	U	12	94	2		firm	
5			X	S	42				slightly moist to moist	SAND, trace of silt, predominantly fine grained, subangular, nonplastic, light brown
									medium dense to very dense	note: trace of gravel at 7'6" & considerable gravel from 15' to 20'
10			X	S	15			SP-SM		
15			X	S	47					
20			X	S	50/5½"					
25										Stopped auger at 19'6" Sampler refused at 20'5½"

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

SERGENT, HAUSKINS & BECKWITH
CONSULTING GEOTECHNICAL ENGINEERS
PHOENIX • TUCSON • ALBUQUERQUE • SANTA FE • SALT LAKE CITY • EL PASO

PROJECT Camelback Ranch Levee Design

JOB NO. E88-36 DATE 2-17-88

LOG OF TEST BORING NO. 20

RIG TYPE CME-55

BORING TYPE 6 5/8" Hollow Stem Auger

SURFACE ELEV. 1016'±

DATUM Plan & Profile

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			X	S	17		6	SM	moist	SILTY SAND, trace of gravel, predominantly fine to medium grained, subangular, nonplastic, brown
				A					firm to moderately firm	
			X	S	11		8			
5			X	S	14		3			
								SP-SM	slightly moist to moist	SAND, trace of silt, predominantly fine to medium grained, subangular, nonplastic, light brown
10			X	S	22		5		medium dense	note: trace of gravel at 7'6"
15			X	S	62		7		moist	SILTY SAND, considerable gravel, poorly graded, subangular, weakly lime cemented, nonplastic to low plasticity, light reddish brown
								SM	very dense	
20			X	S	69		5			
25										Stopped auger at 19'6" Stopped sampler at 21'

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

SERGENT, HAUSKINS & BECKWITH

CONSULTING GEOTECHNICAL ENGINEERS
PHOENIX · TUCSON · ALBUQUERQUE · SANTA FE · SALT LAKE CITY · EL PASO

PROJECT Camelback Ranch Levee Design

JOB NO. E88-36 DATE 2-16-88

LOG OF TEST BORING NO. 21

RIG TYPE CME-55

BORING TYPE 6 5/8" Hollow Stem Auger

SURFACE ELEV. 1019.5'±

DATUM Plan & Profile

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				S	22				moist	SILTY CLAY, some sand, medium plasticity, dark brown
				A					firm to soft	
				S	10		20	CL		
5				S	8					
								SP-SM	moist loose	SAND, trace of silt, predominantly fine to medium grained, sub-angular, nonplastic, light brown
10				S	6					
15										Stopped auger at 9'6" Stopped sampler at 11'

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

SERGENT, HAUSKINS & BECKWITH
CONSULTING GEOTECHNICAL ENGINEERS
PHOENIX · TUCSON · ALBUQUERQUE · SANTA FE · SALT LAKE CITY · EL PASO

PROJECT Camelback Ranch Levee Design

JOB NO. E88-36 DATE 2-16-88

LOG OF TEST BORING NO. 22

RIG TYPE CME-55

BORING TYPE 6 5/8" Hollow Stem Auger

SURFACE ELEV. 1020'±

DATUM Plan & Profile

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			X	S	9			CL	moist	SANDY CLAY, low to medium plasticity, brown
			X	S	9				moderately firm	
5			X	U	11			SC	moist	CLAYEY SAND, considerable silt, predominantly fine grained, subangular, low plasticity, light brown
								SP-SM	moderately firm	
10			X	S	47			CL	moist	SAND, some silt, trace of gravel, predominantly fine to medium grained, subangular, nonplastic, light brown
15									moist very firm	SILTY CLAY, some sand, weakly lime cemented, medium plasticity, brown
										Stopped auger at 9'6" Stopped sampler at 11'

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

SERGENT, HAUSKINS & BECKWITH
CONSULTING GEOTECHNICAL ENGINEERS
PHOENIX - TUCSON - ALBUQUERQUE - SANTA FE - SALT LAKE CITY - EL PASO

APPENDIX B

LABORATORY TESTING PROCEDURES

Consolidation Tests Soiltest or Clockhouse apparatus of the "floating-ring" type are employed for the one-dimensional consolidation tests. They are designed to receive one inch high 2.5 inch O.D. brass liner rings with soil specimens as secured in the field. Procedures for the tests generally are those outlined in ASTM D2435. Loads are applied in several increments to the upper surface of the test specimen and the resulting deformations are recorded at selected time intervals for each increment. For soils which are essentially saturated, each increment of load is maintained until the deformation versus log of time curve indicates completion of primary consolidation. For partially saturated soils, each increment of load is maintained until the rate of deformation is equal or less than 1/10,000 inch per hour. Applied loads are such that each new increment is equal to the total previously applied loading. Porous stones are placed in contact with the top and bottom of the specimens to permit free addition or expulsion of water. For partially saturated soils, the tests are normally performed at in situ moisture conditions until consolidation is complete under stresses approximately equal to those which will be imposed by the combined overburden and foundation loads. The samples are then submerged to show the effect of moisture increase and the tests continued under higher loadings. Generally, the tests are continued to about twice the anticipated curve due to overburden and structural loads with a rebound curve then being established by releasing loads.

Expansion Tests The same type of consolidometer apparatus described above is used in expansion testing. Undisturbed samples contained in brass liner rings are placed in the consolidometers, subjected to appropriate surcharge loads and submerged. The loads are maintained until the expansion versus log of time curve indicates the completion of "primary swell".

Direct Shear Tests Direct shear tests are run using a Clockhouse or Soiltest apparatus of the strain-control of approximately 0.05 inches per minute. The machine is designed to receive one of the one inch high 2.42 inch diameter specimens obtained by tube sampling. Generally, each sample is sheared under a normal load equivalent to the effective overburden pressure at the point of sampling. In some instances, samples are sheared at several normal loads to obtain the cohesion and angle of internal friction. When necessary, samples are saturated and/or consolidated before shearing in order to approximate the anticipated controlling field loading conditions.

SERGENT, HAUSKINS & BECKWITH

TABULATION OF TEST RESULTS

Job No. E88-36
W/O 1

HOLE NO	DEPTH	UNIFIED CLASS	L.L.	P.I.	SIEVE ANALYSIS-ACCUM % PASSING #200 .75"	#100 1"	#50 1.5"	#40 2"	#30 2.5"	#16 3"	#10 3.5"	#8 4"	#4 6"	.25" 8"	.375" 10"	.5" 12"	LAB NO
#1	2'6"-4'	CL-ML	26	6	64	75	84	88	91	97	99	99	100				8-36-2
#3	0-4'6"	SM	NV	NP	13	21	39	55	67	86	94	96	100				8-36-10
#4	0-4'6"	ML	21	1	51	66	80	86	92	98	99	99	100				8-36-17
#5	2'6"-4'	SM	NV	NP	37	72	84	92	98	99	99	99	100				8-36-24
#6	2'6"-4'	SW-SM	NV	NP	12	16	27	37	48	69	83	86	92	92	93	96	
					100												8-36-30
#7	4'6"-5'6"	SP-SC	28	9	8.4	9	13	24	45	87	98	99	100				8-36-36
#8	6"-2'	ML	23	2	63	78	91	96	98	99	100						8-36-38
#8	5'-9'	SM	NV	NP	26	34	46	58	71	89	95	96	100				8-36-41
#9	2'6"-4'	CL	31	11	55	69	81	88	93	98	99	100					8-36-44
#10	6"-2'	SM	NV	NP	24	33	48	60	72	90	96	97	100				8-36-50
#10	4'6"-6'	SP-SM	NV	NP	5.4	9	21	37	54	75	84	85	90	90	91	96	
					100												8-36-52
#11	2'6"-4'	SP-SM	NV	NP	5.6	13	34	56	76	94	96	97	98	99	100		8-36-55
#12	6"-2'	SM	NV	NP	39	50	70	81	88	95	97	98	99	99	100		8-36-59
#13	2'6"-4'	SM	NV	NP	21	30	48	62	79	97	99	100					8-36-64
#14	2'6"-4'	CL	28	12	54	66	85	92	96	99							8-36-68

SERGENT, HAUSKINS & BECKWITH

TABULATION OF TEST RESULTS

Job No. E88-36
W/O 1

HOLE NO	DEPTH	UNIFIED CLASS	L.L.	P.I.	SIEVE ANALYSIS-ACCUM % PASSING #200 .75"	#100 1"	#50 1.5"	#40 2"	#30 2.5"	#16 3"	#10 3.5"	#8 4"	#4 6"	.25" 8"	.375" 10"	.5" 12"	LAB NO
#15	0-4'	CL	32	14	52 92	61 94	71 97	75 100	79	82	83	83	84	85	87	90	8-36-73
#16	4'6"-6'	SM	NV	NP	15	31	60	74	85	94	96	97	98	98	100		8-36-81
#17	2'6"-4'	SM	NV	NP	39	51	69	81	89	96	99	99	100				8-36-84
#21	2'6"-4'	CL	41	20	79	88	94	96	98	99							8-36-90
#18	2'6"-4'	SM	23	2	47	57	75	85	91	97	98	99	99	100			8-36-98
#19	2'6"-3'6"	SP-SM	NV	NP	6.5	14	42	72	89	98	100						8-36-103
#20	6"-2'	SM	24	2	47	57	71	80	87	94	96	96	97	99	100		8-36-109

SERGENT, HAUSKINS & BECKWITH

CONSULTING GEOTECHNICAL ENGINEERS

REPORT OF LABORATORY TESTS

PROJECT: CAMELBACK RANCH

LOCATION:#5 @ 4'6"-5'6"

DATE 2/29/88

JOB NO. E88-36

W.O.NO. 1

LAB NO. 25

DIRECT SHEAR TEST(SATURATED)ASTM D-3080

POINT NO. 1 (NORMAL STRESS 0.995 KSF)

Initial Moisture Content	17.9%
Dry Density	105.1 LB/CU FT
Moisture at Saturation	21.7%
Maximum Vertical Deformation @ T max.	0.003 IN
Shearing Stress, T max.	0.7 KSF

POINT NO. 2 (NORMAL STRESS 2.059 KSF)

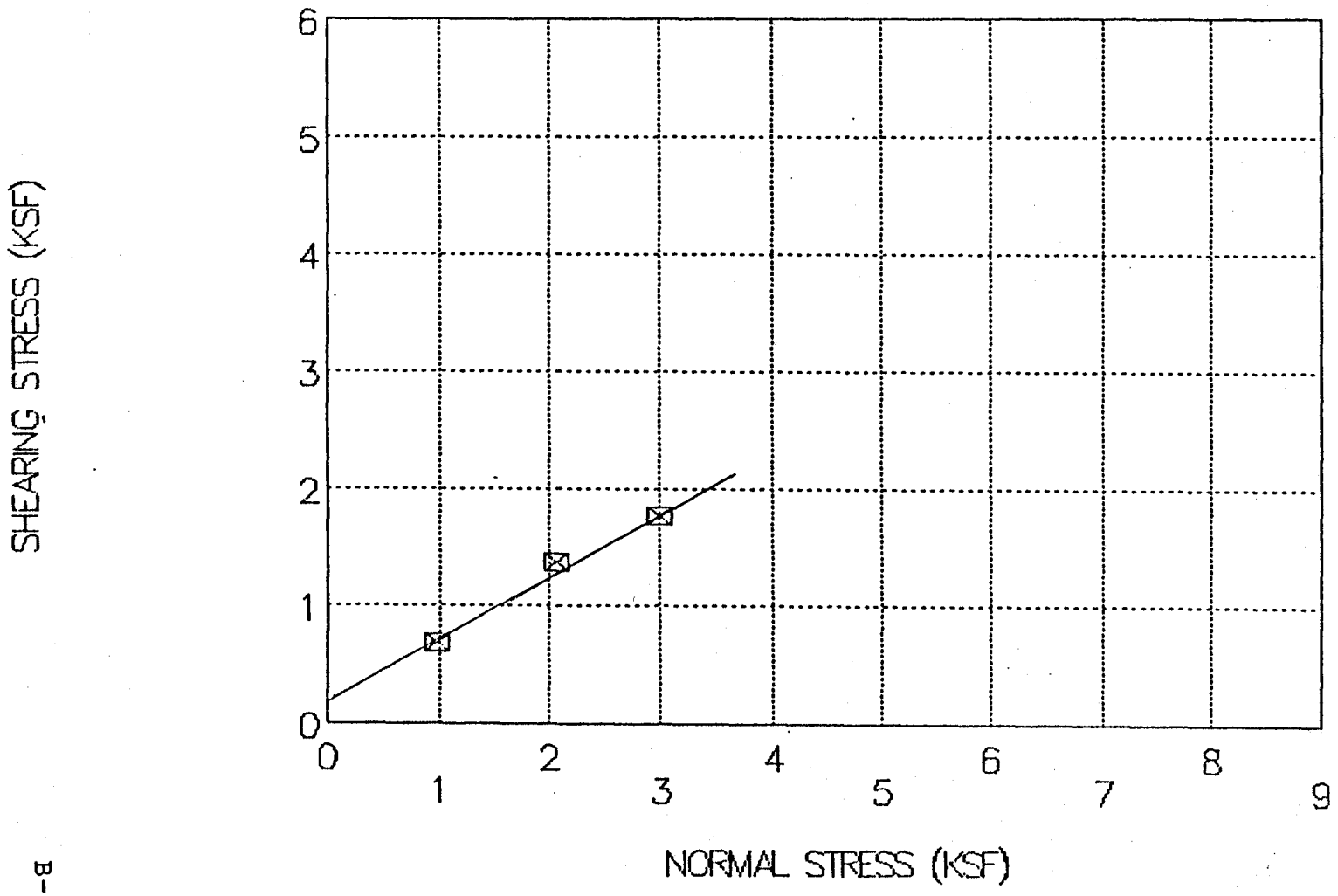
Initial Moisture Content	18.1%
Dry Density	106.0 LB/CU FT
Moisture at Saturation	21.5%
Maximum Vertical Deformation @ T max.	-0.006 IN
Shearing Stress, T max.	1.4 KSF

POINT NO. 3 (NORMAL STRESS 2.998 KSF)

Initial Moisture Content	16.8%
Dry Density	106.4 LB/CU FT
Moisture at Saturation	21.5%
Maximum Vertical Deformation @ T max.	-0.014 IN
Shearing Stress, T max.	1.8 KSF

DIRECT SHEAR

#5 @ 4'6"–5'6"



SERGENT, HAUSKINS & BECKWITH

CONSULTING GEOTECHNICAL ENGINEERS

REPORT OF LABORATORY TESTS

PROJECT: CAMELBACK RANCH

LOCATION: #7 @ 4'6"-5'6"

DATE 2/29/88

JOB NO. E88-36

W.O.NO. 1

LAB NO. 36

DIRECT SHEAR TEST(IN SITU)ASTM D-3080

POINT NO. 1 (NORMAL STRESS 0.995 KSF)

Initial Moisture Content	3.3%
Dry Density	90.5 LB/CU FT
Maximum Vertical Deformation @ T max.	0.009 IN
Shearing Stress, T max.	0.9 KSF

POINT NO. 2 (NORMAL STRESS 2.059 KSF)

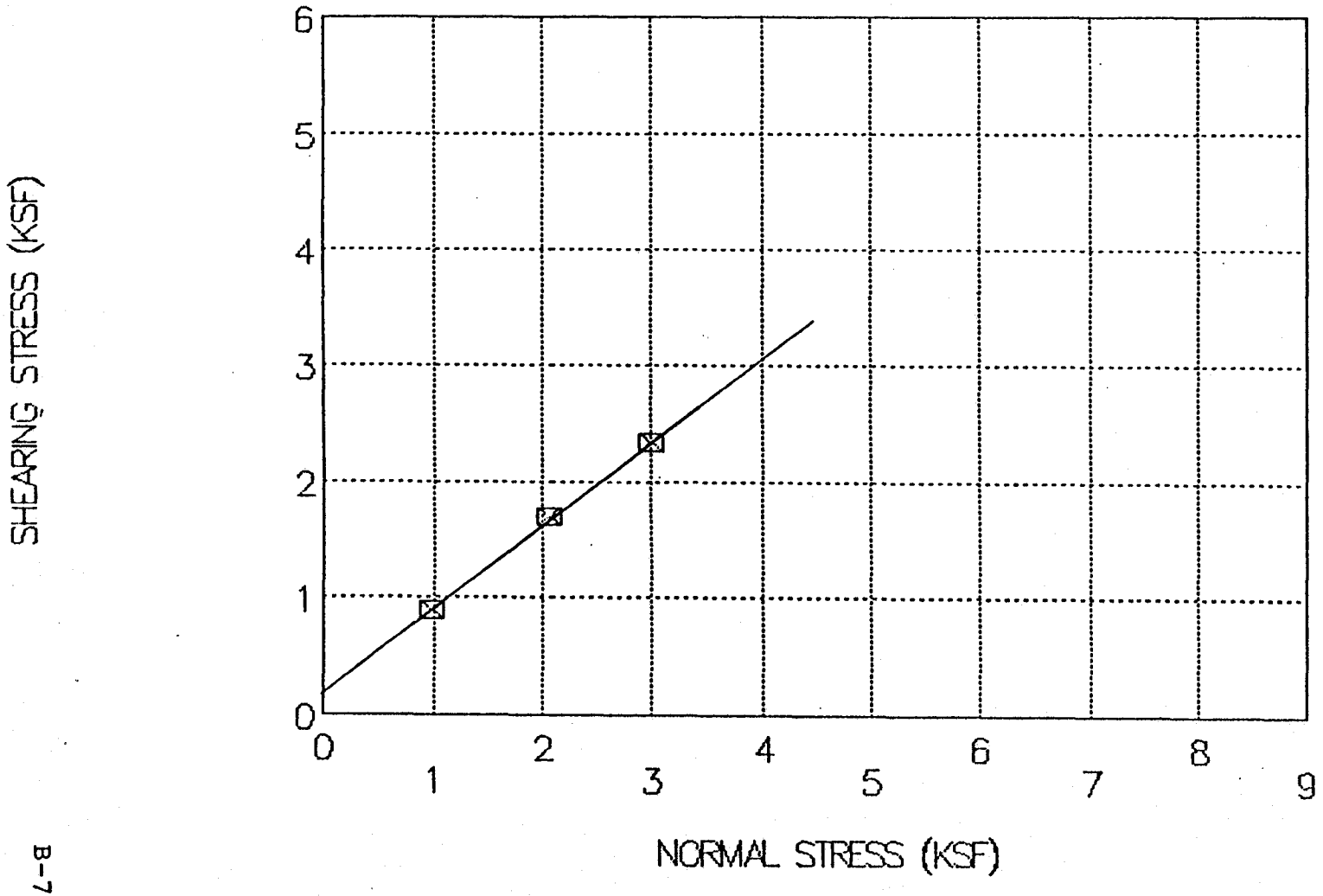
Initial Moisture Content	14.1%
Dry Density	80.2 LB/CU FT
Maximum Vertical Deformation @ T max.	-0.002 IN
Shearing Stress, T max.	1.7 KSF

POINT NO. 3 (NORMAL STRESS 2.998 KSF)

Initial Moisture Content	3.7%
Dry Density	92.5 LB/CU FT
Maximum Vertical Deformation @ T max.	-0.003 IN
Shearing Stress, T max.	2.3 KSF

DIRECT SHEAR

#7 @ 4'6"–5'6"



SERGENT, HAUSKINS & BECKWITH

CONSULTING GEOTECHNICAL ENGINEERS

REPORT OF LABORATORY TESTS		DATE	2/29/88
PROJECT: CAMELBACK RANCH		JOB NO.	E88-36
LOCATION:#8 @ 9'6"-10'6"		W.O.NO.	1
		LAB NO.	42

DIRECT SHEAR TEST(IN SITU)ASTM D-3080

POINT NO. 1 (NORMAL STRESS 0.995 KSF)

Initial Moisture Content	3.5%
Dry Density	97.4 LB/CU FT
Maximum Vertical Deformation @ T max.	0.007 IN
Shearing Stress, T max.	0.8 KSF

POINT NO. 2 (NORMAL STRESS 2.059 KSF)

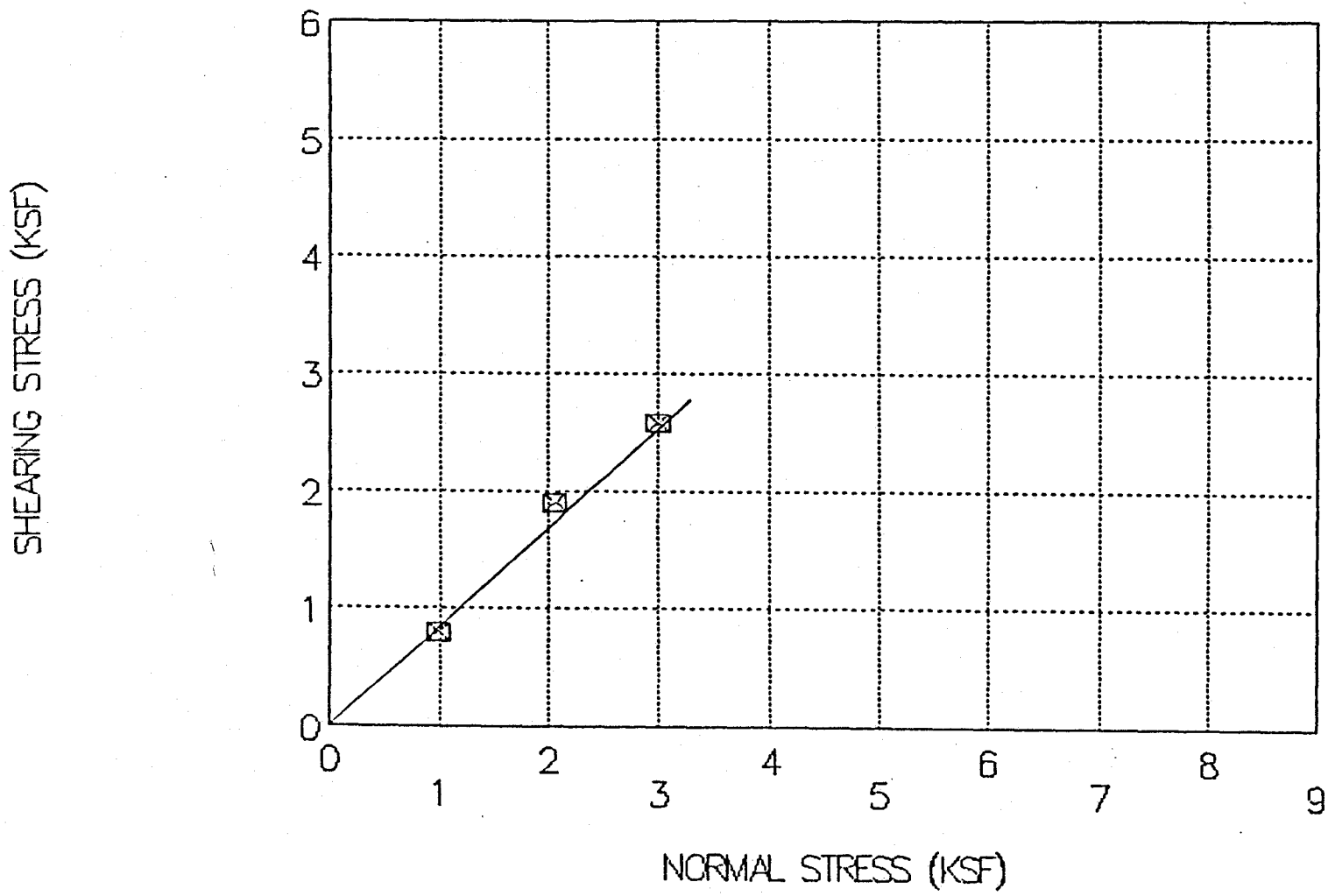
Initial Moisture Content	2.2%
Dry Density	94.6 LB/CU FT
Maximum Vertical Deformation @ T max.	0.014 IN
Shearing Stress, T max.	1.9 KSF

POINT NO. 3 (NORMAL STRESS 2.998 KSF)

Initial Moisture Content	3.1%
Dry Density	98.8 LB/CU FT
Maximum Vertical Deformation @ T max.	0.014 IN
Shearing Stress, T max.	2.6 KSF

DIRECT SHEAR

#8 @ 9'6"–10'6"



SERGENT, HAUSKINS & BECKWITH

CONSULTING GEOTECHNICAL ENGINEERS

REPORT OF LABORATORY TESTS

PROJECT: CAMELBACK RANCH

LOCATION: #19 @ 2'6"-3'6"

DATE 2/29/88

JOB NO. E88-36

W.O.NO. 1

LAB NO. 103

DIRECT SHEAR TEST(IN SITU)ASTM D-3080

POINT NO. 1 (NORMAL STRESS 0.995 KSF)

Initial Moisture Content	2.4%
Dry Density	94.5 LB/CU FT
Maximum Vertical Deformation @ T max.	0.012 IN
Shearing Stress, T max.	0.9 KSF

POINT NO. 2 (NORMAL STRESS 2.059 KSF)

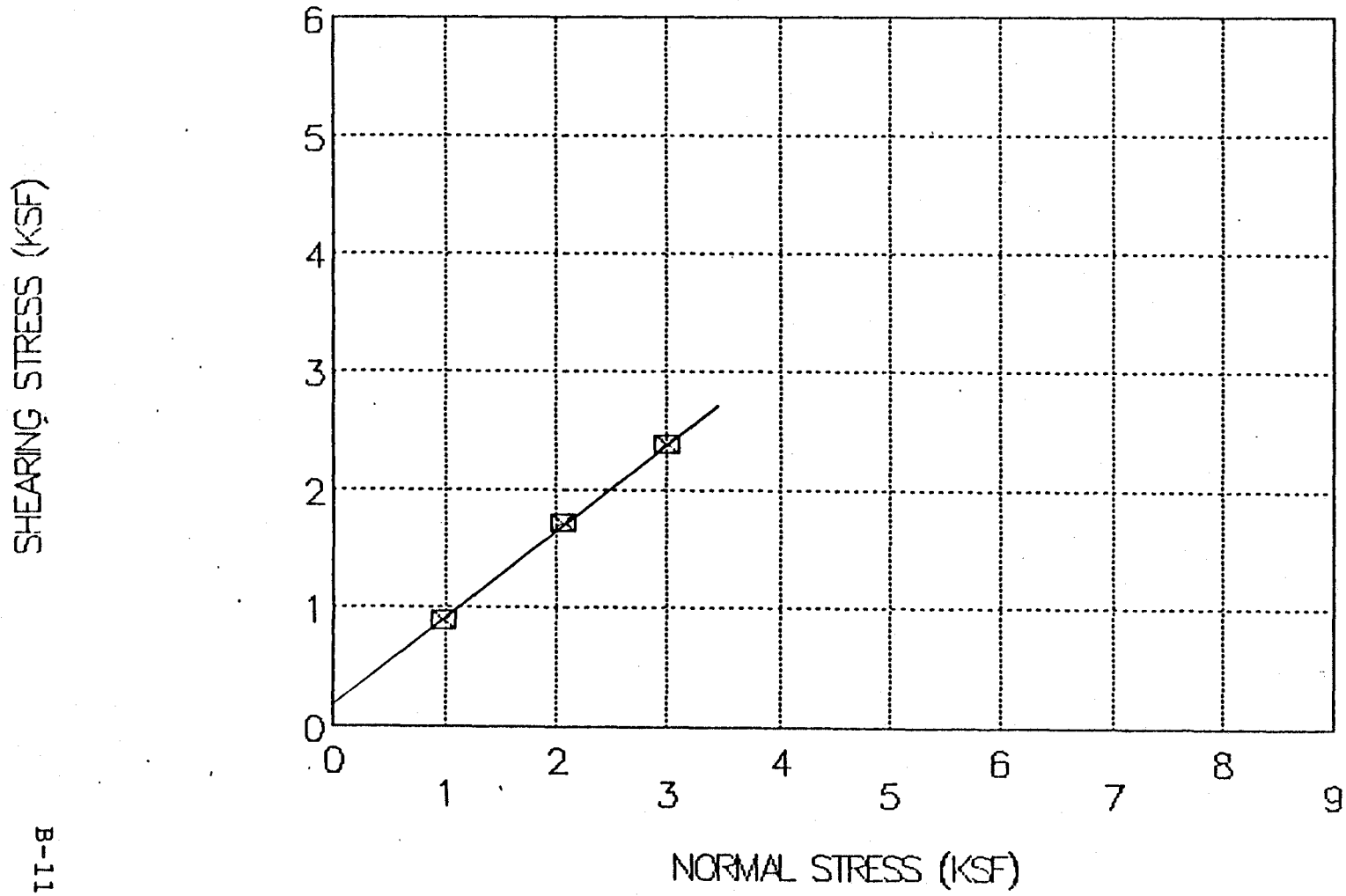
Initial Moisture Content	2.4%
Dry Density	93.9 LB/CU FT
Maximum Vertical Deformation @ T max.	0.013 IN
Shearing Stress, T max.	1.7 KSF

POINT NO. 3 (NORMAL STRESS 2.998 KSF)

Initial Moisture Content	2.3%
Dry Density	93.4 LB/CU FT
Maximum Vertical Deformation @ T max.	0.01 IN
Shearing Stress, T max.	2.4 KSF

DIRECT SHEAR

#19 @ 2'6"–3'6"



APPENDIX C

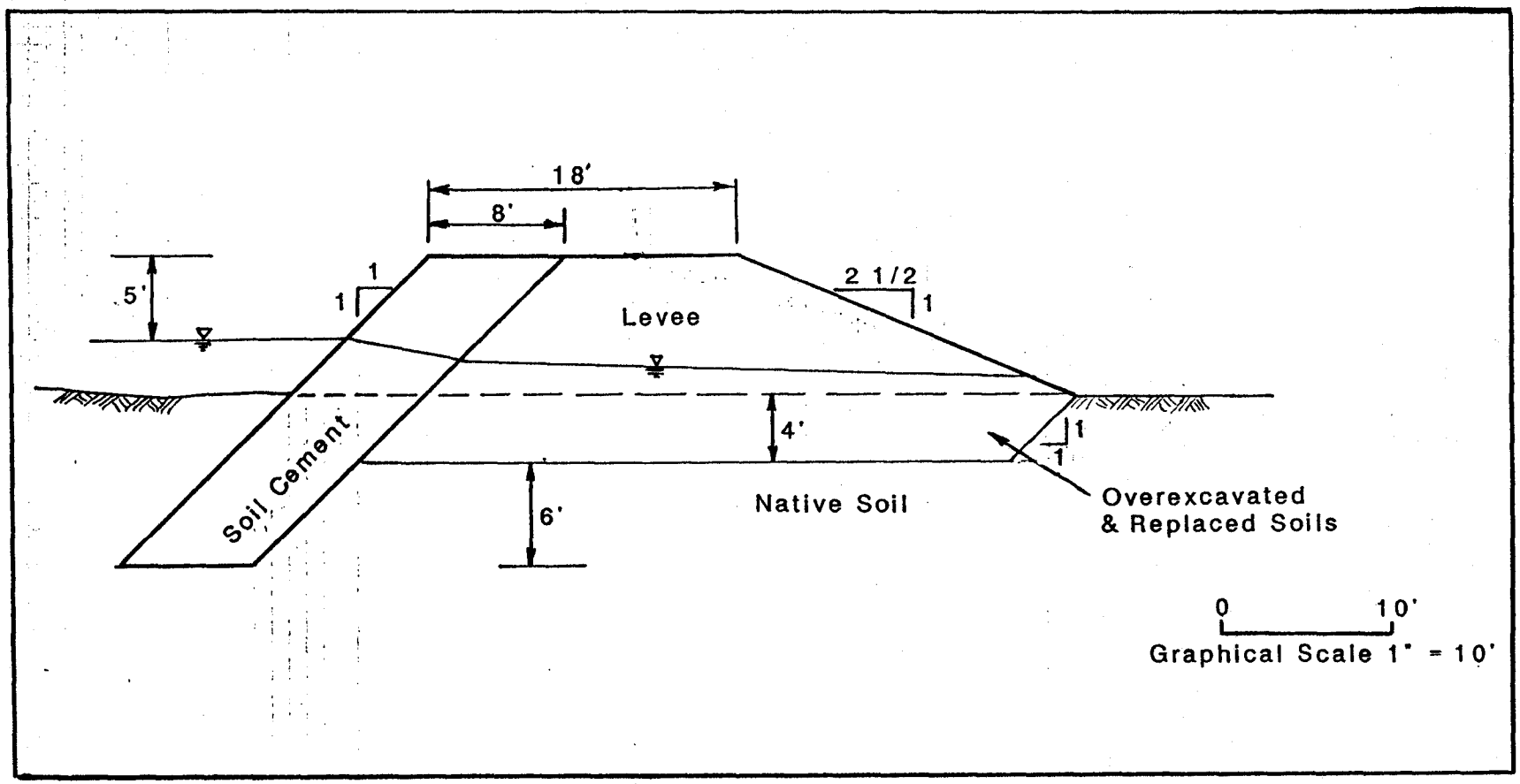


FIGURE 1

Typical Levee Section At New River

SERGENT, HAUSKINS & BECKWITH

CONSULTING GEOTECHNICAL ENGINEERS
PHOENIX · TUCSON · ALBUQUERQUE · SANTA FE · SALT LAKE CITY · EL PASO

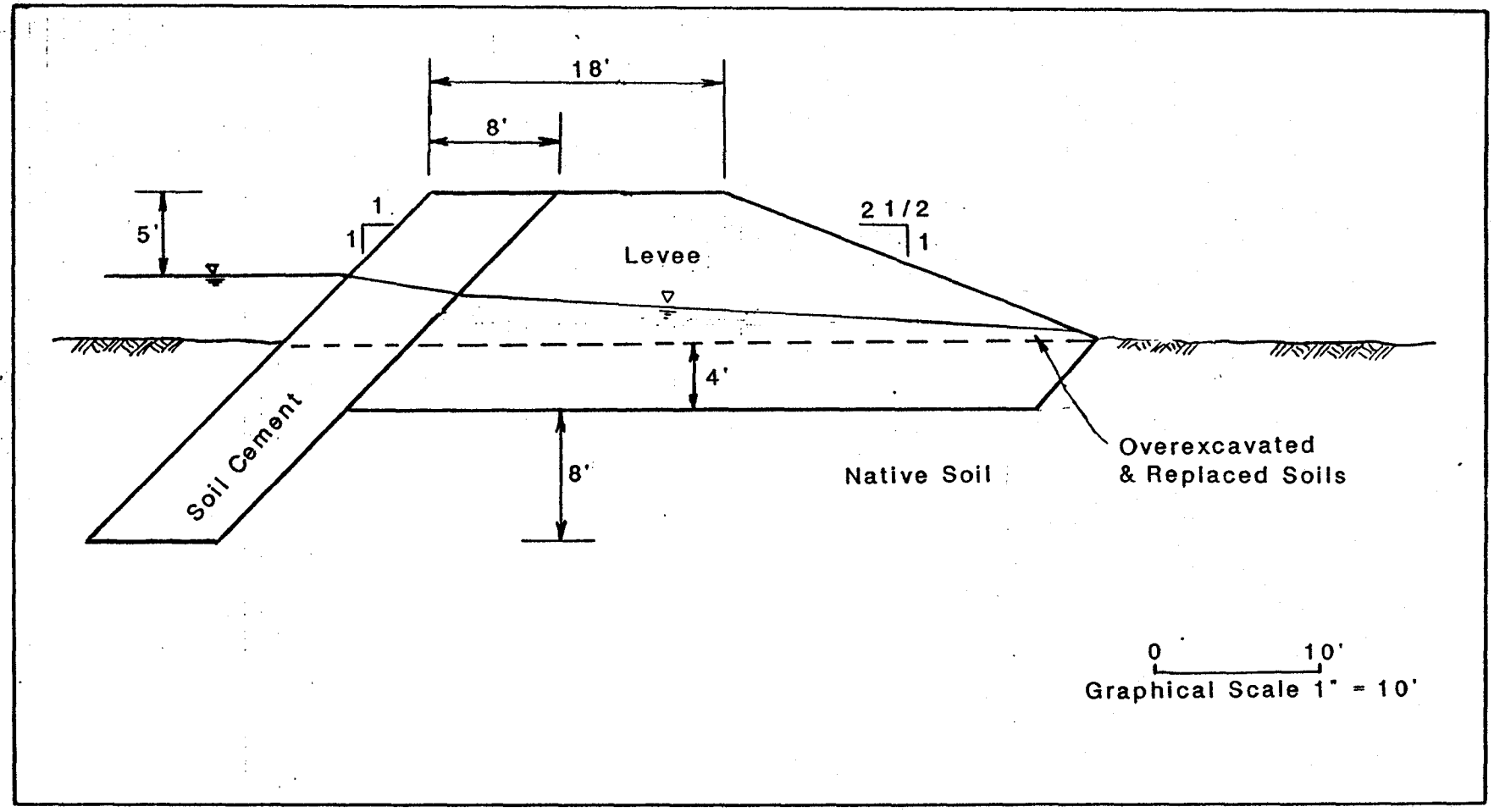


FIGURE 2

Typical Levee Section At Aqua Fria River

SERGENT, HAUSKINS & BECKWITH

CONSULTING GEOTECHNICAL ENGINEERS
PHOENIX · TUCSON · ALBUQUERQUE · SANTA FE · SALT LAKE CITY · EL PASO

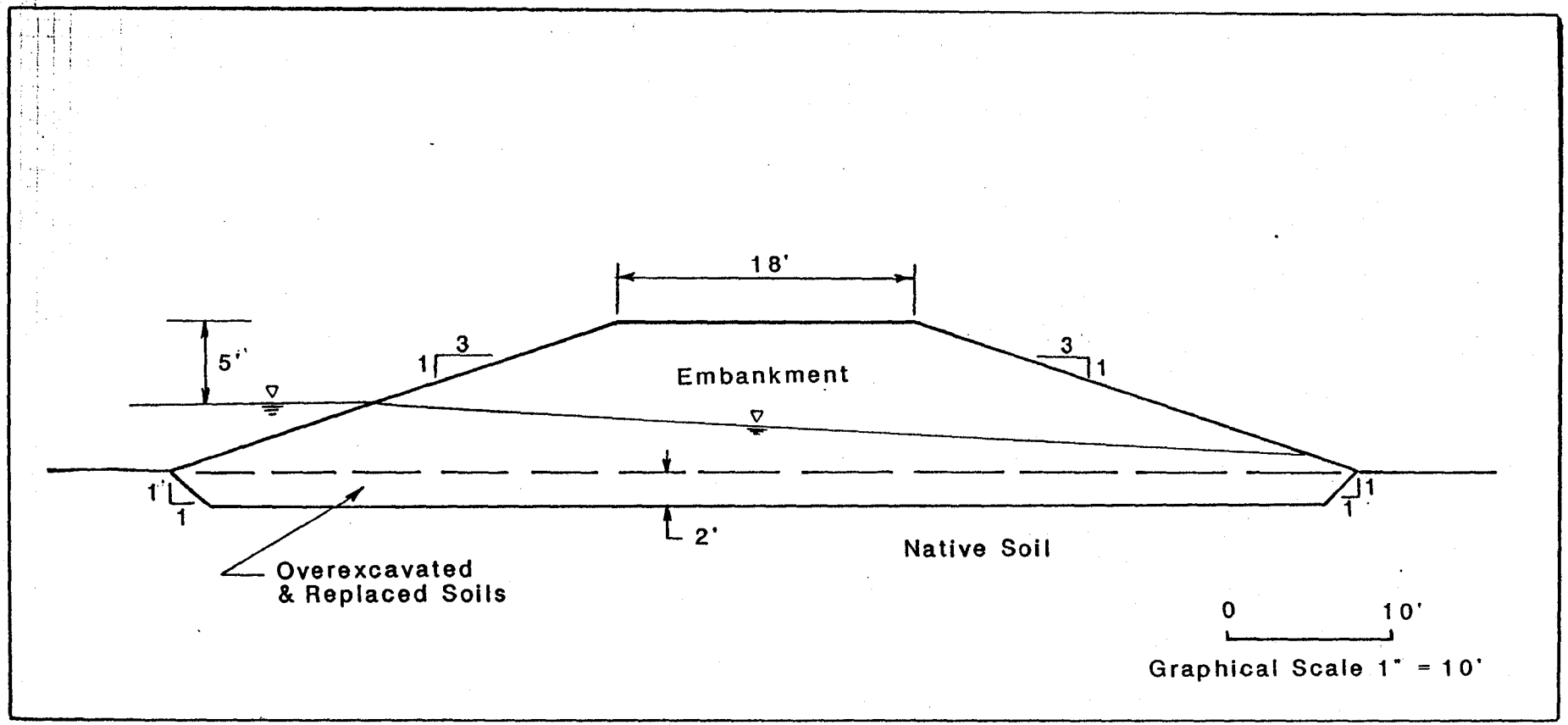
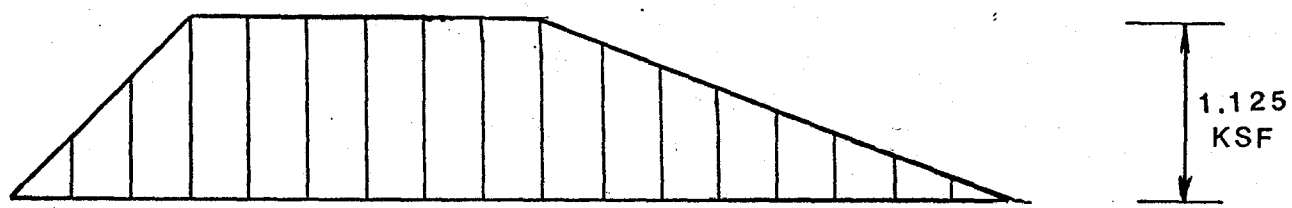


FIGURE 3

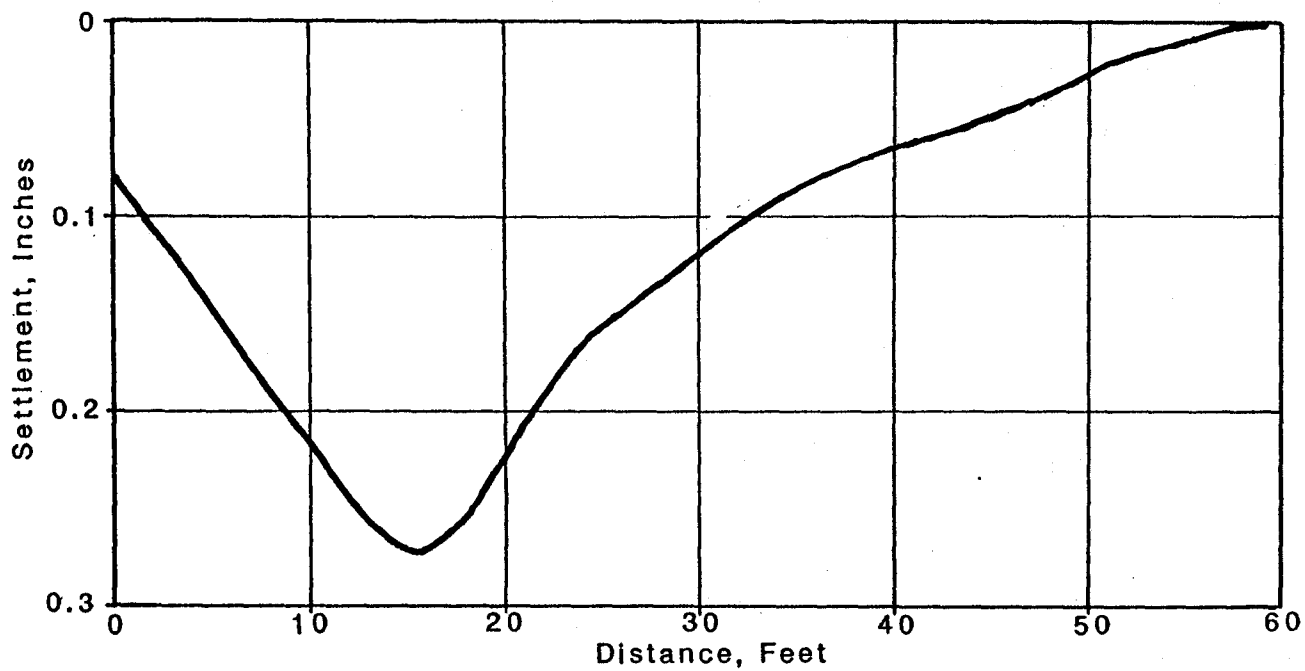
Typical Unprotected Levee Section

SERGENT, HAUSKINS & BECKWITH

CONSULTING GEOTECHNICAL ENGINEERS
PHOENIX · TUCSON · ALBUQUERQUE · SANTA FE · SALT LAKE CITY · EL PASO



(a) LOADING DUE TO LEVEE



(b) SETTLEMENT PROFILE

FIGURE 4

Settlement Profile For Typical Aqua Fria Levee Section

SERGENT, HAUSKINS & BECKWITH

CONSULTING GEOTECHNICAL ENGINEERS
PHOENIX · TUCSON · ALBUQUERQUE · SANTA FE · SALT LAKE CITY · EL PASO

SERGENT, HAUSKINS & BECKWITH CONSULTING GEOTECHNICAL ENGINEERS

APPLIED SOIL MECHANICS • ENGINEERING GEOLOGY • MATERIALS ENGINEERING • HYDROLOGY

B. DWAINE SERGENT, P.E.
LAWRENCE A. HANSEN, PH.D., P.E.
RALPH E. WEEKS, P.G.
DARREL L. BUFFINGTON, P.E.
DONALD VAN BUSKIRK, P.G.
DALE V. SEDENKOP, P.E.
JOHN B. HAUSKINS, P.E.
MICHAEL L. RUCKER, P.E.
ROBERT W. CROSSLEY, P.E.
JONATHAN A. CRYSTAL, P.E.
PAUL V. SMITH, P.G.
NORMAN H. WETZ, P.E.
GEORGE H. BECKWITH, P.E.
ROBERT L. FREW
JAMES H. CLARY, C.P.G.
NICHOLAS T. KORECKI, P.E.
GERALD P. LINDSEY, P.G.
RONALD E. RAGER, P.G.
ROBERT D. BOOTH, P.E.
SUANG CHENG, P.E.
JAMES R. RAHY, P.E.
MICHAEL HULPKE, P.G.
DAVID E. PETERSON, P.G.
ALBERT C. RUCKMAN, P.E.
PAUL KAPLAN, P.E.

July 1, 1988

Coe and Van Loo
Consulting Engineers, Inc.
4550 North 12th Street
Phoenix, Arizona 85014

SHB Job No. E88-36
Addendum No. 1

Attention: Ashok C. Patel, P.E., R.L.S.

Re: Camelback Ranch Levee Design
Agua Fria River & New River
113th Avenue & Camelback Road
Maricopa County, Arizona

Gentlemen:

Pursuant to the request of Dave Dust, P.E., of Coe and Van Loo Consulting Engineers, Inc., we have reviewed our original Geotechnical Investigation Report on the above referenced project with respect to seismic forces as they relate to stability of the dikes. In addition, settlement calculations for the dike embankments are provide.

The most likely severe earthquake which could potentially affect the structures would be a magnitude 8 plus event on the extension of the San Andreas Fault Zone in the Imperial Valley of California and the Gulf of California. The nearest point on this zone to the site is about 175 miles. Thus, it is highly unlikely that the effective peak horizontal ground acceleration (A_a) would exceed 0.05g for this type of earthquake. The recurrence interval of this type of earthquake probably is on the order of 200 years.

A second earthquake source which could produce significant

REPLY TO: 3232 W. VIRGINIA, PHOENIX, ARIZONA 85009

PHOENIX (602) 272-6848 | TUCSON (602) 792-2778 | ALBUQUERQUE (505) 884-0950 | SANTA FE (505) 471-7838 | SALT LAKE CITY (801) 266-0720 | EL PASO (915) 778-3369

effects at the site are faults within the transition zone between the Colorado Plateau and Basin and Range Physiographic Province north of Phoenix. The portions of these faults which display any evidence of being active in the engineering sense do not extend any closer than about 75 miles from Phoenix. The maximum credible earthquake (MCE) of these faults appears to be about magnitude 7. Such an event could also produce an A_a value at this site up to about 0.05g. However, the recurrence interval of this type of earthquake probably is several thousand years.

Stability analysis was performed for the same cases discussed in our orginal Geotechnical Investigation Report utilizing a psuedostatic force of .05g (A^a) to account for potential earthquake forces. Calculated safety of factors are listed in Table 1. The soil parameters and embankment geometry are the same as those considered in our original Geotechnical Report.

Of the three conditions, sudden drawdown subsequent to development of a full phreatic surface results in the minimum computed safety factor for the river side of the embankment. Computed safety factors vary from 1.14 to 1.46. For all other conditions, the safety factors vary from 1.30 to 3.04. It is our opinion that the above safety factors are conservative due to the fact that a full phreatic surface will not be achieved during the anticipated flood durations for the project.

Camelback Ranch Levee Design
Agua Fria River & New River
113th Avenue & Camelback Road
Maricopa County, Arizona
SHB Job No. E88-36
Addendum No. 1

TABLE 1

Results of Psuedostatic Stability Analyses

Typical Section	Condition	Slope	Factor of Safety
Figure 1	Case I	River side	3.02
	Case II	River side	1.46
	Case III	River side	1.92
	Case III	Land side	1.32
Figure 2	Case I	River side	3.04
	Case II	River side	1.46
	Case III	River side	1.92
	Case III	Land side	1.30
Figure 3	Case I	River side	1.69
	Case II	River side	1.14
	Case III	River side	1.47
	Case III	Land side	1.46

Note: Case I - End of construction.

Case II - Full phreatic surface subject to sudden drawdown.

Case III - Full phreatic surface at flood stage.

The settlement analysis was performed utilizing our inhouse computer. Methods used in the settlement calculations are based upon criteria presented by Osterberg, 1957*. A calculation sheet showing the formula used in the analysis along with computer print out sheets are attached.

This addendum should be attached to the original report and made a part thereof. If there are any questions pertaining to this report, please do not hesitate to contact us.

Respectfully Submitted,
Sergent, Hauskins & Beckwith Engineers

By _____
Suang S. Chang, P.E.

And _____
Norman H. Weitz, P.E.

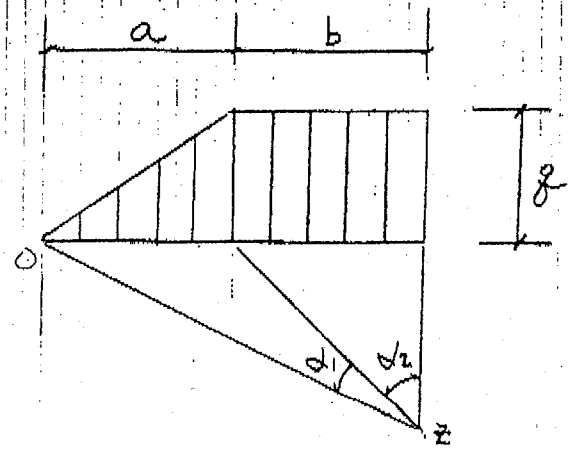
Reviewed by _____
Lawrence A. Hansen, P.E.

Copies: Addressee (6)

*Osterberg, J.O., 1957, Influence Value for Vertical Stresses in Semi-Infinite Mass Due to Embankment Loading, Proceedings of the 4th International Conference on Soil Mechanics and Foundation Engineering, Volume 1, London, August, pp. 393-394.

Settlement Analysis

BASED ON OSTERBERG (1957)



$$\sigma_z = \frac{q}{\pi}\left[\left(\frac{a+b}{a}\right)(\alpha_1+\alpha_2) - \frac{b}{a}\alpha_2\right]$$

$$\sigma_x = \sigma_z - \frac{q}{2\pi}\frac{z}{a}\left\{\ln\left[1+\left(\frac{a+b}{z}\right)^2\right] - \ln\left[1+\left(\frac{b}{z}\right)^2\right]\right\}$$

ASSUMING PLANE STRAIN CONDITION

$$\epsilon_x = \frac{(1+\nu)}{E_s}\left[\sigma_x(1-\nu) - \nu\sigma_z\right]$$

$$\epsilon_z = \frac{1+\nu}{E_s}\left[\sigma_z(1-\nu) - \nu\sigma_z\right]$$

$$\rho_z = \int_0^H \epsilon_z \, dz$$

BASIC ASSUMPTION

$E_s = 4.88$ ksi

$q = 1.125$ KSF

$H = 30'$

$\nu = .40$

SERGENT, HAUSKINS & BECKWITH
CONSULTING GEOTECHNICAL ENGINEERS
PHOENIX · TUCSON · ALBUQUERQUE · SANTA FE · SALT LAKE CITY · EL PASO

Project: Canelbrick Ranch Levee Design
Job No: E88-B6
Computed by: SSC Ckd. by: NHW.
Date: 6/22/88 Page 1 of 1

E88-36 : SECTION Y-Y SETTLEMENT DUE TO LEFT HALF

point	x-cord. (ft)	deformation vertical (inch)	deformation horizontal (inch)	hrizontal strain (per cent)	embankment height (ft)
0	2.00	0.09938	0.0290	0.1302	2.00
1	3.00	0.12587	0.0401	0.0457	3.00
2	4.00	0.14281	0.0438	0.0246	4.00
3	5.00	0.15893	0.0517	0.2022	5.00
4	6.00	0.17535	0.0807	0.1822	6.00
5	7.00	0.19705	0.0980	0.2030	7.00
6	8.00	0.21729	0.1138	-0.0925	8.00
7	9.00	0.23787	0.0872	-0.2542	9.00
8	10.00	0.24926	0.0564	-0.2467	9.00
9	11.00	0.25696	0.0321	-0.0983	9.00
10	12.00	0.26115	0.0265	-0.0509	9.00
11	13.00	0.26526	0.0194	-0.0752	9.00
12	14.00	0.26766	0.0096	-0.0870	9.00
13	15.00	0.26846	0.0000	-0.0662	9.00

E88-36 : SECTION Y-Y SETTLEMENT DUE TO LEFT HALF

X-coordinate at toe	0.0 ft
X-coordinate at crest	9.0 ft
X-coordinate at center	15.0 ft
depth to incompressible alyer	30.0 ft
unit weight of embankment material ...	125.0 pcf
maximum surcharge	1.125 ksf

soil No.	soil modulus (ksi)	Poison's ratio	depth (ft)
1	4.88	0.40	30.00

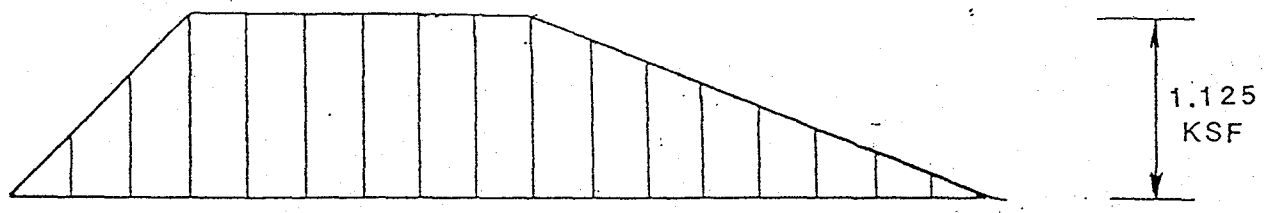
E88-36 : SECTION Y-Y SETTLTMENT DUE TO RIGHT HALF

point	x-cord. (ft)	deformation vertical (inch)	deformation horizontal (inch)	hrizontal strain (per cent)	embankment height (ft)
0	2.00	0.01105	0.0018	0.0080	0.50
1	3.00	0.01972	0.0028	0.0102	0.75
2	4.00	0.02856	0.0042	0.0129	1.00
3	5.00	0.03781	0.0059	0.0181	1.25
4	6.00	0.04762	0.0081	0.0198	1.50
5	7.00	0.05808	0.0107	0.0214	1.75
6	8.00	0.06926	0.0139	0.0563	2.00
7	9.00	0.08122	0.0185	-0.0216	2.25
8	10.00	0.09399	0.0135	-0.0407	2.50
9	11.00	0.09965	0.0101	-0.0072	2.75
10	12.00	0.10502	0.0105	0.0034	3.00
11	13.00	0.11016	0.0109	0.0036	3.25
12	14.00	0.11511	0.0114	0.0040	3.50
13	15.00	0.11991	0.0119	0.0044	3.75
14	16.00	0.12461	0.0124	0.0050	4.00
15	17.00	0.12925	0.0131	0.0057	4.25
16	18.00	0.13385	0.0138	0.0065	4.50
17	19.00	0.13846	0.0146	0.0075	4.75
18	20.00	0.14311	0.0156	0.0087	5.00
19	21.00	0.14784	0.0167	0.0100	5.25
20	22.00	0.15268	0.0180	0.0115	5.50
21	23.00	0.15768	0.0195	0.0133	5.75
22	24.00	0.16287	0.0212	0.0153	6.00
23	25.00	0.16830	0.0232	0.0178	6.25
24	26.00	0.17403	0.0255	0.0207	6.50
25	27.00	0.18010	0.0282	0.0242	6.75
26	28.00	0.18658	0.0313	0.0285	7.00
27	29.00	0.19356	0.0351	0.0338	7.25
28	30.00	0.20114	0.0396	0.0410	7.50
29	31.00	0.20945	0.0451	0.0507	7.75
30	32.00	0.21867	0.0520	0.0651	8.00
31	33.00	0.22909	0.0610	0.0372	8.25
32	34.00	0.24119	0.0731	0.4900	8.50
33	35.00	0.25595	0.1251	-0.2809	8.75
34	36.00	0.27649	0.0563	-0.4471	9.00
35	37.00	0.28008	0.0185	-0.1327	9.00
36	38.00	0.28272	0.0137	-0.0355	9.00
37	39.00	0.28466	0.0098	-0.0304	9.00
38	40.00	0.28601	0.0063	-0.0277	9.00
39	41.00	0.28679	0.0031	-0.0284	9.00
40	42.00	0.28705	0.0000	-0.0217	9.00

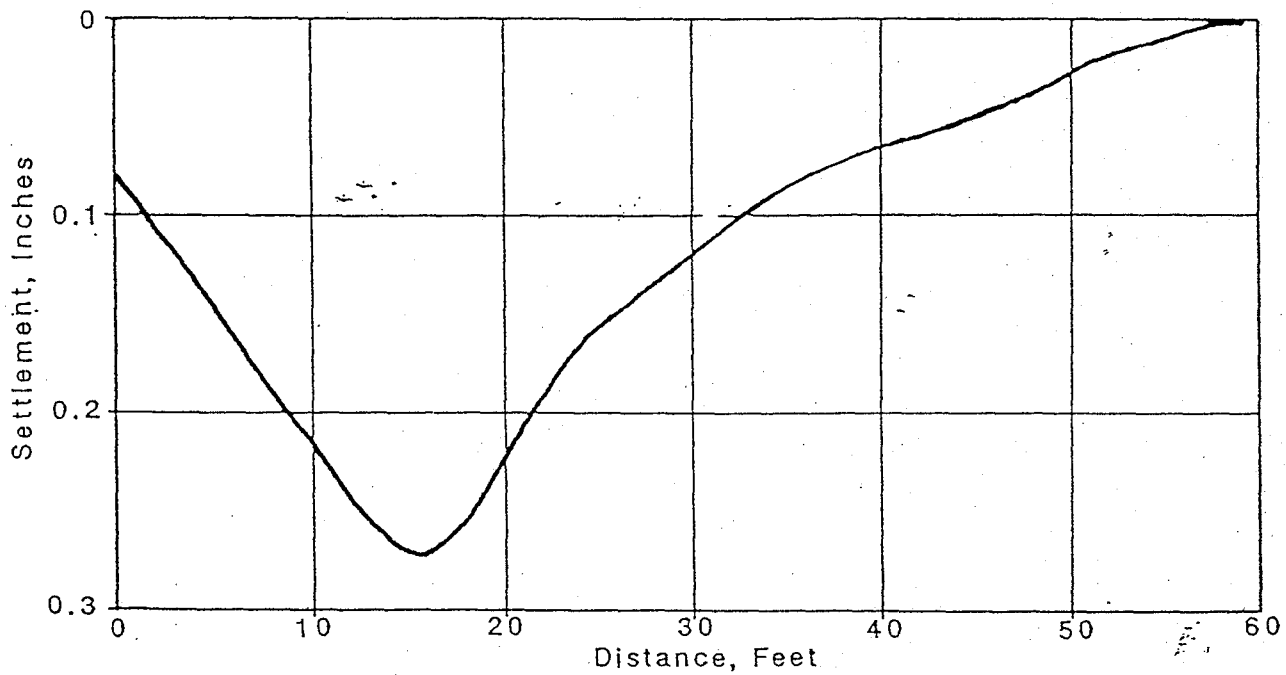
E88-36 : SECTION Y-Y SETTLTMENT DUE TO RIGHT HALF

X-coordinate at toe	0.0 ft
X-coordinate at crest	36.0 ft
X-coordinate at center	42.0 ft
depth to incompressible alyer	30.0 ft
unit weight of embankment material ...	125.0 pcf
maximum surcharge	1.125 ksf

soil No.	soil modulus (ksi)	Poison's ratio	depth (ft)
1	4.88	0.40	30.00



(a) LOADING DUE TO LEVEE



(b) SETTLEMENT PROFILE

FIGURE 4

Settlement Profile For Typical Aqua Fria Levee Section

SERGENT, HAUSKINS & BECKWITH

CONSULTING GEOTECHNICAL ENGINEERS
PHOENIX · TUCSON · ALBUQUERQUE · SANTA FE · SALT LAKE CITY · EL PASO

Federal Emergency Management Agency

Washington, D.C. 20472

AUG 16 1988

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

The Honorable Tom Freestone
Chairman, Maricopa County
Board of Supervisors
111 South 3rd Avenue
Phoenix, Arizona 85003

Case #88-09-25R
RE: Camelback Ranch

Dear Mr. Freestone:

This is in response to a letter dated January 20, 1988, from Mr. Ashok Patel, Coe & Van Loo Consulting Engineers, Inc., in which Mr. Patel requested that our office review the Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM) for the unincorporated areas of Maricopa County, Arizona. The FIS and FIRM are to be reviewed with respect to a proposed project that includes levee improvements along the New River and the Agua Fria River, channelization along the New River; a pumping station along the Agua Fria River, and stormwater detention facilities within the project boundaries.

To support his request, Mr. Patel submitted the following data with his January 20 letter and letters dated June 19 and July 5, 1988:

- A report entitled "Camelback Ranch, Floodplain Study and Conditional LOMR"
- A report entitled "Addendum to: Camelback Ranch, Floodplain Study and Conditional LOMR Request," dated May 1988
- A report entitled "Addendum to: Camelback Ranch, Floodplain Study and Conditional LOMR Request," dated June 1988
- Geotechnical information concerning the potential seismic loadings in the geotechnical analyses by the proposed levees

We have completed our review of the data submitted with regard to the data used to produce the effective FIS for Maricopa County and believe that if the proposed project is constructed as shown on the aforementioned plans the 100-year flood will be attenuated and will be contained by the proposed levees along the New River and the Agua Fria River from Campbell Avenue to Bethany Home Road.

Upon completion of the project, please submit as-built plans, certified by a registered professional engineer, and evidence that maintenance and operation provisions for the proposed levee, stormwater detention facilities and pumping station have been made. For the levees, that evidence must be in the form of an officially adopted plan that meets the requirements set forth in Section 65.10(d) of the enclosed National Flood Insurance Program (NFIP) regulations. For the pumping station and detention facility, the evidence should be in the form of a plan that specifies the activities to be performed, the frequency of their performance, and the community officials reponsible for their performance. All maintenance and operation activities should be under the jurisdiction of a Federal or State agency, an agency created by Federal or State law, or an agency of a community participating in the NFIP that assumes ultimate responsibility for these activities. Upon receipt of this information, we will make a final determination on revising the FIRM.

The basis of this conditional Letter of Map Revision is in part a proposed channel modification project. NFIP regulations, as cited in Section 60.3(b)(7), require that communities "assure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained."

This provision is incorporated into your community's existing floodplain management regulations. Consequently, upon completion of this proposed project, the ultimate responsibility for maintenance of the channel modification will rest with your community.

Should you have any questions regarding the matter, please contact the Chief, Natural and Technological Hazards Division of the Federal Emergency Management Agency, in San Francisco, California, at (415) 923-7175 or Mr. William Judkins of my staff in Washington, D.C., at (202) 646-3458.

Sincerely,

John L. Matticks
for Chief, Risk Studies Division
Federal Insurance Administration

Enclosure

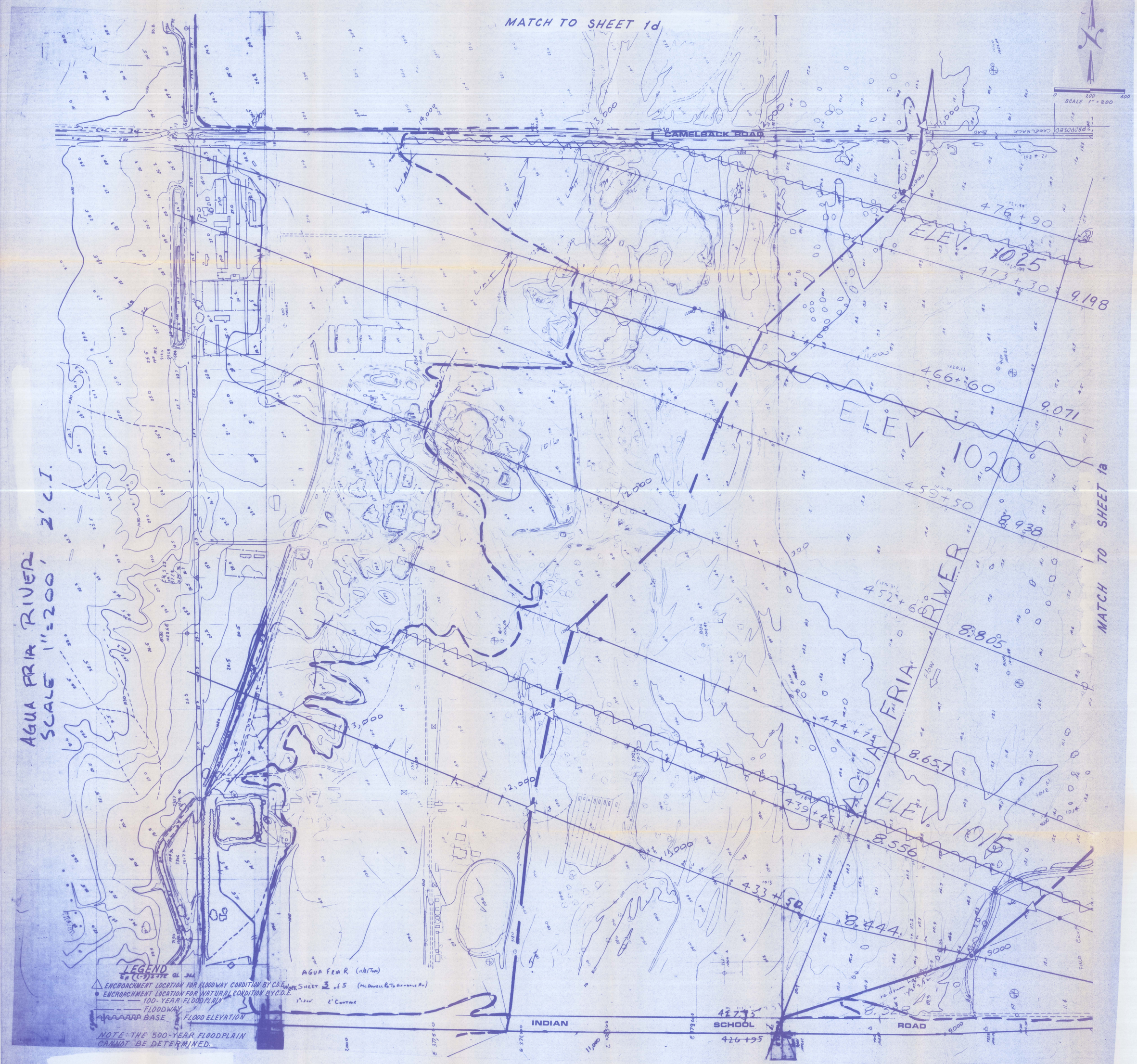
cc: Mr. James Morris, P.E.
Arizona Department of Water Resources

Mr. Dan Sagramoso, P.E.
Flood Control District of Maricopa County

Mr. Ashok Patel, P.E., L.S.
Coe & Van Loo Consulting Engineers, Inc.

APPENDIX IV

FEMA CORRESPONDENCE CLOMR



APPENDIX E SHEET 1b

SOURCE: CORPS OF ENGINEERS REF. 4

CVL #1122-03
DATE: 1/88

COE & VAN LOO CONSULTING ENGINEERING INC. PHOENIX ARIZONA

GLENDALE AVE.

RM #3

RM #4

ZONE A9

MATCH LINE

SEE SHEET 3

ZONE A10

RIVER

107TH AVE

GLENDALE MUNICIPAL AIRPORT
CHANNELIZATION COMPLETED FOR GLENDALE AIRPORT WAS REDUCED & SPLICED ONTO THIS MAP TO SHOW NEW RIGHT BANK ALIGNMENT. ORIGINAL C.O.E. CONTROL LINE WAS USED WITH UPDATED CHANNELIZATION.

* 100 YR. OVERFLOW FLOODWAY

MATCH LINE

SEE SHEET 1

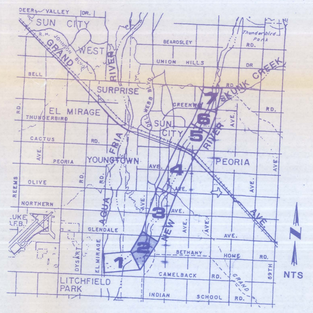
NEW RIVER

1" = 200' 2' CONTOUR

RM#2

LEGEND

- 100 YEAR FLOOD LIMITS
- FLOODWAY LIMITS
- BASE FLOOD ELEVATION
- 85+00 — DISTANCE IN HUNDREDS OF FEET FROM THE CONFLUENCE WITH AGUA FRIA
- 204.0 — CROSS SECTION
- + RM#4 — REFERENCE MARK
- FLOOD ZONE LINE



KEY MAP

APPENDIX X SHEET 2b

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

NEW RIVER FLOODPLAIN DELINEATION

AGUA FRIA RIVER TO SKUNK CREEK WASH

RECOMMENDED BY: DATE:

APPROVED BY: DATE:

FLOODPLAIN ADMINISTRATOR

PANEL 2 OF 7

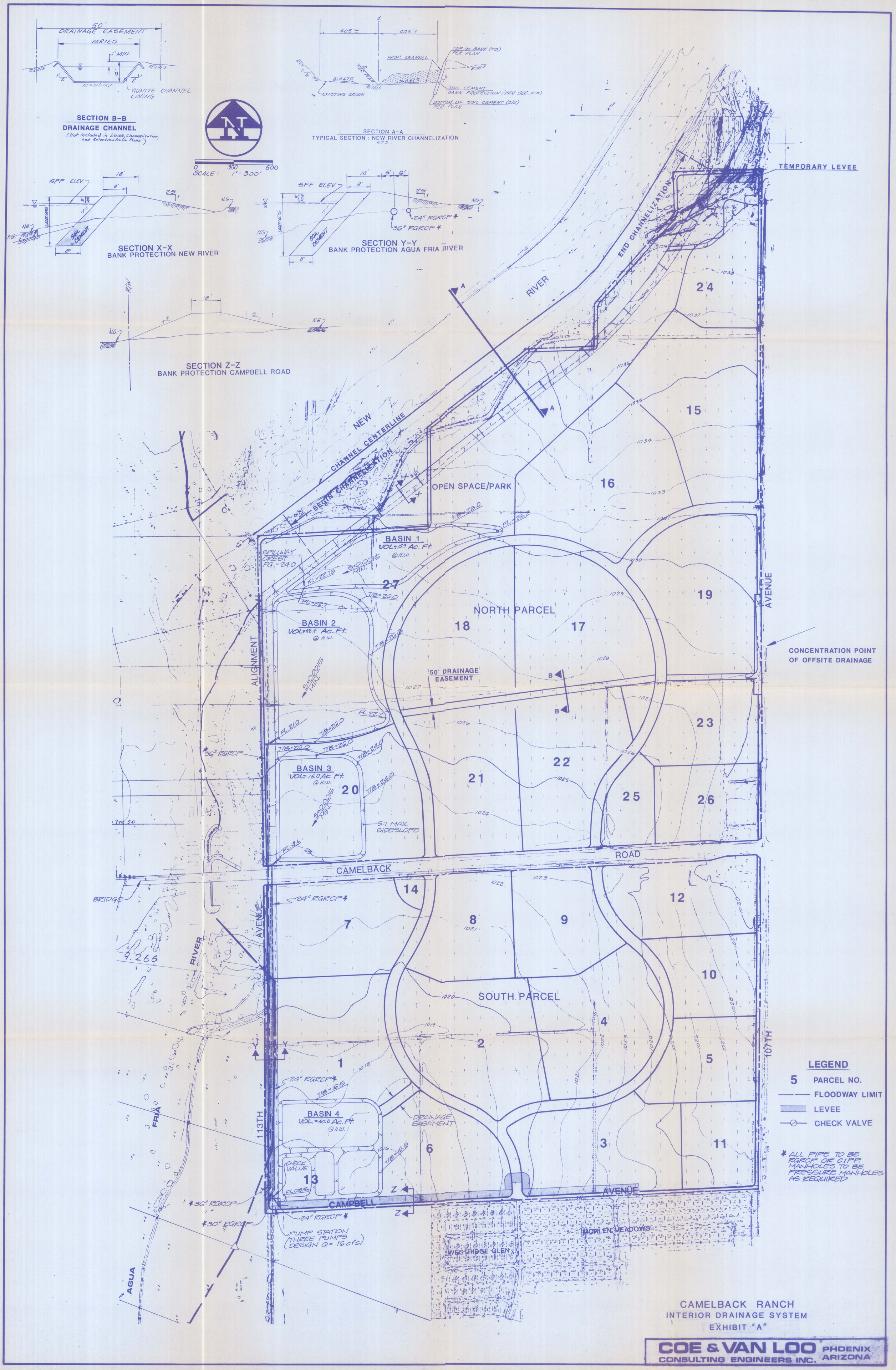
COE & VAN LOO CONSULTING ENGINEERS INC. PHOENIX ARIZONA

SCALE: 1"=200.00' (0 200 400)

CVL #1122-12

REV. 7-87

1/88


50' DRAINAGE EASEMENT
VARIES
1' MIN.
GUNITE CHANNEL LINING
SECTION B-B
DRAINAGE CHANNEL
(Not included in Levee, Channelization, and Retention Basin Plans)
405'±
405'±
PROP. CHANNEL
TOP OF BANK (T/B) PER PLAN
S=0.67%
EXISTING GRADE
SOIL CEMENT BANK PROTECTION (PER SEC. X-X)
BOTTOM OF SOIL CEMENT (B/B) PER PLAN
SECTION A-A
TYPICAL SECTION : NEW RIVER CHANNELIZATION
N.T.S.
SCALE: 1" = 300'
SPF ELEV.
SOIL CEMENT
SECTION X-X
BANK PROTECTION NEW RIVER
24" RGRCP
36" RGRCP
SECTION Y-Y
BANK PROTECTION AGUA FRIA RIVER
SECTION Z-Z
BANK PROTECTION CAMPBELL ROAD
TEMPORARY LEVEE
END CHANNELIZATION
NEW RIVER
CHANNEL CENTERLINE
BEGIN CHANNELIZATION
OPEN SPACE/PARK
BASIN 1
VOL.=15.9 Ac. Ft. @ H.W.
BASIN 2
VOL.=48.4 Ac. Ft. @ H.W.
BASIN 3
VOL.=16.0 Ac. Ft. @ H.W.
BASIN 4
VOL.=40.0 Ac. Ft. @ H.W.
SPILLWAY CREST EL.=24.0
S=0.0015 MIN.
NORTH PARCEL
SOUTH PARCEL
50' DRAINAGE EASEMENT
DRAINAGE EASEMENT
5:1 MAX. SIDESLOPE
CHECK VALVE
ELOBS
PUMP STATION (THREE PUMPS DESIGN Q=16 cfs)
ALIGNMENT
CAMELBACK ROAD
CAMPBELL AVENUE
113TH AVENUE
107TH AVENUE
AGUA FRIA RIVER
BRIDGE
CONCENTRATION POINT OF OFFSITE DRAINAGE
WESTRIDGE GLEN
MORLEN MEADOWS
LEGEND
5 PARCEL NO.
FLOODWAY LIMIT
LEVEE
CHECK VALVE
* ALL PIPE TO BE RGRCP OR CIPP. MANHOLES TO BE PRESSURE MANHOLES AS REQUIRED
CAMELBACK RANCH
INTERIOR DRAINAGE SYSTEM
EXHIBIT "A"
COE & VAN LOO
CONSULTING ENGINEERS INC.
PHOENIX ARIZONA
C.V.L. JOB # 1122-03-03

APPENDIX E SHEET 1a

CVL #1122-03

DATE: 1/88

COE & VAN LOO CONSULTING ENGINEERING INC. PHOENIX ARIZONA

SOURCE: CORPS OF ENGINEERS REF. 4