CAREFREE DRAINAGE MASTER PLAN TECHNICAL DATA NOTEBOOK ADDENDUM

Carefree, Arizona

Prepared for
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009

CONTRACT NO: FCD 2000C037

in Cooperation with
Town of Carefree
100 Easy Street
Carefree, AZ 85377

Prepared by
CH2MHILL
2625 South Plaza Drive, Suite 300
Tempe, Arizona 85282-3397

September 2003

W042003002PHX_08

Carefree Drainage Master Plan Technical Data Notebook Addendum

TO: Flood Control District of Maricopa County

COPIES: File

FROM: Tony Bokich and Rob Lyons

DATE: June 24, 2003

The Flood Control District of Maricopa County (FCDMC) contracted with CH2M HILL in June 2001 to complete the Carefree Drainage Master Plan (DMP) study (FCD Contract No. 2000C037). The Carefree DMP study area encompasses the entire Town of Carefree including the Unnamed Central Tributary to Cave Creek (UCTCC). The original scope of work for the study entailed floodplain analyses for the UCTCC between Terravita Way and Cave Creek Road as well as other reaches of other washes.

During the development of the Technical Data Notebook, multiple flow splits were discovered between Terravita Way and Cave Creek Road on both the North and South branches of the UCTCC in an area between two major washes that was not mapped topographically. Originally the flow split was thought to be confined to the two major washes but it was evident from the modeling that there may be properties located within the floodplain within the unmapped area between the washes. It was mutually agreed by CH2M HILL, the Flood Control District, and the Town of Carefree to remove this portion of the floodplain mapping from the FEMA submittal until such time as the remainder of the area could be mapped and analyzed, allowing for a complete picture of the flooding and flow splits to be determined.

This addendum was then developed to disclose the results of the floodplain mapping downstream of Terravita Way. This mapping is for informational purposes only and is not intended to be submitted to FEMA or in any way represent a regulatory floodplain.

Based on this floodplain mapping, 14 homes and one vacant lot are located within the floodplain. The 14 homeowners were notified and elevation certificates were prepared for each home.

The study documentation included in this addendum is listed in the Addendum Contents. Due to the incomplete nature of the topographic mapping the results of the study included in this addendum should be used with caution.

Addendum

Carefree Drainage Master Plan Floodplain Delineation Technical Data Notebook Addendum

Prepared for

Flood Control District of Maricopa County

2801 West Durango
Phoenix, AZ 85009
(602) 506-1501

May 2004

Registered Professional Engineer (Civil)
CERTIFICATE NO.
24971
TONY A.
BOKICH
Date Signed 5-11-04
ARIZONA, U.S.A.

CH2MHILL

2625 South Plaza Drive
Suite 300
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CH2MHILL

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Attachments

Flood Profiles

Floodplain Delineation Study Map

Summary of HEC-RAS Model Flow Changes

Finish Floor Elevations and Elevation Certificates by Aztec Engineering

Terravita Way Flow Diversion – Unnamed Central Tributary to Cave Creek – Analysis

Flow Split at Scottsdale Health Center, Unnamed Central Tributary to Cave Creek – Analysis

Los Reales Flow Diversion – Unnamed Central Tributary to Cave Creek – Analysis

Carefree Mountain Drive Flow Split – Analysis

Boundary Conditions, Culvert No. 3, Unnamed Central Tributary to Cave Creek – Analysis

Boundary Conditions, Culvert No. 6, Unnamed Central Tributary to Cave Creek-North Branch

N-Value determination figures

HEC-RAS Reports and Model Summary Tables

HEC-RAS Cross Sections

CHECK-RAS Reports

Digital data files

SECTION 1

Flow Splits Summary

There are numerous flow splits and islands in the Unnamed Central Tributary to Cave Creek model. Islands were only excluded from the mapped floodplain if they were more than 1 foot above the calculated water surface elevation.

Detailed analysis and calculations were performed at all flow splits using Haestad computer software. Documentation and explanation of methodology at each flow split is included in this Carefree Drainage Master Plan Technical Data Notebook Addendum. A general description of each flow split is presented below.

1.1 Downstream of Terravita Way

The North and South Branch of the Unnamed Central Tributary to Cave Creek diverge downstream of Terravita Way. The channel thalweg for the North Branch is approximately 2 feet lower than the channel thalweg for the South Branch. Consequently, the water surface profile for the North Branch is also approximately 2 feet lower than the water surface profile for the South Branch.

Using the previous flows, it was calculated that 61 cfs spilled over the south branch into the north branch. The new flows at this location are much lower and as a result, there is no flow "spilling" back into the north branch from the south branch.

1.2 Scottsdale Health Center

A flow split was calculated upstream of the Scottsdale Health Center, which was based on the previous flows. This split was calculated to be 61 cfs. However, the updated flows are much lower and this split does not occur anymore. The flow that now arrives upstream of the Health Center is 576 cfs, which is lower than the 602 cfs that was previously calculated with the flow split.

The Health Center is located at a topographical high point at the diversion. The amount of flow diverted around this facility was determined by the percentage of cross sectional area of flow on each side of the diversion plus a 10 percent margin of error as a factor of safety. With the factor of safety factored into the analysis, approximately 400 cubic feet per second (cfs), will continue north, and 233 cfs will travel south around this structure.

1.3 Los Reales

A box culvert exists on Los Reales Drive that is under-sized for the 100-year event. Approximately 2,228 cfs arrives at the culvert crossing. Of the 2,228 cfs arriving at the culvert, 1,480 cfs will be conveyed through the culvert, and 748 cfs will overtop the roadway. Out of the 748 cfs overtopping the roadway and based on the percentage of cross

sectional area occupying key segments of the roadway overtopping profile, approximately 494 cfs will be diverted to the south, and 254 cfs will continue to the north.

1.4 Carefree Mountain Drive

A flow split exists on the Unnamed Central Tributary to Cave Creek – Diversion Branch immediately upstream of Carefree Mountain Drive. A total of 494 cfs arrives at this diversion during the 100-year event based on flow splits at the Scottsdale Health Center and Los Reales. The portion of the discharge split flows to the north, rejoining the Unnamed Central Tributary to Cave Creek – North Branch, while the flow diverted to the south flows towards Cave Creek Road.

A topographic high point exists as the diversion which influences the diverted flow amounts. Based on the total flow of 494 cfs and the percentage of cross sectional area that the discharge occupies on either side of the diversion, approximately 437 cfs continues to the north and 57 cfs flows to the south. A more precise understanding of where the 57 cfs actually flows to can be determined once the topographic map section separating the North and South Branches is obtained.

SECTION 2

Levees and Dikes

An unengineered berm system was constructed on the southern branch of the Unnamed Central Tributary to Cave Creek. The berm is approximately 6-feet high, approximately 100-feet long and begins just upstream of a masonry wall that is located parallel to the main channel. The berm is constructed of compacted, noncohesive soil, and is subject to failure during flooding events. Additionally, this berm will be flanked by the approaching width of the flow, increasing the chance for failure or partial failure. Therefore, this area was modeled with the berm geometry in place, but not containing any flow behind it. The terrain immediately north of this berm is lower than the adjacent river thalweg and, consequently, the hydraulic model will automatically assume this lower area is to be part of the overall cross section conveyance. Since it is known that the berm will initially prevent flow from entering along the north side during a large flow event, the model was adjusted to confine the flow to the south side of the berm.

2.1 Medical Center near Carefree Highway and 60th Street

An unengineered berm system was constructed on the property located at the southeast corner of Carefree Highway and 60th Street on the Unnamed Central Tributary to Cave Creek. During a 100-year flood event, the location of flooding will be dependent on the performance of this berm system. The medical center building, located to the north of the berm system, exists at a lower elevation than the surrounding wash and is subject to inundation by floodwaters.

SECTION 3

FIS Draft Data

Table 1 contains the Summary of Discharges for the Draft Field Investigation Study (FIS) data.

TABLE 1
Summary of Discharges for the Draft FIS data

Flooding Source and Location	Drainage Area	Peak Discharge (cfs)
	Sq Mi	100-Year
Unnamed Central Tributary to Cave Creek - South Branch		
At River Mile 0.0151 above Cave Creek Road	2.58	566
Unnamed Central Tributary to Cave Creek - Diversion Branch		
At River Mile 0.0241	N/A	894

3.1 Flood Elevations

Table 2 contains the Draft FIS Data.

TABLE 2
Unnamed Central Tributary to Cave Creek

Flooding Source		Base Flood Water Surface Elevation			
Cross Section	Distance	Regulatory (Feet NGVD29)	Q (cfs)	Velocity (fps)	Depth (feet)
North					
0.8848	0.8848	2137.69	2174	9.52	4.66
0.8582	0.8582	2134.53	2174	7.87	2.51
0.8342	0.8342	2132.49	2174	5.95	4.61
0.8062	0.8062	2129.28	2174	4.65	5.67
0.7874	0.7874	2126.80	2174	4.89	4.91
0.7698	0.7698	2123.91	2250	6.72	4.19
0.7490	0.7490	2122.76	2250	2.96	4.82
0.7352	0.7352	2120.93	2250	3.50	3.93
0.7098	0.7098	2117.05	1775	5.77	5.18
0.6796	0.6796	2112.36	1775	6.90	4.27

TABLE 2
Unnamed Central Tributary to Cave Creek

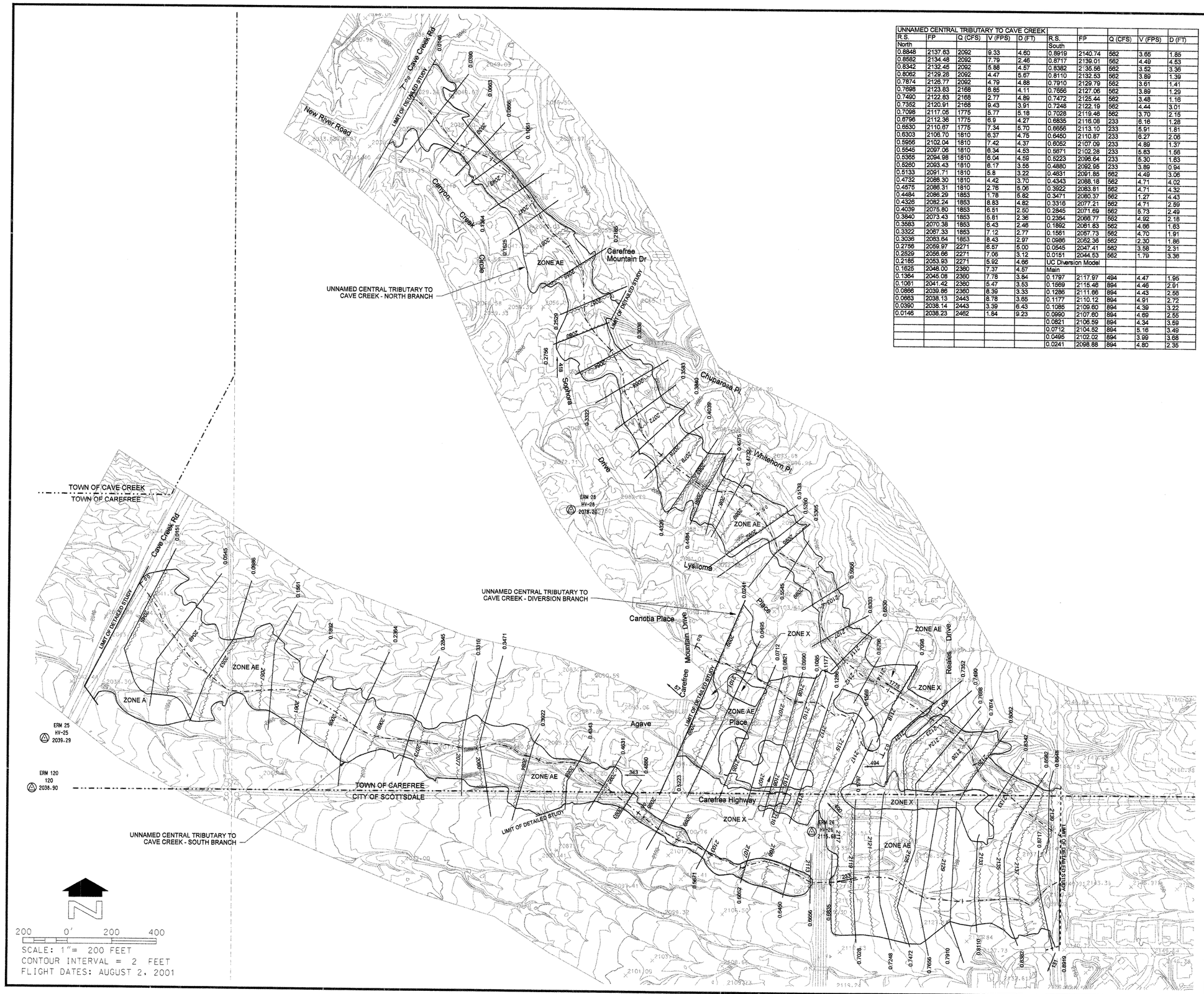
Flooding Source		Base Flood Water Surface Elevation			
Cross Section	Distance	Regulatory (Feet NGVD29)	Q (cfs)	Velocity (fps)	Depth (feet)
0.6530	0.6530	2110.67	1775	7.34	5.70
0.6303	0.6303	2106.70	1810	6.37	4.75
0.5956	0.5956	2102.04	1810	7.42	4.37
0.5545	0.5545	2097.06	1810	6.34	4.53
0.5365	0.5365	2094.98	1810	6.04	4.59
0.5260	0.5260	2093.43	1810	6.17	3.55
0.5133	0.5133	2091.71	1810	5.8	3.22
0.4732	0.4732	2086.30	1810	4.42	3.70
0.4575	0.4575	2086.31	1810	2.76	5.06
0.4484	0.4484	2086.29	1853	1.78	5.82
0.4326	0.4326	2082.24	1853	8.83	4.82
0.4039	0.4039	2075.80	1853	6.51	2.50
0.3840	0.3840	2073.43	1853	5.81	2.36
0.3583	0.3583	2070.38	1853	6.43	2.46
0.3322	0.3322	2067.33	1853	7.12	2.77
0.3036	0.3036	2063.64	1853	8.43	2.97
0.2756	0.2756	2059.97	2271	6.57	5.00
0.2529	0.2529	2056.66	2271	7.06	3.12
0.2185	0.2185	2053.93	2271	5.92	4.66
0.1625	0.1625	2048.00	2360	7.37	4.57
0.1364	0.1364	2045.08	2360	7.78	3.84
0.1061	0.1061	2041.42	2360	5.47	3.53
0.0866	0.0866	2039.86	2360	8.39	3.33
0.0663	0.0663	2038.13	2443	8.78	3.65
0.0390	0.0390	2038.14	2443	3.39	6.43
0.0146	0.0146	2038.23	2462	1.84	9.23
South					
0.9065	0.9065	2141.85	685	3.94	3.15
0.8919	0.8919	2140.75	576	3.69	1.86
0.8717	0.8717	2139.04	576	4.42	4.56
0.8382	0.8382	2135.56	576	3.62	3.36

TABLE 2
Unnamed Central Tributary to Cave Creek

Flooding Source		Base Flood Water Surface Elevation			
Cross Section	Distance	Regulatory (Feet NGVD29)	Q (cfs)	Velocity (fps)	Depth (feet)
0.8110	0.8110	2132.55	576	3.80	1.41
0.7910	0.7910	2129.79	576	3.64	1.41
0.7656	0.7656	2127.08	576	3.87	1.31
0.7472	0.7472	2125.45	576	3.48	1.17
0.7248	0.7248	2122.19	576	4.55	3.01
0.7028	0.7028	2119.48	576	3.70	2.17
0.6835	0.6835	2116.08	233	6.16	1.28
0.6656	0.6656	2113.10	233	5.91	1.81
0.6450	0.6450	2110.87	233	6.27	2.06
0.6052	0.6052	2107.09	233	4.89	1.37
0.5671	0.5671	2102.28	233	5.83	1.56
0.5223	0.5223	2096.64	233	5.30	1.63
0.4880	0.4880	2092.96	233	3.82	0.95
0.4631	0.4631	2091.87	576	4.50	3.08
0.4343	0.4343	2088.19	576	4.74	4.03
0.3922	0.3922	2083.83	576	4.72	4.34
0.3471	0.3471	2080.40	576	1.28	4.46
0.3316	0.3316	2077.22	576	4.80	2.60
0.2845	0.2845	2071.71	576	5.75	2.51
0.2364	0.2364	2066.77	576	5.05	2.18
0.1892	0.1892	2061.85	576	4.69	1.65
0.1561	0.1561	2057.73	576	4.79	1.91
0.0986	0.0986	2052.36	576	2.36	1.86
0.0545	0.0545	2047.42	566	3.59	2.32
0.0151	0.0151	2044.53	566	1.81	3.36
UC Diversion Model					
Main					
0.1797	0.1797	2117.97	494	4.47	1.95
0.1569	0.1569	2115.46	894	4.46	2.91
0.1286	0.1286	2111.66	894	4.43	2.56

TABLE 2
Unnamed Central Tributary to Cave Creek

Flooding Source		Base Flood Water Surface Elevation			
Cross Section	**Distance**	**Regulatory (Feet NGVD29)**	**Q (cfs)**	**Velocity (fps)**	**Depth (feet)**
0.1177	0.1177	2110.12	894	4.91	2.72
0.1085	0.1085	2109.60	894	4.39	3.22
0.0990	0.0990	2107.60	894	4.69	2.55
0.0821	0.0821	2106.59	894	4.34	3.59
0.0712	0.0712	2104.52	894	5.16	3.49
0.0495	0.0495	2102.02	894	3.99	3.68
0.0241	0.0241	2098.88	894	4.80	2.35



UNNAMED CENTRAL TRIBUTARY TO CAVE CREEK									
R.S.	FP	Q (CFS)	V (FPS)	D (FT)	R.S.	FP	Q (CFS)	V (FPS)	D (FT)
North					South				
0.8848	2137.83	2092	9.33	4.60	0.8919	2140.74	562	3.65	1.85
0.8582	2134.48	2092	7.79	2.46	0.8717	2139.01	562	4.49	4.53
0.8342	2132.45	2092	5.88	4.57	0.8382	2135.56	562	3.52	3.36
0.8062	2129.28	2092	4.47	5.67	0.8110	2132.53	562	3.89	1.39
0.7874	2126.77	2092	4.79	4.88	0.7910	2129.79	562	3.61	1.41
0.7698	2123.83	2168	6.85	4.11	0.7656	2127.06	562	3.89	1.29
0.7490	2122.83	2168	2.77	4.89	0.7472	2125.44	562	3.48	1.16
0.7352	2120.91	2168	9.43	3.91	0.7248	2122.19	562	4.44	3.01
0.7098	2117.05	1775	5.77	5.18	0.7028	2119.46	562	3.70	2.16
0.6796	2112.36	1775	6.9	4.27	0.6835	2116.08	233	6.16	1.28
0.6530	2110.67	1775	7.34	5.70	0.6656	2113.10	233	5.91	1.81
0.6303	2106.70	1810	6.37	4.75	0.6450	2110.87	233	6.27	2.06
0.5956	2102.04	1810	7.42	4.37	0.6052	2107.09	233	4.89	1.37
0.5545	2097.06	1810	6.34	4.53	0.5871	2102.28	233	5.83	1.56
0.5365	2094.98	1810	6.04	4.59	0.5223	2096.64	233	5.30	1.63
0.5260	2093.43	1810	6.17	3.55	0.4880	2092.95	233	3.89	0.94
0.5133	2091.71	1810	5.8	3.22	0.4631	2091.85	562	4.49	3.06
0.4732	2086.30	1810	4.42	3.70	0.4343	2088.18	562	4.71	4.02
0.4575	2086.31	1810	2.76	5.06	0.3922	2083.81	562	4.71	4.32
0.4484	2086.29	1853	1.78	5.82	0.3471	2080.37	562	1.27	4.43
0.4326	2082.24	1853	8.83	4.82	0.3316	2077.21	562	4.71	2.59
0.4039	2075.80	1853	6.51	2.50	0.2845	2071.69	562	5.73	2.49
0.3840	2073.43	1853	5.81	2.36	0.2384	2066.77	562	4.92	2.18
0.3583	2070.38	1853	8.43	2.46	0.1892	2061.83	562	4.66	1.83
0.3322	2067.33	1853	7.12	2.77	0.1561	2057.73	562	4.70	1.91
0.3036	2063.64	1853	8.43	2.97	0.0986	2052.36	562	2.30	1.86
0.2756	2059.97	2271	6.57	5.00	0.0545	2047.41	562	3.58	2.31
0.2529	2058.66	2271	7.06	3.12	0.0151	2044.53	562	1.79	3.36
0.2185	2053.93	2271	5.92	4.66	UC Diversion Model				
0.1625	2048.00	2360	7.37	4.57	Main				
0.1364	2045.08	2360	7.78	3.84	0.1797	2117.97	494	4.47	1.95
0.1061	2041.42	2360	5.47	3.53	0.1569	2115.48	894	4.46	2.91
0.0866	2039.86	2360	8.39	3.33	0.1286	2111.66	894	4.43	2.56
0.0663	2038.13	2443	8.78	3.65	0.1177	2110.12	894	4.91	2.72
0.0390	2038.14	2443	3.39	6.43	0.1085	2109.60	894	4.39	3.22
0.0146	2038.23	2462	1.64	9.23	0.0990	2107.60	894	4.69	2.55
					0.0921	2106.59	894	4.34	3.59
					0.0712	2104.52	894	5.16	3.49
					0.0495	2102.02	894	3.99	3.68
					0.0241	2098.88	894	4.80	2.35

LEGEND

- 100-YR FLOODPLAIN BOUNDARY
- FLOODWAY BOUNDARY
- HYDRAULIC BASE LINE WITH RIVER MILE
- SECTION LINE
- SECTION CORNER (26|25 / 35|36)
- CROSS SECTION (0.2185)
- FLOW DIVERSION (CFS) (381)
- ELEVATION REFERENCE MARK
- BASE FLOOD ELEVATIONS (2505)
- ZONE DESIGNATIONS — ZONE AE
- CORPORATE LIMITS — Corporate Limits
- COUNTY, PARISH, STATE OR INTERNATIONAL BOUNDARY — County Boundary

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929. CONVERSION FACTOR 1988 NAVD = -2.23 AVERAGE TO 1929 NGVD

I.D. NUMBER	ELEVATION (FT)	DESCRIPTION/LOCATION
ERM 25	2039.29	SET 1/2" REBAR N: 1,018,548.93 E: 685,766.84
ERM 26	2115.68	SET 1/2" REBAR N: 1,018,159.48 E: 689,226.01
ERM 28	2078.20	SET CONCRETE NAIL N: 1,019,592.46 E: 688,127.48
ERM 120	2038.90	TOP OF PAVEMENT N: 1,018,325.30 E: 685,711.48

NOTES

1.) HORIZONTAL DATUM IS NAD 83 STATE PLANE GRID COORDINATES, ARIZONA CENTRAL ZONE.
2.) TOWN LIMITS APPROXIMATE.

REGISTERED LAND SURVEYOR CERTIFICATE NO. 25396 ALAN D. REECE Date 5/7/04 ARIZONA, U.S.A.

LOCATION MAP

NO.	REVISION	BY	DATE
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

UNNAMED CENTRAL TRIBUTARY TO CAVE CREEK

CAREFREE FLOODPLAIN DELINEATION

F.C.D. CONTRACT NO. 2000 C037

Registered Professional Engineer (Civil) CERTIFICATE NO. 24971 TONY A. LOSK Date Signed 5/7/04 ARIZONA, U.S.A.

CH2MHILL

	BY	DATE
DESIGN	ROL	03/07/03
DESIGN CHK.	LAP	03/07/03
PLANS	ROL	09/04/03
PLANS CHK.	TAB	09/04/03

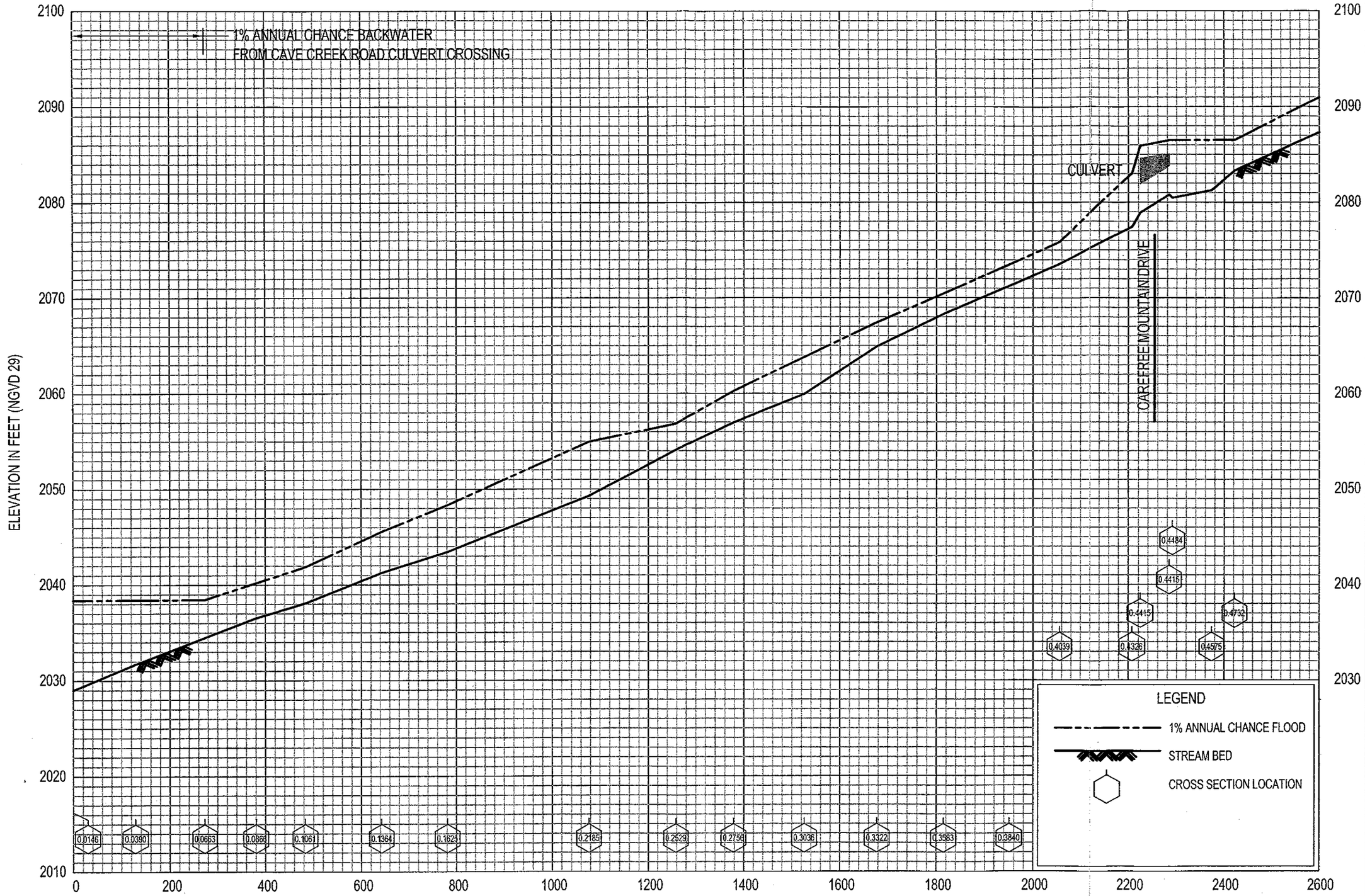
SHEET 1 OF 1

THIS MAP WAS PREPARED BY PHOTOGRAMMETRIC METHODS TO NATIONAL MAP ACCURACY STANDARDS FOR 1"= 200' HORIZONTAL SCALE AND 2' CONTOUR INTERVALS.

MAPPING COMPANY: M&B AERIAL (INTERNAL JOB # FCD-1184)

GROUND CONTROL SURVEY DATA PROVIDED BY AZTEC ENGINEERING

2944f1d1A1.div 06-MAY-2004



FLOOD PROFILES

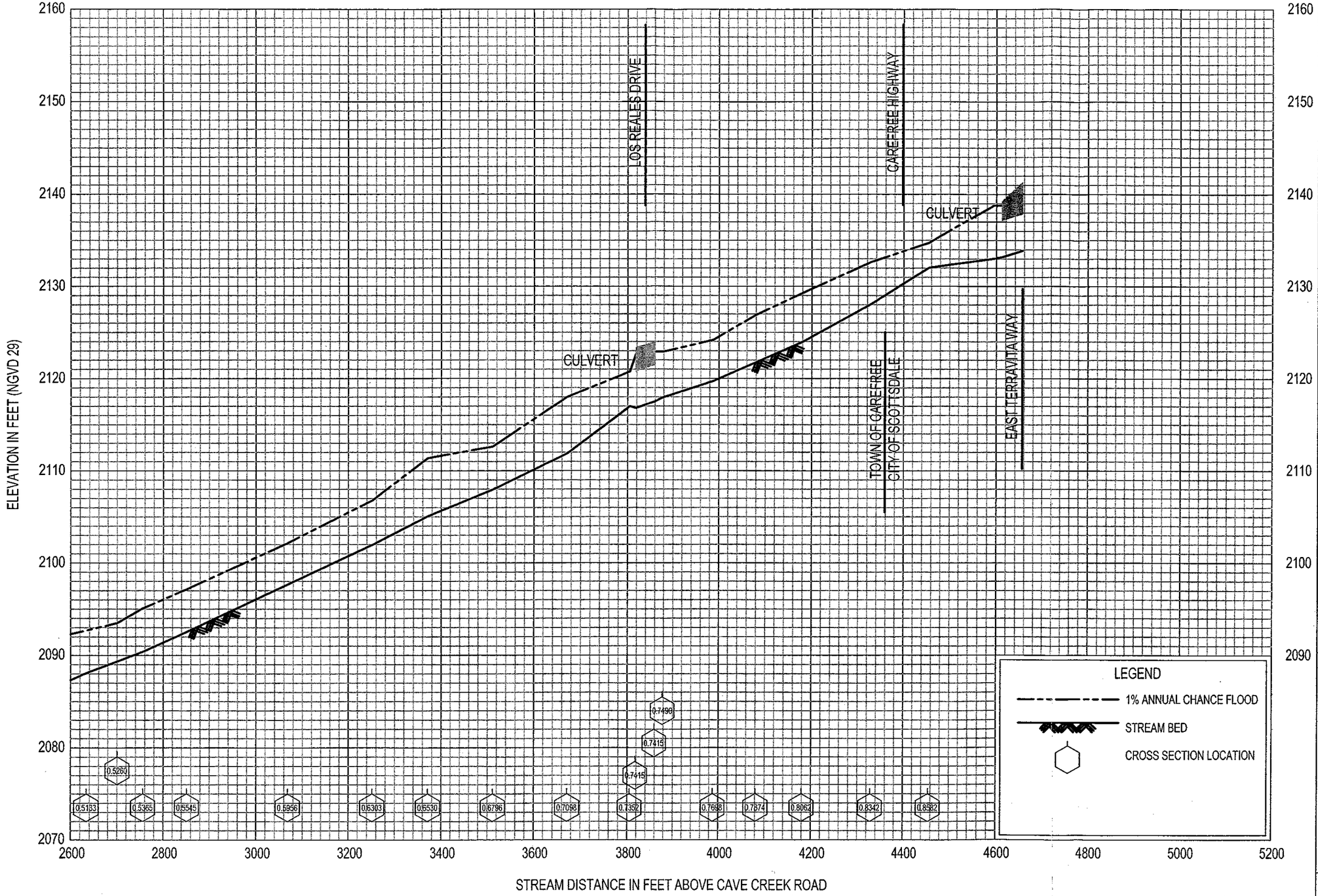
UNNAMED CENTRAL TRIBUTARY TO CAVE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF CAREFREE, AZ

MARICOPA COUNTY

A01U



FLOOD PROFILES

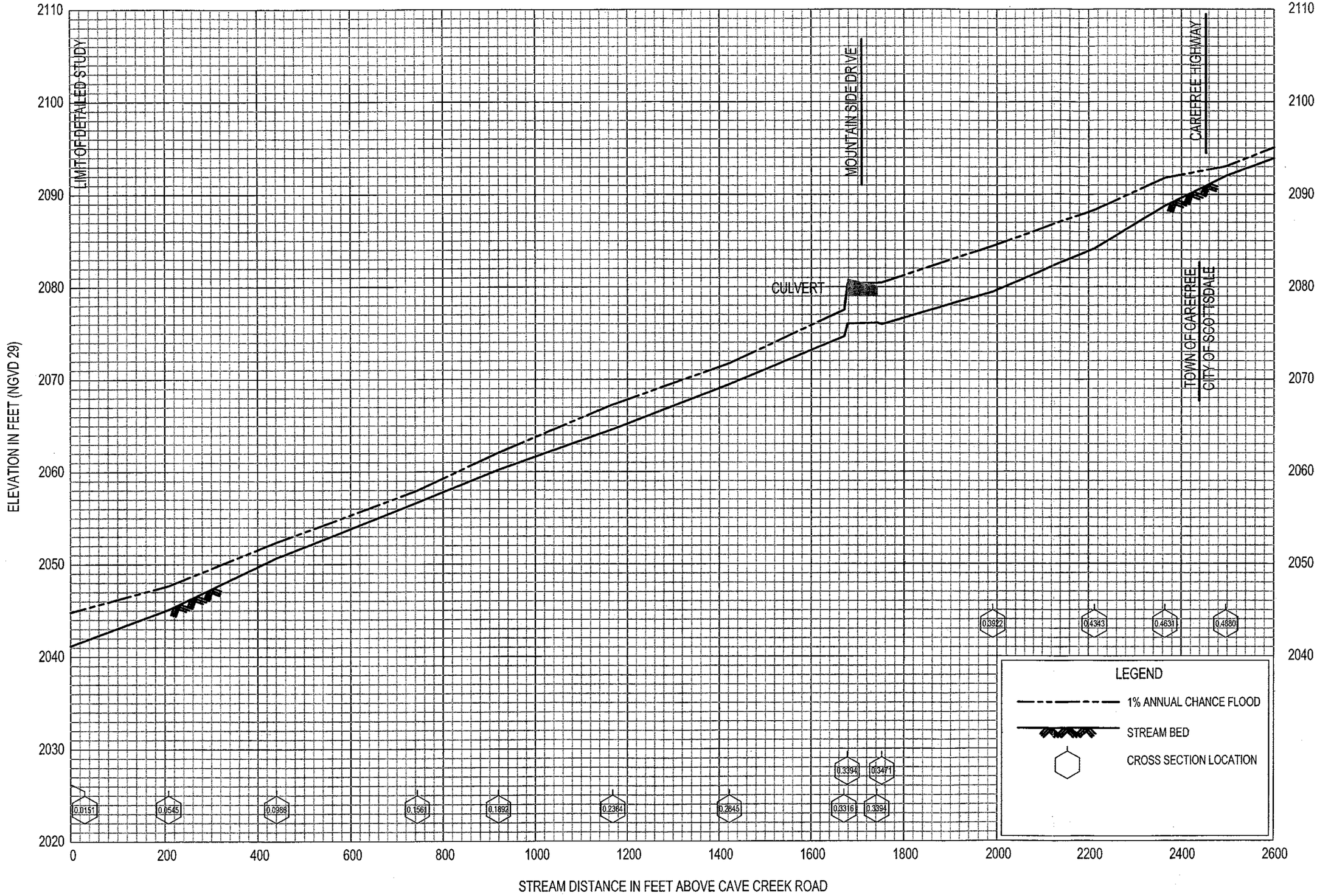
UNNAMED CENTRAL TRIBUTARY TO CAVE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF CAREFREE, AZ

MARICOPA COUNTY

A02U



FLOOD PROFILES

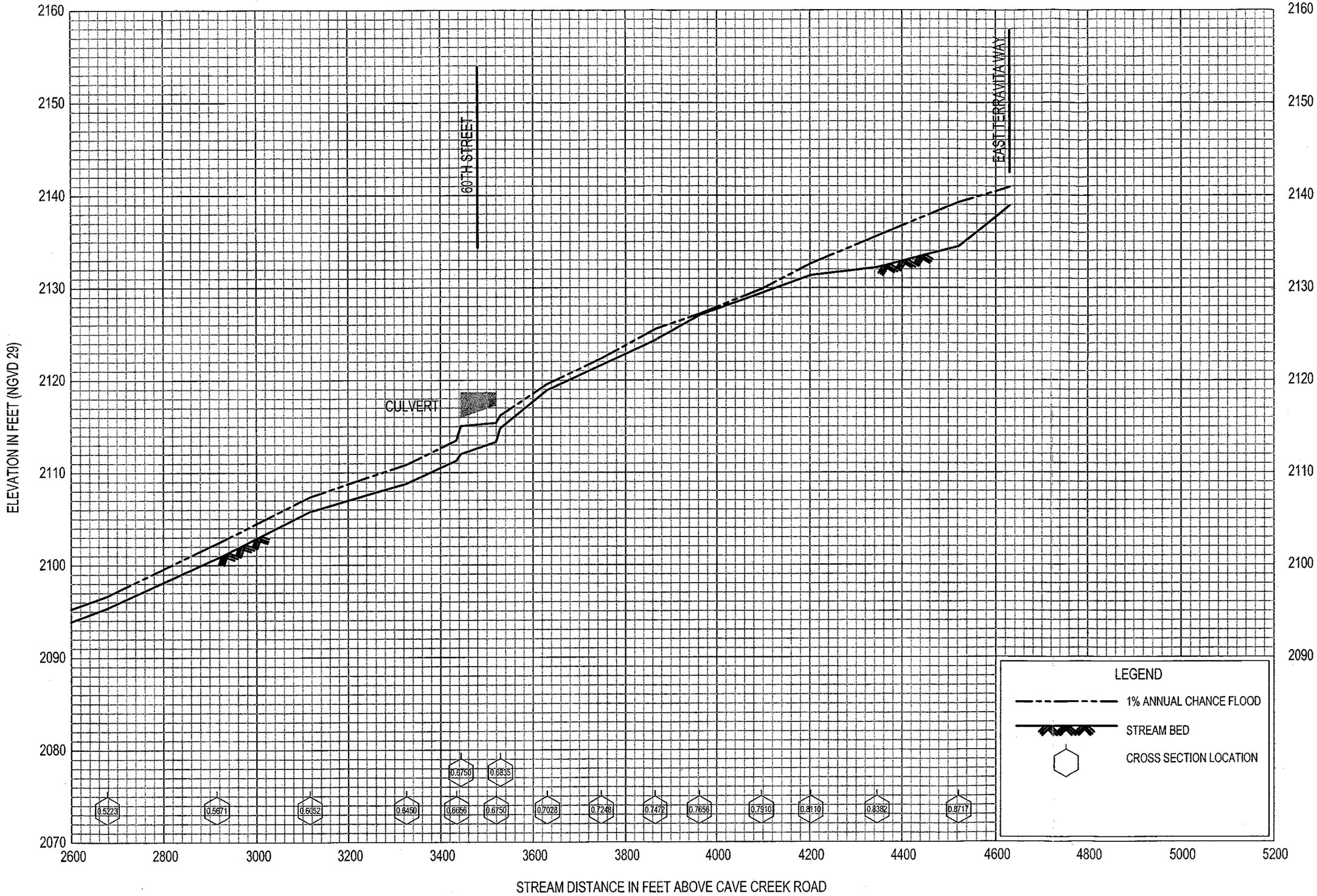
UNNAMED CENTRAL TRIBUTARY TO CAVE CREEK - SOUTH BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF CAREFREE, AZ

MARICOPA COUNTY

A03U



FLOOD PROFILES

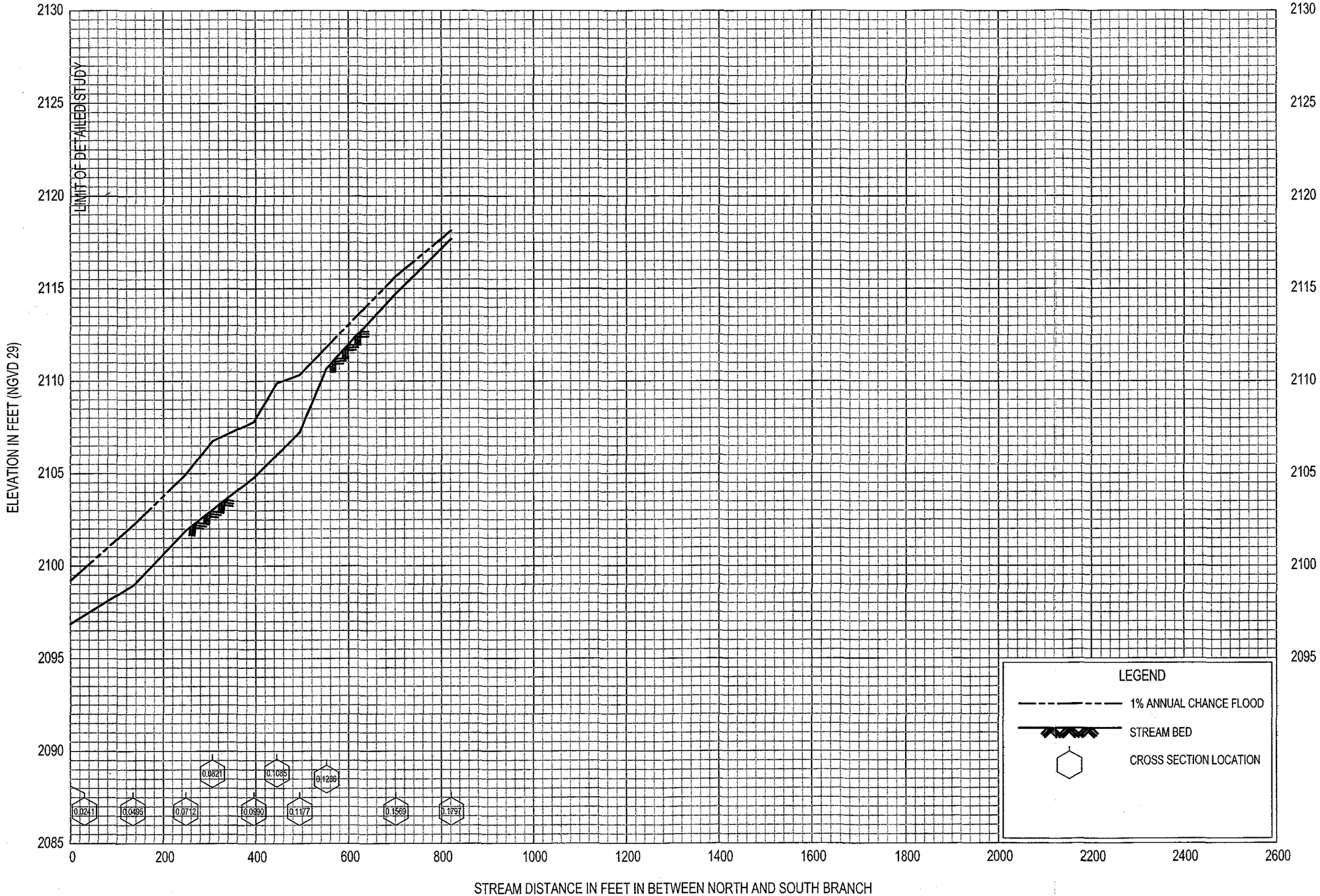
UNNAMED CENTRAL TRIBUTARY TO CAVE CREEK - SOUTH BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF CAREFREE, AZ

MARICOPA COUNTY

A04U



FLOOD PROFILES

UNNAMED CENTRAL TRIBUTARY TO CAVE CREEK - DIVERSION BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF CAREFREE, AZ

MARICOPA COUNTY

A05U

Unnamed Central Tributary to Cave Creek			
From R.S. to R.S.	**Discharge**	**Flow Equation**	**Source**
North Branch			
0.8848	2092	=CP84	CH2M HILL, Carefree DMP, Data Collection Report, 03/04
0.8582 to 0.8062	2092	=CP84	CH2M HILL, Carefree DMP, Data Collection Report, 03/04
0.7698 to 0.7352	2168	Add 35% of (CP7879-CP84)	CH2M HILL, Carefree DMP, Data Collection Report, 03/04
0.7098 to 0.653	1775	Add 9% of (CP7879 - CP84) - 494 cfs diversion	CH2M HILL, Carefree DMP, Data Collection Report, 03/04
0.6303 to 0.4575	1810	Add 16% of (CP7879-CP84)	CH2M HILL, Carefree DMP, Data Collection Report, 03/04
0.4484 to 0.3036	1853	Add 20% of (CP7879-CP84)	CH2M HILL, Carefree DMP, Data Collection Report, 03/04
0.2756 to 0.2185	2271	=Diversion Returns, CP7879 - 57 cfs	CH2M HILL, Carefree DMP, Data Collection Report, 03/04
0.1625 to 0.0866	2360	=CP77 - 57 cfs	CH2M HILL, Carefree DMP, Data Collection Report, 03/04
0.0663 to 0.039	2443	=CP89 - 57 cfs	CH2M HILL, Carefree DMP, Data Collection Report, 03/04
0.0146	2462	=Flow at Culvert 6	CH2M HILL, Carefree DMP, Data Collection Report, 03/04
South Branch			
0.8919 to 0.7028	562	= Flow Split at Terravita Way	CH2M HILL, Carefree DMP, Data Collection Report, 03/04
0.6835	233	Diversion, refer to memo "Flow Split at Scottsdale Health Center"	CH2M HILL, Carefree DMP, Data Collection Report, 03/04
0.4631 to 0.0151	562	= Flow Split at Terravita Way	CH2M HILL, Carefree DMP, Data Collection Report, 03/04

C:\Carefree\Updated\

Letter of Transmittal

AZTEC ENGINEERING

To: Mr. Robert Lyons
CH2MHILL
2625 S. Plaza Dr. Ste 300
Tempe, Arizona, 85285

From: Al Reece

Date/Time: April 11, 2003
Subject: Survey Report
Project: Carefree Drainage Elevations
Project Number: AZ01056.00002.01.001

Method of Delivery: U.S. Mail x Courier To Be Picked Up Hand Carry

We Are Sending You: x Attached ____ Under Separate Cover

____ Shop Drawings ____ Prints ____ Plans ____ Specifications ____ Submittal
____ Change Order ____ Reports ____ Letter ____ Review Comments ____ Other (CD)

Quantity	Doc Date	Doc No.	Description
1			Stamped Survey Report

The above transmitted as follows:

____ For approval ____ Approved as submitted ____ Resubmit ___ copies for approval
____ For your use ____ Approved as noted ____ Submit ___ copies for distribution
____ As requested ____ Returned for corrections ____ Return for ___ corrected prints
____ Other ____ For review and comment ____ Please sign and return one copy

Remarks:

c:

File Name and Path: F:\Az01056\Corr\041702t1adr.doc

3747 East Grove Street • Phoenix, Arizona 85040 • 602/454-0402 • FAX 602/454-0403

rev 2/00

Engineers • Planners • Surveyors • Program Managers • Construction Administrators • Utility Locators • Consultants • Engineers • Planners • Surveyors • Program Managers • Construction Administrators • Utility Locators • Consultants

AZTEC
www.aztec.us
Since 1992

MARICOPA COUNTY FLOOD DISTRICT
CAREFREE FINISH FLOOR ELEVATIONS

Address	FF Elev.
35191 N. Saphora Drive	2062.30
5932 E. Lysiloma Place	2092.69
5927 E. Lysiloma Place	2097.75
5951 E. Lysiloma Place	2102.20
5952 E. Agave Place	2105.78
5976 E. Agave Place	2108.58
5973 E. Agave Place	2111.79
5925 E. Agave Place	2105.51
5901 E. Agave Place	2102.55
34619 Los Reales Drive	2123.03
34659 Los Reales Drive	2127.24
6031 Agave Circle	2115.72
6034 Agave Circle	2115.72
6035 E. Languid Lane	2110.48

The above listed finish floor elevations are NGVD29 datum. I, Alan D. Reece, do hereby certify that the data shown meets the accuracy of 3rd Order leveling per FEMA Manual 37, and is correct and accurate to the best of my knowledge and belief.

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
25396
ALAN D.
REECE
Date Signed 4/11/03
ARIZONA, U.S.A.

Alan D. Reece

Administrators • Utility Locators • Consultants • Engineers • Planners • Surveyors • Program Managers • Construction Administrators • Utility Locators • Consultants • Engineers • Planners • Surveyors • Program Managers • Construction

AZTEC
www.aztec.us

3747 E. Grove St
Phoenix, Arizona 85040
[602] 454-0402
[602] 454-0403 Fax

Letter Of Transmittal

To:	Tony Bokich CH2M HILL 2625 South Plaza Drive, Suite300 Tempe, AZ, 85282-3375	Date/Time: Subject: Project:	June 16, 2003 Elevation Certificates Carefree Master Drainage Plan
From:	Al Reece	Project Number:	Aztec Job No. az01056

Method of Delivery: U.S. Mail x Courier To Be Picked Up Hand Carry

We Are Sending You: x Attached ____ Under Separate Cover

____ Shop Drawings ____ Prints ____ Plans ____ Specifications ____ Submittal

____ Change Order ____ Reports ____ Letter ____ Review Comments ____ Other (CD)

Quantity	Doc Date	Doc No.	Description
14	6/13/03		Revised Elevation Certificates

The above transmitted as follows:

____ For approval ____ Approved as submitted ____ Resubmit ___ copies for approval

____ For your use ____ Approved as noted ____ Submit ___ copies for distribution

x As requested ____ Returned for corrections ____ Return for ___ corrected prints

____ Other ____ For review and comment ____ Please sign and return one copy

Remarks:

c:

File Name and Path: G:\Projects\az01056\Corr\061603tladr.doc

FEDERAL EMERGENCY MANAGEMENT AGENCY
NATIONAL FLOOD INSURANCE PROGRAM

O.M.B. No. 3067-0077
Expires December 31, 2005

ELEVATION CERTIFICATE

Important: Read the instructions on pages 1 - 7.

SECTION A - PROPERTY OWNER INFORMATION

For Insurance Company Use:
Policy Number
Company NAIC Number

BUILDING OWNER'S NAME
Thomas R & Pamela A Sitton

BUILDING STREET ADDRESS (Including Apt., Unit, Suite, and/or Bldg. No.) OR P.O. ROUTE AND BOX NO.
5973 E Agave Pl

CITY	STATE	ZIP CODE
Carefree	**AZ**	**85331**

PROPERTY DESCRIPTION (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.)
Lot 4, Carefree Mountain Estates Unit One 211-28-237

BUILDING USE (e.g., Residential, Non-residential, Addition, Accessory, etc. Use a Comments area, if necessary.)
Residential

LATITUDE/LONGITUDE (OPTIONAL) (##° - ##' - ##.##" or ##.#####°)
33°47'59.20" N 111°57'08.43" W

HORIZONTAL DATUM: ☐ NAD 1927 X NAD 1983

SOURCE: X GPS (Type): **RTK** ☐ USGS Quad Map ☐ Other: ____

SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

B1. NFIP COMMUNITY NAME & COMMUNITY NUMBER	B2. COUNTY NAME	B3. STATE
Carefree, Town of 040126	**Maricopa**	**AZ**

B4. MAP AND PANEL NUMBER	B5. SUFFIX	B6. FIRM INDEX DATE	B7. FIRM PANEL EFFECTIVE/REVISED DATE	B8. FLOOD ZONE(S)	B9. BASE FLOOD ELEVATION(S) (Zone AO, use depth of flooding)
04013C0815	**H**	**April 15, 1998**	**July 19, 2001**	X	2111.89

B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in B9.
☐ FIS Profile ☐ FIRM ☒ Community Determined ☐ Other (Describe): ____

B11. Indicate the elevation datum used for the BFE in B9: X NGVD 1929 ☐ NAVD 1988 ☐ Other (Describe): ____

B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? ☐ Yes X No Designation Date____

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

C1. Building elevations are based on: ☐ Construction Drawings* ☐ Building Under Construction* X Finished Construction

*A new Elevation Certificate will be required when construction of the building is complete.

C2. Building Diagram Number 7 (Select the building diagram most similar to the building for which this certificate is being completed - see pages 6 and 7. If no diagram accurately represents the building, provide a sketch or photograph.)

C3. Elevations – Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO

Complete Items C3.-a-i below according to the building diagram specified in Item C2. State the datum used. If the datum is different from the datum used for the BFE in Section B, convert the datum to that used for the BFE. Show field measurements and datum conversion calculation. Use the space provided or the Comments area of Section D or Section G, as appropriate, to document the datum conversion.

Datum **NGVD 29** Conversion/Comments ____

Elevation reference mark used **RM 120** Does the elevation reference mark used appear on the FIRM? X Yes ☐ No

X a) Top of bottom floor (including basement or enclosure)	**2111.79 ft.**
☐ b) Top of next higher floor	____.__ft.(m)
☐ c) Bottom of lowest horizontal structural member (V zones only)	____.__ft.(m)
☐ d) Attached garage (top of slab)	____.__ft.(m)
☐ e) Lowest elevation of machinery and/or equipment servicing the building (Describe in a Comments area)	____.__ft.(m)
X f) Lowest adjacent (finished) grade (LAG)	**2110.71 ft.**
X g) Highest adjacent (finished) grade (HAG)	**2111.18 ft.**

☐ h) No. of permanent openings (flood vents) within 1 ft. above adjacent grade ____

☐ i) Total area of all permanent openings (flood vents) in C3.h ____sq. in. (sq. cm)

License Number, Embossed Seal, Signature, and Date

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
25396
ALAN D.
REECE
Date Signed 6/13/03
ARIZONA, U.S.A.

Alan D. Reece

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

This certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by law to certify elevation information.
I certify that the information in Sections A, B, and C on this certificate represents my best efforts to interpret the data available.
I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.

CERTIFIER'S NAME **Alan D. Reece** LICENSE NUMBER **RLS 25396**

TITLE **Associate Vice President** COMPANY NAME **AZTEC**

ADDRESS	CITY	STATE	ZIP CODE
3747 East Grove Street	**Phoenix**	**AZ**	**85040**

SIGNATURE	DATE	TELEPHONE
	6/12/2003	**602-454-0402**

IMPORTANT: In these spaces, copy the corresponding information from Section A.			For Insurance Company Use:
BUILDING STREET ADDRESS (Including Apt., Unit, Suite, and/or Bldg. No.) OR P.O. ROUTE AND BOX NO.			Policy Number
CITY	STATE	ZIP CODE	Company NAIC Number

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION (CONTINUED)

Copy both sides of this Elevation Certificate for (1) community official, (2) insurance agent/company, and (3) building owner.

COMMENTS

☐ Check here if attachments

SECTION E - BUILDING ELEVATION INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO AND ZONE A (WITHOUT BFE)

For Zone AO and Zone A (without BFE), complete Items E1 through E4. If the Elevation Certificate is intended for use as supporting information for a LOMA or LOMR-F, Section C must be completed.

E1. Building Diagram Number _(Select the building diagram most similar to the building for which this certificate is being completed – see pages 6 and 7. If no diagram accurately represents the building, provide a sketch or photograph.)

E2. The top of the bottom floor (including basement or enclosure) of the building is __ft.(m) __in.(cm) ☐ above or ☐ below (check one) the highest adjacent grade. (Use natural grade, if available).

E3. For Building Diagrams 6-8 with openings (see page 7), the next higher floor or elevated floor (elevation b) of the building is __ft.(m) __in.(cm) above the highest adjacent grade. Complete items C3.h and C3.i on front of form.

E4. The top of the platform of machinery and/or equipment servicing the building is __ft.(m) __in.(cm) ☐ above or ☐ below (check one) the highest adjacent grade. (Use natural grade, if available).

E5. For Zone AO only: If no flood depth number is available, is the top of the bottom floor elevated in accordance with the community's floodplain management ordinance?
☐ Yes ☐ No ☐ Unknown. The local official must certify this information in Section G.

SECTION F - PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION

The property owner or owner's authorized representative who completes Sections A, B, C (Items C3.h and C3.i only), and E for Zone A (without a FEMA-issued or community-issued BFE) or Zone AO must sign here. *The statements in Sections A, B, C, and E are correct to the best of my knowledge.*

PROPERTY OWNER'S OR OWNER'S AUTHORIZED REPRESENTATIVE'S NAME

ADDRESS	CITY	STATE	ZIP CODE
SIGNATURE	DATE	TELEPHONE	

COMMENTS

☐ Check here if attachments

SECTION G - COMMUNITY INFORMATION (OPTIONAL)

The local official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Complete the applicable item(s) and sign below.

G1. ☐ The information in Section C was taken from other documentation that has been signed and embossed by a licensed surveyor, engineer, or architect who is authorized by state or local law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)

G2. ☐ A community official completed Section E for a building located in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.

G3. ☐ The following information (Items G4-G9) is provided for community floodplain management purposes.

G4. PERMIT NUMBER	G5. DATE PERMIT ISSUED	G6. DATE CERTIFICATE OF COMPLIANCE/OCCUPANCY ISSUED

G7. This permit has been issued for: ☐ New Construction ☐ Substantial Improvement

G8. Elevation of as-built lowest floor (including basement) of the building is: ____.__ft.(m) Datum: _____

G9. BFE or (in Zone AO) depth of flooding at the building site is: ____.__ft.(m) Datum: _____

LOCAL OFFICIAL'S NAME	TITLE
COMMUNITY NAME	TELEPHONE
SIGNATURE	DATE

COMMENTS

☐ Check here if attachments

FEDERAL EMERGENCY MANAGEMENT AGENCY
NATIONAL FLOOD INSURANCE PROGRAM

O.M.B. No. 3067-0077
Expires December 31, 2005

ELEVATION CERTIFICATE

Important: Read the instructions on pages 1 - 7.

SECTION A - PROPERTY OWNER INFORMATION

For Insurance Company Use:
Policy Number
Company NAIC Number

BUILDING OWNER'S NAME
William D & Carol F McDonald

BUILDING STREET ADDRESS (Including Apt., Unit, Suite, and/or Bldg. No.) OR P.O. ROUTE AND BOX NO.
5952 E Agave Pl

CITY	STATE	ZIP CODE
Carefree	**AZ**	**85331**

PROPERTY DESCRIPTION (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.)
Lot 6, Carefree Mountain Estates Unit One 211-28-239

BUILDING USE (e.g., Residential, Non-residential, Addition, Accessory, etc. Use a Comments area, if necessary.)
Residential

LATITUDE/LONGITUDE (OPTIONAL) (##° - ##' - ##.##" or ##.#####°)
33°48'02.85" N 111°57'10.36" W

HORIZONTAL DATUM: ☐ NAD 1927 X NAD 1983

SOURCE: X GPS (Type): **RTK** ☐ USGS Quad Map ☐ Other: ____

SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

B1. NFIP COMMUNITY NAME & COMMUNITY NUMBER	B2. COUNTY NAME	B3. STATE
Carefree, Town of 040126	**Maricopa**	**AZ**

B4. MAP AND PANEL NUMBER	B5. SUFFIX	B6. FIRM INDEX DATE	B7. FIRM PANEL EFFECTIVE/REVISED DATE	B8. FLOOD ZONE(S)	B9. BASE FLOOD ELEVATION(S) (Zone AO, use depth of flooding)
04013C0815	**H**	**April 15, 1998**	**July 19, 2001**	X	2106.77

B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in B9.
☐ FIS Profile ☐ FIRM ☒ Community Determined ☐ Other (Describe): ____

B11. Indicate the elevation datum used for the BFE in B9: X NGVD 1929 ☐ NAVD 1988 ☐ Other (Describe): ____

B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? ☐ Yes X No Designation Date ____

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

C1. Building elevations are based on: ☐ Construction Drawings* ☐ Building Under Construction* X Finished Construction
*A new Elevation Certificate will be required when construction of the building is complete.

C2. Building Diagram Number 7 (Select the building diagram most similar to the building for which this certificate is being completed - see pages 6 and 7. If no diagram accurately represents the building, provide a sketch or photograph.)

C3. Elevations – Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO
Complete Items C3.-a-i below according to the building diagram specified in Item C2. State the datum used. If the datum is different from the datum used for the BFE in Section B, convert the datum to that used for the BFE. Show field measurements and datum conversion calculation. Use the space provided or the Comments area of Section D or Section G, as appropriate, to document the datum conversion.

Datum **NGVD 29** Conversion/Comments ____

Elevation reference mark used **RM 120** Does the elevation reference mark used appear on the FIRM? X Yes ☐ No

X a) Top of bottom floor (including basement or enclosure)	**2105.78 ft.**
☐ b) Top of next higher floor	____.__ft.(m)
☐ c) Bottom of lowest horizontal structural member (V zones only)	____.__ft.(m)
☐ d) Attached garage (top of slab)	____.__ft.(m)
☐ e) Lowest elevation of machinery and/or equipment servicing the building (Describe in a Comments area)	____.__ft.(m)
X f) Lowest adjacent (finished) grade (LAG)	**2104.50 ft.**
X g) Highest adjacent (finished) grade (HAG)	**2105.66 ft.**
☐ h) No. of permanent openings (flood vents) within 1 ft. above adjacent grade ____	
☐ i) Total area of all permanent openings (flood vents) in C3.h ____sq. in. (sq. cm)	

License Number, Embossed Seal, Signature, and Date

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
25396
ALAN D.
REECE
Date Signed 6/13/03
ARIZONA, U.S.A.

Alan D. Reece

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

This certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by law to certify elevation information.
I certify that the information in Sections A, B, and C on this certificate represents my best efforts to interpret the data available.
I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.

CERTIFIER'S NAME **Alan D. Reece** LICENSE NUMBER **RLS 25396**

TITLE **Associate Vice President** COMPANY NAME **AZTEC**

ADDRESS	CITY	STATE	ZIP CODE
3747 East Grove Street	**Phoenix**	**AZ**	**85040**

SIGNATURE	DATE	TELEPHONE
	6/12/2003	**602-454-0402**

IMPORTANT: In these spaces, copy the corresponding information from Section A.			For Insurance Company Use:
BUILDING STREET ADDRESS (Including Apt., Unit, Suite, and/or Bldg. No.) OR P.O. ROUTE AND BOX NO.			Policy Number
CITY	STATE	ZIP CODE	Company NAIC Number

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION (CONTINUED)

Copy both sides of this Elevation Certificate for (1) community official, (2) insurance agent/company, and (3) building owner.

COMMENTS

☐ Check here if attachments

SECTION E - BUILDING ELEVATION INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO AND ZONE A (WITHOUT BFE)

For Zone AO and Zone A (without BFE), complete Items E1 through E4. If the Elevation Certificate is intended for use as supporting information for a LOMA or LOMR-F, Section C must be completed.

E1. Building Diagram Number _(Select the building diagram most similar to the building for which this certificate is being completed – see pages 6 and 7. If no diagram accurately represents the building, provide a sketch or photograph.)

E2. The top of the bottom floor (including basement or enclosure) of the building is __ ft.(m) __in.(cm) ☐ above or ☐ below (check one) the highest adjacent grade. (Use natural grade, if available).

E3. For Building Diagrams 6-8 with openings (see page 7), the next higher floor or elevated floor (elevation b) of the building is __ ft.(m) __in.(cm) above the highest adjacent grade. Complete items C3.h and C3.i on front of form.

E4. The top of the platform of machinery and/or equipment servicing the building is __ ft.(m) __in.(cm) ☐ above or ☐ below (check one) the highest adjacent grade. (Use natural grade, if available).

E5. For Zone AO only: If no flood depth number is available, is the top of the bottom floor elevated in accordance with the community's floodplain management ordinance?
☐ Yes ☐ No ☐ Unknown. The local official must certify this information in Section G.

SECTION F - PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION

The property owner or owner's authorized representative who completes Sections A, B, C (Items C3.h and C3.i only), and E for Zone A (without a FEMA-issued or community-issued BFE) or Zone AO must sign here. *The statements in Sections A, B, C, and E are correct to the best of my knowledge.*

PROPERTY OWNER'S OR OWNER'S AUTHORIZED REPRESENTATIVE'S NAME

ADDRESS | CITY | STATE | ZIP CODE

SIGNATURE | DATE | TELEPHONE

COMMENTS

☐ Check here if attachments

SECTION G - COMMUNITY INFORMATION (OPTIONAL)

The local official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Complete the applicable item(s) and sign below.

G1. ☐ The information in Section C was taken from other documentation that has been signed and embossed by a licensed surveyor, engineer, or architect who is authorized by state or local law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)

G2. ☐ A community official completed Section E for a building located in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.

G3. ☐ The following information (Items G4-G9) is provided for community floodplain management purposes.

G4. PERMIT NUMBER	G5. DATE PERMIT ISSUED	G6. DATE CERTIFICATE OF COMPLIANCE/OCCUPANCY ISSUED

G7. This permit has been issued for: ☐ New Construction ☐ Substantial Improvement

G8. Elevation of as-built lowest floor (including basement) of the building is: ____.__ft.(m) Datum: ____

G9. BFE or (in Zone AO) depth of flooding at the building site is: ____.__ft.(m) Datum: ____

LOCAL OFFICIAL'S NAME | TITLE

COMMUNITY NAME | TELEPHONE

SIGNATURE | DATE

COMMENTS

☐ Check here if attachments

FEDERAL EMERGENCY MANAGEMENT AGENCY
NATIONAL FLOOD INSURANCE PROGRAM

O.M.B. No. 3067-0077
Expires December 31, 2005

ELEVATION CERTIFICATE

Important: Read the instructions on pages 1 - 7.

SECTION A - PROPERTY OWNER INFORMATION

For Insurance Company Use:
Policy Number
Company NAIC Number

BUILDING OWNER'S NAME
Todd D. & Dorothy C. Behrens

BUILDING STREET ADDRESS (Including Apt., Unit, Suite, and/or Bldg. No.) OR P.O. ROUTE AND BOX NO.
5951 E Lysiloma Pl

CITY	STATE	ZIP CODE
Carefree	**AZ**	**85331**

PROPERTY DESCRIPTION (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.)
Lot 11, Carefree Mountain Estates Unit One 211-28-244

BUILDING USE (e.g., Residential, Non-residential, Addition, Accessory, etc. Use a Comments area, if necessary.)
Residential

LATITUDE/LONGITUDE (OPTIONAL) (##° - ##' - ##.##" or ##.#####°)
33°48'04.52" N 111°57'10.96" W

HORIZONTAL DATUM: ☐ NAD 1927 X NAD 1983

SOURCE: X GPS (Type): **RTK** ☐ USGS Quad Map ☐ Other: ____

SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

B1. NFIP COMMUNITY NAME & COMMUNITY NUMBER	B2. COUNTY NAME	B3. STATE
Carefree, Town of 040126	**Maricopa**	**AZ**

B4. MAP AND PANEL NUMBER	B5. SUFFIX	B6. FIRM INDEX DATE	B7. FIRM PANEL EFFECTIVE/REVISED DATE	B8. FLOOD ZONE(S)	B9. BASE FLOOD ELEVATION(S) (Zone AO, use depth of flooding)
04013C0815	**H**	**April 15, 1998**	**July 19, 2001**	X	2103.31

B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in B9.
☐ FIS Profile ☐ FIRM ☒ Community Determined ☐ Other (Describe): ____

B11. Indicate the elevation datum used for the BFE in B9: X NGVD 1929 ☐ NAVD 1988 ☐ Other (Describe): ____

B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? ☐ Yes X No Designation Date____

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

C1. Building elevations are based on: ☐ Construction Drawings* ☐ Building Under Construction* X Finished Construction
*A new Elevation Certificate will be required when construction of the building is complete.

C2. Building Diagram Number 7 (Select the building diagram most similar to the building for which this certificate is being completed - see pages 6 and 7. If no diagram accurately represents the building, provide a sketch or photograph.)

C3. Elevations – Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO
Complete Items C3.-a-i below according to the building diagram specified in Item C2. State the datum used. If the datum is different from the datum used for the BFE in Section B, convert the datum to that used for the BFE. Show field measurements and datum conversion calculation. Use the space provided or the Comments area of Section D or Section G, as appropriate, to document the datum conversion.

Datum **NGVD 29** Conversion/Comments ____

Elevation reference mark used **RM 120** Does the elevation reference mark used appear on the FIRM? X Yes ☐ No

X a) Top of bottom floor (including basement or enclosure)	**2102.20 ft.**
☐ b) Top of next higher floor	____.__ft.(m)
☐ c) Bottom of lowest horizontal structural member (V zones only)	____.__ft.(m)
☐ d) Attached garage (top of slab)	____.__ft.(m)
☐ e) Lowest elevation of machinery and/or equipment servicing the building (Describe in a Comments area)	____.__ft.(m)
X f) Lowest adjacent (finished) grade (LAG)	**2099.73 ft.**
X g) Highest adjacent (finished) grade (HAG)	**2103.98 ft.**
☐ h) No. of permanent openings (flood vents) within 1 ft. above adjacent grade ____	
☐ i) Total area of all permanent openings (flood vents) in C3.h ____sq. in. (sq. cm)	

License Number, Embossed Seal, Signature, and Date

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
25396
ALAN D.
REECE
Date Signed 6/13/03
ARIZONA, U.S.A.

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

This certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by law to certify elevation information.
I certify that the information in Sections A, B, and C on this certificate represents my best efforts to interpret the data available.
I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.

CERTIFIER'S NAME **Alan D. Reece** LICENSE NUMBER **RLS 25396**

TITLE **Associate Vice President** COMPANY NAME **AZTEC**

ADDRESS	CITY	STATE	ZIP CODE
3747 East Grove Street	**Phoenix**	**AZ**	**85040**

SIGNATURE	DATE	TELEPHONE
	6/12/2003	**602-454-0402**

IMPORTANT: In these spaces, copy the corresponding information from Section A.			For Insurance Company Use:
BUILDING STREET ADDRESS (Including Apt., Unit, Suite, and/or Bldg. No.) OR P.O. ROUTE AND BOX NO.			Policy Number
CITY	STATE	ZIP CODE	Company NAIC Number

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION (CONTINUED)

Copy both sides of this Elevation Certificate for (1) community official, (2) insurance agent/company, and (3) building owner.

COMMENTS

☐ Check here if attachments

SECTION E - BUILDING ELEVATION INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO AND ZONE A (WITHOUT BFE)

For Zone AO and Zone A (without BFE), complete Items E1 through E4. If the Elevation Certificate is intended for use as supporting information for a LOMA or LOMR-F, Section C must be completed.

E1. Building Diagram Number _(Select the building diagram most similar to the building for which this certificate is being completed – see pages 6 and 7. If no diagram accurately represents the building, provide a sketch or photograph.)

E2. The top of the bottom floor (including basement or enclosure) of the building is __ ft.(m) __in.(cm) ☐ above or ☐ below (check one) the highest adjacent grade. (Use natural grade, if available).

E3. For Building Diagrams 6-8 with openings (see page 7), the next higher floor or elevated floor (elevation b) of the building is __ ft.(m) __in.(cm) above the highest adjacent grade. Complete items C3.h and C3.i on front of form.

E4. The top of the platform of machinery and/or equipment servicing the building is __ ft.(m) __in.(cm) ☐ above or ☐ below (check one) the highest adjacent grade. (Use natural grade, if available).

E5. For Zone AO only: If no flood depth number is available, is the top of the bottom floor elevated in accordance with the community's floodplain management ordinance?
☐ Yes ☐ No ☐ Unknown. The local official must certify this information in Section G.

SECTION F - PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION

The property owner or owner's authorized representative who completes Sections A, B, C (Items C3.h and C3.i only), and E for Zone A (without a FEMA-issued or community-issued BFE) or Zone AO must sign here. *The statements in Sections A, B, C, and E are correct to the best of my knowledge.*

PROPERTY OWNER'S OR OWNER'S AUTHORIZED REPRESENTATIVE'S NAME

ADDRESS | CITY | STATE | ZIP CODE

SIGNATURE | DATE | TELEPHONE

COMMENTS

☐ Check here if attachments

SECTION G - COMMUNITY INFORMATION (OPTIONAL)

The local official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Complete the applicable item(s) and sign below.

G1. ☐ The information in Section C was taken from other documentation that has been signed and embossed by a licensed surveyor, engineer, or architect who is authorized by state or local law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)

G2. ☐ A community official completed Section E for a building located in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.

G3. ☐ The following information (Items G4-G9) is provided for community floodplain management purposes.

G4. PERMIT NUMBER	G5. DATE PERMIT ISSUED	G6. DATE CERTIFICATE OF COMPLIANCE/OCCUPANCY ISSUED

G7. This permit has been issued for: ☐ New Construction ☐ Substantial Improvement

G8. Elevation of as-built lowest floor (including basement) of the building is: ____.__ft.(m) Datum: ____

G9. BFE or (in Zone AO) depth of flooding at the building site is: ____.__ft.(m) Datum: ____

LOCAL OFFICIAL'S NAME | TITLE

COMMUNITY NAME | TELEPHONE

SIGNATURE | DATE

COMMENTS

☐ Check here if attachments

FEDERAL EMERGENCY MANAGEMENT AGENCY
NATIONAL FLOOD INSURANCE PROGRAM

O.M.B. No. 3067-0077
Expires December 31, 2005

ELEVATION CERTIFICATE

Important: Read the instructions on pages 1 - 7.

SECTION A - PROPERTY OWNER INFORMATION

For Insurance Company Use:
Policy Number
Company NAIC Number

BUILDING OWNER'S NAME
Susan V & Patricia J Weber

BUILDING STREET ADDRESS (Including Apt., Unit, Suite, and/or Bldg. No.) OR P.O. ROUTE AND BOX NO.
5932 E Lysiloma Pl

CITY	STATE	ZIP CODE
Carefree	**AZ**	**85331**

PROPERTY DESCRIPTION (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.)
Lot 15, Carefree Mountain Estates Unit One 211-28-248

BUILDING USE (e.g., Residential, Non-residential, Addition, Accessory, etc. Use a Comments area, if necessary.)
Residential

LATITUDE/LONGITUDE (OPTIONAL) (##° - ##' - ##.##" or ##.#####°)
33°48'07.38" N 111°57'12.33" W

HORIZONTAL DATUM: ☐ NAD 1927 X NAD 1983

SOURCE: X GPS (Type): **RTK** ☐ USGS Quad Map ☐ Other: ____

SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

B1. NFIP COMMUNITY NAME & COMMUNITY NUMBER	B2. COUNTY NAME	B3. STATE
Carefree, Town of 040126	**Maricopa**	**AZ**

B4. MAP AND PANEL NUMBER	B5. SUFFIX	B6. FIRM INDEX DATE	B7. FIRM PANEL EFFECTIVE/REVISED DATE	B8. FLOOD ZONE(S)	B9. BASE FLOOD ELEVATION(S) (Zone AO, use depth of flooding)
04013C0815	**H**	**April 15, 1998**	**July 19, 2001**	X	2094.09

B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in B9.
☐ FIS Profile ☐ FIRM ☒ Community Determined ☐ Other (Describe): ____

B11. Indicate the elevation datum used for the BFE in B9: X NGVD 1929 ☐ NAVD 1988 ☐ Other (Describe): ____

B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? ☐ Yes X No Designation Date____

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

C1. Building elevations are based on: ☐ Construction Drawings* ☐ Building Under Construction* X Finished Construction
*A new Elevation Certificate will be required when construction of the building is complete.

C2. Building Diagram Number **7** (Select the building diagram most similar to the building for which this certificate is being completed - see pages 6 and 7. If no diagram accurately represents the building, provide a sketch or photograph.)

C3. Elevations – Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO
Complete Items C3.-a-i below according to the building diagram specified in Item C2. State the datum used. If the datum is different from the datum used for the BFE in Section B, convert the datum to that used for the BFE. Show field measurements and datum conversion calculation. Use the space provided or the Comments area of Section D or Section G, as appropriate, to document the datum conversion.

Datum **NGVD 29** Conversion/Comments ____

Elevation reference mark used **RM 120** Does the elevation reference mark used appear on the FIRM? X Yes ☐ No

X a) Top of bottom floor (including basement or enclosure)	**2092.69 ft.**
☐ b) Top of next higher floor	____.__ft.(m)
☐ c) Bottom of lowest horizontal structural member (V zones only)	____.__ft.(m)
☐ d) Attached garage (top of slab)	____.__ft.(m)
☐ e) Lowest elevation of machinery and/or equipment servicing the building (Describe in a Comments area)	____.__ft.(m)
X f) Lowest adjacent (finished) grade (LAG)	**2089.51 ft.**
X g) Highest adjacent (finished) grade (HAG)	**2092.49 ft.**
☐ h) No. of permanent openings (flood vents) within 1 ft. above adjacent grade ____	
☐ i) Total area of all permanent openings (flood vents) in C3.h ____sq. in. (sq. cm)	

License Number, Embossed Seal, Signature, and Date

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
25396
ALAN D.
REECE
Date Signed 6/13/03
ARIZONA, U.S.A.

Alan D Reece

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

This certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by law to certify elevation information.
I certify that the information in Sections A, B, and C on this certificate represents my best efforts to interpret the data available.
I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.

CERTIFIER'S NAME **Alan D. Reece** LICENSE NUMBER **RLS 25396**

TITLE **Associate Vice President** COMPANY NAME **AZTEC**

ADDRESS	CITY	STATE	ZIP CODE
3747 East Grove Street	**Phoenix**	**AZ**	**85040**

SIGNATURE	DATE	TELEPHONE
	6/12/2003	**602-454-0402**

IMPORTANT: In these spaces, copy the corresponding information from Section A.	For Insurance Company Use:
BUILDING STREET ADDRESS (Including Apt., Unit, Suite, and/or Bldg. No.) OR P.O. ROUTE AND BOX NO.	Policy Number
CITY STATE ZIP CODE	Company NAIC Number

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION (CONTINUED)

Copy both sides of this Elevation Certificate for (1) community official, (2) insurance agent/company, and (3) building owner.

COMMENTS

☐ Check here if attachments

SECTION E - BUILDING ELEVATION INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO AND ZONE A (WITHOUT BFE)

For Zone AO and Zone A (without BFE), complete Items E1 through E4. If the Elevation Certificate is intended for use as supporting information for a LOMA or LOMR-F, Section C must be completed.

E1. Building Diagram Number _(Select the building diagram most similar to the building for which this certificate is being completed – see pages 6 and 7. If no diagram accurately represents the building, provide a sketch or photograph.)

E2. The top of the bottom floor (including basement or enclosure) of the building is __ ft.(m) __in.(cm) ☐ above or ☐ below (check one) the highest adjacent grade. (Use natural grade, if available).

E3. For Building Diagrams 6-8 with openings (see page 7), the next higher floor or elevated floor (elevation b) of the building is __ ft.(m) __in.(cm) above the highest adjacent grade. Complete items C3.h and C3.i on front of form.

E4. The top of the platform of machinery and/or equipment servicing the building is __ ft.(m) __in.(cm) ☐ above or ☐ below (check one) the highest adjacent grade. (Use natural grade, if available).

E5. For Zone AO only: If no flood depth number is available, is the top of the bottom floor elevated in accordance with the community's floodplain management ordinance?
☐ Yes ☐ No ☐ Unknown. The local official must certify this information in Section G.

SECTION F - PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION

The property owner or owner's authorized representative who completes Sections A, B, C (Items C3.h and C3.i only), and E for Zone A (without a FEMA-issued or community-issued BFE) or Zone AO must sign here. *The statements in Sections A, B, C, and E are correct to the best of my knowledge.*

PROPERTY OWNER'S OR OWNER'S AUTHORIZED REPRESENTATIVE'S NAME

ADDRESS CITY STATE ZIP CODE

SIGNATURE DATE TELEPHONE

COMMENTS

☐ Check here if attachments

SECTION G - COMMUNITY INFORMATION (OPTIONAL)

The local official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Complete the applicable item(s) and sign below.

G1. ☐ The information in Section C was taken from other documentation that has been signed and embossed by a licensed surveyor, engineer, or architect who is authorized by state or local law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)

G2. ☐ A community official completed Section E for a building located in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.

G3. ☐ The following information (Items G4-G9) is provided for community floodplain management purposes.

G4. PERMIT NUMBER	G5. DATE PERMIT ISSUED	G6. DATE CERTIFICATE OF COMPLIANCE/OCCUPANCY ISSUED

G7. This permit has been issued for: ☐ New Construction ☐ Substantial Improvement

G8. Elevation of as-built lowest floor (including basement) of the building is: ____.__ft.(m) Datum: ____

G9. BFE or (in Zone AO) depth of flooding at the building site is: ____.__ft.(m) Datum: ____

LOCAL OFFICIAL'S NAME TITLE

COMMUNITY NAME TELEPHONE

SIGNATURE DATE

COMMENTS

☐ Check here if attachments

FEDERAL EMERGENCY MANAGEMENT AGENCY
NATIONAL FLOOD INSURANCE PROGRAM

O.M.B. No. 3067-0077
Expires December 31, 2005

ELEVATION CERTIFICATE

Important: Read the instructions on pages 1 - 7.

SECTION A - PROPERTY OWNER INFORMATION

For Insurance Company Use:
Policy Number
Company NAIC Number

BUILDING OWNER'S NAME
Russ W & Cindy S Metcalfe

BUILDING STREET ADDRESS (Including Apt., Unit, Suite, and/or Bldg. No.) OR P.O. ROUTE AND BOX NO.
5927 E Lysiloma Pl

CITY **Carefree** STATE **AZ** ZIP CODE **85331**

PROPERTY DESCRIPTION (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.)
Lot 10, Carefree Mountain Estates Unit One 211-28-243

BUILDING USE (e.g., Residential, Non-residential, Addition, Accessory, etc. Use a Comments area, if necessary.)
Residential

LATITUDE/LONGITUDE (OPTIONAL) (##° - ##' - ##.##" or ##.#####°)
33°48'04.41" N 111°57'12.43" W

HORIZONTAL DATUM: ☐ NAD 1927 X NAD 1983

SOURCE: X GPS (Type): **RTK** ☐ USGS Quad Map ☐ Other: ____

SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

B1. NFIP COMMUNITY NAME & COMMUNITY NUMBER	B2. COUNTY NAME	B3. STATE
Carefree, Town of 040126	Maricopa	AZ

B4. MAP AND PANEL NUMBER	B5. SUFFIX	B6. FIRM INDEX DATE	B7. FIRM PANEL EFFECTIVE/REVISED DATE	B8. FLOOD ZONE(S)	B9. BASE FLOOD ELEVATION(S) (Zone AO, use depth of flooding)
04013C0815	H	April 15, 1998	July 19, 2001	X	2099.20

B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in B9.
☐ FIS Profile ☐ FIRM ☒ Community Determined ☐ Other (Describe): ____

B11. Indicate the elevation datum used for the BFE in B9: X NGVD 1929 ☐ NAVD 1988 ☐ Other (Describe): ____

B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? ☐ Yes X No Designation Date ____

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

C1. Building elevations are based on: ☐ Construction Drawings* ☐ Building Under Construction* X Finished Construction
*A new Elevation Certificate will be required when construction of the building is complete.

C2. Building Diagram Number 7 (Select the building diagram most similar to the building for which this certificate is being completed - see pages 6 and 7. If no diagram accurately represents the building, provide a sketch or photograph.)

C3. Elevations – Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO
Complete Items C3.-a-i below according to the building diagram specified in Item C2. State the datum used. If the datum is different from the datum used for the BFE in Section B, convert the datum to that used for the BFE. Show field measurements and datum conversion calculation. Use the space provided or the Comments area of Section D or Section G, as appropriate, to document the datum conversion.

Datum NGVD 29 Conversion/Comments ____

Elevation reference mark used RM 120 Does the elevation reference mark used appear on the FIRM? X Yes ☐ No

X a) Top of bottom floor (including basement or enclosure) 2097.75 ft.
☐ b) Top of next higher floor ____.__ft.(m)
☐ c) Bottom of lowest horizontal structural member (V zones only) ____.__ft.(m)
☐ d) Attached garage (top of slab) ____.__ft.(m)
☐ e) Lowest elevation of machinery and/or equipment servicing the building (Describe in a Comments area) ____.__ft.(m)
X f) Lowest adjacent (finished) grade (LAG) 2095.86 ft.
X g) Highest adjacent (finished) grade (HAG) 2098.14 ft.
☐ h) No. of permanent openings (flood vents) within 1 ft. above adjacent grade ____
☐ i) Total area of all permanent openings (flood vents) in C3.h ____sq. in. (sq. cm)

License Number, Embossed Seal, Signature, and Date

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
25396
ALAN D.
REECE
Date Signed 6/13/03
ARIZONA, U.S.A.

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

This certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by law to certify elevation information.
I certify that the information in Sections A, B, and C on this certificate represents my best efforts to interpret the data available.
I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.

CERTIFIER'S NAME **Alan D. Reece** LICENSE NUMBER **RLS 25396**

TITLE **Associate Vice President** COMPANY NAME **AZTEC**

ADDRESS	CITY	STATE	ZIP CODE
3747 East Grove Street	Phoenix	AZ	85040

SIGNATURE	DATE	TELEPHONE
	6/12/2003	602-454-0402

IMPORTANT: In these spaces, copy the corresponding information from Section A.			For Insurance Company Use:
BUILDING STREET ADDRESS (Including Apt., Unit, Suite, and/or Bldg. No.) OR P.O. ROUTE AND BOX NO.			Policy Number
CITY	STATE	ZIP CODE	Company NAIC Number

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION (CONTINUED)

Copy both sides of this Elevation Certificate for (1) community official, (2) insurance agent/company, and (3) building owner.

COMMENTS

☐ Check here if attachments

SECTION E - BUILDING ELEVATION INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO AND ZONE A (WITHOUT BFE)

For Zone AO and Zone A (without BFE), complete Items E1 through E4. If the Elevation Certificate is intended for use as supporting information for a LOMA or LOMR-F, Section C must be completed.

E1. Building Diagram Number __(Select the building diagram most similar to the building for which this certificate is being completed – see pages 6 and 7. If no diagram accurately represents the building, provide a sketch or photograph.)

E2. The top of the bottom floor (including basement or enclosure) of the building is __ ft.(m) __in.(cm) ☐ above or ☐ below (check one) the highest adjacent grade. (Use natural grade, if available).

E3. For Building Diagrams 6-8 with openings (see page 7), the next higher floor or elevated floor (elevation b) of the building is __ ft.(m) __in.(cm) above the highest adjacent grade. Complete items C3.h and C3.i on front of form.

E4. The top of the platform of machinery and/or equipment servicing the building is __ ft.(m) __in.(cm) ☐ above or ☐ below (check one) the highest adjacent grade. (Use natural grade, if available).

E5. For Zone AO only: If no flood depth number is available, is the top of the bottom floor elevated in accordance with the community's floodplain management ordinance?
☐ Yes ☐ No ☐ Unknown. The local official must certify this information in Section G.

SECTION F - PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION

The property owner or owner's authorized representative who completes Sections A, B, C (Items C3.h and C3.i only), and E for Zone A (without a FEMA-issued or community-issued BFE) or Zone AO must sign here. *The statements in Sections A, B, C, and E are correct to the best of my knowledge.*

PROPERTY OWNER'S OR OWNER'S AUTHORIZED REPRESENTATIVE'S NAME

ADDRESS | CITY | STATE | ZIP CODE

SIGNATURE | DATE | TELEPHONE

COMMENTS

☐ Check here if attachments

SECTION G - COMMUNITY INFORMATION (OPTIONAL)

The local official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Complete the applicable item(s) and sign below.

G1. ☐ The information in Section C was taken from other documentation that has been signed and embossed by a licensed surveyor, engineer, or architect who is authorized by state or local law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)

G2. ☐ A community official completed Section E for a building located in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.

G3. ☐ The following information (Items G4-G9) is provided for community floodplain management purposes.

G4. PERMIT NUMBER	G5. DATE PERMIT ISSUED	G6. DATE CERTIFICATE OF COMPLIANCE/OCCUPANCY ISSUED

G7. This permit has been issued for: ☐ New Construction ☐ Substantial Improvement

G8. Elevation of as-built lowest floor (including basement) of the building is: ____.__ft.(m) Datum: ____

G9. BFE or (in Zone AO) depth of flooding at the building site is: ____.__ft.(m) Datum: ____

LOCAL OFFICIAL'S NAME | TITLE

COMMUNITY NAME | TELEPHONE

SIGNATURE | DATE

COMMENTS

☐ Check here if attachments

FEDERAL EMERGENCY MANAGEMENT AGENCY
NATIONAL FLOOD INSURANCE PROGRAM

O.M.B. No. 3067-0077
Expires December 31, 2005

ELEVATION CERTIFICATE

Important: Read the instructions on pages 1 - 7.

SECTION A - PROPERTY OWNER INFORMATION

For Insurance Company Use:
Policy Number
Company NAIC Number

BUILDING OWNER'S NAME
Lisa A Fallon

BUILDING STREET ADDRESS (Including Apt., Unit, Suite, and/or Bldg. No.) OR P.O. ROUTE AND BOX NO.
5925 E Agave Pl

CITY	STATE	ZIP CODE
Carefree	**AZ**	**85331**

PROPERTY DESCRIPTION (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.)
Lot 2, Carefree Mountain Estates Unit One 211-28-235

BUILDING USE (e.g., Residential, Non-residential, Addition, Accessory, etc. Use a Comments area, if necessary.)
Residential

LATITUDE/LONGITUDE (OPTIONAL) (##° - ##' - ##.##" or ##.#####°)
33°47'59.44" N 111°57'12.13" W

HORIZONTAL DATUM: ☐ NAD 1927 X NAD 1983

SOURCE: X GPS (Type): **RTK** ☐ USGS Quad Map ☐ Other: ____

SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

B1. NFIP COMMUNITY NAME & COMMUNITY NUMBER	B2. COUNTY NAME	B3. STATE
Carefree, Town of 040126	**Maricopa**	**AZ**

B4. MAP AND PANEL NUMBER	B5. SUFFIX	B6. FIRM INDEX DATE	B7. FIRM PANEL EFFECTIVE/REVISED DATE	B8. FLOOD ZONE(S)	B9. BASE FLOOD ELEVATION(S) (Zone AO, use depth of flooding)
04013C0815	**H**	**April 15, 1998**	**July 19, 2001**	X	2105.96

B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in B9.
☐ FIS Profile ☐ FIRM ☒ Community Determined ☐ Other (Describe): ____

B11. Indicate the elevation datum used for the BFE in B9: X NGVD 1929 ☐ NAVD 1988 ☐ Other (Describe): ____

B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? ☐ Yes X No Designation Date____

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

C1. Building elevations are based on: ☐ Construction Drawings* ☐ Building Under Construction* X Finished Construction

*A new Elevation Certificate will be required when construction of the building is complete.

C2. Building Diagram Number 7 (Select the building diagram most similar to the building for which this certificate is being completed - see pages 6 and 7. If no diagram accurately represents the building, provide a sketch or photograph.)

C3. Elevations – Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO

Complete Items C3.-a-i below according to the building diagram specified in Item C2. State the datum used. If the datum is different from the datum used for the BFE in Section B, convert the datum to that used for the BFE. Show field measurements and datum conversion calculation. Use the space provided or the Comments area of Section D or Section G, as appropriate, to document the datum conversion.

Datum **NGVD 29** Conversion/Comments ____

Elevation reference mark used **RM 120** Does the elevation reference mark used appear on the FIRM? X Yes ☐ No

X a) Top of bottom floor (including basement or enclosure) **2105.51 ft.**
☐ b) Top of next higher floor ____.__ft.(m)
☐ c) Bottom of lowest horizontal structural member (V zones only) ____.__ft.(m)
☐ d) Attached garage (top of slab) ____.__ft.(m)
☐ e) Lowest elevation of machinery and/or equipment servicing the building (Describe in a Comments area) ____.__ft.(m)
X f) Lowest adjacent (finished) grade (LAG) **2104.31 ft.**
X g) Highest adjacent (finished) grade (HAG) **2104.51 ft.**
☐ h) No. of permanent openings (flood vents) within 1 ft. above adjacent grade ____
☐ i) Total area of all permanent openings (flood vents) in C3.h ____sq. in. (sq. cm)

License Number, Embossed Seal, Signature, and Date

REGISTERED LAND SURVEYOR
CERTIFICATE NO. 25396
ALAN D. REECE
Date Signed 6/13/03
ARIZONA, U.S.A.

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

This certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by law to certify elevation information.
I certify that the information in Sections A, B, and C on this certificate represents my best efforts to interpret the data available.
I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.

CERTIFIER'S NAME **Alan D. Reece** LICENSE NUMBER **RLS 25396**

TITLE **Associate Vice President** COMPANY NAME **AZTEC**

ADDRESS	CITY	STATE	ZIP CODE
3747 East Grove Street	**Phoenix**	**AZ**	**85040**

SIGNATURE	DATE	TELEPHONE
	6/12/2003	**602-454-0402**

IMPORTANT: In these spaces, copy the corresponding information from Section A.			For Insurance Company Use:
BUILDING STREET ADDRESS (Including Apt., Unit, Suite, and/or Bldg. No.) OR P.O. ROUTE AND BOX NO.			Policy Number
CITY	STATE	ZIP CODE	Company NAIC Number

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION (CONTINUED)

Copy both sides of this Elevation Certificate for (1) community official, (2) insurance agent/company, and (3) building owner.

COMMENTS

☐ Check here if attachments

SECTION E - BUILDING ELEVATION INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO AND ZONE A (WITHOUT BFE)

For Zone AO and Zone A (without BFE), complete Items E1 through E4. If the Elevation Certificate is intended for use as supporting information for a LOMA or LOMR-F, Section C must be completed.

E1. Building Diagram Number _(Select the building diagram most similar to the building for which this certificate is being completed – see pages 6 and 7. If no diagram accurately represents the building, provide a sketch or photograph.)

E2. The top of the bottom floor (including basement or enclosure) of the building is __ ft.(m) __in.(cm) ☐ above or ☐ below (check one) the highest adjacent grade. (Use natural grade, if available).

E3. For Building Diagrams 6-8 with openings (see page 7), the next higher floor or elevated floor (elevation b) of the building is __ ft.(m) __in.(cm) above the highest adjacent grade. Complete items C3.h and C3.i on front of form.

E4. The top of the platform of machinery and/or equipment servicing the building is __ ft.(m) __in.(cm) ☐ above or ☐ below (check one) the highest adjacent grade. (Use natural grade, if available).

E5. For Zone AO only: If no flood depth number is available, is the top of the bottom floor elevated in accordance with the community's floodplain management ordinance?
☐ Yes ☐ No ☐ Unknown. The local official must certify this information in Section G.

SECTION F - PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION

The property owner or owner's authorized representative who completes Sections A, B, C (Items C3.h and C3.i only), and E for Zone A (without a FEMA-issued or community-issued BFE) or Zone AO must sign here. *The statements in Sections A, B, C, and E are correct to the best of my knowledge.*

PROPERTY OWNER'S OR OWNER'S AUTHORIZED REPRESENTATIVE'S NAME

ADDRESS | CITY | STATE | ZIP CODE

SIGNATURE | DATE | TELEPHONE

COMMENTS

☐ Check here if attachments

SECTION G - COMMUNITY INFORMATION (OPTIONAL)

The local official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Complete the applicable item(s) and sign below.

G1. ☐ The information in Section C was taken from other documentation that has been signed and embossed by a licensed surveyor, engineer, or architect who is authorized by state or local law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)

G2. ☐ A community official completed Section E for a building located in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.

G3. ☐ The following information (Items G4-G9) is provided for community floodplain management purposes.

G4. PERMIT NUMBER	G5. DATE PERMIT ISSUED	G6. DATE CERTIFICATE OF COMPLIANCE/OCCUPANCY ISSUED

G7. This permit has been issued for: ☐ New Construction ☐ Substantial Improvement

G8. Elevation of as-built lowest floor (including basement) of the building is: ____. __ft.(m) Datum: ____

G9. BFE or (in Zone AO) depth of flooding at the building site is: ____. __ ft.(m) Datum: ____

LOCAL OFFICIAL'S NAME | TITLE

COMMUNITY NAME | TELEPHONE

SIGNATURE | DATE

COMMENTS

☐ Check here if attachments

FEDERAL EMERGENCY MANAGEMENT AGENCY
NATIONAL FLOOD INSURANCE PROGRAM

O.M.B. No. 3067-0077
Expires December 31, 2005

ELEVATION CERTIFICATE

Important: Read the instructions on pages 1 - 7.

SECTION A - PROPERTY OWNER INFORMATION

For Insurance Company Use:
Policy Number
Company NAIC Number

BUILDING OWNER'S NAME
Victor L & Michelle M Campbell

BUILDING STREET ADDRESS (Including Apt., Unit, Suite, and/or Bldg. No.) OR P.O. ROUTE AND BOX NO.
5901 E Agave Pl

CITY	STATE	ZIP CODE
Carefree	**AZ**	**85331**

PROPERTY DESCRIPTION (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.)
Lot 1, Carefree Mountain Estates Unit One 211-28-234

BUILDING USE (e.g., Residential, Non-residential, Addition, Accessory, etc. Use a Comments area, if necessary.)
Residential

LATITUDE/LONGITUDE (OPTIONAL) (##° - ##' - ##.##" or ##.#####°)
33°47'59.46" N 111°57'12.98" W

HORIZONTAL DATUM: ☐ NAD 1927 X NAD 1983

SOURCE: X GPS (Type): **RTK** ☐ USGS Quad Map ☐ Other: ____

SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

B1. NFIP COMMUNITY NAME & COMMUNITY NUMBER	B2. COUNTY NAME	B3. STATE
Carefree, Town of 040126	**Maricopa**	**AZ**

B4. MAP AND PANEL NUMBER	B5. SUFFIX	B6. FIRM INDEX DATE	B7. FIRM PANEL EFFECTIVE/REVISED DATE	B8. FLOOD ZONE(S)	B9. BASE FLOOD ELEVATION(S) (Zone AO, use depth of flooding)
04013C0815	**H**	**April 15, 1998**	**July 19, 2001**	X	2102.24

B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in B9.
☐ FIS Profile ☐ FIRM ☒ Community Determined ☐ Other (Describe): ____

B11. Indicate the elevation datum used for the BFE in B9: X NGVD 1929 ☐ NAVD 1988 ☐ Other (Describe): ____

B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? ☐ Yes X No Designation Date____

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

C1. Building elevations are based on: ☐ Construction Drawings* ☐ Building Under Construction* X Finished Construction

*A new Elevation Certificate will be required when construction of the building is complete.

C2. Building Diagram Number 7 (Select the building diagram most similar to the building for which this certificate is being completed - see pages 6 and 7. If no diagram accurately represents the building, provide a sketch or photograph.)

C3. Elevations – Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO

Complete Items C3.-a-i below according to the building diagram specified in Item C2. State the datum used. If the datum is different from the datum used for the BFE in Section B, convert the datum to that used for the BFE. Show field measurements and datum conversion calculation. Use the space provided or the Comments area of Section D or Section G, as appropriate, to document the datum conversion.

Datum **NGVD 29** Conversion/Comments ____

Elevation reference mark used **RM 120** Does the elevation reference mark used appear on the FIRM? X Yes ☐ No

X a) Top of bottom floor (including basement or enclosure)	**2102.55 ft.**
☐ b) Top of next higher floor	____.__ft.(m)
☐ c) Bottom of lowest horizontal structural member (V zones only)	____.__ft.(m)
☐ d) Attached garage (top of slab)	____.__ft.(m)
☐ e) Lowest elevation of machinery and/or equipment servicing the building (Describe in a Comments area)	____.__ft.(m)
X f) Lowest adjacent (finished) grade (LAG)	**2101.73 ft.**
X g) Highest adjacent (finished) grade (HAG)	**2102.25 ft.**
☐ h) No. of permanent openings (flood vents) within 1 ft. above adjacent grade ____	
☐ i) Total area of all permanent openings (flood vents) in C3.h ____sq. in. (sq. cm)	

License Number, Embossed Seal, Signature, and Date

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
25396
ALAN D.
REECE
Date Signed 6/13/03
ARIZONA, U.S.A.

Alan D Reece

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

This certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by law to certify elevation information.
I certify that the information in Sections A, B, and C on this certificate represents my best efforts to interpret the data available.
I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.

CERTIFIER'S NAME **Alan D. Reece** LICENSE NUMBER **RLS 25396**

TITLE **Associate Vice President** COMPANY NAME **AZTEC**

ADDRESS	CITY	STATE	ZIP CODE
3747 East Grove Street	**Phoenix**	**AZ**	**85040**

SIGNATURE	DATE	TELEPHONE
	6/12/2003	**602-454-0402**

IMPORTANT: In these spaces, copy the corresponding information from Section A.			For Insurance Company Use:
BUILDING STREET ADDRESS (Including Apt., Unit, Suite, and/or Bldg. No.) OR P.O. ROUTE AND BOX NO.			Policy Number
CITY	STATE	ZIP CODE	Company NAIC Number

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION (CONTINUED)

Copy both sides of this Elevation Certificate for (1) community official, (2) insurance agent/company, and (3) building owner.

COMMENTS

☐ Check here if attachments

SECTION E - BUILDING ELEVATION INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO AND ZONE A (WITHOUT BFE)

For Zone AO and Zone A (without BFE), complete Items E1 through E4. If the Elevation Certificate is intended for use as supporting information for a LOMA or LOMR-F, Section C must be completed.

E1. Building Diagram Number _(Select the building diagram most similar to the building for which this certificate is being completed – see pages 6 and 7. If no diagram accurately represents the building, provide a sketch or photograph.)

E2. The top of the bottom floor (including basement or enclosure) of the building is __ft.(m) __in.(cm) ☐ above or ☐ below (check one) the highest adjacent grade. (Use natural grade, if available).

E3. For Building Diagrams 6-8 with openings (see page 7), the next higher floor or elevated floor (elevation b) of the building is __ ft.(m) __in.(cm) above the highest adjacent grade. Complete items C3.h and C3.i on front of form.

E4. The top of the platform of machinery and/or equipment servicing the building is __ ft.(m) __in.(cm) ☐ above or ☐ below (check one) the highest adjacent grade. (Use natural grade, if available).

E5. For Zone AO only: If no flood depth number is available, is the top of the bottom floor elevated in accordance with the community's floodplain management ordinance?
☐ Yes ☐ No ☐ Unknown. The local official must certify this information in Section G.

SECTION F - PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION

The property owner or owner's authorized representative who completes Sections A, B, C (Items C3.h and C3.i only), and E for Zone A (without a FEMA-issued or community-issued BFE) or Zone AO must sign here. *The statements in Sections A, B, C, and E are correct to the best of my knowledge.*

PROPERTY OWNER'S OR OWNER'S AUTHORIZED REPRESENTATIVE'S NAME

ADDRESS | CITY | STATE | ZIP CODE

SIGNATURE | DATE | TELEPHONE

COMMENTS

☐ Check here if attachments

SECTION G - COMMUNITY INFORMATION (OPTIONAL)

The local official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Complete the applicable item(s) and sign below.

G1. ☐ The information in Section C was taken from other documentation that has been signed and embossed by a licensed surveyor, engineer, or architect who is authorized by state or local law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)

G2. ☐ A community official completed Section E for a building located in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.

G3. ☐ The following information (Items G4-G9) is provided for community floodplain management purposes.

G4. PERMIT NUMBER	G5. DATE PERMIT ISSUED	G6. DATE CERTIFICATE OF COMPLIANCE/OCCUPANCY ISSUED

G7. This permit has been issued for: ☐ New Construction ☐ Substantial Improvement

G8. Elevation of as-built lowest floor (including basement) of the building is: ___.__ft.(m) Datum: ____

G9. BFE or (in Zone AO) depth of flooding at the building site is: ___.__ft.(m) Datum: ____

LOCAL OFFICIAL'S NAME | TITLE

COMMUNITY NAME | TELEPHONE

SIGNATURE | DATE

COMMENTS

☐ Check here if attachments

FEDERAL EMERGENCY MANAGEMENT AGENCY
NATIONAL FLOOD INSURANCE PROGRAM

O.M.B. No. 3067-0077
Expires December 31, 2005

ELEVATION CERTIFICATE

Important: Read the instructions on pages 1 - 7.

SECTION A - PROPERTY OWNER INFORMATION

For Insurance Company Use:
Policy Number
Company NAIC Number

BUILDING OWNER'S NAME
Michael L & Rosemary Casadei

BUILDING STREET ADDRESS (Including Apt., Unit, Suite, and/or Bldg. No.) OR P.O. ROUTE AND BOX NO.
35191 N Saphora Dr

CITY	STATE	ZIP CODE
Carefree	**AZ**	**85331**

PROPERTY DESCRIPTION (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.)
Lot 22, Carefree Mountain Estates Unit One 211-28-255

BUILDING USE (e.g., Residential, Non-residential, Addition, Accessory, etc. Use a Comments area, if necessary.)
Residential

LATITUDE/LONGITUDE (OPTIONAL) (##° - ##' - ##.##" or ##.#####°)
33°48'16.95 N 111°57'19.70" W

HORIZONTAL DATUM: ☐ NAD 1927 X NAD 1983

SOURCE: X GPS (Type): **RTK** ☐ USGS Quad Map ☐ Other: ____

SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

B1. NFIP COMMUNITY NAME & COMMUNITY NUMBER	B2. COUNTY NAME	B3. STATE
Carefree, Town of 040126	**Maricopa**	**AZ**

B4. MAP AND PANEL NUMBER	B5. SUFFIX	B6. FIRM INDEX DATE	B7. FIRM PANEL EFFECTIVE/REVISED DATE	B8. FLOOD ZONE(S)	B9. BASE FLOOD ELEVATION(S) (Zone AO, use depth of flooding)
04013C0815	**H**	**April 15, 1998**	**July 19, 2001**	X	2064.26

B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in B9.
☐ FIS Profile ☐ FIRM ☒ Community Determined ☐ Other (Describe): ____

B11. Indicate the elevation datum used for the BFE in B9: X NGVD 1929 ☐ NAVD 1988 ☐ Other (Describe): ____

B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? ☐ Yes X No Designation Date____

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

C1. Building elevations are based on: ☐ Construction Drawings* ☐ Building Under Construction* X Finished Construction
*A new Elevation Certificate will be required when construction of the building is complete.

C2. Building Diagram Number 7 (Select the building diagram most similar to the building for which this certificate is being completed - see pages 6 and 7. If no diagram accurately represents the building, provide a sketch or photograph.)

C3. Elevations – Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO
Complete Items C3.-a-i below according to the building diagram specified in Item C2. State the datum used. If the datum is different from the datum used for the BFE in Section B, convert the datum to that used for the BFE. Show field measurements and datum conversion calculation. Use the space provided or the Comments area of Section D or Section G, as appropriate, to document the datum conversion.

Datum **NGVD 29** Conversion/Comments ____

Elevation reference mark used **RM 120** Does the elevation reference mark used appear on the FIRM? X Yes ☐ No

X a) Top of bottom floor (including basement or enclosure) **2062.30 ft.**
☐ b) Top of next higher floor ____.__ft.(m)
☐ c) Bottom of lowest horizontal structural member (V zones only) ____.__ft.(m)
☐ d) Attached garage (top of slab) ____.__ft.(m)
☐ e) Lowest elevation of machinery and/or equipment servicing the building (Describe in a Comments area) ____.__ft.(m)
X f) Lowest adjacent (finished) grade (LAG) **2060.77 ft.**
X g) Highest adjacent (finished) grade (HAG) **2061.56 ft.**
☐ h) No. of permanent openings (flood vents) within 1 ft. above adjacent grade ____
☐ i) Total area of all permanent openings (flood vents) in C3.h ____sq. in. (sq. cm)

License Number, Embossed Seal, Signature, and Date

REGISTERED LAND SURVEYOR
CERTIFICATE NO. 25396
ALAN D. REECE
Date Signed 6/13/03
ARIZONA, U.S.A.

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

This certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by law to certify elevation information.
I certify that the information in Sections A, B, and C on this certificate represents my best efforts to interpret the data available.
I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.

CERTIFIER'S NAME **Alan D. Reece** LICENSE NUMBER **RLS 25396**

TITLE **Associate Vice President** COMPANY NAME **AZTEC**

ADDRESS	CITY	STATE	ZIP CODE
3747 East Grove Street	**Phoenix**	**AZ**	**85040**

SIGNATURE	DATE	TELEPHONE
	6/12/2003	**602-454-0402**

IMPORTANT: In these spaces, copy the corresponding information from Section A.			For Insurance Company Use:
BUILDING STREET ADDRESS (Including Apt., Unit, Suite, and/or Bldg. No.) OR P.O. ROUTE AND BOX NO.			Policy Number
CITY	STATE	ZIP CODE	Company NAIC Number

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION (CONTINUED)

Copy both sides of this Elevation Certificate for (1) community official, (2) insurance agent/company, and (3) building owner.

COMMENTS

☐ Check here if attachments

SECTION E - BUILDING ELEVATION INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO AND ZONE A (WITHOUT BFE)

For Zone AO and Zone A (without BFE), complete Items E1 through E4. If the Elevation Certificate is intended for use as supporting information for a LOMA or LOMR-F, Section C must be completed.

E1. Building Diagram Number _(Select the building diagram most similar to the building for which this certificate is being completed – see pages 6 and 7. If no diagram accurately represents the building, provide a sketch or photograph.)

E2. The top of the bottom floor (including basement or enclosure) of the building is __ft.(m) __in.(cm) ☐ above or ☐ below (check one) the highest adjacent grade. (Use natural grade, if available).

E3. For Building Diagrams 6-8 with openings (see page 7), the next higher floor or elevated floor (elevation b) of the building is __ft.(m) __in.(cm) above the highest adjacent grade. Complete items C3.h and C3.i on front of form.

E4. The top of the platform of machinery and/or equipment servicing the building is __ft.(m) __in.(cm) ☐ above or ☐ below (check one) the highest adjacent grade. (Use natural grade, if available).

E5. For Zone AO only: If no flood depth number is available, is the top of the bottom floor elevated in accordance with the community's floodplain management ordinance?
☐ Yes ☐ No ☐ Unknown. The local official must certify this information in Section G.

SECTION F - PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION

The property owner or owner's authorized representative who completes Sections A, B, C (Items C3.h and C3.i only), and E for Zone A (without a FEMA-issued or community-issued BFE) or Zone AO must sign here. *The statements in Sections A, B, C, and E are correct to the best of my knowledge.*

PROPERTY OWNER'S OR OWNER'S AUTHORIZED REPRESENTATIVE'S NAME

ADDRESS | CITY | STATE | ZIP CODE

SIGNATURE | DATE | TELEPHONE

COMMENTS

☐ Check here if attachments

SECTION G - COMMUNITY INFORMATION (OPTIONAL)

The local official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Complete the applicable item(s) and sign below.

G1. ☐ The information in Section C was taken from other documentation that has been signed and embossed by a licensed surveyor, engineer, or architect who is authorized by state or local law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)

G2. ☐ A community official completed Section E for a building located in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.

G3. ☐ The following information (Items G4-G9) is provided for community floodplain management purposes.

G4. PERMIT NUMBER	G5. DATE PERMIT ISSUED	G6. DATE CERTIFICATE OF COMPLIANCE/OCCUPANCY ISSUED

G7. This permit has been issued for: ☐ New Construction ☐ Substantial Improvement

G8. Elevation of as-built lowest floor (including basement) of the building is: ____.__ft.(m) Datum: _____

G9. BFE or (in Zone AO) depth of flooding at the building site is: ____.__ft.(m) Datum: _____

LOCAL OFFICIAL'S NAME | TITLE

COMMUNITY NAME | TELEPHONE

SIGNATURE | DATE

COMMENTS

☐ Check here if attachments

FEDERAL EMERGENCY MANAGEMENT AGENCY
NATIONAL FLOOD INSURANCE PROGRAM

O.M.B. No. 3067-0077
Expires December 31, 2005

ELEVATION CERTIFICATE

Important: Read the instructions on pages 1 - 7.

SECTION A - PROPERTY OWNER INFORMATION

For Insurance Company Use:
Policy Number
Company NAIC Number

BUILDING OWNER'S NAME
Gerald T & Joan M Bednorz

BUILDING STREET ADDRESS (Including Apt., Unit, Suite, and/or Bldg. No.) OR P.O. ROUTE AND BOX NO.
34659 N Los Reales Dr

CITY	STATE	ZIP CODE
Carefree	**AZ**	**85331**

PROPERTY DESCRIPTION (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.)
Lot 17, Los Reales at Carefree 211-28-347

BUILDING USE (e.g., Residential, Non-residential, Addition, Accessory, etc. Use a Comments area, if necessary.)
Residential

LATITUDE/LONGITUDE (OPTIONAL) (##° - ##' - ##.##" or ##.#####°)
33°47'59.56" N 111°57'00.35" W

HORIZONTAL DATUM: ☐ NAD 1927 X NAD 1983

SOURCE: X GPS (Type): **RTK** ☐ USGS Quad Map ☐ Other: ____

SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

B1. NFIP COMMUNITY NAME & COMMUNITY NUMBER	B2. COUNTY NAME	B3. STATE
Carefree, Town of 040126	**Maricopa**	**AZ**

B4. MAP AND PANEL NUMBER	B5. SUFFIX	B6. FIRM INDEX DATE	B7. FIRM PANEL EFFECTIVE/REVISED DATE	B8. FLOOD ZONE(S)	B9. BASE FLOOD ELEVATION(S) (Zone AO, use depth of flooding)
04013C0815	**H**	**April 15, 1998**	**July 19, 2001**	X	2126.71

B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in B9.
☐ FIS Profile ☐ FIRM ☒ Community Determined ☐ Other (Describe): ____

B11. Indicate the elevation datum used for the BFE in B9: X NGVD 1929 ☐ NAVD 1988 ☐ Other (Describe): ____

B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? ☐ Yes X No Designation Date____

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

C1. Building elevations are based on: ☐ Construction Drawings* ☐ Building Under Construction* X Finished Construction
*A new Elevation Certificate will be required when construction of the building is complete.

C2. Building Diagram Number 7 (Select the building diagram most similar to the building for which this certificate is being completed - see pages 6 and 7. If no diagram accurately represents the building, provide a sketch or photograph.)

C3. Elevations – Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO
Complete Items C3.-a-i below according to the building diagram specified in Item C2. State the datum used. If the datum is different from the datum used for the BFE in Section B, convert the datum to that used for the BFE. Show field measurements and datum conversion calculation. Use the space provided or the Comments area of Section D or Section G, as appropriate, to document the datum conversion.

Datum **NGVD 29** Conversion/Comments ____

Elevation reference mark used **RM 120** Does the elevation reference mark used appear on the FIRM? X Yes ☐ No

X a) Top of bottom floor (including basement or enclosure) **2127.24 ft.**
☐ b) Top of next higher floor ____.__ft.(m)
☐ c) Bottom of lowest horizontal structural member (V zones only) ____.__ft.(m)
☐ d) Attached garage (top of slab) ____.__ft.(m)
☐ e) Lowest elevation of machinery and/or equipment servicing the building (Describe in a Comments area) ____.__ft.(m)
X f) Lowest adjacent (finished) grade (LAG) **2126.45 ft.**
X g) Highest adjacent (finished) grade (HAG) **2127.06 ft.**
☐ h) No. of permanent openings (flood vents) within 1 ft. above adjacent grade ____
☐ i) Total area of all permanent openings (flood vents) in C3.h ____sq. in. (sq. cm)

License Number, Embossed Seal, Signature, and Date

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
25396
ALAN D.
REECE
Date Signed 6/13/03
ARIZONA, U.S.A.

Alan D Reece

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

This certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by law to certify elevation information.
I certify that the information in Sections A, B, and C on this certificate represents my best efforts to interpret the data available.
I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.

CERTIFIER'S NAME **Alan D. Reece** LICENSE NUMBER **RLS 25396**

TITLE **Associate Vice President** COMPANY NAME **AZTEC**

ADDRESS	CITY	STATE	ZIP CODE
3747 East Grove Street	**Phoenix**	**AZ**	**85040**

SIGNATURE	DATE	TELEPHONE
	6/12/2003	**602-454-0402**

IMPORTANT: In these spaces, copy the corresponding information from Section A.			For Insurance Company Use:
BUILDING STREET ADDRESS (Including Apt., Unit, Suite, and/or Bldg. No.) OR P.O. ROUTE AND BOX NO.			Policy Number
CITY	STATE	ZIP CODE	Company NAIC Number

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION (CONTINUED)

Copy both sides of this Elevation Certificate for (1) community official, (2) insurance agent/company, and (3) building owner.

COMMENTS

☐ Check here if attachments

SECTION E - BUILDING ELEVATION INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO AND ZONE A (WITHOUT BFE)

For Zone AO and Zone A (without BFE), complete Items E1 through E4. If the Elevation Certificate is intended for use as supporting information for a LOMA or LOMR-F, Section C must be completed.

E1. Building Diagram Number __(Select the building diagram most similar to the building for which this certificate is being completed – see pages 6 and 7. If no diagram accurately represents the building, provide a sketch or photograph.)

E2. The top of the bottom floor (including basement or enclosure) of the building is __ ft.(m) __in.(cm) ☐ above or ☐ below (check one) the highest adjacent grade. (Use natural grade, if available).

E3. For Building Diagrams 6-8 with openings (see page 7), the next higher floor or elevated floor (elevation b) of the building is __ ft.(m) __in.(cm) above the highest adjacent grade. Complete items C3.h and C3.i on front of form.

E4. *The top of the platform of machinery and/or equipment servicing the building is* __ ft.(m) __in.(cm) ☐ above or ☐ below (check one) the highest adjacent grade. (Use natural grade, if available).

E5. For Zone AO only: If no flood depth number is available, is the top of the bottom floor elevated in accordance with the community's floodplain management ordinance?
☐ Yes ☐ No ☐ Unknown. The local official must certify this information in Section G.

SECTION F - PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION

The property owner or owner's authorized representative who completes Sections A, B, C (Items C3.h and C3.i only), and E for Zone A (without a FEMA-issued or community-issued BFE) or Zone AO must sign here. *The statements in Sections A, B, C, and E are correct to the best of my knowledge.*

PROPERTY OWNER'S OR OWNER'S AUTHORIZED REPRESENTATIVE'S NAME

ADDRESS | CITY | STATE | ZIP CODE

SIGNATURE | DATE | TELEPHONE

COMMENTS

☐ Check here if attachments

SECTION G - COMMUNITY INFORMATION (OPTIONAL)

The local official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Complete the applicable item(s) and sign below.

G1. ☐ The information in Section C was taken from other documentation that has been signed and embossed by a licensed surveyor, engineer, or architect who is authorized by state or local law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)

G2. ☐ A community official completed Section E for a building located in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.

G3. ☐ The following information (Items G4-G9) is provided for community floodplain management purposes.

G4. PERMIT NUMBER	G5. DATE PERMIT ISSUED	G6. DATE CERTIFICATE OF COMPLIANCE/OCCUPANCY ISSUED

G7. This permit has been issued for: ☐ New Construction ☐ Substantial Improvement

G8. Elevation of as-built lowest floor (including basement) of the building is: ____.__ft.(m) Datum: ____

G9. BFE or (in Zone AO) depth of flooding at the building site is: ____.__ft.(m) Datum: ____

LOCAL OFFICIAL'S NAME | TITLE

COMMUNITY NAME | TELEPHONE

SIGNATURE | DATE

COMMENTS

☐ Check here if attachments

FEDERAL EMERGENCY MANAGEMENT AGENCY
NATIONAL FLOOD INSURANCE PROGRAM

O.M.B. No. 3067-0077
Expires December 31, 2005

ELEVATION CERTIFICATE

Important: Read the instructions on pages 1 - 7.

SECTION A - PROPERTY OWNER INFORMATION

For Insurance Company Use:
Policy Number
Company NAIC Number

BUILDING OWNER'S NAME
Martin J Wieczorek

BUILDING STREET ADDRESS (Including Apt., Unit, Suite, and/or Bldg. No.) OR P.O. ROUTE AND BOX NO.
34619 Los Reales Dr

CITY	STATE	ZIP CODE
Carefree	**AZ**	**85331**

PROPERTY DESCRIPTION (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.)
Lot 18, Los Reales at Carefree 211-28-348

BUILDING USE (e.g., Residential, Non-residential, Addition, Accessory, etc. Use a Comments area, if necessary.)
Residential

LATITUDE/LONGITUDE (OPTIONAL) (##° - ##' - ##.##" or ##.#####°)
33°47'58.89" N 111° 57'02.50" W

HORIZONTAL DATUM: ☐ NAD 1927 X NAD 1983

SOURCE: X GPS (Type): **RTK** ☐ USGS Quad Map ☐ Other: ____

SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

B1. NFIP COMMUNITY NAME & COMMUNITY NUMBER	B2. COUNTY NAME	B3. STATE
Carefree, Town of 040126	**Maricopa**	**AZ**

B4. MAP AND PANEL NUMBER	B5. SUFFIX	B6. FIRM INDEX DATE	B7. FIRM PANEL EFFECTIVE/REVISED DATE	B8. FLOOD ZONE(S)	B9. BASE FLOOD ELEVATION(S) (Zone AO, use depth of flooding)
04013C0815	**H**	**April 15, 1998**	**July 19, 2001**	X	2124.74

B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in B9.
☐ FIS Profile ☐ FIRM ☒ Community Determined ☐ Other (Describe): ____

B11. Indicate the elevation datum used for the BFE in B9: X NGVD 1929 ☐ NAVD 1988 ☐ Other (Describe): ____

B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? ☐ Yes X No Designation Date ____

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

C1. Building elevations are based on: ☐ Construction Drawings* ☐ Building Under Construction* X Finished Construction

*A new Elevation Certificate will be required when construction of the building is complete.

C2. Building Diagram Number 7 (Select the building diagram most similar to the building for which this certificate is being completed - see pages 6 and 7. If no diagram accurately represents the building, provide a sketch or photograph.)

C3. Elevations – Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO

Complete Items C3.-a-i below according to the building diagram specified in Item C2. State the datum used. If the datum is different from the datum used for the BFE in Section B, convert the datum to that used for the BFE. Show field measurements and datum conversion calculation. Use the space provided or the Comments area of Section D or Section G, as appropriate, to document the datum conversion.

Datum **NGVD 29** Conversion/Comments ____

Elevation reference mark used **RM 120** Does the elevation reference mark used appear on the FIRM? X Yes ☐ No

X a) Top of bottom floor (including basement or enclosure)	**2123.03 ft.**
☐ b) Top of next higher floor	____.__ft.(m)
☐ c) Bottom of lowest horizontal structural member (V zones only)	____.__ft.(m)
☐ d) Attached garage (top of slab)	____.__ft.(m)
☐ e) Lowest elevation of machinery and/or equipment servicing the building (Describe in a Comments area)	____.__ft.(m)
X f) Lowest adjacent (finished) grade (LAG)	**2122.20 ft.**
X g) Highest adjacent (finished) grade (HAG)	**2122.91 ft.**
☐ h) No. of permanent openings (flood vents) within 1 ft. above adjacent grade	____
☐ i) Total area of all permanent openings (flood vents) in C3.h	____sq. in. (sq. cm)

License Number, Embossed Seal, Signature, and Date

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
25396
ALAN D.
REECE
Date Signed 6/13/03
ARIZONA, U.S.A.

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

This certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by law to certify elevation information.
I certify that the information in Sections A, B, and C on this certificate represents my best efforts to interpret the data available.
I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.

CERTIFIER'S NAME **Alan D. Reece** LICENSE NUMBER **RLS 25396**

TITLE **Associate Vice President** COMPANY NAME **AZTEC**

ADDRESS	CITY	STATE	ZIP CODE
3747 East Grove Street	**Phoenix**	**AZ**	**85040**

SIGNATURE	DATE	TELEPHONE
	6/12/2003	**602-454-0402**

IMPORTANT: In these spaces, copy the corresponding information from Section A.			For Insurance Company Use:
BUILDING STREET ADDRESS (Including Apt., Unit, Suite, and/or Bldg. No.) OR P.O. ROUTE AND BOX NO.			Policy Number
CITY	STATE	ZIP CODE	Company NAIC Number

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION (CONTINUED)

Copy both sides of this Elevation Certificate for (1) community official, (2) insurance agent/company, and (3) building owner.

COMMENTS

☐ Check here if attachments

SECTION E - BUILDING ELEVATION INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO AND ZONE A (WITHOUT BFE)

For Zone AO and Zone A (without BFE), complete Items E1 through E4. If the Elevation Certificate is intended for use as supporting information for a LOMA or LOMR-F, Section C must be completed.

E1. Building Diagram Number _(Select the building diagram most similar to the building for which this certificate is being completed – see pages 6 and 7. If no diagram accurately represents the building, provide a sketch or photograph.)

E2. The top of the bottom floor (including basement or enclosure) of the building is __ft.(m) __in.(cm) ☐ above or ☐ below (check one) the highest adjacent grade. (Use natural grade, if available).

E3. For Building Diagrams 6-8 with openings (see page 7), the next higher floor or elevated floor (elevation b) of the building is __ft.(m) __in.(cm) above the highest adjacent grade. Complete items C3.h and C3.i on front of form.

E4. The top of the platform of machinery and/or equipment servicing the building is __ft.(m) __in.(cm) ☐ above or ☐ below (check one) the highest adjacent grade. (Use natural grade, if available).

E5. For Zone AO only: If no flood depth number is available, is the top of the bottom floor elevated in accordance with the community's floodplain management ordinance?
☐ Yes ☐ No ☐ Unknown. The local official must certify this information in Section G.

SECTION F - PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION

The property owner or owner's authorized representative who completes Sections A, B, C (Items C3.h and C3.i only), and E for Zone A (without a FEMA-issued or community-issued BFE) or Zone AO must sign here. *The statements in Sections A, B, C, and E are correct to the best of my knowledge.*

PROPERTY OWNER'S OR OWNER'S AUTHORIZED REPRESENTATIVE'S NAME

ADDRESS | CITY | STATE | ZIP CODE

SIGNATURE | DATE | TELEPHONE

COMMENTS

☐ Check here if attachments

SECTION G - COMMUNITY INFORMATION (OPTIONAL)

The local official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Complete the applicable item(s) and sign below.

G1. ☐ The information in Section C was taken from other documentation that has been signed and embossed by a licensed surveyor, engineer, or architect who is authorized by state or local law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)

G2. ☐ A community official completed Section E for a building located in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.

G3. ☐ The following information (Items G4-G9) is provided for community floodplain management purposes.

G4. PERMIT NUMBER	G5. DATE PERMIT ISSUED	G6. DATE CERTIFICATE OF COMPLIANCE/OCCUPANCY ISSUED

G7. This permit has been issued for: ☐ New Construction ☐ Substantial Improvement

G8. Elevation of as-built lowest floor (including basement) of the building is: ____.__ft.(m) Datum: ____

G9. BFE or (in Zone AO) depth of flooding at the building site is: ____.__ft.(m) Datum: ____

LOCAL OFFICIAL'S NAME | TITLE

COMMUNITY NAME | TELEPHONE

SIGNATURE | DATE

COMMENTS

☐ Check here if attachments

FEDERAL EMERGENCY MANAGEMENT AGENCY
NATIONAL FLOOD INSURANCE PROGRAM

O.M.B. No. 3067-0077
Expires December 31, 2005

ELEVATION CERTIFICATE

Important: Read the instructions on pages 1 - 7.

SECTION A - PROPERTY OWNER INFORMATION

For Insurance Company Use:
Policy Number
Company NAIC Number

BUILDING OWNER'S NAME
Scott & Joan M Dahmer

BUILDING STREET ADDRESS (Including Apt., Unit, Suite, and/or Bldg. No.) OR P.O. ROUTE AND BOX NO.
6034 Agave Circle

CITY	STATE	ZIP CODE
Carefree	**AZ**	**85331**

PROPERTY DESCRIPTION (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.)
Lot 3, Los Reales at Carefree 211-28-333

BUILDING USE (e.g., Residential, Non-residential, Addition, Accessory, etc. Use a Comments area, if necessary.)
Residential

LATITUDE/LONGITUDE (OPTIONAL) (##° - ##' - ##.##" or ##.#####°)
33°48'01.59" N 111°57'05.44" W

HORIZONTAL DATUM: ☐ NAD 1927 X NAD 1983

SOURCE: X GPS (Type): **RTK** ☐ USGS Quad Map ☐ Other: ____

SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

B1. NFIP COMMUNITY NAME & COMMUNITY NUMBER	B2. COUNTY NAME	B3. STATE
Carefree, Town of 040126	**Maricopa**	**AZ**

B4. MAP AND PANEL NUMBER	B5. SUFFIX	B6. FIRM INDEX DATE	B7. FIRM PANEL EFFECTIVE/REVISED DATE	B8. FLOOD ZONE(S)	B9. BASE FLOOD ELEVATION(S) (Zone AO, use depth of flooding)
04013C0815	**H**	**April 15, 1998**	**July 19, 2001**	X	2115.61

B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in B9.
☐ FIS Profile ☐ FIRM ☒ Community Determined ☐ Other (Describe): ____

B11. Indicate the elevation datum used for the BFE in B9: X NGVD 1929 ☐ NAVD 1988 ☐ Other (Describe): ____

B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? ☐ Yes X No Designation Date ____

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

C1. Building elevations are based on: ☐ Construction Drawings* ☐ Building Under Construction* X Finished Construction
*A new Elevation Certificate will be required when construction of the building is complete.

C2. Building Diagram Number 7 (Select the building diagram most similar to the building for which this certificate is being completed - see pages 6 and 7. If no diagram accurately represents the building, provide a sketch or photograph.)

C3. Elevations – Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO
Complete Items C3.-a-i below according to the building diagram specified in Item C2. State the datum used. If the datum is different from the datum used for the BFE in Section B, convert the datum to that used for the BFE. Show field measurements and datum conversion calculation. Use the space provided or the Comments area of Section D or Section G, as appropriate, to document the datum conversion.

Datum **NGVD 29** Conversion/Comments ____

Elevation reference mark used **RM 120** Does the elevation reference mark used appear on the FIRM? X Yes ☐ No

X a) Top of bottom floor (including basement or enclosure) **2115.72 ft.**
☐ b) Top of next higher floor ____.__ft.(m)
☐ c) Bottom of lowest horizontal structural member (V zones only) ____.__ft.(m)
☐ d) Attached garage (top of slab) ____.__ft.(m)
☐ e) Lowest elevation of machinery and/or equipment servicing the building (Describe in a Comments area) ____.__ft.(m)
X f) Lowest adjacent (finished) grade (LAG) **2114.18 ft.**
X g) Highest adjacent (finished) grade (HAG) **2115.12 ft.**
☐ h) No. of permanent openings (flood vents) within 1 ft. above adjacent grade ____
☐ i) Total area of all permanent openings (flood vents) in C3.h ____sq. in. (sq. cm)

License Number, Embossed Seal, Signature, and Date

REGISTERED LAND SURVEYOR
CERTIFICATE NO. 25396
ALAN D. REECE
Date Signed 6/13/03
ARIZONA, U.S.A.

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

This certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by law to certify elevation information.
I certify that the information in Sections A, B, and C on this certificate represents my best efforts to interpret the data available.
I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.

CERTIFIER'S NAME **Alan D. Reece** LICENSE NUMBER **RLS 25396**

TITLE **Associate Vice President** COMPANY NAME **AZTEC**

ADDRESS	CITY	STATE	ZIP CODE
3747 East Grove Street	**Phoenix**	**AZ**	**85040**

SIGNATURE	DATE	TELEPHONE
	6/12/2003	**602-454-0402**

IMPORTANT: In these spaces, copy the corresponding information from Section A.			For Insurance Company Use:
BUILDING STREET ADDRESS (Including Apt., Unit, Suite, and/or Bldg. No.) OR P.O. ROUTE AND BOX NO.			Policy Number
CITY	STATE	ZIP CODE	Company NAIC Number

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION (CONTINUED)

Copy both sides of this Elevation Certificate for (1) community official, (2) insurance agent/company, and (3) building owner.

COMMENTS

☐ Check here if attachments

SECTION E - BUILDING ELEVATION INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO AND ZONE A (WITHOUT BFE)

For Zone AO and Zone A (without BFE), complete Items E1 through E4. If the Elevation Certificate is intended for use as supporting information for a LOMA or LOMR-F, Section C must be completed.

E1. Building Diagram Number __(Select the building diagram most similar to the building for which this certificate is being completed – see pages 6 and 7. If no diagram accurately represents the building, provide a sketch or photograph.)

E2. The top of the bottom floor (including basement or enclosure) of the building is __ ft.(m) __in.(cm) ☐ above or ☐ below (check one) the highest adjacent grade. (Use natural grade, if available).

E3. For Building Diagrams 6-8 with openings (see page 7), the next higher floor or elevated floor (elevation b) of the building is __ ft.(m) __in.(cm) above the highest adjacent grade. Complete items C3.h and C3.i on front of form.

E4. *The top of the platform of machinery and/or equipment servicing the building is* __ ft.(m) __in.(cm) ☐ above or ☐ below (check one) the highest adjacent grade. (Use natural grade, if available).

E5. For Zone AO only: If no flood depth number is available, is the top of the bottom floor elevated in accordance with the community's floodplain management ordinance?
☐ Yes ☐ No ☐ Unknown. The local official must certify this information in Section G.

SECTION F - PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION

The property owner or owner's authorized representative who completes Sections A, B, C (Items C3.h and C3.i only), and E for Zone A (without a FEMA-issued or community-issued BFE) or Zone AO must sign here. *The statements in Sections A, B, C, and E are correct to the best of my knowledge.*

PROPERTY OWNER'S OR OWNER'S AUTHORIZED REPRESENTATIVE'S NAME

ADDRESS | CITY | STATE | ZIP CODE

SIGNATURE | DATE | TELEPHONE

COMMENTS

☐ Check here if attachments

SECTION G - COMMUNITY INFORMATION (OPTIONAL)

The local official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Complete the applicable item(s) and sign below.

G1. ☐ The information in Section C was taken from other documentation that has been signed and embossed by a licensed surveyor, engineer, or architect who is authorized by state or local law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)

G2. ☐ A community official completed Section E for a building located in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.

G3. ☐ The following information (Items G4-G9) is provided for community floodplain management purposes.

G4. PERMIT NUMBER	G5. DATE PERMIT ISSUED	G6. DATE CERTIFICATE OF COMPLIANCE/OCCUPANCY ISSUED

G7. This permit has been issued for: ☐ New Construction ☐ Substantial Improvement

G8. Elevation of as-built lowest floor (including basement) of the building is: ____. __ft.(m) Datum: ____

G9. BFE or (in Zone AO) depth of flooding at the building site is: ____. __ft.(m) Datum: ____

LOCAL OFFICIAL'S NAME | TITLE

COMMUNITY NAME | TELEPHONE

SIGNATURE | DATE

COMMENTS

☐ Check here if attachments

FEDERAL EMERGENCY MANAGEMENT AGENCY
NATIONAL FLOOD INSURANCE PROGRAM

O.M.B. No. 3067-0077
Expires December 31, 2005

ELEVATION CERTIFICATE

Important: Read the instructions on pages 1 - 7.

SECTION A - PROPERTY OWNER INFORMATION

For Insurance Company Use:
Policy Number
Company NAIC Number

BUILDING OWNER'S NAME
Christopher A Grier

BUILDING STREET ADDRESS (Including Apt., Unit, Suite, and/or Bldg. No.) OR P.O. ROUTE AND BOX NO.
6031 Agave Circle

CITY	STATE	ZIP CODE
Carefree	**AZ**	**85331**

PROPERTY DESCRIPTION (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.)
Lot 2, Los Reales at Carefree 211-28-332

BUILDING USE (e.g., Residential, Non-residential, Addition, Accessory, etc. Use a Comments area, if necessary.)
Residential

LATITUDE/LONGITUDE (OPTIONAL) (##° - ##' - ##.##" or ##.#####°)
33°47'59.03" N 111°57'06.11" W

HORIZONTAL DATUM: ☐ NAD 1927 X NAD 1983

SOURCE: X GPS (Type): **RTK** ☐ USGS Quad Map ☐ Other: ____

SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

B1. NFIP COMMUNITY NAME & COMMUNITY NUMBER	B2. COUNTY NAME	B3. STATE
Carefree, Town of 040126	**Maricopa**	**AZ**

B4. MAP AND PANEL NUMBER	B5. SUFFIX	B6. FIRM INDEX DATE	B7. FIRM PANEL EFFECTIVE/REVISED DATE	B8. FLOOD ZONE(S)	B9. BASE FLOOD ELEVATION(S) (Zone AO, use depth of flooding)
04013C0815	**H**	**April 15, 1998**	**July 19, 2001**	X	2115.82

B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in B9.
☐ FIS Profile ☐ FIRM ☒ Community Determined ☐ Other (Describe): ____

B11. Indicate the elevation datum used for the BFE in B9: X NGVD 1929 ☐ NAVD 1988 ☐ Other (Describe): ____

B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? ☐ Yes X No Designation Date____

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

C1. Building elevations are based on: ☐ Construction Drawings* ☐ Building Under Construction* X Finished Construction
*A new Elevation Certificate will be required when construction of the building is complete.

C2. Building Diagram Number 7 (Select the building diagram most similar to the building for which this certificate is being completed - see pages 6 and 7. If no diagram accurately represents the building, provide a sketch or photograph.)

C3. Elevations – Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO
Complete Items C3.-a-i below according to the building diagram specified in Item C2. State the datum used. If the datum is different from the datum used for the BFE in Section B, convert the datum to that used for the BFE. Show field measurements and datum conversion calculation. Use the space provided or the Comments area of Section D or Section G, as appropriate, to document the datum conversion.

Datum **NGVD 29** Conversion/Comments ____

Elevation reference mark used **RM 120** Does the elevation reference mark used appear on the FIRM? X Yes ☐ No

X a) Top of bottom floor (including basement or enclosure)	**2115.72 ft.**
☐ b) Top of next higher floor	____.__ft.(m)
☐ c) Bottom of lowest horizontal structural member (V zones only)	____.__ft.(m)
☐ d) Attached garage (top of slab)	____.__ft.(m)
☐ e) Lowest elevation of machinery and/or equipment servicing the building (Describe in a Comments area)	____.__ft.(m)
X f) Lowest adjacent (finished) grade (LAG)	**2113.93 ft.**
X g) Highest adjacent (finished) grade (HAG)	**2114.93 ft.**
☐ h) No. of permanent openings (flood vents) within 1 ft. above adjacent grade ____	
☐ i) Total area of all permanent openings (flood vents) in C3.h ____sq. in. (sq. cm)	

License Number, Embossed Seal, Signature, and Date

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
25396
ALAN D.
REECE
Date Signed 6/13/03
ARIZONA, U.S.A.

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

This certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by law to certify elevation information.
I certify that the information in Sections A, B, and C on this certificate represents my best efforts to interpret the data available.
I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.

CERTIFIER'S NAME **Alan D. Reece** LICENSE NUMBER **RLS 25396**

TITLE **Associate Vice President** COMPANY NAME **AZTEC**

ADDRESS	CITY	STATE	ZIP CODE
3747 East Grove Street	**Phoenix**	**AZ**	**85040**

SIGNATURE	DATE	TELEPHONE
	6/12/2003	**602-454-0402**

IMPORTANT: In these spaces, copy the corresponding information from Section A.			For Insurance Company Use:
BUILDING STREET ADDRESS (Including Apt., Unit, Suite, and/or Bldg. No.) OR P.O. ROUTE AND BOX NO.			Policy Number
CITY	STATE	ZIP CODE	Company NAIC Number

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION (CONTINUED)

Copy both sides of this Elevation Certificate for (1) community official, (2) insurance agent/company, and (3) building owner.

COMMENTS

☐ Check here if attachments

SECTION E - BUILDING ELEVATION INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO AND ZONE A (WITHOUT BFE)

For Zone AO and Zone A (without BFE), complete Items E1 through E4. If the Elevation Certificate is intended for use as supporting information for a LOMA or LOMR-F, Section C must be completed.

E1. Building Diagram Number _(Select the building diagram most similar to the building for which this certificate is being completed – see pages 6 and 7. If no diagram accurately represents the building, provide a sketch or photograph.)

E2. The top of the bottom floor (including basement or enclosure) of the building is __ ft.(m) __in.(cm) ☐ above or ☐ below (check one) the highest adjacent grade. (Use natural grade, if available).

E3. For Building Diagrams 6-8 with openings (see page 7), the next higher floor or elevated floor (elevation b) of the building is __ ft.(m) __in.(cm) above the highest adjacent grade. Complete items C3.h and C3.i on front of form.

E4. The top of the platform of machinery and/or equipment servicing the building is __ ft.(m) __in.(cm) ☐ above or ☐ below (check one) the highest adjacent grade. (Use natural grade, if available).

E5. For Zone AO only: If no flood depth number is available, is the top of the bottom floor elevated in accordance with the community's floodplain management ordinance?
☐ Yes ☐ No ☐ Unknown. The local official must certify this information in Section G.

SECTION F - PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION

The property owner or owner's authorized representative who completes Sections A, B, C (Items C3.h and C3.i only), and E for Zone A (without a FEMA-issued or community-issued BFE) or Zone AO must sign here. *The statements in Sections A, B, C, and E are correct to the best of my knowledge.*

PROPERTY OWNER'S OR OWNER'S AUTHORIZED REPRESENTATIVE'S NAME

ADDRESS | CITY | STATE | ZIP CODE

SIGNATURE | DATE | TELEPHONE

COMMENTS

☐ Check here if attachments

SECTION G - COMMUNITY INFORMATION (OPTIONAL)

The local official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Complete the applicable item(s) and sign below.

G1. ☐ The information in Section C was taken from other documentation that has been signed and embossed by a licensed surveyor, engineer, or architect who is authorized by state or local law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)

G2. ☐ A community official completed Section E for a building located in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.

G3. ☐ The following information (Items G4-G9) is provided for community floodplain management purposes.

G4. PERMIT NUMBER	G5. DATE PERMIT ISSUED	G6. DATE CERTIFICATE OF COMPLIANCE/OCCUPANCY ISSUED

G7. This permit has been issued for: ☐ New Construction ☐ Substantial Improvement

G8. Elevation of as-built lowest floor (including basement) of the building is: ____. __ft.(m) Datum: _____

G9. BFE or (in Zone AO) depth of flooding at the building site is: ____. __ft.(m) Datum: _____

LOCAL OFFICIAL'S NAME | TITLE

COMMUNITY NAME | TELEPHONE

SIGNATURE | DATE

COMMENTS

☐ Check here if attachments

FEDERAL EMERGENCY MANAGEMENT AGENCY
NATIONAL FLOOD INSURANCE PROGRAM

O.M.B. No. 3067-0077
Expires December 31, 2005

ELEVATION CERTIFICATE

Important: Read the instructions on pages 1 - 7.

SECTION A - PROPERTY OWNER INFORMATION

For Insurance Company Use:
Policy Number
Company NAIC Number

BUILDING OWNER'S NAME
John Whitehurst

BUILDING STREET ADDRESS (Including Apt., Unit, Suite, and/or Bldg. No.) OR P.O. ROUTE AND BOX NO.
5976 E Agave Pl

CITY	STATE	ZIP CODE
Carefree	**AZ**	**85331**

PROPERTY DESCRIPTION (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.)
Lot 5, Carefree Mountain Estates 211-28-238

BUILDING USE (e.g., Residential, Non-residential, Addition, Accessory, etc. Use a Comments area, if necessary.)
Residential

LATITUDE/LONGITUDE (OPTIONAL) (##° - ##' - ##.##" or ##.#####°)
33°48'02.28" N 111°57'07.49" W

HORIZONTAL DATUM: ☐ NAD 1927 X NAD 1983

SOURCE: X GPS (Type): **RTK** ☐ USGS Quad Map ☐ Other: ____

SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

B1. NFIP COMMUNITY NAME & COMMUNITY NUMBER	B2. COUNTY NAME	B3. STATE
Carefree, Town of 040126	**Maricopa**	**AZ**

B4. MAP AND PANEL NUMBER	B5. SUFFIX	B6. FIRM INDEX DATE	B7. FIRM PANEL EFFECTIVE/REVISED DATE	B8. FLOOD ZONE(S)	B9. BASE FLOOD ELEVATION(S) (Zone AO, use depth of flooding)
04013C0815	**H**	**April 15, 1998**	**July 19, 2001**	X	2109.75

B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in B9.
☐ FIS Profile ☐ FIRM ☒ Community Determined ☐ Other (Describe): ____

B11. Indicate the elevation datum used for the BFE in B9: X NGVD 1929 ☐ NAVD 1988 ☐ Other (Describe): ____

B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? ☐ Yes X No Designation Date____

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

C1. Building elevations are based on: ☐ Construction Drawings* ☐ Building Under Construction* X Finished Construction

*A new Elevation Certificate will be required when construction of the building is complete.

C2. Building Diagram Number 7 (Select the building diagram most similar to the building for which this certificate is being completed - see pages 6 and 7. If no diagram accurately represents the building, provide a sketch or photograph.)

C3. Elevations – Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO

Complete Items C3.-a-i below according to the building diagram specified in Item C2. State the datum used. If the datum is different from the datum used for the BFE in Section B, convert the datum to that used for the BFE. Show field measurements and datum conversion calculation. Use the space provided or the Comments area of Section D or Section G, as appropriate, to document the datum conversion.

Datum **NGVD 29** Conversion/Comments ____

Elevation reference mark used **RM 120** Does the elevation reference mark used appear on the FIRM? X Yes ☐ No

X a) Top of bottom floor (including basement or enclosure) **2108.58 ft.**
☐ b) Top of next higher floor ____.__ft.(m)
☐ c) Bottom of lowest horizontal structural member (V zones only) ____.__ft.(m)
☐ d) Attached garage (top of slab) ____.__ft.(m)
☐ e) Lowest elevation of machinery and/or equipment servicing the building (Describe in a Comments area) ____.__ft.(m)
X f) Lowest adjacent (finished) grade (LAG) **2107.07 ft.**
X g) Highest adjacent (finished) grade (HAG) **2108.56 ft.**
☐ h) No. of permanent openings (flood vents) within 1 ft. above adjacent grade ____
☐ i) Total area of all permanent openings (flood vents) in C3.h ____sq. in. (sq. cm)

License Number, Embossed Seal, Signature, and Date

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
25396
ALAN D.
REECE
Date Signed 6/13/03
ARIZONA, U.S.A.

Alan D Reece

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

This certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by law to certify elevation information.
I certify that the information in Sections A, B, and C on this certificate represents my best efforts to interpret the data available.
I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.

CERTIFIER'S NAME **Alan D. Reece** LICENSE NUMBER **RLS 25396**

TITLE **Associate Vice President** COMPANY NAME **AZTEC**

ADDRESS	CITY	STATE	ZIP CODE
3747 East Grove Street	**Phoenix**	**AZ**	**85040**

SIGNATURE	DATE	TELEPHONE
	6/12/2003	**602-454-0402**

IMPORTANT: In these spaces, copy the corresponding information from Section A.			For Insurance Company Use:
BUILDING STREET ADDRESS (Including Apt., Unit, Suite, and/or Bldg. No.) OR P.O. ROUTE AND BOX NO.			Policy Number
CITY	STATE	ZIP CODE	Company NAIC Number

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION (CONTINUED)

Copy both sides of this Elevation Certificate for (1) community official, (2) insurance agent/company, and (3) building owner.

COMMENTS

☐ Check here if attachments

SECTION E - BUILDING ELEVATION INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO AND ZONE A (WITHOUT BFE)

For Zone AO and Zone A (without BFE), complete Items E1 through E4. If the Elevation Certificate is intended for use as supporting information for a LOMA or LOMR-F, Section C must be completed.

E1. Building Diagram Number _(Select the building diagram most similar to the building for which this certificate is being completed – see pages 6 and 7. If no diagram accurately represents the building, provide a sketch or photograph.)

E2. The top of the bottom floor (including basement or enclosure) of the building is __ ft.(m) __in.(cm) ☐ above or ☐ below (check one) the highest adjacent grade. (Use natural grade, if available).

E3. For Building Diagrams 6-8 with openings (see page 7), the next higher floor or elevated floor (elevation b) of the building is __ ft.(m) __in.(cm) above the highest adjacent grade. Complete items C3.h and C3.i on front of form.

E4. The top of the platform of machinery and/or equipment servicing the building is __ ft.(m) __in.(cm) ☐ above or ☐ below (check one) the highest adjacent grade. (Use natural grade, if available).

E5. For Zone AO only: If no flood depth number is available, is the top of the bottom floor elevated in accordance with the community's floodplain management ordinance?
☐ Yes ☐ No ☐ Unknown. The local official must certify this information in Section G.

SECTION F - PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION

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PROPERTY OWNER'S OR OWNER'S AUTHORIZED REPRESENTATIVE'S NAME

ADDRESS | CITY | STATE | ZIP CODE

SIGNATURE | DATE | TELEPHONE

COMMENTS

☐ Check here if attachments

SECTION G - COMMUNITY INFORMATION (OPTIONAL)

The local official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Complete the applicable item(s) and sign below.

G1. ☐ The information in Section C was taken from other documentation that has been signed and embossed by a licensed surveyor, engineer, or architect who is authorized by state or local law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)

G2. ☐ A community official completed Section E for a building located in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.

G3. ☐ The following information (Items G4-G9) is provided for community floodplain management purposes.

G4. PERMIT NUMBER	G5. DATE PERMIT ISSUED	G6. DATE CERTIFICATE OF COMPLIANCE/OCCUPANCY ISSUED

G7. This permit has been issued for: ☐ New Construction ☐ Substantial Improvement

G8. Elevation of as-built lowest floor (including basement) of the building is: ____.__ft.(m) Datum: _____

G9. BFE or (in Zone AO) depth of flooding at the building site is: ____.__ft.(m) Datum: _____

LOCAL OFFICIAL'S NAME | TITLE

COMMUNITY NAME | TELEPHONE

SIGNATURE | DATE

COMMENTS

☐ Check here if attachments

FEDERAL EMERGENCY MANAGEMENT AGENCY
NATIONAL FLOOD INSURANCE PROGRAM

O.M.B. No. 3067-0077
Expires December 31, 2005

ELEVATION CERTIFICATE

Important: Read the instructions on pages 1 - 7.

SECTION A - PROPERTY OWNER INFORMATION

For Insurance Company Use:
Policy Number
Company NAIC Number

BUILDING OWNER'S NAME
John Merendino

BUILDING STREET ADDRESS (Including Apt., Unit, Suite, and/or Bldg. No.) OR P.O. ROUTE AND BOX NO.
6035 E Languid Lane

CITY	STATE	ZIP CODE
Carefree	**AZ**	**85331**

PROPERTY DESCRIPTION (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.)
Lot 7, Los Reales at Carefree 211-28-337

BUILDING USE (e.g., Residential, Non-residential, Addition, Accessory, etc. Use a Comments area, if necessary.)
Residential

LATITUDE/LONGITUDE (OPTIONAL) (##° - ##' - ##.##" or ##.#####°)
33°48'03.48" N 111°57'05.85" W

HORIZONTAL DATUM: ☐ NAD 1927 X NAD 1983

SOURCE: X GPS (Type): **RTK** ☐ USGS Quad Map ☐ Other: ____

SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

B1. NFIP COMMUNITY NAME & COMMUNITY NUMBER	B2. COUNTY NAME	B3. STATE
Carefree, Town of 040126	**Maricopa**	**AZ**

B4. MAP AND PANEL NUMBER	B5. SUFFIX	B6. FIRM INDEX DATE	B7. FIRM PANEL EFFECTIVE/REVISED DATE	B8. FLOOD ZONE(S)	B9. BASE FLOOD ELEVATION(S) (Zone AO, use depth of flooding)
04013C0815	**H**	**April 15, 1998**	**July 19, 2001**	X	2113.00

B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in B9.
☐ FIS Profile ☐ FIRM ☒ Community Determined ☐ Other (Describe): ____

B11. Indicate the elevation datum used for the BFE in B9: X NGVD 1929 ☐ NAVD 1988 ☐ Other (Describe): ____

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Datum **NGVD 29** Conversion/Comments ____

Elevation reference mark used **RM 120** Does the elevation reference mark used appear on the FIRM? X Yes ☐ No

X a) Top of bottom floor (including basement or enclosure) **2110.48 ft.**
☐ b) Top of next higher floor ____.__ft.(m)
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X f) Lowest adjacent (finished) grade (LAG) **2109.22 ft.**
X g) Highest adjacent (finished) grade (HAG) **2113.43 ft.**
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☐ i) Total area of all permanent openings (flood vents) in C3.h ____sq. in. (sq. cm)

License Number, Embossed Seal, Signature, and Date

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
25396
ALAN D.
REECE
Date Signed 6/13/03
ARIZONA, U.S.A.

Alan D. Reece

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I certify that the information in Sections A, B, and C on this certificate represents my best efforts to interpret the data available.
I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.

CERTIFIER'S NAME **Alan D. Reece** LICENSE NUMBER **RLS 25396**

TITLE **Associate Vice President** COMPANY NAME **AZTEC**

ADDRESS	CITY	STATE	ZIP CODE
3747 East Grove Street	**Phoenix**	**AZ**	**85040**

SIGNATURE	DATE	TELEPHONE
	6/12/2003	**602-454-0402**

IMPORTANT: In these spaces, copy the corresponding information from Section A.			For Insurance Company Use:
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COMMENTS

☐ Check here if attachments

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E5. For Zone AO only: If no flood depth number is available, is the top of the bottom floor elevated in accordance with the community's floodplain management ordinance?
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SECTION F - PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION

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PROPERTY OWNER'S OR OWNER'S AUTHORIZED REPRESENTATIVE'S NAME

ADDRESS | CITY | STATE | ZIP CODE

SIGNATURE | DATE | TELEPHONE

COMMENTS

☐ Check here if attachments

SECTION G - COMMUNITY INFORMATION (OPTIONAL)

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G1. ☐ The information in Section C was taken from other documentation that has been signed and embossed by a licensed surveyor, engineer, or architect who is authorized by state or local law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)

G2. ☐ A community official completed Section E for a building located in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.

G3. ☐ The following information (Items G4-G9) is provided for community floodplain management purposes.

G4. PERMIT NUMBER	G5. DATE PERMIT ISSUED	G6. DATE CERTIFICATE OF COMPLIANCE/OCCUPANCY ISSUED

G7. This permit has been issued for: ☐ New Construction ☐ Substantial Improvement

G8. Elevation of as-built lowest floor (including basement) of the building is: ____.__ft.(m) Datum: ____

G9. BFE or (in Zone AO) depth of flooding at the building site is: ____.__ft.(m) Datum: ____

LOCAL OFFICIAL'S NAME | TITLE

COMMUNITY NAME | TELEPHONE

SIGNATURE | DATE

COMMENTS

☐ Check here if attachments

Terravita Way Boundary Conditions and Flow Split Determination

TO: File

COPIES: File

FROM: Tony Bokich

DATE: April 30, 2003 (Revised (3/19/04)

A hydraulic analysis was performed on Terravita Way to determine the downstream boundary condition for the Unnamed Central Tributary to Cave Creek and to determine the direction flow would travel. Flow could travel north through 4-10'x4' RCBC's, or north, south or west over Terravita Way.

The Haestad CulvertMaster program was used to determine the maximum water surface elevation at Terravita Way of 2141.45 and used as the boundary condition. This information was used to determine the maximum flow through the box culverts and overtopping flows at 4 low points along the roadway profile. Culvert and channel analyses generated a flow-rating table of box culvert and overtopping flows at four low points on the roadway profile. The analysis determined that 1,578 cfs flows through the box culvert while 142 cfs, 562 cfs, and 514 cfs will flow to the south, west, and north, respectively, of Terravita Way.

The total flow used in the analysis is 2,849 cfs. This figure omits the small side channel flow that enters the north side of the main stream about 70 feet upstream of the culvert. This wash (UC84 in the HEC-1 output) was combined at this location after the initial flow split of 2092 to the north and 704 to the south. It increased the north peak to 2116 cfs. The difference in peak flows between the overtopping analysis and the HEC-RAS flows at Terravita Way is a total of 24 cfs or 1.1% of the total flow.

The results of the flow split analysis produced rating curves that determine the flow split quantitatively. These rating curves were incorporated into the HEC-1 model. The peak flow entering the Unnamed Central Tributary to Cave Creek - North Branch is taken from concentration point CP84. The peak flow entering the South Branch is taken from RD84S and then D84IIN. Refer to the Summary of HEC-RAS Model Flow Changes table in the TDN.

Terravita Way Flow Split Estimation
03/22/2004
Carefree DMP
162944.DP.15.03

A total flow of 2849 cfs arrives at Terravita Way. The 2489 cfs flow will split at Terravita Way and will go:

1. Through the culvert to the North
2. Over the Road to the North
3. Over the Road to the West and
4. Over the Road and to the South.

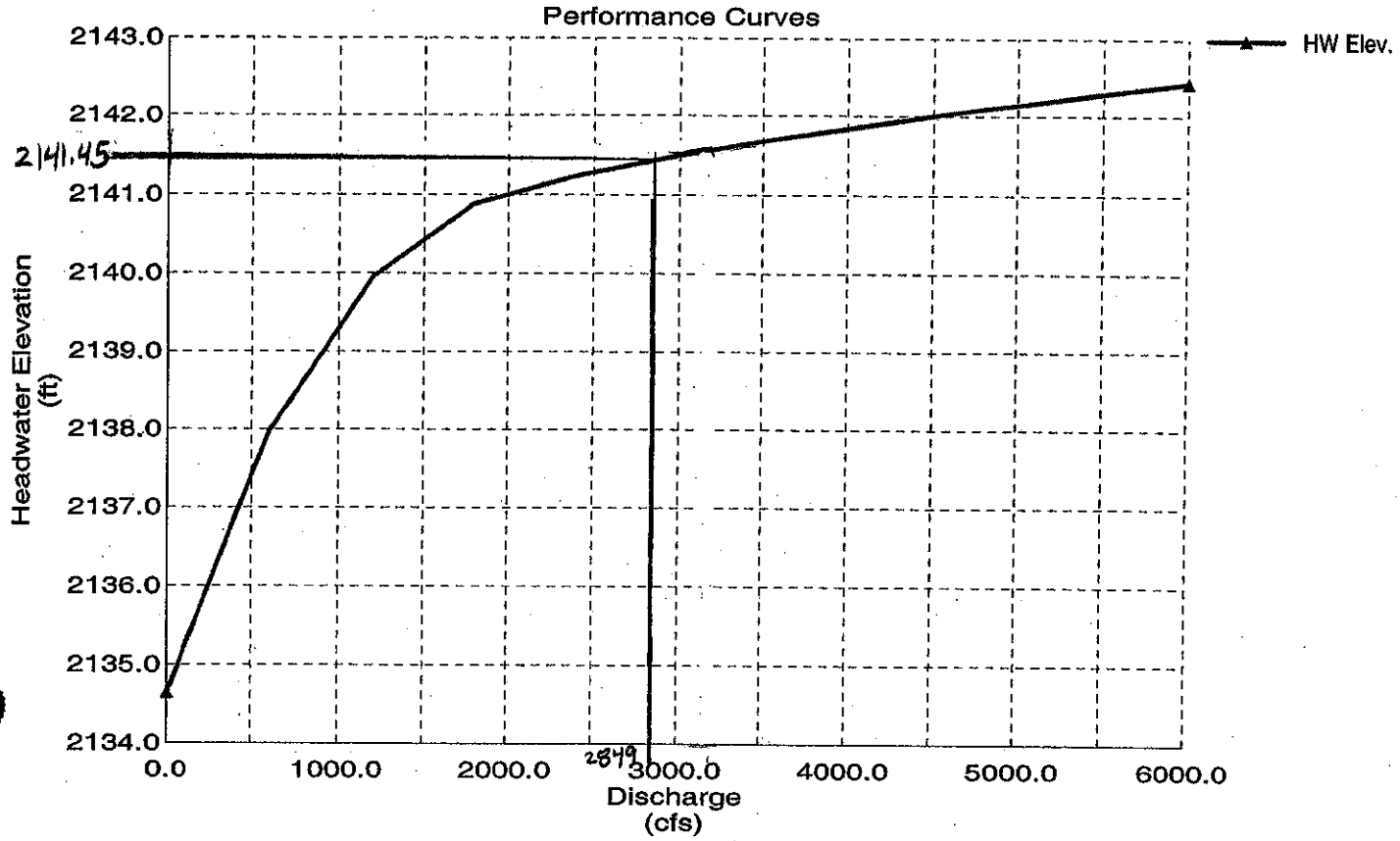
Culvert capacity was analyzed using both Culvert Master and HY-8 and the results were identical. A rating curve was developed that takes into account the headwater depths. Rating curves were developed for the total flow, culvert and overtopping and just for the culvert. The flow split was further analyzed with the Culvertmaster program at the centerline of overtopping (see attached map). This is the line at which overtopping will occur, it is not the centerline of the roadway. Using the 5 existing low points on the centerline profile, the centerline was divided into individual sections to determine the amount of flow that will go North, South, or West. A rating table was determined for each section to yield total flow for each section.

The resulting Rating Table is as follows:

WSE	Total Flow	Road	Culvert	North (Road & Culvert)	South	West
2134.64	0	0	0	0	0	0
2135.5	79.7	0	79.7	79.7	0	0
2136.55	255	0	255	255	0	0
2137.59	490	0	490	490	0	0
2138.98	880	0	880	880	0	0
2140.08	1250	50	1200	1250	0	0
2140.67	1550	175	1375	1550	0	0
2141	1964	514	1450	1839	0	125
2141.28	2475	950	1525	1992	10	375
2141.45	2849	1271	1578	2092	142	562
2141.52	3043	1443	1600	2270	150	663

Performance Curves Report
terravita way

Range Data:				
	Minimum	Maximum	Increment	
Discharge	0.00	6,000.00	600.00	cfs



Culvert Analysis Report
Terravita Way

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	2,141.45 ft	Discharge	1,577.80 cfs
Inlet Control HW Elev	2,141.45 ft	Tailwater Elevation	2,133.70 ft
Outlet Control HW Elev	2,140.83 ft	Control Type	Inlet Control
Headwater Depth/ Height	1.70		

Grades			
Upstream Invert	2,134.64 ft	Downstream Invert	2,133.70 ft
Length	90.00 ft	Constructed Slope	0.010444 ft/ft

Hydraulic Profile			
Profile	S2	Depth, Downstream	2.79 ft
Slope Type	Steep	Normal Depth	2.43 ft
Flow Regime	Supercritical	Critical Depth	3.64 ft
Velocity Downstream	14.12 ft/s	Critical Slope	0.003320 ft/ft

Section			
Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	10.00 ft
Section Size	10 x 4 ft	Rise	4.00 ft
Number Sections	4		

Outlet Control Properties			
Outlet Control HW Elev	2,140.83 ft	Upstream Velocity Head	1.82 ft
Ke	0.40	Entrance Loss	0.73 ft

Inlet Control Properties			
Inlet Control HW Elev	2,141.45 ft	Flow Control	Submerged
Inlet Type 3/4" chamfers; 45 ° skewed headwall		Area Full	160.0 ft²
K	0.52200	HDS 5 Chart	11
M	0.66700	HDS 5 Scale	1
C	0.04020	Equation Form	2
Y	0.73000		

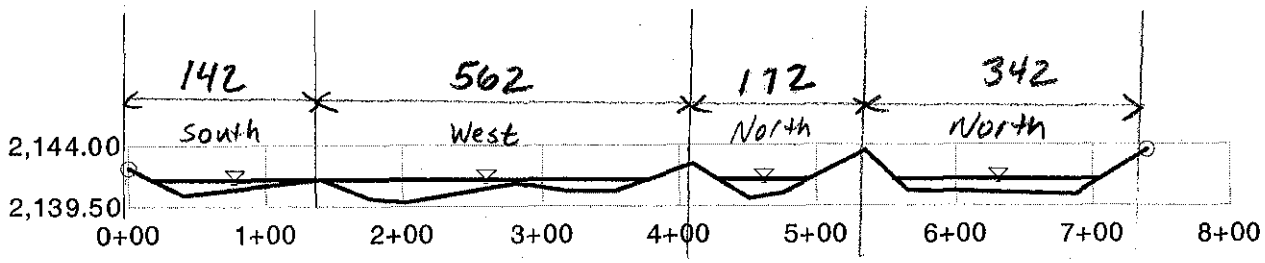
Cross Section
Cross Section for Irregular Channel

TERRAVITA WAY FLOW SPLIT ESTIMATION

Project Description	
Worksheet	Overall Roadway Section
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Total Flow = 2849 cfs
Culvert = 1578 cfs
Road = 1271 cfs
WSE = 2141.45 ft

Section Data	
Mannings Coefficient	0.035
Slope	0.005919 ft/ft
Water Surface Elevation	2,141.45 ft
Elevation Range	2,139.80 to 2,143.56
Discharge	1,271.07 cfs



Roadway Profile

V:10.0
H:1
NTS

Worksheet
Worksheet for Irregular Channel

Project Description	
Worksheet	Overall Roadway Section
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Input Data		
Slope	0.005919	ft/ft
Water Surface Elevation	2,141.45	ft

Options	
Current Roughness Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results		
Mannings Coefficient	0.035	
Elevation Range	2,139.80 to 2,143.56	
Discharge	1,271.07	cfs
Flow Area	453.2	ft²
Wetted Perimeter	569.63	ft
Top Width	569.39	ft
Actual Depth	1.65	ft
Critical Elevation	2,141.15	ft
Critical Slope	0.021377	ft/ft
Velocity	2.80	ft/s
Velocity Head	0.12	ft
Specific Energy	2,141.57	ft
Froude Number	0.55	
Flow Type	Subcritical	

Calculation Messages:
Flow is divided.

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00	7+40	0.035

Natural Channel Points

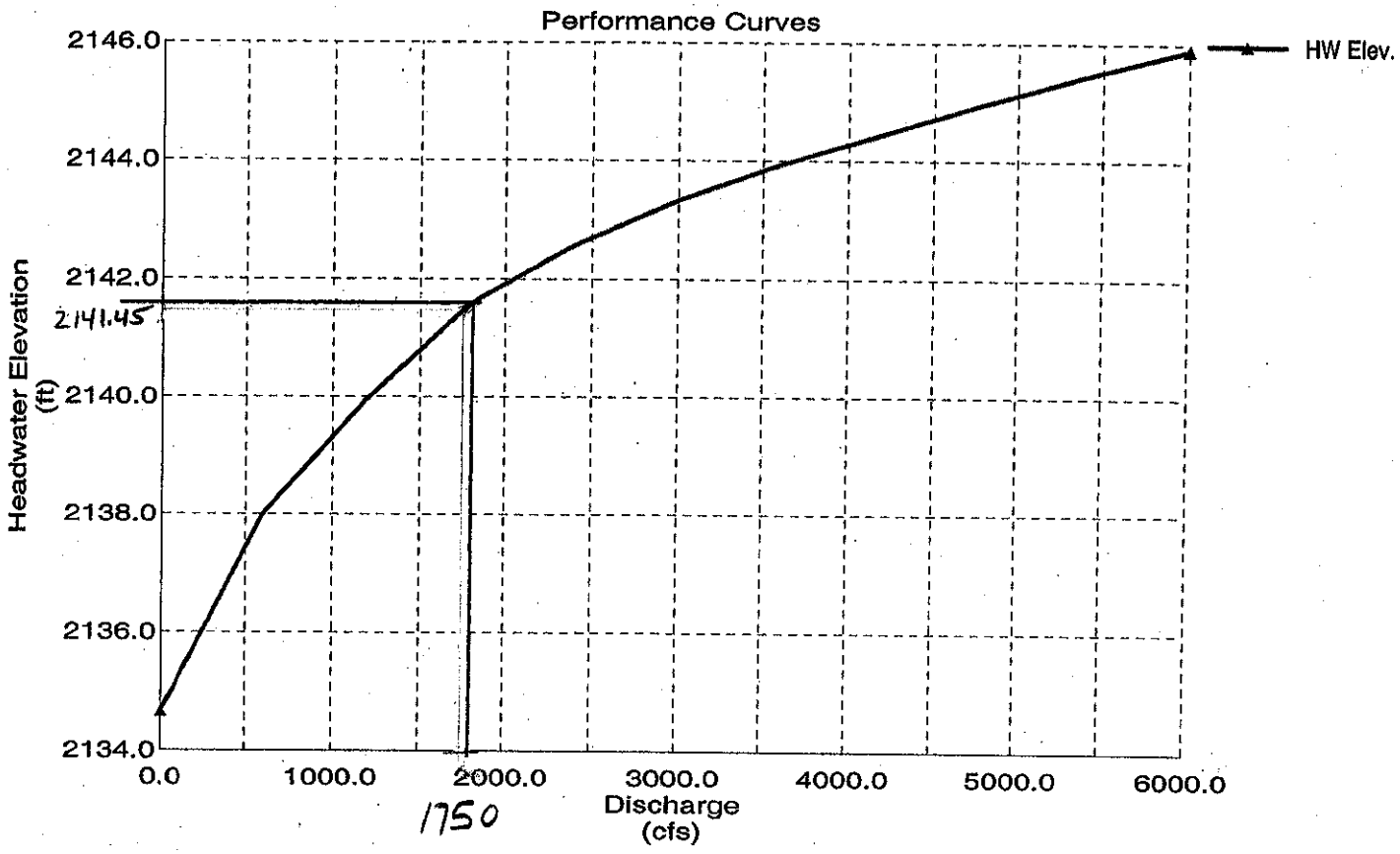
Station (ft)	Elevation (ft)
0+00	2,142.30
0+40	2,140.35
1+40	2,141.50
1+75	2,140.05
2+01	2,139.80
2+81	2,141.14
3+17	2,140.62
3+54	2,140.62
4+10	2,142.62
4+51	2,140.08
4+76	2,140.49

Worksheet
Worksheet for Irregular Channel

Natural Channel Points	
Station (ft)	Elevation (ft)
5+35	2,143.56
5+65	2,140.58
6+88	2,140.38
7+40	2,143.50

Performance Curves Report
terravita way <north 1>

Range Data:				
	Minimum	Maximum	Increment	
Discharge	0.00	6,000.00	600.00	cfs



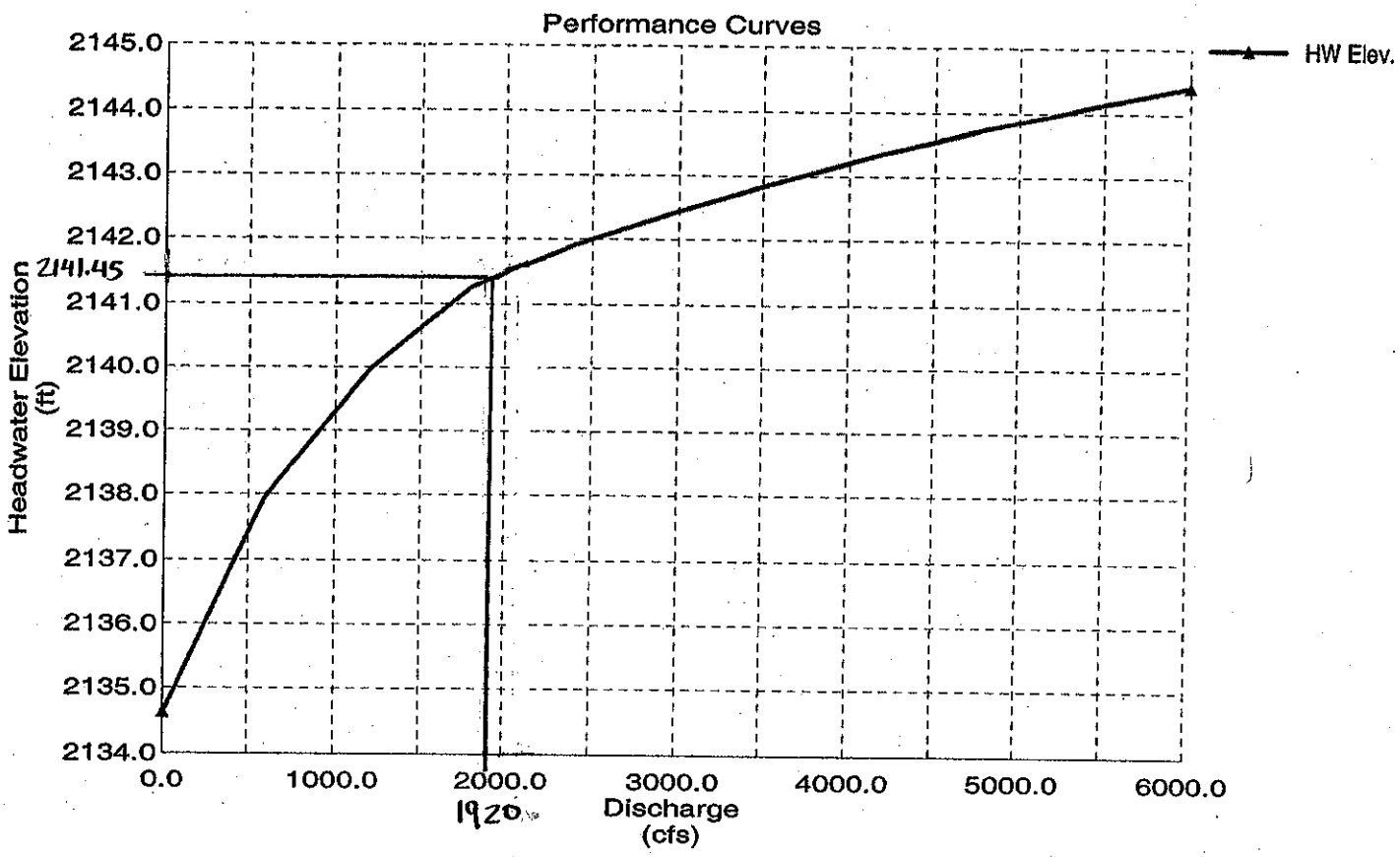
1750 - 1578 = 172 CFS

CULVERT FLOW

OVERTOPPING

Performance Curves Report
terravita way <north 2>

Range Data:				
	Minimum	Maximum	Increment	
Discharge	0.00	6,000.00	600.00	cfs



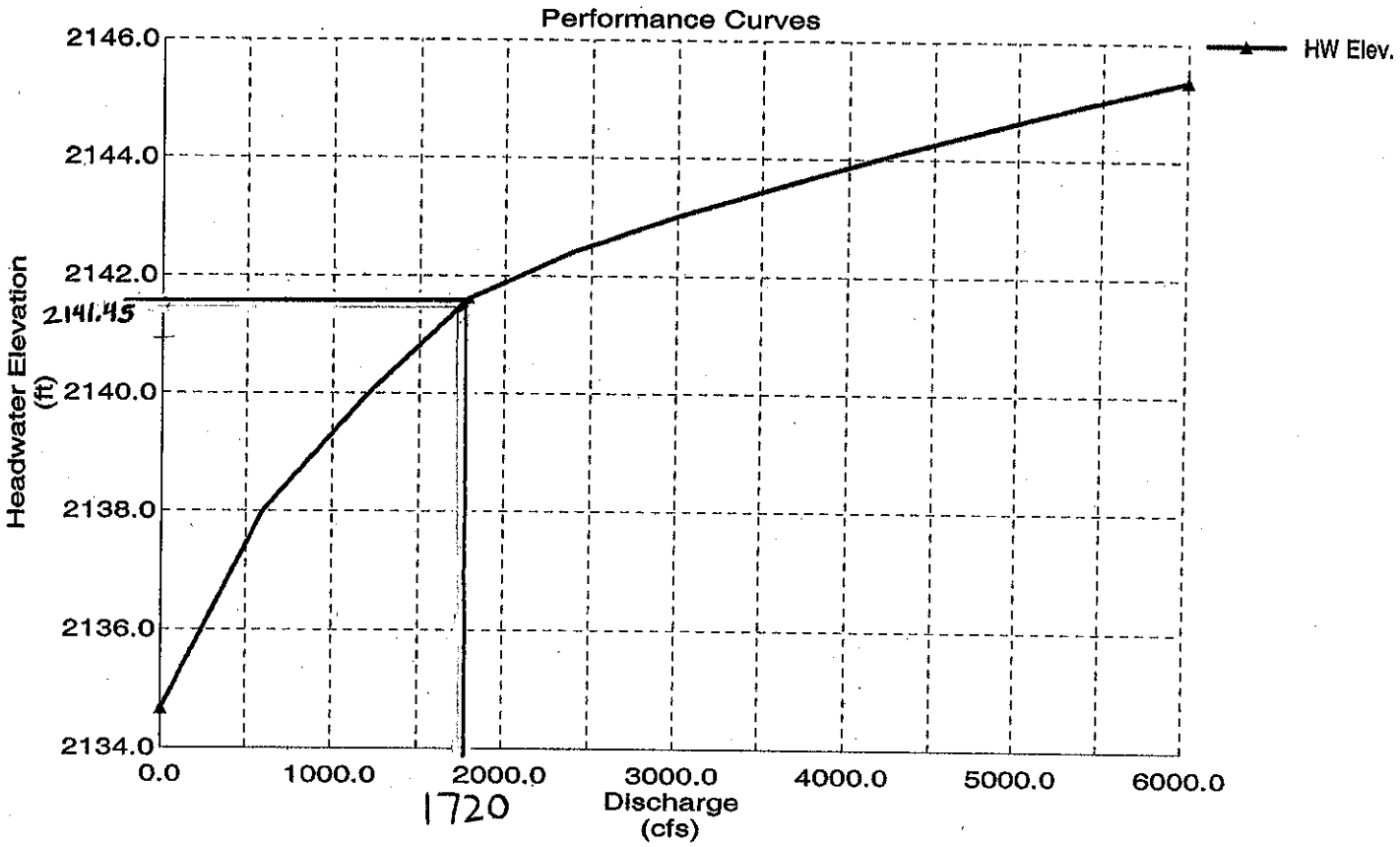
1920 - 1578 = 342 cfs

↑ CULVERT FLOW

↑ OVERTOPPING

Performance Curves Report
terravita way <south>

Range Data:			
	Minimum	Maximum	Increment
Discharge	0.00	6,000.00	600.00 cfs



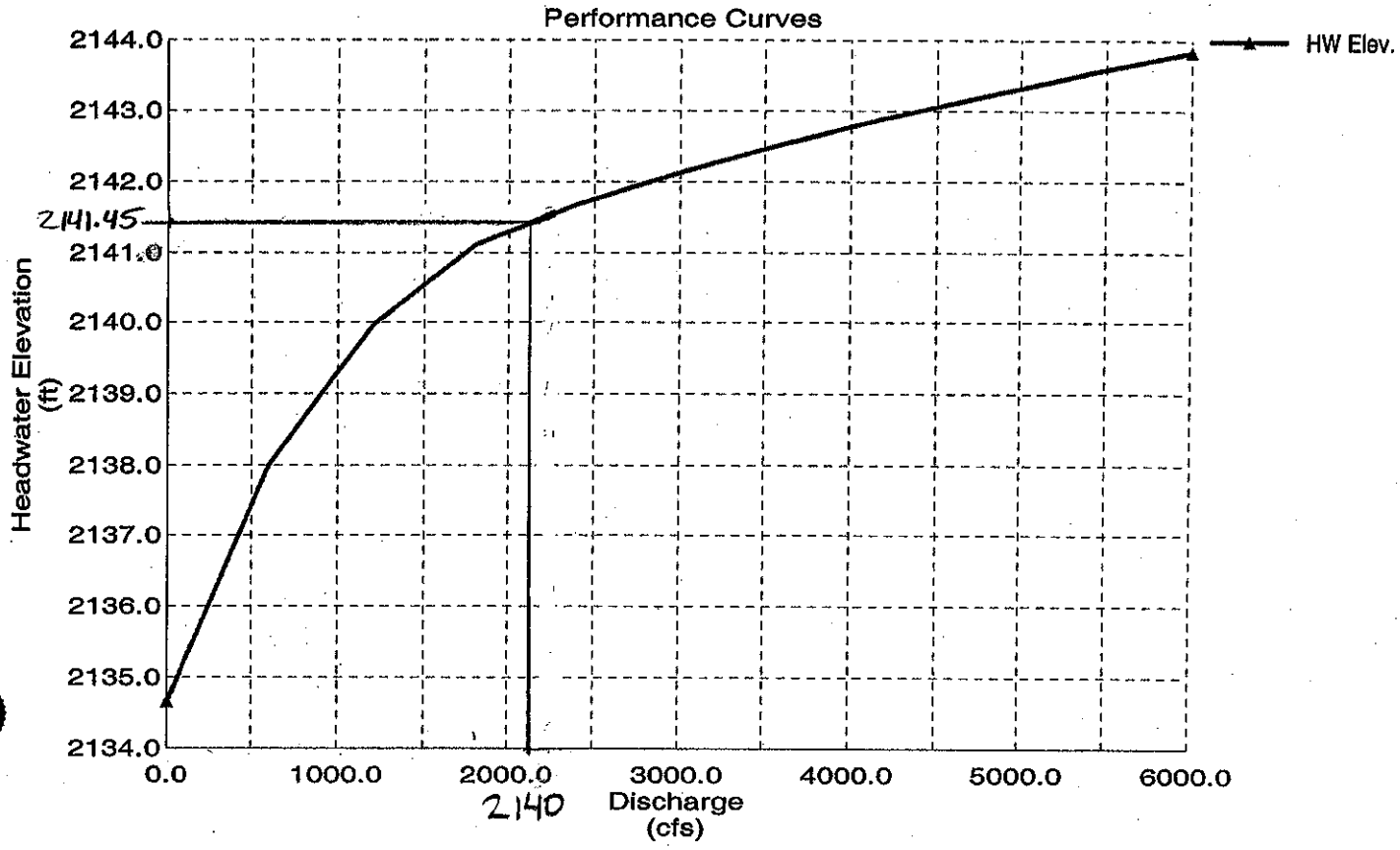
1720 - 1578 = 142 cfs

culvert flow

overtopping

Performance Curves Report
terravita way <west>

Range Data:				
	Minimum	Maximum	Increment	
Discharge	0.00	6,000.00	600.00	cfs

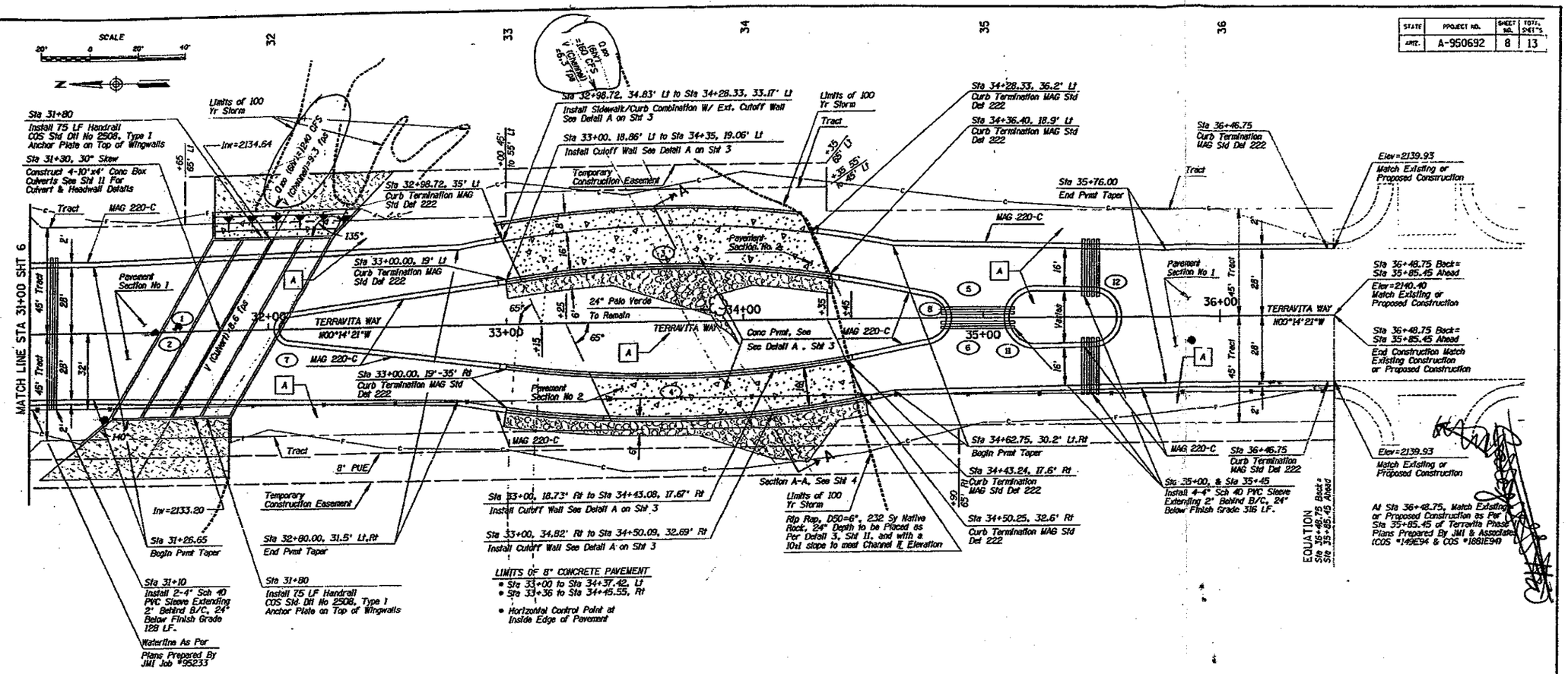


2140 − 1578 = 562 cfs

culvert flow

overtopping

STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
ARIZ.	A-950692	8	13



HORIZONTAL CONTROL-TERRAVITA WAY (All Locations At Inside EOP)						
No	Rad	Length	Tangent	Delta	PI Sta	PI Off
1	450'	58.62'	29.35'	07°27'48.58"	31+56.00	0' Lt
2	450'	58.62'	29.35'	07°27'48.58"	31+56.00	0' Lt
3	450'	150.43'	75.92'	19°09'10.30"	33+85.00	30' Lt
4	450'	150.43'	75.92'	19°09'10.30"	33+85.00	30' Rt
5	450'	91.81'	46.06'	11°41'21.80"	35+30.00	0' Lt
6	450'	91.81'	46.06'	11°41'12.80"	35+30.00	0' Lt
7	7'	18.34'	-	-	32+09.44	0' Lt
8	11'	30.18'	-	-	34+75.71	0' Lt
9	30'	47.14'	-	-	30+82.00	60' Lt
10	30'	47.14'	-	-	30+94.00	60' Rt
11	13.1'	41.85'	-	-	35+22.09	0' Lt
12	12.6'	39.10'	-	-	35+45.38	0' Lt

SURVEY MARKER Type B, MAG 120-1			
Sta	Off	Lt	Rt
31+26.65	0'	X	
31+85.35	3.84'	X	X
33+09.72	20.14'	X	X
34+55.65	14.62'	X	X
34+84.89	9.33'	X	X
35+76.06	0'	X	

SURVEY MARKER Type A, MAG 120-1			
Sta	Off	Lt	Rt
31+56.00	0'	X	
33+85.00	30'	X	X
35+30.00	0'	X	

LIST OF QUANTITIES		
Roadway Excavation	Cu Yd	2977
Aggregate Base Course (6" ABC)	Ton	842
3" Asphaltic Concrete (C-¾)	Sq Yd	2344
8" Concrete Pvmt	Sq Yd	429
Rip Rap	Sq Yd	253
Survey Marker, Type A	Each	4
Survey Marker, Type B	Each	10
Cutoff Wall	Lin Ft	560
Structure Excavation	Cu Yd	831
4" Schedule 40 PVC	Lin Ft	444
Roll Curb & Gutter, Type C	Lin Ft	1266

A See Landscape Plans for Complete Median and Roadside Design Information

Notes: 1. Transition Low Flow Crossing Grading to Natural Ground In 50' Each Side. Mesquite Trees Identified on Landscape Plans To Remain Shall Not Be Disturbed on Upstream Side.

2. DRAINAGE EASEMENT CORRIDOR as Defined Under Plat No. 553E95.

3. All Q Quantities are for 100 Year Return Storm-6 Hour Duration.

Terravita Way Construction Drawing

25719

1455E95

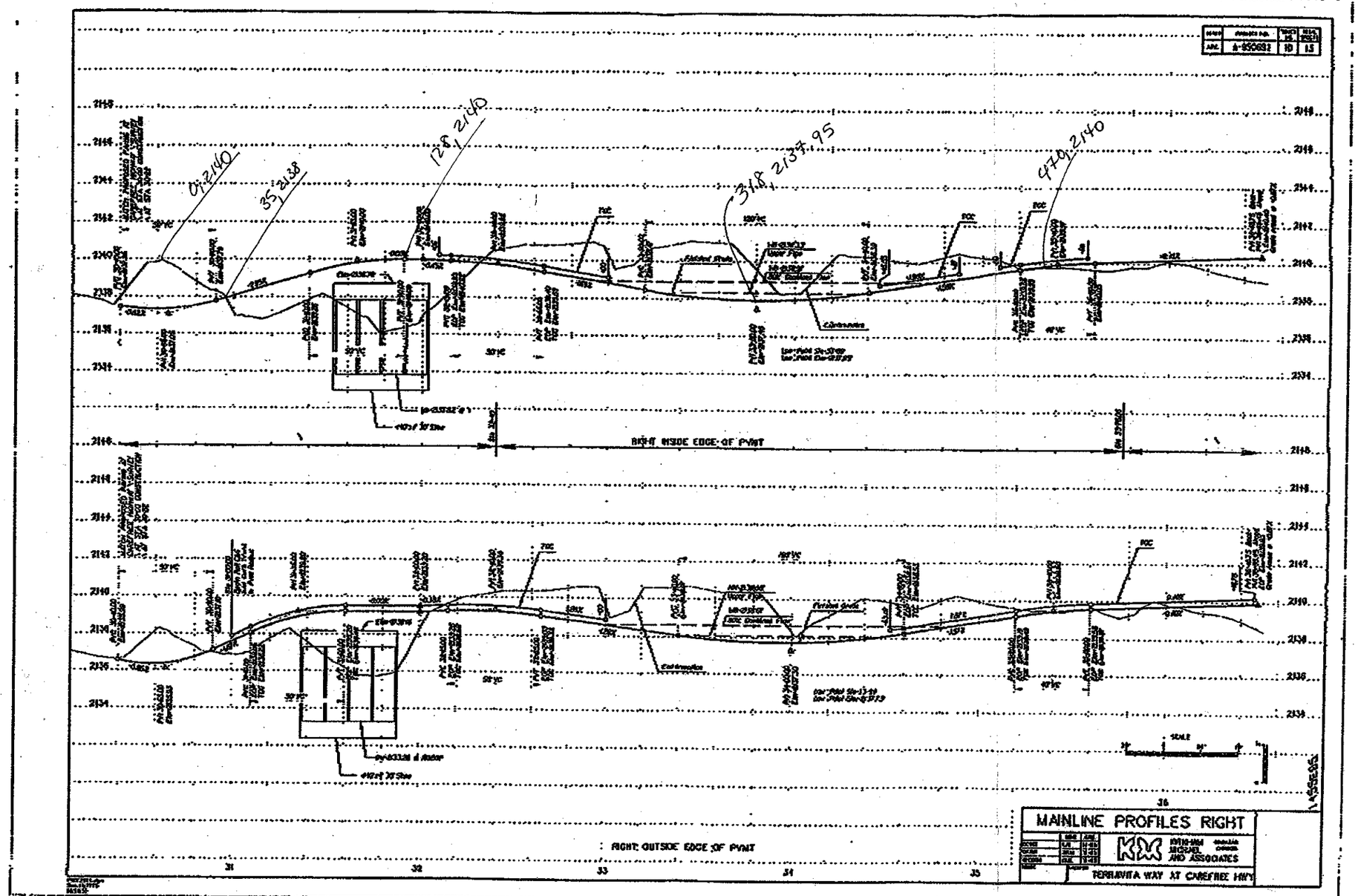
STA 31+00 TO 36+48.75

	NAME	DATE
DESIGN	LR	11-95
DRAWN	JFM	11-95
CHECKED	BJL	11-95
REVISE		

KIRKHAM MICHAEL AND ASSOCIATES CONSULTING ENGINEERS

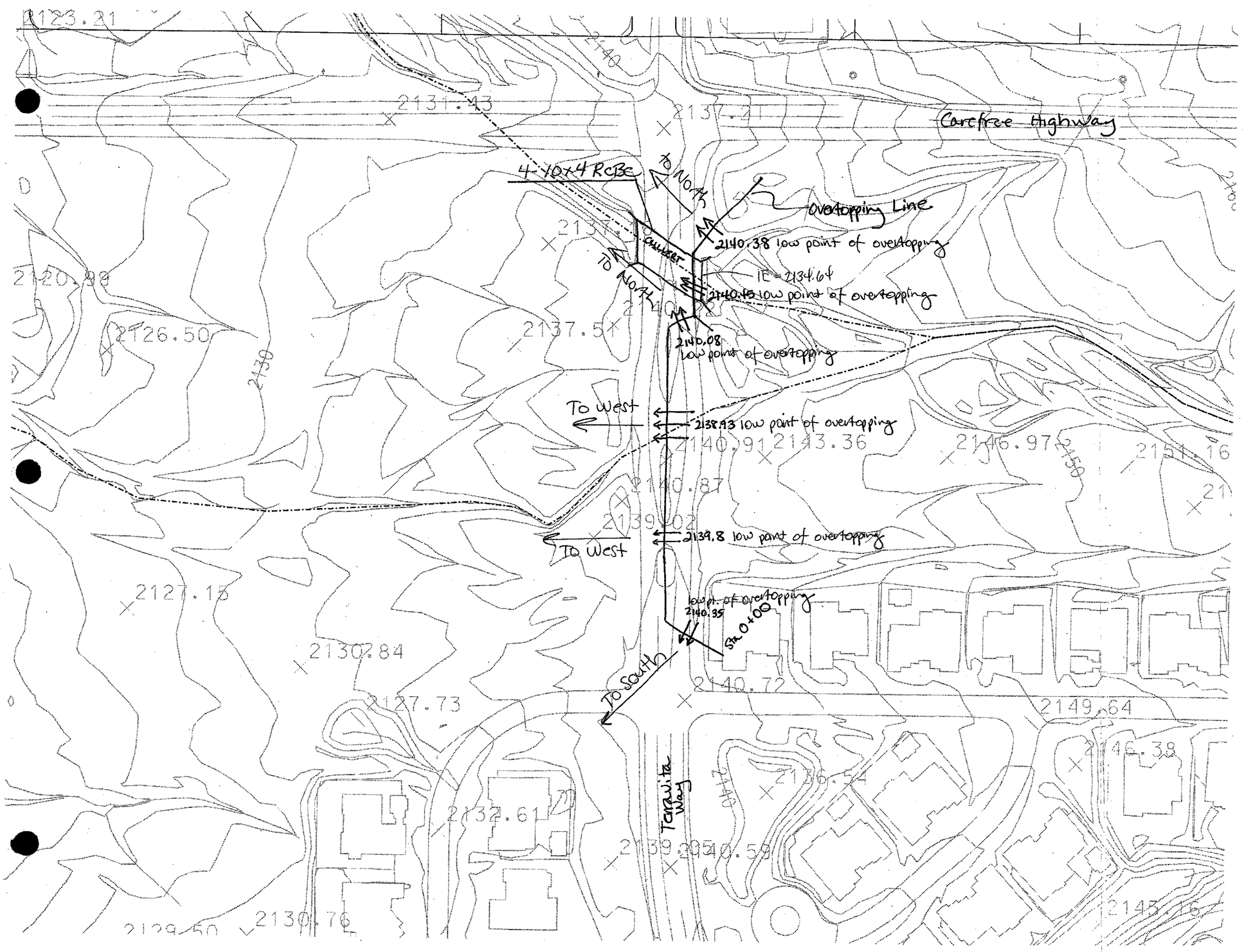
LOCATION: TERRAVITA WAY AT CAREFREE HWY

D84



E:\95\950682\prof\p02.dgn 01/09/2002 11:10:57 AM Kirkham Michael - Do not reproduce

Terravita Way Roadway
Profile At Carefree
Highway



TERRAVITA WAY FLOW SPLIT ESTIMATION

Overtopping Legend

2139.8 Low Point & Low Point Elevation for overtopping

N

1" = 100'

Flow Split at Scottsdale Health Center, Unnamed Central Tributary To Cave Creek

TO: Tony Bokich

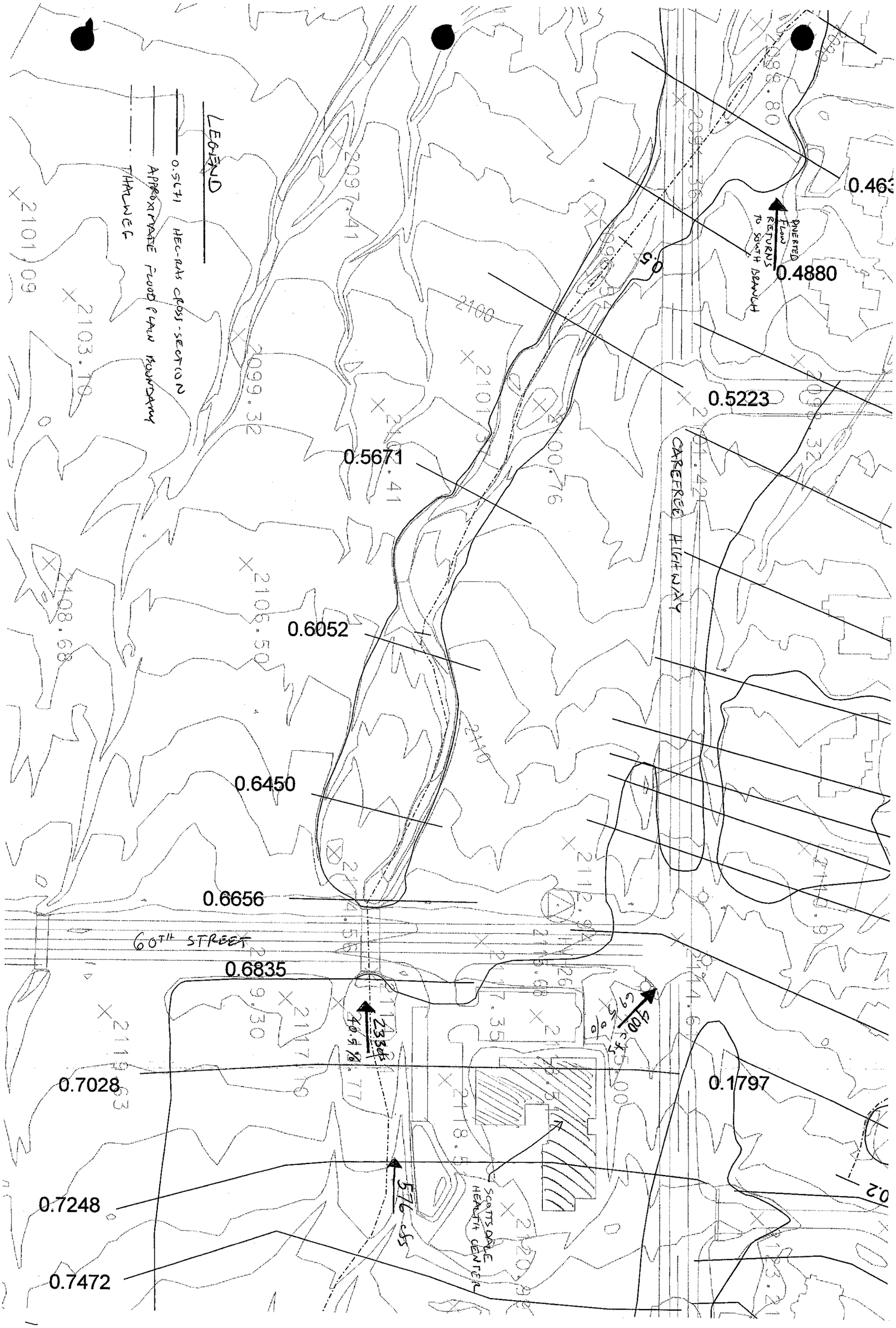
COPIES: File

FROM: Patrick Wolf

DATE: March 13, 2003 (Revised March 23, 2004)

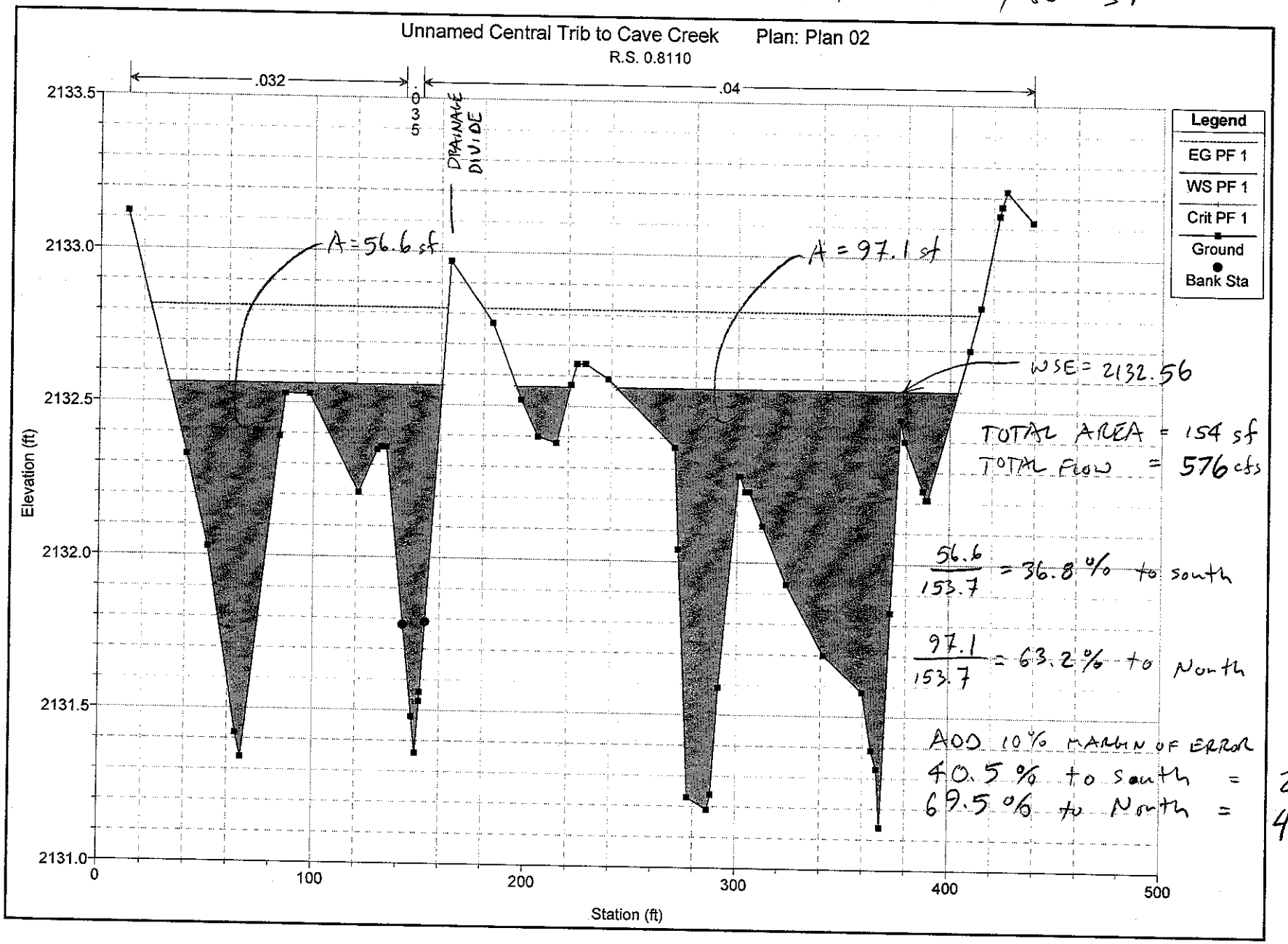
A flow split was calculated upstream of the Scottsdale Health Center, which was based on the previous flows. This split was calculated to be 61 cfs. However, the updated flows are much lower and this split does not occur anymore. The flow that now arrives upstream of the Health Center is 576 cfs, which is lower than the 602 cfs that was previously calculated with the flow split.

The Health Center forms a topographical high point at the diversion. The amount of flow diverted was determined by the percentage of cross sectional area of flow on each side of the diversion plus a 10 percent margin of error (see attached documentation) . With the margin of error factored into the analysis, approximately 400 cfs, will continue north, and 233 cfs will travel south around the structure. Once the diverted flow returns to the South Branch, the flow is calculated by adding 20percent of (CP88EN - D84iiN) as reported from the HEC-1 model. Refer to the Summary of HEC-RAS Model Flow Changes.



FLOWSPLIT AT SCOTTSDALE HEALTH CENTER

FLOW SPLIT @ SCOTTSDALE HEALTH CENTER / 60th ST



TOTAL AREA = 154 sf
TOTAL FLOW = 576 cfs

$\frac{56.6}{153.7}$ = 36.8 % to south

$\frac{97.1}{153.7}$ = 63.2 % to North

ADD 10% MARGIN OF ERROR
40.5 % to south = 233 cfs
69.5 % to North = 400 cfs

Carefree DMP
03-27-03
Cross section stations were adjusted to eliminate area calculation error

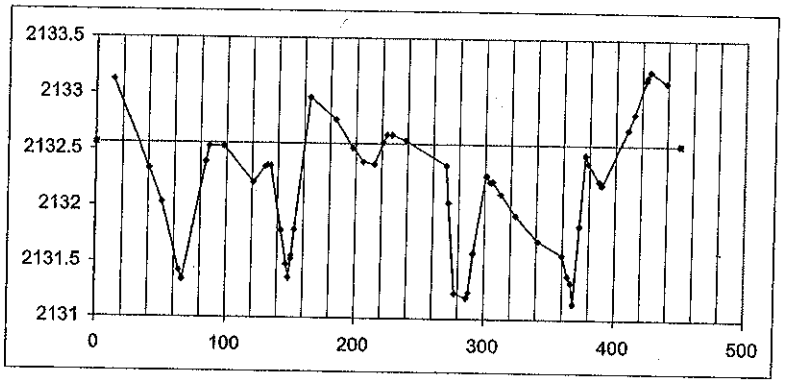
Computation of areas, perimeters, and topwidths

-1 indicates section is completely dry
0 indicates section is partially submerged
1 indicates section is fully submerged or at water line

Xsect # 0.611
wse = 2132.66

Sta	elev	Water Surface	Area Partially Submerged d	Area Submerge	Area Total Area	Perimeter Partial	Perimeter Full Sego.	Perimeter Total Per.	Top Width Partial	Top Width Full	Top Width Total Top
12.89	2133.12	0	0.9270892	0	0.927089	8.064926	0	8.064926	8.061646	0	8.061646
40.38	2132.33	1	0	3.838	3.838	0	10.10445	10.10445	0	10.1	10.1
50.48	2132.03	1	0	11.2558	11.2558	0	13.49379	13.49379	0	13.48	13.48
63.96	2131.42	1	0	2.9382	2.9382	0	2.491285	2.491285	0	2.49	2.49
66.45	2131.34	1	0	12.0513	12.0513	0	17.37176	17.37176	0	17.34	17.34
83.79	2132.39	1	0	0.249	0.249	0	2.493933	2.493933	0	2.49	2.49
86.28	2132.53	1	0	0.345	0.345	0	11.5	11.5	0	11.5	11.5
97.76	2132.53	1	0	4.4308	4.4308	0	23.3222	23.3222	0	23.32	23.32
121.1	2132.21	1	0	2.4752	2.4752	0	8.841109	8.841109	0	8.84	8.84
129.94	2132.35	1	0	0.35055	0.35055	0	1.710029	1.710029	0	1.71	1.71
131.65	2132.36	1	0	0.532	0.532	0	2.66	2.66	0	2.66	2.66
134.31	2132.36	1	0	4.0621	4.0621	0	8.310265	8.310265	0	8.29	8.29
142.6	2131.78	1	0	0.0078	0.0078	0	0.01	0.01	0	0.01	0.01
142.61	2131.78	1	0	3.999	3.999	0	4.310462	4.310462	0	4.3	4.3
146.61	2131.48	1	0	1.9494	1.9494	0	1.714205	1.714205	0	1.71	1.71
148.62	2131.36	1	0	1.92895	1.92895	0	1.738333	1.738333	0	1.73	1.73
150.35	2131.53	1	0	0.406	0.406	0	0.401123	0.401123	0	0.4	0.4
150.75	2131.56	1	0	1.99125	1.99125	0	2.261725	2.261725	0	2.25	2.25
153	2131.79	0	2.8765899	0	2.87657	7.511182	0	7.511182	7.47161	0	7.47161
164.45	2132.97	-1	0	0	0	0	0	0	0	0	0
184.33	2132.77	0	0.043072	0	0.043072	2.153971	0	2.153971	2.1536	0	2.1536
197.79	2132.52	1	0	0.795	0.795	0	7.950906	7.950906	0	7.95	7.95
205.74	2132.4	1	0	1.4637	1.4637	0	8.610023	8.610023	0	8.61	8.61
214.35	2132.38	0	0.5738211	0	0.573821	6.37833	0	6.37833	6.375789	0	6.375789
221.09	2132.67	-1	0	0	0	0	0	0	0	0	0
223.55	2132.64	-1	0	0	0	0	0	0	0	0	0
227.86	2132.84	-1	0	0	0	0	0	0	0	0	0
238.45	2132.59	0	2.6049432	0	2.604943	27.42111	0	27.42111	27.42045	0	27.42045
270.2	2132.37	1	0	0.6603	0.6603	0	1.889047	1.889047	0	1.86	1.86
272.06	2132.04	1	0	4.773	4.773	0	5.223188	5.223188	0	5.18	5.16
277.22	2131.23	1	0	12.609	12.609	0	9.340086	9.340086	0	9.34	9.34
285.56	2131.19	1	0	2.21925	2.21925	0	1.650757	1.650757	0	1.65	1.65
288.21	2131.24	1	0	3.60675	3.60675	0	3.189355	3.189355	0	3.15	3.15
291.36	2131.59	1	0	5.725	5.725	0	9.185951	9.185951	0	9.16	9.16
300.52	2132.28	1	0	0.2296	0.2296	0	0.82	0.82	0	0.82	0.82
301.34	2132.28	1	0	0.72895	0.72895	0	2.390523	2.390523	0	2.39	2.39
303.73	2132.23	1	0	0.2937	0.2937	0	0.89	0.89	0	0.89	0.89
304.62	2132.23	1	0	0.3762	0.3762	0	1.14	1.14	0	1.14	1.14
305.76	2132.23	1	0	2.4332	2.4332	0	6.320957	6.320957	0	6.32	6.32
312.08	2132.12	1	0	6.0883	6.0883	0	11.38159	11.38159	0	11.36	11.36
323.45	2131.98	1	0	13.2163	13.2163	0	17.74149	17.74149	0	17.74	17.74
341.2	2131.7	1	0	17.02	17.02	0	18.50039	18.50039	0	18.5	18.5
359.7	2131.58	1	0	4.71925	4.71925	0	4.39411	4.39411	0	4.39	4.39
364.09	2131.39	1	0	3.012	3.012	0	2.510717	2.510717	0	2.51	2.51
366.6	2131.33	1	0	2.12	2.12	0	1.611242	1.611242	0	1.6	1.6
368.2	2131.14	1	0	4.5261	4.5261	0	4.287528	4.287528	0	4.23	4.23
372.43	2131.64	1	0	1.74555	1.74555	0	4.355801	4.355801	0	4.31	4.31
376.74	2132.47	1	0	0.25	0.25	0	2.001225	2.001225	0	2	2
378.74	2132.4	1	0	2.0928	2.0928	0	8.721468	8.721468	0	8.72	8.72
387.46	2132.24	1	0	0.51255	0.51255	0	1.532294	1.532294	0	1.53	1.53
388.99	2132.21	1	0	0.268	0.268	0	0.76	0.76	0	0.76	0.76
389.76	2132.21	0	2.41875	0	2.41875	13.82566	0	13.82566	13.82143	0	13.82143
409.1	2132.7	-1	0	0	0	0	0	0	0	0	0
414.32	2132.84	-1	0	0	0	0	0	0	0	0	0
422.93	2133.14	-1	0	0	0	0	0	0	0	0	0
423.93	2133.17	-1	0	0	0	0	0	0	0	0	0
426.15	2133.22	-1	0	0	0	0	0	0	0	0	0
438.63	2133.12	leave this blank!		leave this blank!		leave this blank!		leave this blank!		leave this blank!	

Area= 153.7371 sf Perim. = 314.4867 ft Top Width 314.0345 ft



Carefree DMP
03-27-03
Cross section stations were adjusted to eliminate area calculation error

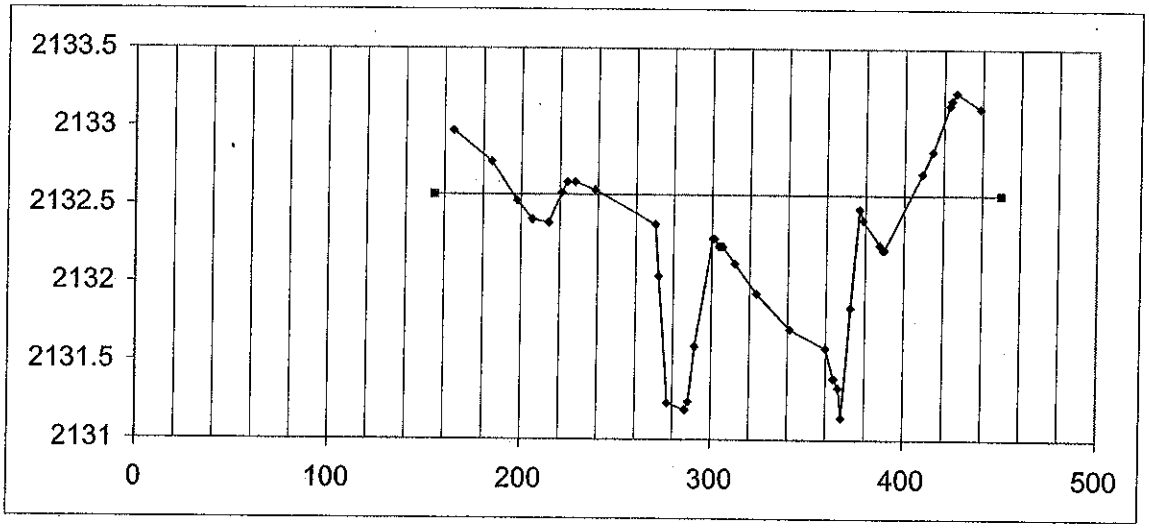
Computation of areas, perimeters, and topwidths

-1 indicates section is completely dry
0 indicates section is partially submerged
1 indicates section is fully submerged or at water line

Xsect # 0.0241
wse = 2132.56

Sta	elev	Water Surface	Area Partially Submerged	Area Submerged	Area Total Area	Perimeter Partials	Perimeter Full Segs.	Perimeter Total Per.	Top Width Partial	Top Width Full	Top Width Total Top
164.45	2132.97	-1	0	0	0	0	0	0	0	0	0
184.33	2132.77	0	0.043072	0	0.043072	2.153971	0	2.153971	2.1536	0	2.1536
197.79	2132.52	1	0	0.795	0.795	0	7.950906	7.950906	0	7.95	7.95
205.74	2132.4	1	0	1.4637	1.4637	0	8.610023	8.610023	0	8.61	8.61
214.35	2132.38	0	0.5738211	0	0.573821	6.37833	0	6.37833	6.375789	0	6.375789
221.08	2132.67	-1	0	0	0	0	0	0	0	0	0
223.85	2132.64	-1	0	0	0	0	0	0	0	0	0
227.86	2132.64	-1	0	0	0	0	0	0	0	0	0
238.45	2132.59	0	2.6049432	0	2.604943	27.42111	0	27.42111	27.42045	0	27.42045
270.2	2132.37	1	0	0.6603	0.6603	0	1.889047	1.889047	0	1.86	1.86
272.06	2132.04	1	0	4.773	4.773	0	5.223189	5.223189	0	5.16	5.16
277.22	2131.23	1	0	12.609	12.609	0	9.340086	9.340086	0	9.34	9.34
286.56	2131.19	1	0	2.21925	2.21925	0	1.650757	1.650757	0	1.65	1.65
288.21	2131.24	1	0	3.60675	3.60675	0	3.169385	3.169385	0	3.15	3.15
291.36	2131.59	1	0	5.725	5.725	0	9.185951	9.185951	0	9.16	9.16
300.52	2132.28	1	0	0.2296	0.2296	0	0.82	0.82	0	0.82	0.82
301.34	2132.28	1	0	0.72895	0.72895	0	2.390523	2.390523	0	2.39	2.39
303.73	2132.23	1	0	0.2937	0.2937	0	0.89	0.89	0	0.89	0.89
304.62	2132.23	1	0	0.3762	0.3762	0	1.14	1.14	0	1.14	1.14
305.76	2132.23	1	0	2.4332	2.4332	0	6.320957	6.320957	0	6.32	6.32
312.08	2132.12	1	0	6.0883	6.0883	0	11.38159	11.38159	0	11.38	11.38
323.46	2131.93	1	0	13.2163	13.2163	0	17.74149	17.74149	0	17.74	17.74
341.2	2131.7	1	0	17.02	17.02	0	18.50039	18.50039	0	18.5	18.5
359.7	2131.58	1	0	4.71925	4.71925	0	4.39411	4.39411	0	4.39	4.39
364.09	2131.39	1	0	3.012	3.012	0	2.510717	2.510717	0	2.51	2.51
366.6	2131.33	1	0	2.12	2.12	0	1.611242	1.611242	0	1.6	1.6
368.2	2131.14	1	0	4.5261	4.5261	0	4.287528	4.287528	0	4.23	4.23
372.43	2131.84	1	0	1.74555	1.74555	0	4.355801	4.355801	0	4.31	4.31
376.74	2132.47	1	0	0.25	0.25	0	2.001225	2.001225	0	2	2
378.74	2132.4	1	0	2.0928	2.0928	0	8.721468	8.721468	0	8.72	8.72
387.46	2132.24	1	0	0.51255	0.51255	0	1.530294	1.530294	0	1.53	1.53
388.99	2132.21	1	0	0.266	0.266	0	0.76	0.76	0	0.76	0.76
389.75	2132.21	0	2.41875	0	2.41875	13.82586	0	13.82586	13.82143	0	13.82143
409.1	2132.7	-1	0	0	0	0	0	0	0	0	0
414.32	2132.84	-1	0	0	0	0	0	0	0	0	0
422.93	2133.14	-1	0	0	0	0	0	0	0	0	0
423.93	2133.17	-1	0	0	0	0	0	0	0	0	0
426.15	2133.22	-1	0	0	0	0	0	0	0	0	0
438.63	2133.12	leave this blank!		leave this blank!		leave this blank!		leave this blank!		leave this blank!	

Area= 97.12309 sf Perim. = 186.1559 ft Top Width 185.8813 ft



Los Reales Flow Diversion - Unnamed Central Tributary to Cave Creek

TO: Tony Bokich

COPIES: File

FROM: Patrick Wolf

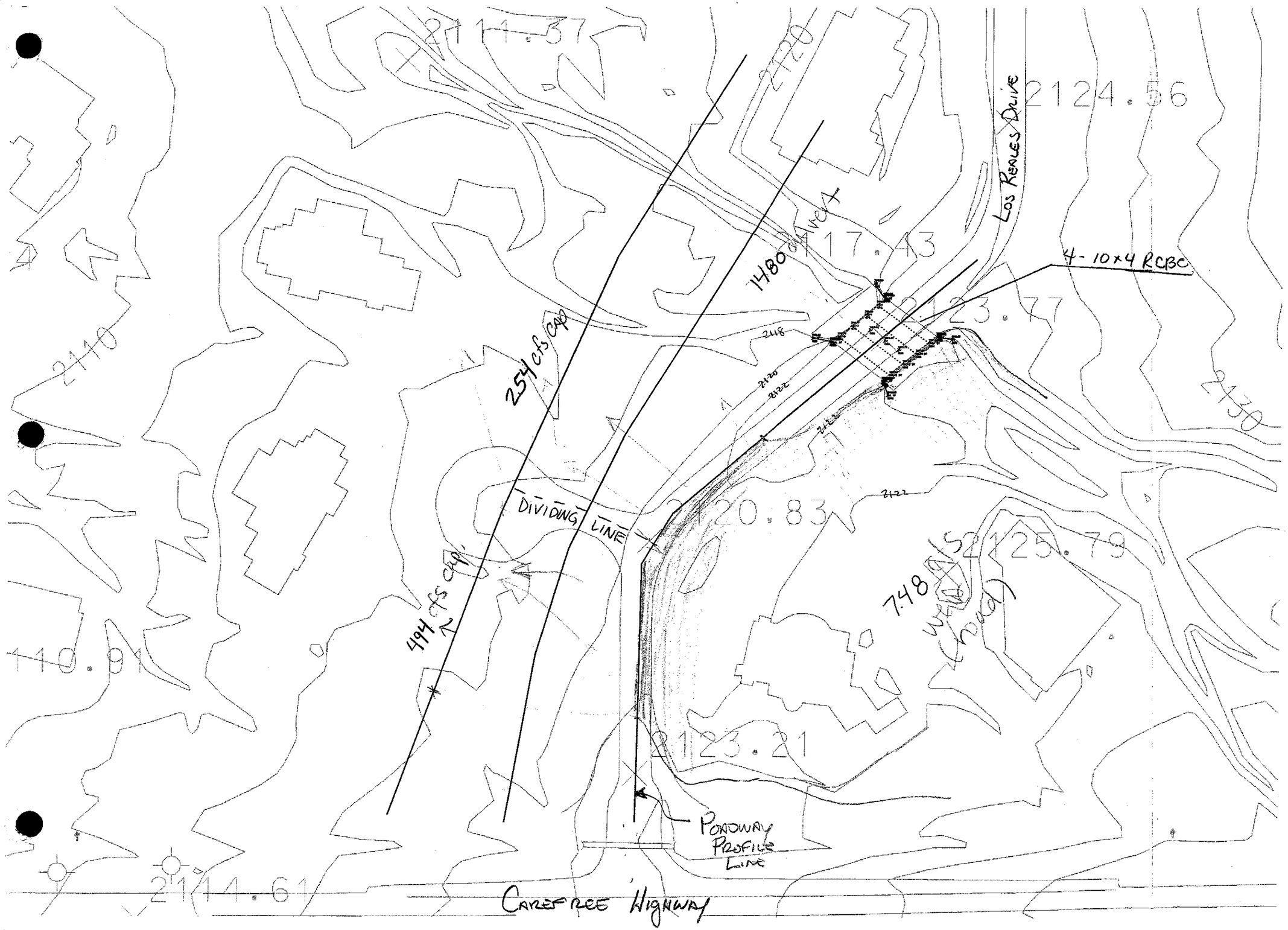
DATE: January 15, 2003 (Revised March 24, 2004)

A box culvert exists on Los Reales Drive that is under-sized for the 100-year event. 2228 cfs arrives at the culvert crossing calculated from the peak flow at the HEC-1 concentration point CP84 plus 35 percent of (CP7879 – CP84). Of the 2228 cfs arriving at the culvert, 1480 cfs will be conveyed through the culvert, and 748 will overtop the roadway. However, the low point in the roadway is not directly over the culvert, and overtopping will occur approximately 120 feet to the south of the culvert.

A topographical high point exists approximately 100 feet downstream of the centerline of the roadway that causes the flow to divert to the north and south. This diversion is important in that the flow that is diverted to the north will rejoin the main channel of the Unnamed Tributary to Cave Creek; however, the flow that is diverted to the south will continue west and not rejoin the main channel until much further downstream. Refer to the Carefree Mountain Drive Diversion memo for more detail.

The dividing line for the north-south diversion was determined from topography taking into account momentum, and is shown on the attached map. The amount of flow diverted to each direction was determined by the percentage of cross sectional area on each side of the dividing line.

Out of the 748 cfs overtopping the roadway, 494 cfs will be diverted to the south, and 254 cfs will continue to the north.



Los Reales Flow Diversion

Legend

← Direction of overtopping flow

1" = 60'

N

Los Realos Road Flow Diversion

Plan: Plan 02 Unnamed Central - North RS: 0.7415 Culv Group: Culvert #1 Profile: PF 1

Q Culv Group (cfs)	1479.87	Culv Full Len (ft)	41.70
# Barrels	4	Culv Vel US (ft/s)	9.25
Q Barrel (cfs)	369.97	Culv Vel DS (ft/s)	9.25
E.G. US. (ft)	2122.96	Culv Inv El Up (ft)	2117.57
W.S. US. (ft)	2122.80	Culv Inv El Dn (ft)	2116.81
E.G. DS (ft)	2121.18	Culv Frctn Ls (ft)	0.64
W.S. DS (ft)	2120.93	Culv Exit Loss (ft)	1.07
Delta EG (ft)	1.77	Culv Entr Loss (ft)	0.53
Delta WS (ft)	1.87	Q Weir (cfs)	809.13
E.G. IC (ft)	2123.15	Weir Sta Lft (ft)	69.16
E.G. OC (ft)	2122.96	Weir Sta Rgt (ft)	310.49
Culvert Control	Outlet	Weir Submerg	0.00
Culv WS Inlet (ft)	2121.57	Weir Max Depth (ft)	1.93
Culv WS Outlet (ft)	2120.81	Weir Avg Depth (ft)	1.13
Culv Nml Depth (ft)	1.93	Weir Flow Area (sq ft)	269.77
Culv Crt Depth (ft)	3.49	Min El Weir Flow (ft)	2121.03

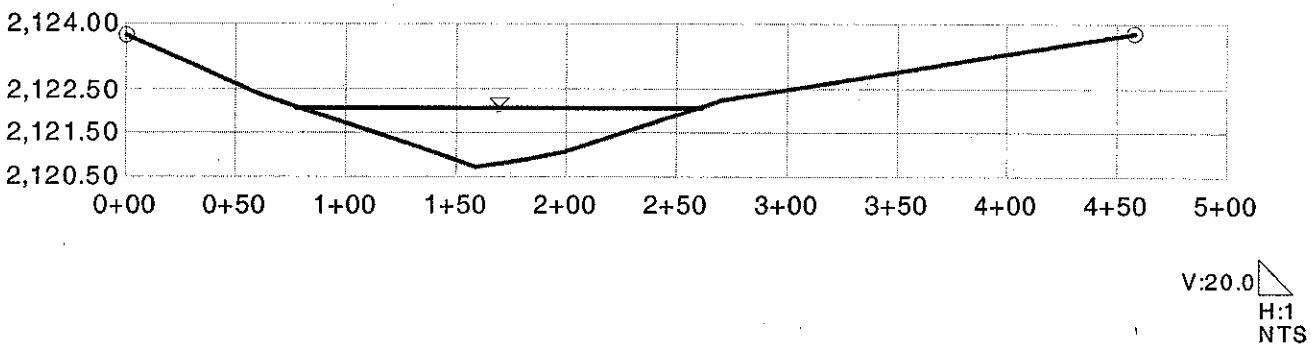
culvert capacity

← Flow over Roadway

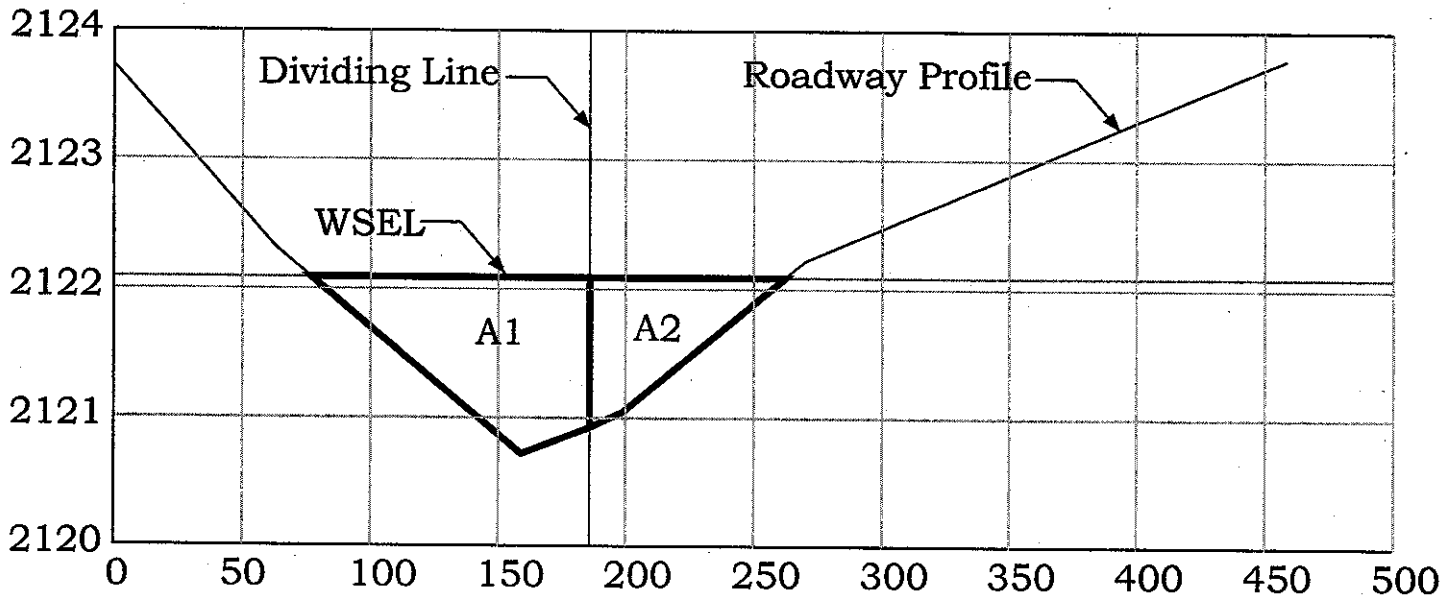
Cross Section
Cross Section for Irregular Channel

Project Description	
Worksheet	CL Los Reales
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.030	
Slope	0.018200	ft/ft
Water Surface Elevation	2,122.09	ft
Elevation Range	2,120.72 to 2,123.78	
Discharge	748.00	cfs



Los Realos Overtopping Split Flow Analysis



A1 = 90.5 sq-ft
A2 = 47.1 sq-ft
A Total = 137.6 sq-ft
A1 = 90.5 / 137.6 = 66%
A2 = 47.1 / 137.6 = 34%

Q Total = 748 cfs
Q A1= 748 x 0.66 = 494 cfs
Q A2 = 748 x 0.34 = 254 cfs

Carefree Mountain Drive Flow Split

TO: Tony Bokich

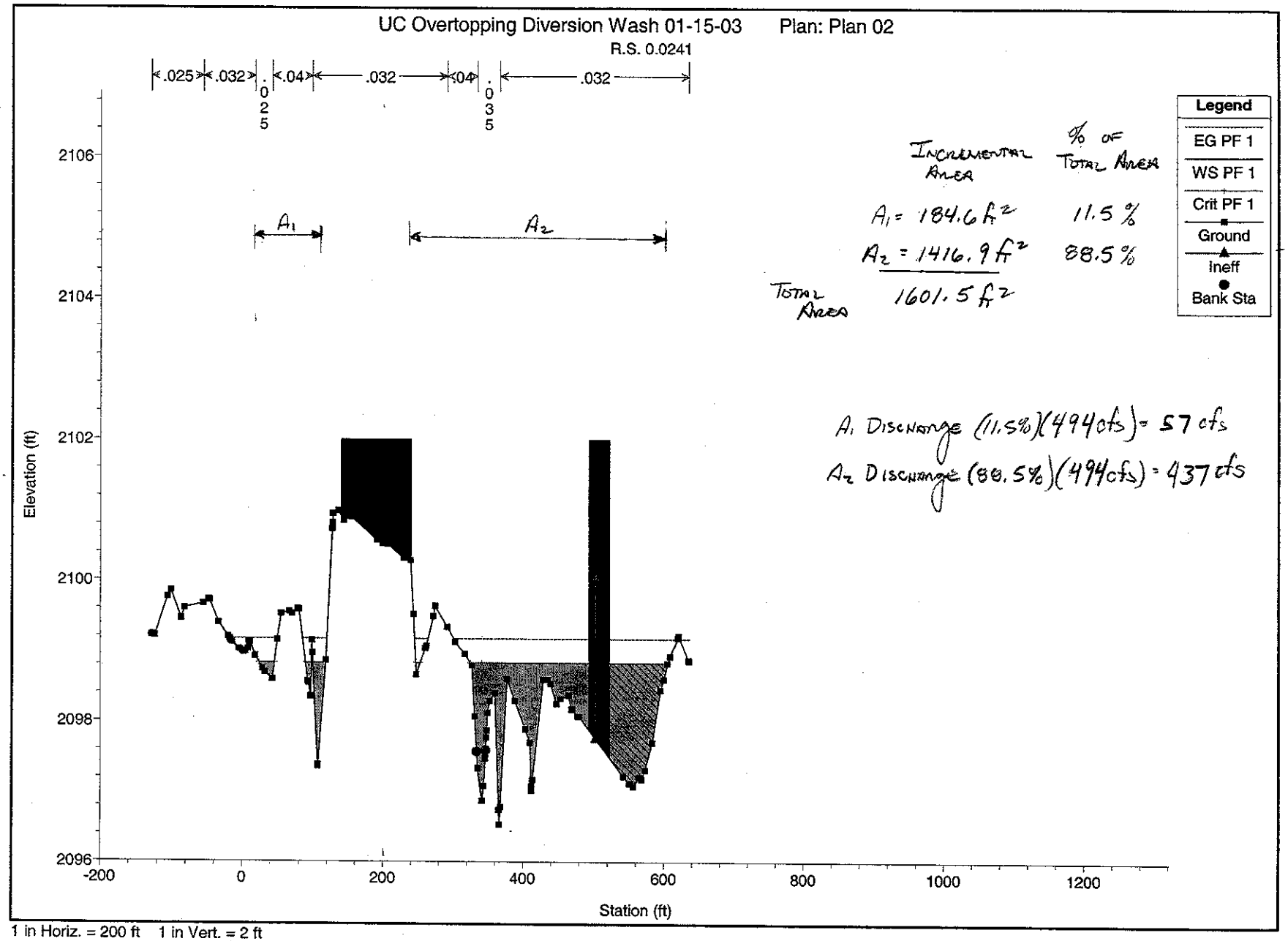
COPIES: File

FROM: Patrick Wolf

DATE: April 22, 2003 (Revised March 24, 2004)

A flow split exists on the Unnamed Central Tributary to Cave Creek – Diversion Branch immediately upstream of Carefree Mountain Drive. A total of 494 cfs arrives at this diversion during the 100-year event. Refer to the flow split memos "Flow Split at Scottsdale Health Center, Unnamed Central Tributary to Cave Creek" and "Los Reales Flow Diversion – Unnamed Central Tributary to Cave Creek" for more information. The portion of the flow diverted to the north rejoins the Unnamed Central Tributary to Cave Creek – North Branch, while the flow diverted to the south does not rejoin the study wash.

A topographical high point at the diversion as shown on the attached sketch. The amount of flow diverted was determined by the percentage of cross sectional area of flow on each side of the diversion. Out of the 494 cfs, approximately 437 cfs will continue north and be added to the model at cross section 0.2756, and 57 cfs will be diverted to the west and out of the study reach.



	Incremental Area	% of Total Area
A_1 =	184.6 ft²	11.5 %
A_2 =	1416.9 ft²	88.5 %
Total Area	1601.5 ft²	

A_1 Discharge (11.5%)(494 cfs) = 57 cfs

A_2 Discharge (88.5%)(494 cfs) = 437 cfs

1 in Horiz. = 200 ft 1 in Vert. = 2 ft

RECEIVED
- 1 1992
Town of Carefree, AZ

DRAINAGE SUMMARY

CAREFREE 80 ACRES

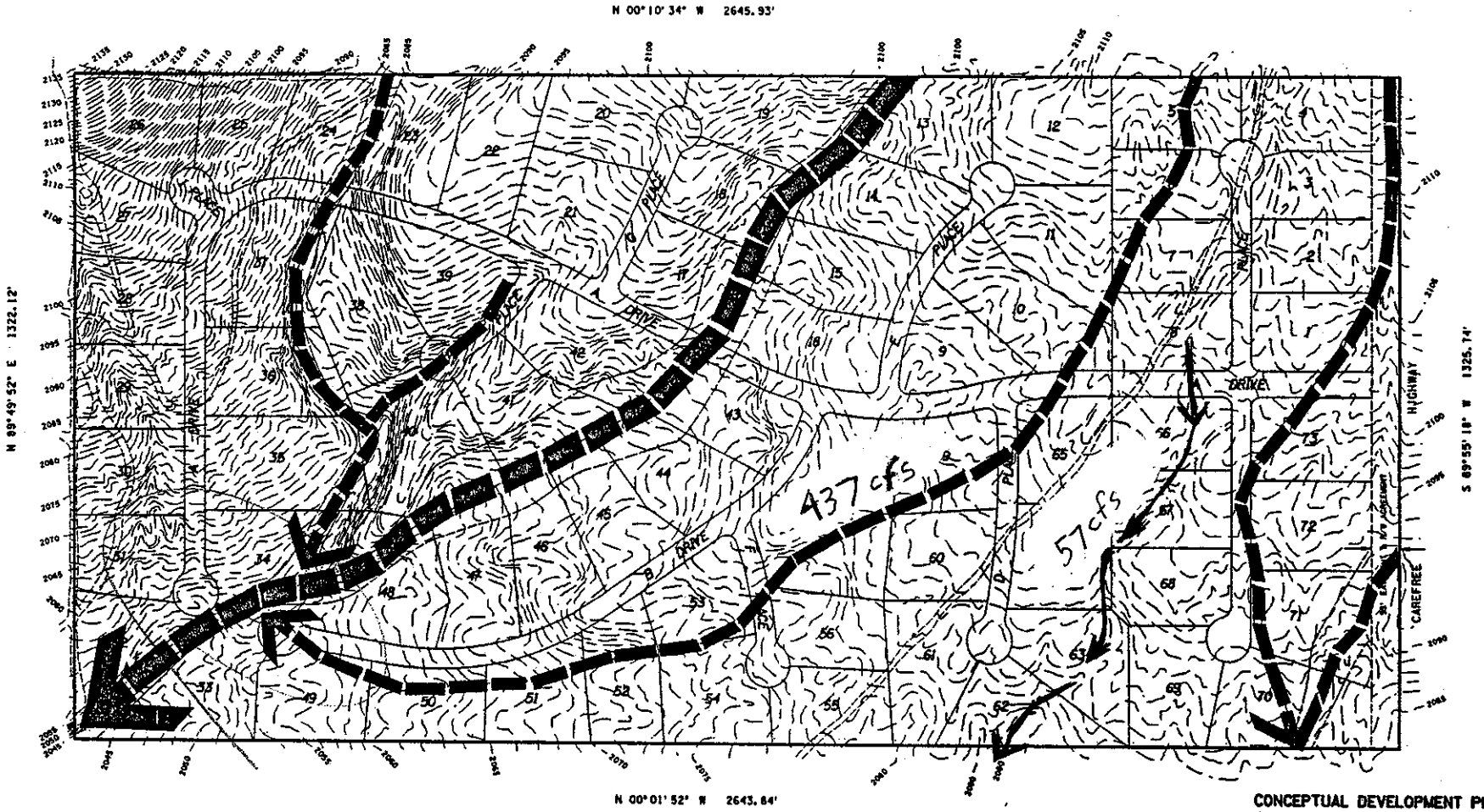
Prepared for:

RJL Properties
6991 East Camelback Road/suite B-111
Scottsdale, Arizona 85251

Prepared By:

Development Planning & Management
David G. Gulino, PE
P.O. Box 3002
Scottsdale, Arizona 85271

May 1992



Z

0' 50' 100' 200' 300'
SCALE 1" = 100'

MAJOR WASH

MINOR WASH

DRAINAGE ANALYSIS

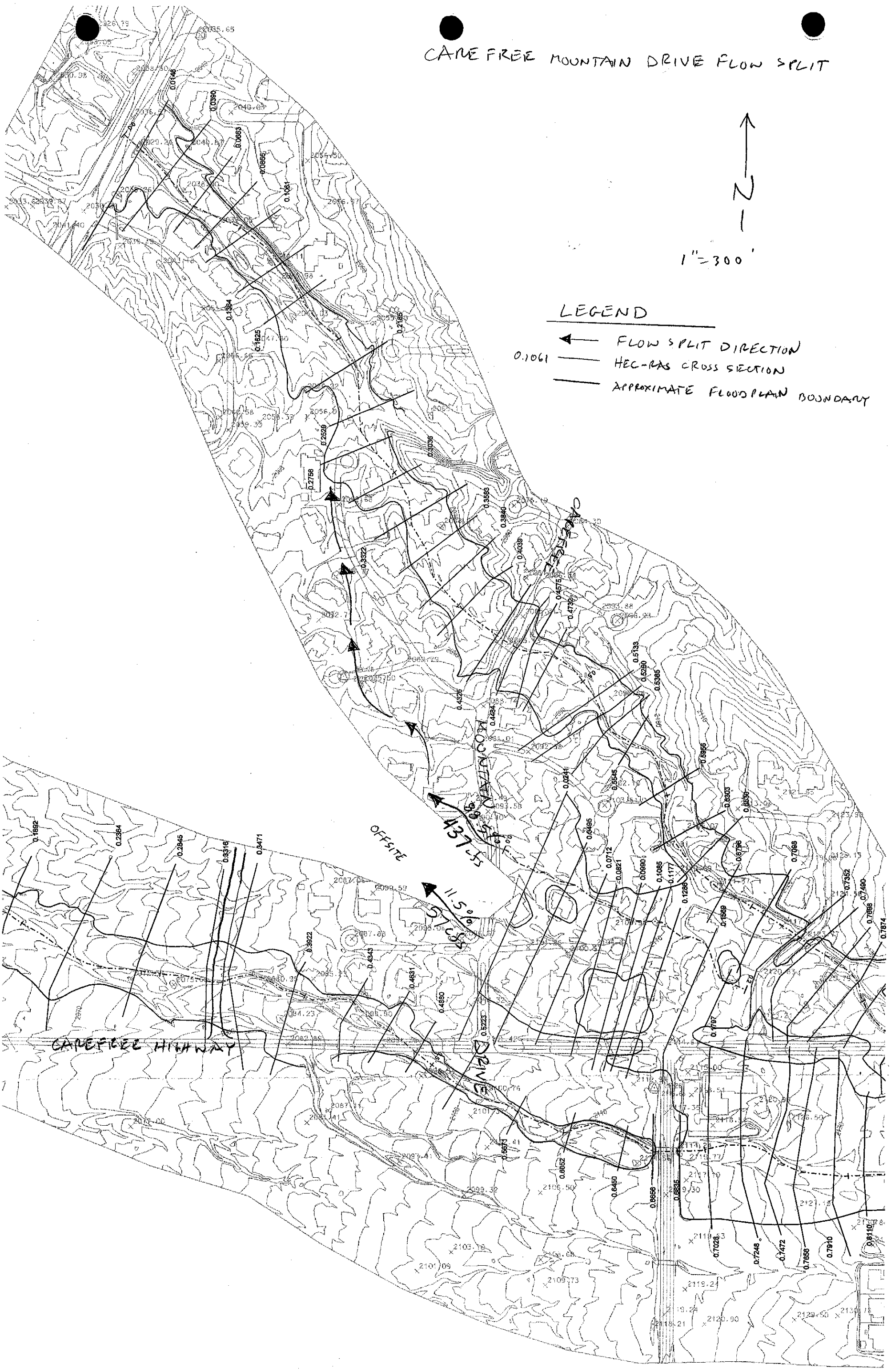
CONCEPTUAL DEVELOPMENT PLAN
CAREFREE, ARIZONA

OF THE EAST HALF OF THE SOUTHWEST QUARTER OF SECTION 4, TOWNSHIP 5 NORTH, RANGE 4 EAST, OF THE GILA AND SALT RIVER BASE AND MERIDIAN, MARICOPA COUNTY, ARIZONA

Development Planning & Management, Inc.
P.O. Box 8002
Scottsdale, AZ 85271
(602) 970-6612
land planning · feasibility analysis · project management

W.O. 40175C5A

CAMEFREE MOUNTAIN DRIVE FLOW SPLIT



Boundary Conditions, Culvert No. 3, Unnamed Central Tributary to Cave Creek

TO: Tony Bokich

COPIES: File

FROM: Patrick Wolf

DATE: March 13, 2003 (Revised March 24, 2004)

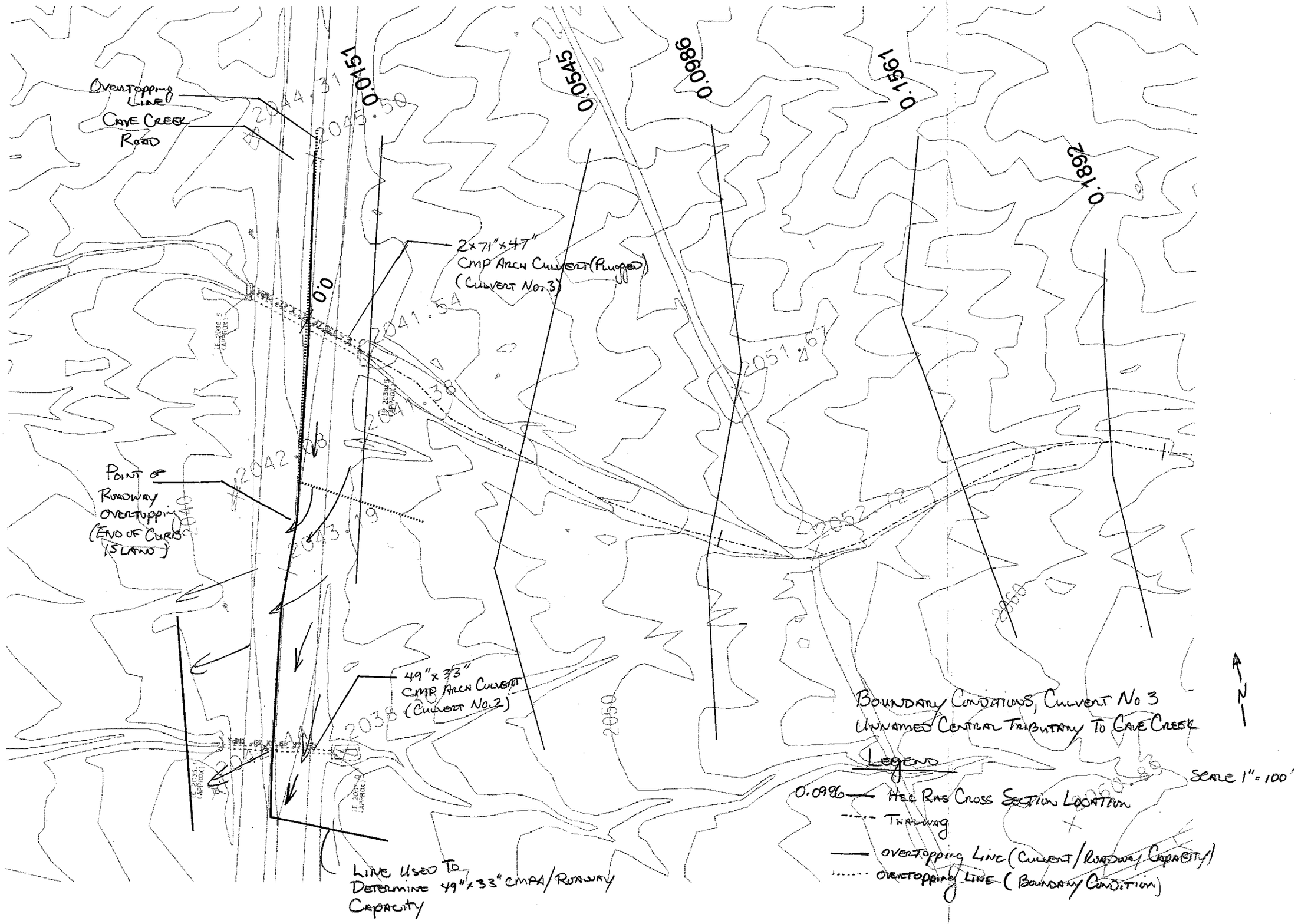
Culverts numbered 2 and 3 at Cave Creek Road exist as the downstream boundary condition for one of the reaches of the Unnamed Central Wash floodplain delineation. According to the hydrology of the project (*see Data Collection Report*), 566 cfs will arrive at these culverts during the 100-year event. Double 71″ by 47″ CMP arch culvert constitute Culvert No. 3 while Culvert No. 2 is a single 49″ by 33″ CMP arch culvert.

The double CMP arch culverts are nearly filled with sediment and for this analysis both cells are assumed to be plugged while the single CMP arch pipe has a capacity of approximately 61 cfs. To establish the boundary condition for the central tributary, HEC-RAS was used to calculate an initial water surface elevation so that the approximate flow area impacting the double cell culvert area could be isolated. Using information derived from HEC-RAS at cross section 0.0986 *(see attached information)* , the associated area and related discharge for that portion of the channel draining in the direction of the dual arch culverts was estimated. Then, using FlowMaster in conjunction with an overtopping line located in the vicinity of the plugged culverts, a water surface elevation was established. From these results, a water surface elevation of 2044.53 was calculated and will be used as the boundary condition for this tributary. Consideration was given to use the single cell RCP arch culvert to establish boundary conditions, however by doing so would result in a unrealistically low starting water surface elevation since this culvert and adjacent roadway section are located at a significantly lower elevation than the double cell culvert and related road section associated with the main portion of the channel.

At this Cave Creek Road crossing, there is no confining dip section on the road, and for the larger magnitude runoff events, runoff is conveyed through the single cell CMP arch culvert, over Cave Creek Road and south along the Road. To determine the flow along and over the roadway, rating tables were developed for the channel and the combined flow of both the culvert and roadway flow. The results and the supporting documentation are attached.

The results indicate that for the 100-year runoff event, approximately 78 cfs flows through the single cell culvert, while approximately 488 cfs flows over and along the road.

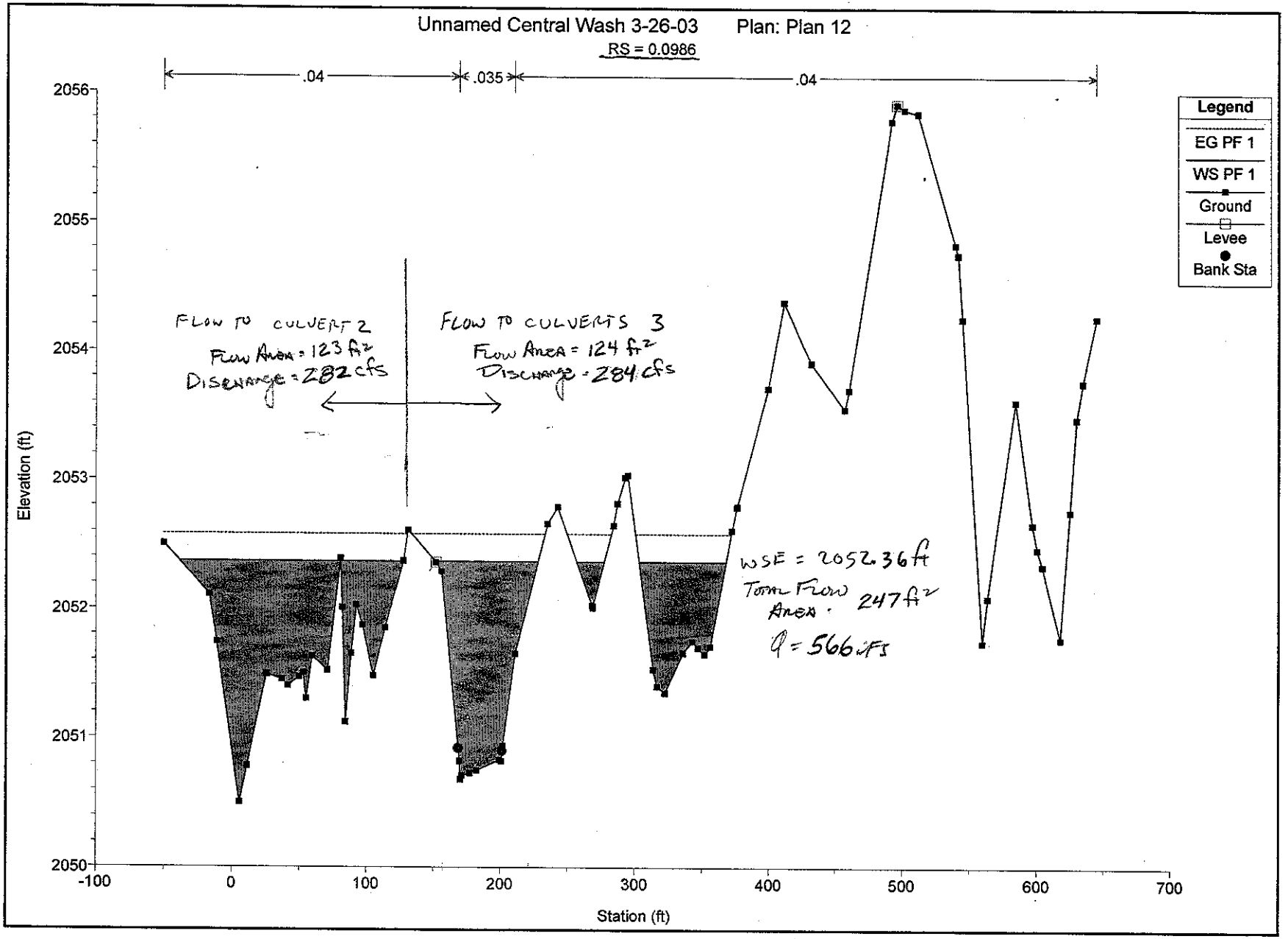
10/8/02


Overtopping Line
Cave Creek Road
0.0151
0.0545
0.0986
0.1561
0.1892
2044.31
2045.50
2041.54
2051.67
2052.72
2042.08
2043.19
2038
2050
2068
2×71"×47" CMP Arch Culvert (Plugged) (Culvert No. 3)
Point of Roadway Overtopping (End of Curb Island)
49"×33" CMPA Arch Culvert (Culvert No. 2)
Line Used To Determine 49"×33" CMPA/Roadway Capacity
Boundary Conditions, Culvert No 3
Unnamed Central Tributary To Cave Creek
Legend
0.0986 — HEC RAS Cross Section Location
Thalweg
Overtopping Line (Culvert/Roadway Capacity)
Overtopping Line (Boundary Condition)
Scale 1" = 100'
N

HEC-RAS CROSS SECTION REPORT

Plan: Plan 02 Unnamed Central South RS: 0.0986 Profile: PF 1

E.G. Elev (ft)	2052.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.	0.040	0.035	0.039
W.S. Elev (ft)	2052.36	Reach Len. (ft)	233.04	233.04	233.04
Crit W.S. (ft)	2052.36	Flow Area (sq ft)	131.35	51.98	61.14
E.G. Slope (ft/ft)	0.004343	Area (sq ft)	131.35	51.98	61.14
Q Total (cfs)	576.00	Flow (cfs)	263.10	197.39	115.50
Top Width (ft)	325.64	Top Width (ft)	181.76	32.70	111.18
Vel Total (ft/s)	2.36	Avg. Vel. (ft/s)	2.00	3.80	1.89
Max Chl Dpth (ft)	1.86	Hydr. Depth (ft)	0.72	1.59	0.55
Conv. Total (cfs)	8740.4	Conv. (cfs)	3992.4	2995.3	1752.7
Length Wtd. (ft)	233.04	Wetted Per. (ft)	182.28	32.73	111.30
Min Ch El (ft)	2050.68	Shear (lb/sq ft)	0.20	0.43	0.15
Alpha	1.35	Stream Power (lb/ft s)	0.39	1.64	0.28
Frctn Loss (ft)	1.35	Cum Volume (acre-ft)	1.02	0.61	0.70
C & E Loss (ft)	0.02	Cum SA (acres)	1.63	0.29	1.00


Unnamed Central Wash 3-26-03 Plan: Plan 12
RS = 0.0986
.04
.035
.04
Legend
EG PF 1
WS PF 1
Ground
Levee
Bank Sta
FLOW TO CULVERT 2
FLOW AREA = 123 ft²
DISCHARGE = 282 cfs
FLOW TO CULVERTS 3
FLOW AREA = 124 ft²
DISCHARGE = 284 cfs
WSE = 2052.36 ft
TOTAL FLOW AREA = 247 ft²
Q = 566 cfs
Elevation (ft)
Station (ft)
2056
2055
2054
2053
2052
2051
2050
-100
0
100
200
300
400
500
600
700

Culvert #3
Worksheet for Irregular Channel

Boundary Condition Determination

Project Description	
Worksheet	#3 UC-South Boundary Condition 2nd Iteration
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	0.004200	ft/ft
Discharge	284.00	cfs

Options	
Current Roughness Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results		
Mannings Coefficient	0.027	
Water Surface Elevation	2,044.53	ft ← Boundary Condition Starting WSEL
Elevation Range	2,042.30 to 2,046.20	
Flow Area	94.0	ft²
Wetted Perimeter	122.13	ft
Top Width	121.98	ft
Actual Depth	2.23	ft
Critical Elevation	2,044.03	ft
Critical Slope	0.011028	ft/ft
Velocity	3.02	ft/s
Velocity Head	0.14	ft
Specific Energy	2,044.68	ft
Froude Number	0.61	
Flow Type	Subcritical	

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+23	0+70	0.032
0+70	1+46	0.028
1+46	5+42	0.025

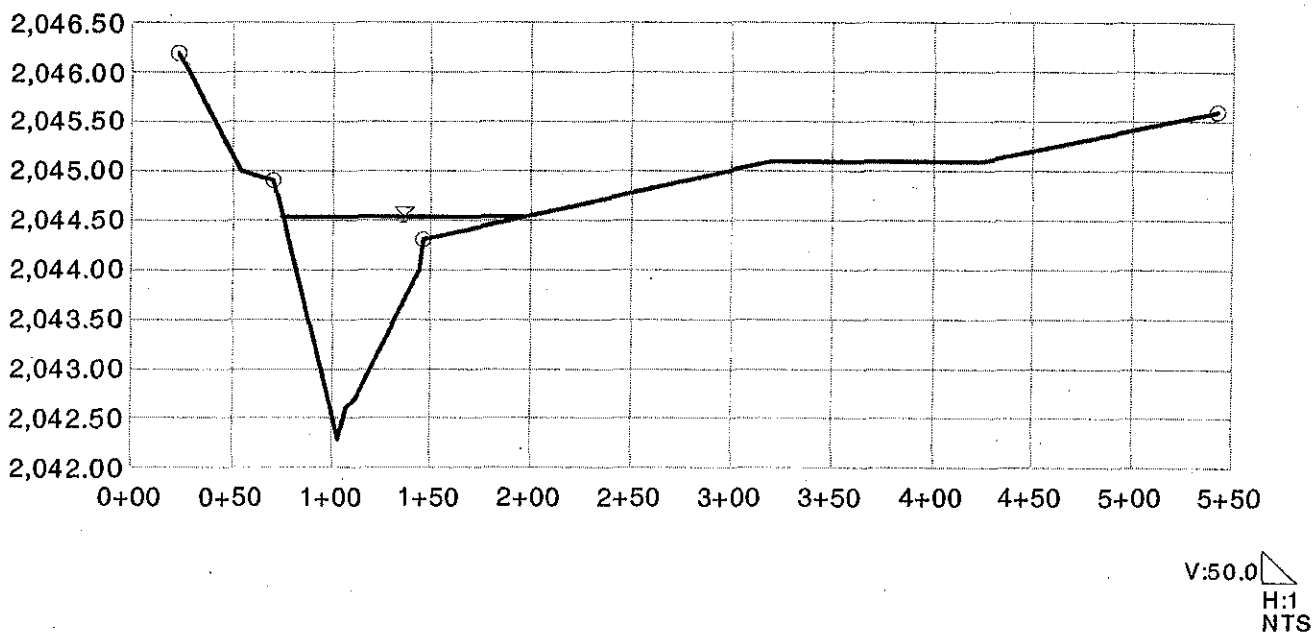
Natural Channel Points

Station (ft)	Elevation (ft)
0+23	2,046.20
0+54	2,045.00
0+70	2,044.90
1+03	2,042.30
1+07	2,042.60
1+12	2,042.70
1+44	2,044.00
1+46	2,044.30
3+19	2,045.10
4+24	2,045.10
5+42	2,045.60

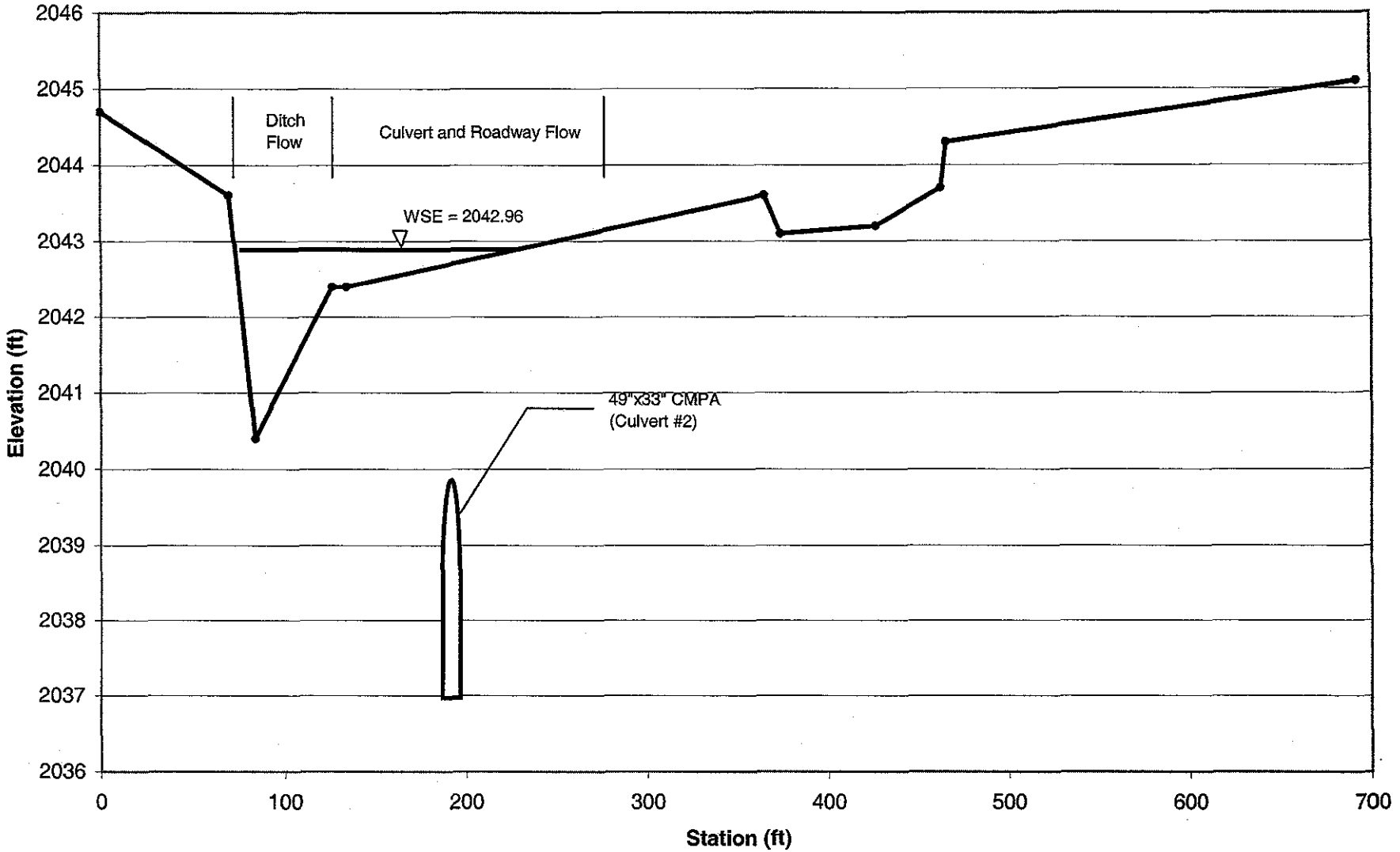
Cross Section
Cross Section for Irregular Channel

Project Description	
Worksheet	#3 UC-South Boundary Condition 2nd Iteration
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.027	
Slope	0.004200	ft/ft
Water Surface Elevation	2,044.53	ft
Elevation Range	2,042.30 to 2,046.20	
Discharge	284.00	cfs



Cave Creek Overtopping at Culvert #2



Summary Table
Rating Analysis for Culvert #2 on Cave Creek Road

Ditch Section		Culvert and Roadway	
Water Surface Elevation (ft)	Discharge (cfs)	HW Elev. (ft)	Discharge (cfs)
2,042.12	144	2,036.95	0
2,042.16	153	2,038.10	10
2,042.20	163	2,038.69	20
2,042.24	172	2,039.19	30
2042.28	183	2,039.64	40
2042.32	193	2,040.06	50
2042.36	204	2,040.55	60
2042.4	195	2,041.77	70
2042.44	210	2,042.61	80
2042.48	225	2,042.74	90
2042.52	241	2,042.82	100
2042.56	257	2,042.88	110
2042.6	274	2,042.94	120
-	-	2042.96 *(1)	125 *(1)
2042.64	291	2,042.98	130
2042.68	308	2,043.03	140
2042.72	326	2,043.07	150
2042.76	344	2,043.10	160
2042.8	363	2,043.13	170
2042.84	382	2,043.16	180
2042.88	402	2,043.19	190
2042.92	422	2,043.22	200
2042.96	442	2043.24	210
2043	463	2,043.26	220
2043.04	484	2,043.28	230
2043.08	505	2,043.30	240
2043.12	527	2,043.32	250
2043.16	549	2,043.34	260
2043.2	572	2,043.35	270
2043.24	595	2,043.37	280
2043.28	618	2,043.39	290
2043.32	642	2,043.40	300
2043.36	666	2,043.42	310
2043.4	690	2,043.43	320
2043.44	715	2,043.45	330
2043.48	740	2,043.46	340
2043.52	766	2,043.48	350
2043.56	792	2,043.49	360
2043.6	818	2,043.50	370
2043.64	835	2,043.51	380
2043.68	854	2,043.53	390
2043.72	800	2,043.54	400
2043.76	805	2,043.55	410
2043.8	812	2,043.56	420
2043.84	821	2,043.58	430
2043.88	830	2,043.59	440
2043.92	841	2,043.60	450
2043.96	853	2,043.61	460

Note :(1) This Value was obtained by interpolating between 2042.94 and 2042.98.

Approximate Headwater Elevation = 2042.96

Table
Rating Table for Irregular Channel
(CHANNEL SECTION)

Project Description	
Worksheet	Cave Creek Ditch Capacity South
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Input Data	
Slope	0.005540 ft/ft

Options	
Current Roughness Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Metho	Horton's Method

Attribute	Minimum	Maximum	Increment
Water Surface Elevation (ft)	2,040.80	2,045.00	0.04

Water Surface Elevation (ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
2,040.80	2.95	1.45	2.0	10.20	10.15
2,040.84	3.80	1.55	2.5	11.23	11.16
2,040.88	4.79	1.64	2.9	12.25	12.18
2,040.92	5.93	1.73	3.4	13.27	13.19
2,040.96	7.23	1.82	4.0	14.29	14.21
2,041.00	8.69	1.90	4.6	15.31	15.22
2,041.04	10.32	1.99	5.2	16.33	16.24
2,041.08	12.13	2.07	5.9	17.35	17.25
2,041.12	14.13	2.15	6.6	18.37	18.27
2,041.16	16.32	2.23	7.3	19.39	19.28
2,041.20	18.71	2.30	8.1	20.41	20.30
2,041.24	21.31	2.38	9.0	21.43	21.31
2,041.28	24.12	2.46	9.8	22.45	22.33
2,041.32	27.16	2.53	10.7	23.47	23.34
2,041.36	30.42	2.60	11.7	24.49	24.36
2,041.40	33.92	2.67	12.7	25.51	25.37
2,041.44	37.66	2.74	13.7	26.53	26.39
2,041.48	41.65	2.81	14.8	27.55	27.40
2,041.52	45.89	2.88	15.9	28.57	28.42
2,041.56	50.39	2.95	17.1	29.59	29.43
2,041.60	55.16	3.02	18.3	30.61	30.45
2,041.64	60.20	3.09	19.5	31.63	31.46
2,041.68	65.52	3.15	20.8	32.65	32.48
2,041.72	71.13	3.22	22.1	33.68	33.49
2,041.76	77.02	3.28	23.5	34.70	34.51
2,041.80	83.21	3.35	24.9	35.72	35.52
2,041.84	89.70	3.41	26.3	36.74	36.54
2,041.88	96.50	3.47	27.8	37.76	37.55
2,041.92	103.61	3.53	29.3	38.78	38.57
2,041.96	111.04	3.60	30.9	39.80	39.58
2,042.00	118.80	3.66	32.5	40.82	40.60
2,042.04	126.89	3.72	34.1	41.84	41.61
2,042.08	135.31	3.78	35.8	42.86	42.63
2,042.12	144.07	3.84	37.5	43.88	43.64

Table
Rating Table for Irregular Channel

Water Surface Elevation (ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
2,042.16	153.18	3.90	39.3	44.90	44.66
2,042.20	162.64	3.96	41.1	45.92	45.67
2,042.24	172.46	4.01	43.0	46.94	46.69
2,042.28	182.63	4.07	44.8	47.96	47.70
2,042.32	193.18	4.13	46.8	48.98	48.72
2,042.36	204.10	4.19	48.7	50.00	49.73
2,042.40	215.40	4.24	50.7	51.02	50.75
2,042.44	209.89	3.95	53.1	59.24	58.93
2,042.48	225.18	4.06	55.5	59.46	59.10
2,042.52	240.92	4.17	57.8	59.68	59.28
2,042.56	257.09	4.27	60.2	59.90	59.45
2,042.60	273.70	4.37	62.6	60.12	59.62
2,042.64	290.73	4.47	65.0	60.34	59.80
2,042.68	308.19	4.57	67.4	60.56	59.98
2,042.72	326.07	4.67	69.8	60.78	60.15
2,042.76	344.35	4.77	72.2	61.00	60.33
2,042.80	363.05	4.87	74.6	61.22	60.50
2,042.84	382.16	4.96	77.0	61.44	60.67
2,042.88	401.66	5.06	79.5	61.66	60.85
2,042.92	421.57	5.15	81.9	61.88	61.02
2,042.96	441.87	5.24	84.3	62.10	61.20
2,043.00	462.56	5.33	86.8	62.32	61.38
2,043.04	483.64	5.42	89.2	62.54	61.55
2,043.08	505.11	5.51	91.7	62.75	61.72
2,043.12	526.96	5.60	94.2	62.97	61.90
2,043.16	549.19	5.68	96.7	63.19	62.07
2,043.20	571.80	5.77	99.1	63.41	62.25
2,043.24	594.78	5.85	101.6	63.63	62.43
2,043.28	618.14	5.94	104.1	63.85	62.60
2,043.32	641.86	6.02	106.7	64.07	62.78
2,043.36	665.96	6.10	109.2	64.29	62.95
2,043.40	690.42	6.18	111.7	64.51	63.12
2,043.44	715.24	6.26	114.2	64.73	63.30
2,043.48	740.42	6.34	116.8	64.95	63.48
2,043.52	765.96	6.42	119.3	65.17	63.65
2,043.56	791.86	6.50	121.8	65.39	63.83
2,043.60	818.12	6.58	124.4	65.61	64.00
2,043.64	834.77	6.57	127.0	68.19	66.55
2,043.68	854.07	6.58	129.7	70.78	69.09
2,043.72	799.61	6.03	132.5	73.37	71.64
2,043.76	805.28	5.95	135.5	75.95	74.18
2,043.80	812.36	5.87	138.5	78.54	76.73
2,043.84	820.76	5.80	141.6	81.12	79.27
2,043.88	830.41	5.73	144.8	83.71	81.82
2,043.92	841.25	5.68	148.1	86.29	84.36
2,043.96	853.23	5.63	151.6	88.88	86.91
2,044.00	866.32	5.59	155.1	91.47	89.45
2,044.04	880.47	5.55	158.7	94.05	92.00
2,044.08	895.65	5.51	162.5	96.64	94.55
2,044.12	911.85	5.48	166.3	99.22	97.09
2,044.16	929.03	5.46	170.2	101.81	99.64
2,044.20	947.19	5.44	174.3	104.40	102.18
2,044.24	966.30	5.42	178.4	106.98	104.73
2,044.28	986.35	5.40	182.6	109.57	107.27

Table
Rating Table for Irregular Channel

Water Surface Elevation (ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
2,044.32	1,007.34	5.39	187.0	112.15	109.82
2,044.36	1,029.26	5.38	191.4	114.74	112.36
2,044.40	1,052.10	5.37	196.0	117.32	114.91
2,044.44	1,075.85	5.36	200.6	119.91	117.45
2,044.48	1,100.52	5.36	205.4	122.50	120.00
2,044.52	1,126.09	5.36	210.2	125.08	122.55
2,044.56	1,152.58	5.36	215.2	127.67	125.09
2,044.60	1,179.97	5.36	220.2	130.25	127.64
2,044.64	1,208.28	5.36	225.4	132.84	130.18
2,044.68	1,237.49	5.37	230.6	135.42	132.73
2,044.72	1,276.27	5.41	236.0	136.76	134.00
2,044.76	1,324.46	5.49	241.3	136.84	134.00
2,044.80	1,373.33	5.57	246.7	136.92	134.00
2,044.84	1,422.89	5.65	252.1	137.00	134.00
2,044.88	1,473.13	5.72	257.4	137.08	134.00
2,044.92	1,524.04	5.80	262.8	137.16	134.00
2,044.96	1,575.61	5.88	268.1	137.24	134.00
2,045.00	1,627.84	5.95	273.5	137.32	134.00

Rating Table Report
Cave Creek Road Overtopping Analysis
(Culvert/Roadway)

Range Data:

	Minimum	Maximum	Increment
Discharge	0.00	900.00	10.00 cfs

Discharge (cfs)	HW Elev. (ft)
0.00	2,036.95
10.00	2,038.10
20.00	2,038.69
30.00	2,039.19
40.00	2,039.64
50.00	2,040.06
60.00	2,040.55
70.00	2,041.77
80.00	2,042.61
90.00	2,042.74
100.00	2,042.82
110.00	2,042.88
120.00	2,042.94
130.00	2,042.98
140.00	2,043.03
150.00	2,043.07
160.00	2,043.10
170.00	2,043.13
180.00	2,043.16
190.00	2,043.19
200.00	2,043.22
210.00	2,043.24
220.00	2,043.26
230.00	2,043.28
240.00	2,043.30
250.00	2,043.32
260.00	2,043.34
270.00	2,043.35
280.00	2,043.37
290.00	2,043.39
300.00	2,043.40
310.00	2,043.42
320.00	2,043.43
330.00	2,043.45
340.00	2,043.46
350.00	2,043.48
360.00	2,043.49
370.00	2,043.50
380.00	2,043.51
390.00	2,043.53
400.00	2,043.54
410.00	2,043.55
420.00	2,043.56
430.00	2,043.58
440.00	2,043.59
450.00	2,043.60
460.00	2,043.61
470.00	2,043.62
480.00	2,043.63
490.00	2,043.64

Rating Table Report
Cave Creek Road Overtopping Analysis

Discharge (cfs)	HW Elev. (ft)
500.00	2,043.65
510.00	2,043.66
520.00	2,043.67
530.00	2,043.67
540.00	2,043.68
550.00	2,043.69
560.00	2,043.70
570.00	2,043.71
580.00	2,043.72
590.00	2,043.73
600.00	2,043.74
610.00	2,043.75
620.00	2,043.76
630.00	2,043.77
640.00	2,043.77
650.00	2,043.78
660.00	2,043.79
670.00	2,043.80
680.00	2,043.81
690.00	2,043.81
700.00	2,043.82
710.00	2,043.83
720.00	2,043.84
730.00	2,043.84
740.00	2,043.85
750.00	2,043.86
760.00	2,043.87
770.00	2,043.87
780.00	2,043.88
790.00	2,043.89
800.00	2,043.90
810.00	2,043.90
820.00	2,043.91
830.00	2,043.92
840.00	2,043.93
850.00	2,043.93
860.00	2,043.94
870.00	2,043.95
880.00	2,043.95
890.00	2,043.96
900.00	2,043.97

Culvert Analysis Report
Culvert-2

Culvert Summary			
Computed Headwater Elevation	2,042.96 ft	Discharge	77.97 cfs
Inlet Control HW Elev.	2,041.74 ft	Tailwater Elevation	2,037.47 ft
Outlet Control HW Elev.	2,042.96 ft	Control Type	Outlet Control
Headwater Depth/Height	2.19		

Grades			
Upstream Invert	2,036.95 ft	Downstream Invert	2,035.07 ft
Length	124.00 ft	Constructed Slope	0.015161 ft/ft

Hydraulic Profile			
Profile	CompositeM2PressureProfile	Depth, Downstream	2.40 ft
Slope Type	Mild	Normal Depth	N/A ft
Flow Regime	Subcritical	Critical Depth	2.25 ft
Velocity Downstream	9.30 ft/s	Critical Slope	0.027494 ft/ft

Section			
Section Shape	Arch	Mannings Coefficient	0.025
Section Material	Steel and Aluminum Var CR	Span	4.08 ft
Section Size	49 x 33 inch	Rise	2.75 ft
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	2,042.96 ft	Upstream Velocity Head	1.19 ft
Ke	0.50	Entrance Loss	0.60 ft

Inlet Control Properties			
Inlet Control HW Elev.	2,041.74 ft	Flow Control	Submerged
Inlet Type	90° headwall	Area Full	8.9 ft^2
K	0.00830	HDS 5 Chart	34
M	2.00000	HDS 5 Scale	1
C	0.03790	Equation Form	1
Y	0.69000		

Culvert Analysis Report
Weir

Hydraulic Component(s): Roadway

Discharge	47.10 cfs	Allowable HW Elevation	2,042.96 ft
Roadway Width	110.00 ft	Overtopping Coefficient	2.92 US
Low Point	2,042.40 ft	Headwater Elevation	2,042.96 ft
Discharge Coefficient (Cr)	2.92	Submergence Factor (Kt)	1.00
Tailwater Elevation	2,037.47 ft		

Sta (ft)	Elev. (ft)
134.00	2,042.40
365.00	2,043.60
374.00	2,043.10
427.00	2,043.20
463.00	2,043.70
466.00	2,044.30
692.00	2,045.10

Culvert Designer/Analyzer Report
Cave Creek Road Overtopping Analysis

Analysis Component			
Storm Event	Design	Discharge	125.00 cfs

Peak Discharge Method: User-Specified			
Design Discharge	125.00 cfs	Check Discharge	125.00 cfs

Tailwater properties: Irregular Channel

Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00	0+82	0.040
0+82	1+15	0.028
1+15	2+39	0.040

Natural Channel Points	
Station (ft)	Elevation (ft)
0+00	2,041.30
0+42	2,041.00
0+82	2,040.00
0+97	2,035.40
1+15	2,039.20
1+68	2,039.60
2+30	2,039.90
2+39	2,040.20

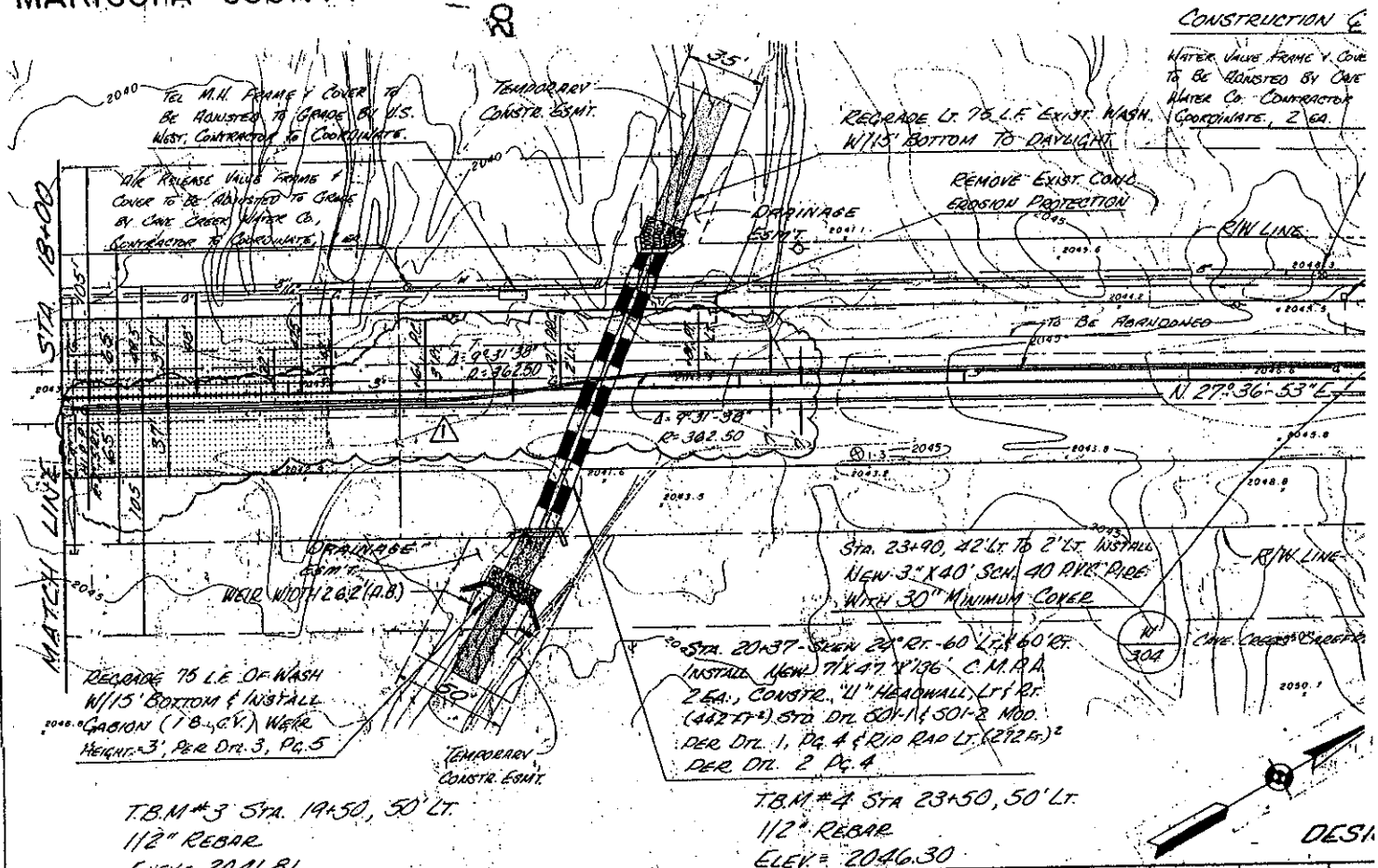
Tailwater conditions for Design Storm.

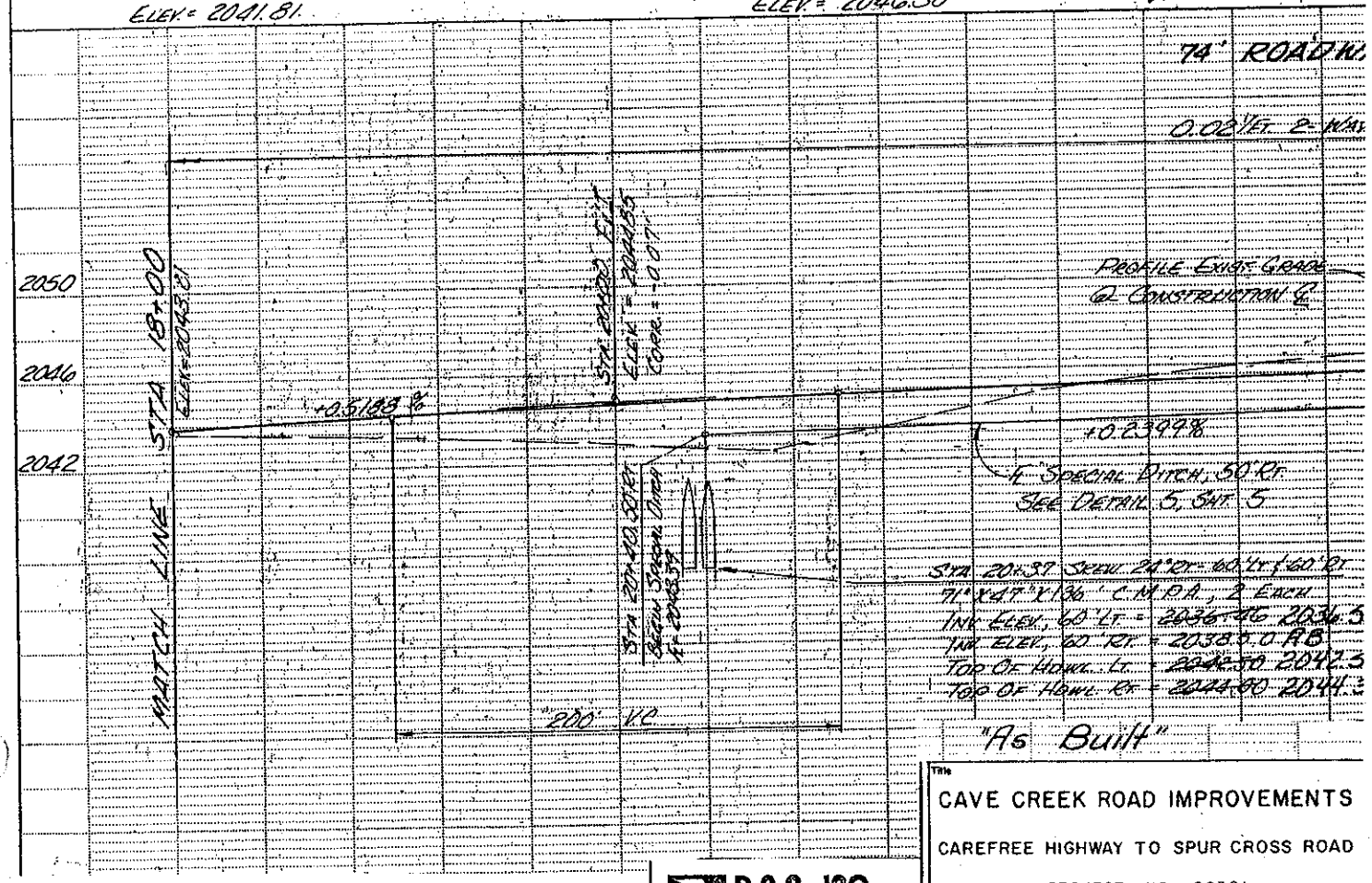
Discharge	125.00 cfs	Actual Depth	2.07 ft
Velocity	7.28 ft/s		

Name	Description	Discharge	HW Elev.	Velocity
Culvert-2	1-49 x 33 inch Arch	77.97 cfs	2,042.96 ft	9.30 ft/s
Weir	Roadway	47.10 cfs	2,042.96 ft	N/A
Total	----------	125.07 cfs	2,042.96 ft	N/A

CAVE CREEK ROAD - CAREFREE HWY. TO SPUR CROSS RD.
MARICOPA COUNTY

W/300 TRI-C INVESTMENT





PLAN

SURVEYED	
PLOTTED	
ALIGNMENT CHECKED	
ST. OF WAY CHECKED	
NOTE BOOK	
NO.	

Title

CAVE CREEK ROAD IMPROVEMENTS

CAREFREE HIGHWAY TO SPUR CROSS ROAD

PROJECT NO. 68301

Description | Sheet | 01

D.N.A. INC.
CIVIL ENGINEERING
LAND SURVEYING

Culvert No 3

Boundary Conditions, Culvert No. 6, Unnamed Central Tributary To Cave Creek-North Branch

TO: Tony Bokich

COPIES: File

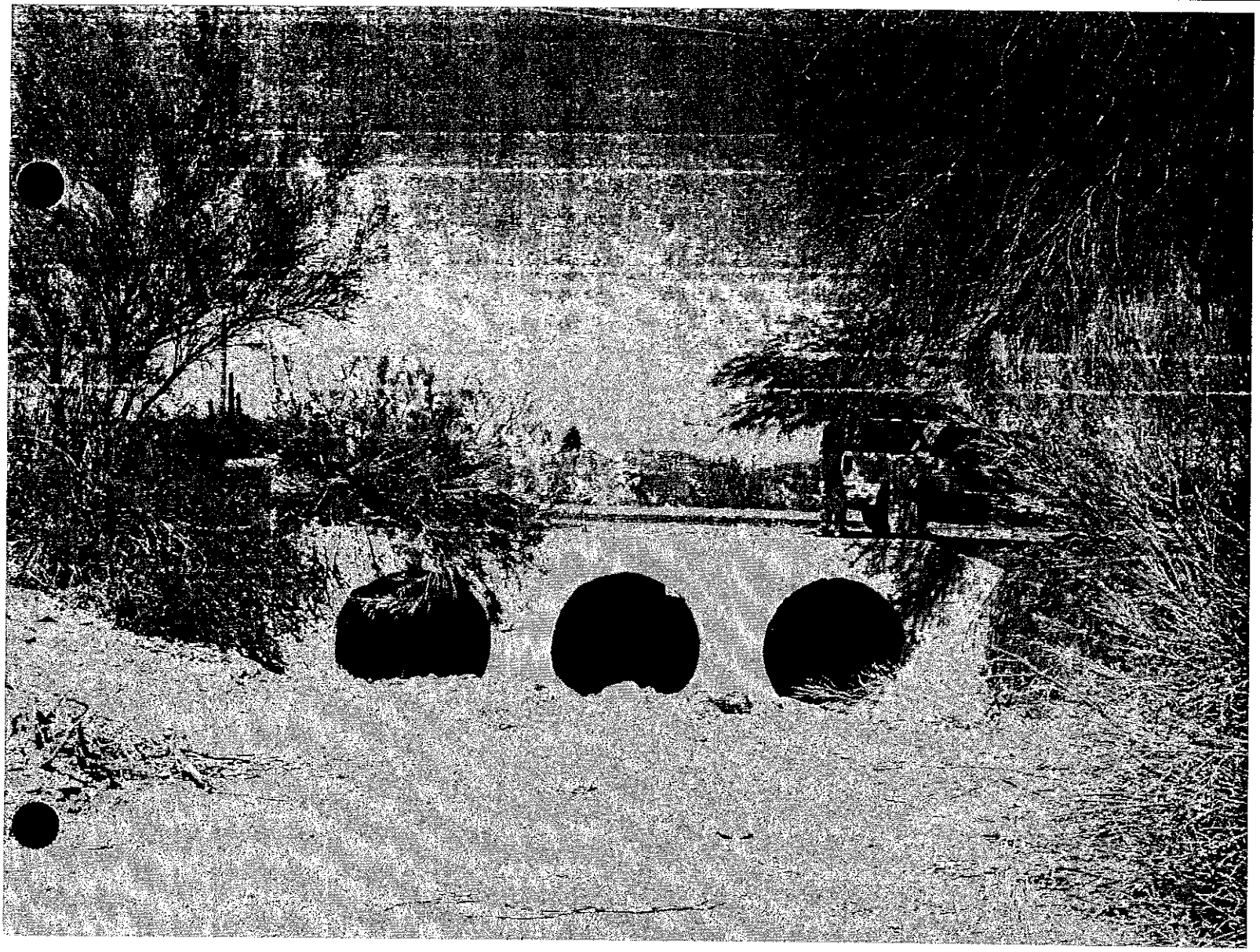
FROM: Patrick Wolf

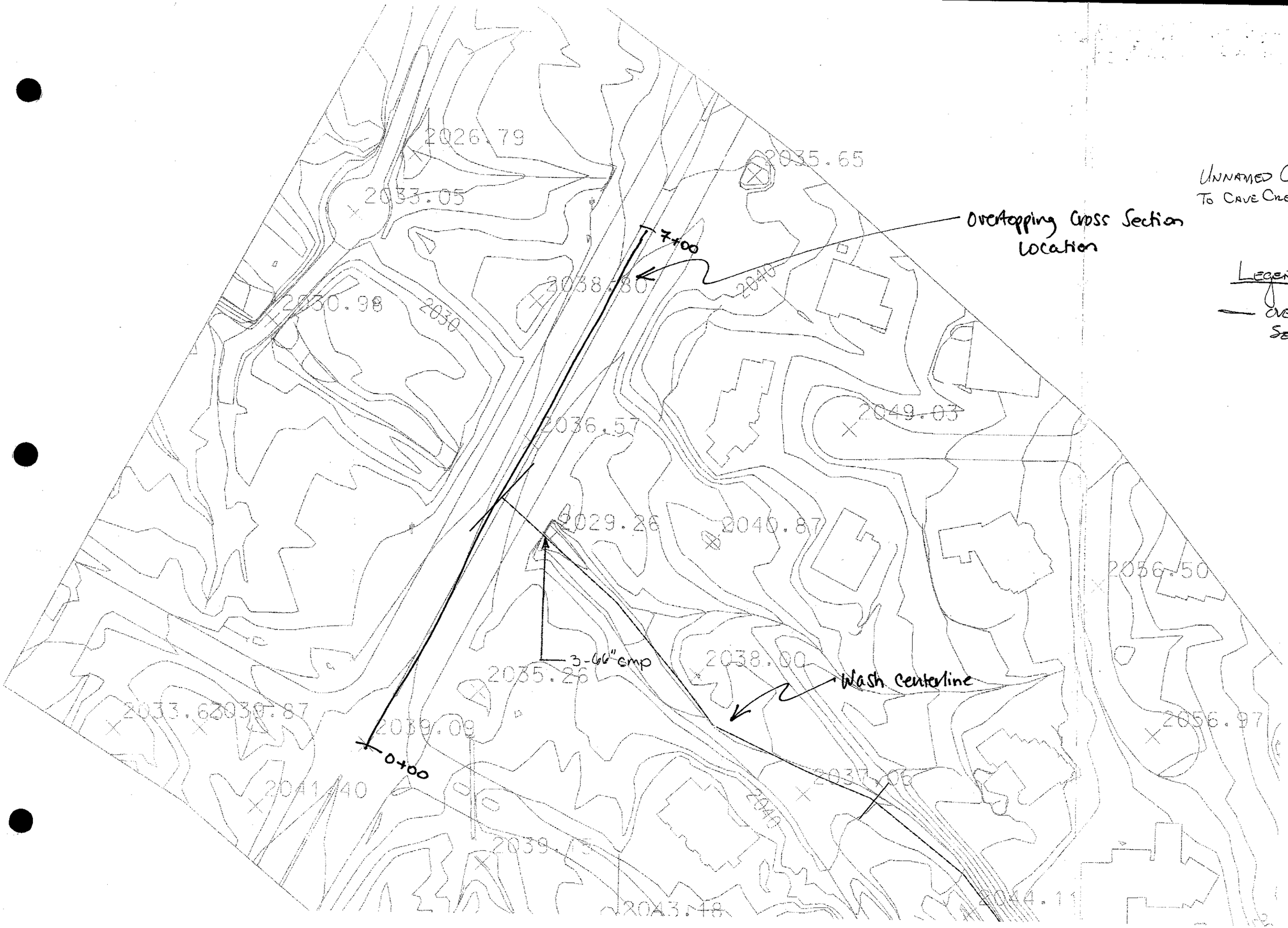
DATE: October 24, 2002 (Revised March 24, 2004)

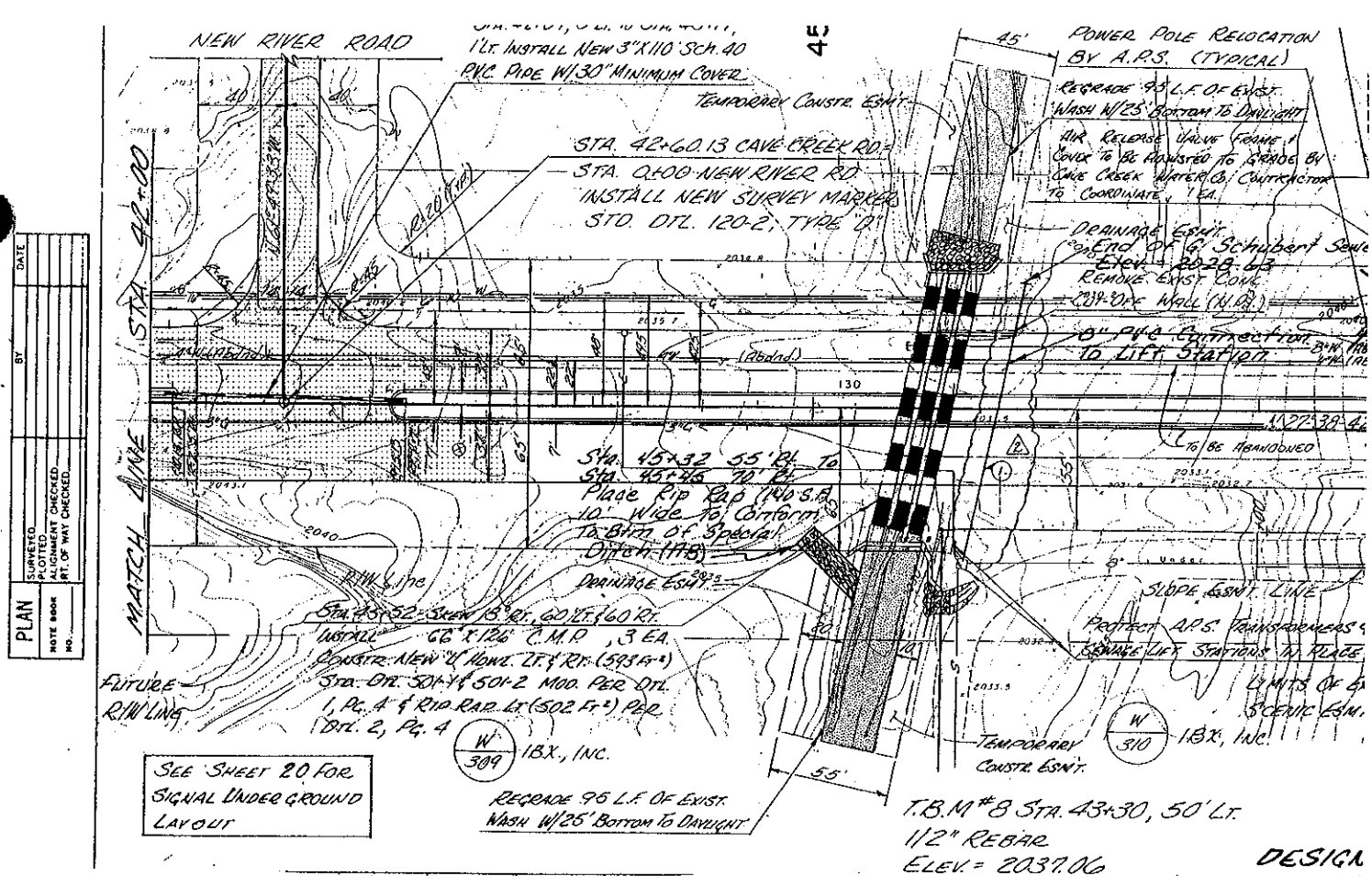
Culvert No. 6 at Cave Creek Road exists as the downstream boundary condition for one of the reaches of the Unnamed Central Wash floodplain delineation. According to the hydrology of the project (*see Data Collection Report*), 2,462 cfs will arrive at the culvert during the 100-year event. Triple 66″ corrugated metal pipes exist under Cave Creek Road at this location.

Hydraulic analysis using Haestad Methods' CulvertMaster software indicates that the culverts can handle approximately 908 cfs (*see attached*) using site specific geometry conditions. A plan view of the site (*see attached*) shows the overtopping line that the remainder of the flow, 1554 cfs, will follow. The road includes a confining dip section, so the flow that is not conveyed through the culverts will overtop road and continue west towards Cave Creek.

The results indicate that the headwater elevation will be 2038.23, resulting in a maximum depth of almost two feet over the roadway. Therefore, this elevation will be used as the downstream boundary condition in the HEC-RAS floodplain model, with a boundary water surface elevation of 2038.23.




UNNAMED CENTRAL TRIBUTARY
TO CAVE CREEK - NORTH WASH
N
1" = 60'
LEGEND
OVERTOPPING CROSS SECTION
Overtopping Cross Section Location
7+00
0+00
3-66" cmp
Wash Centerline
2026.79
2033.05
2035.65
2030.98
2030
2038.80
2040
2036.57
2049.03
2029.26
2040.87
2056.50
2035.26
2038.00
2033.62
2039.87
2039.09
2056.97
2041.40
2037.05
2043.18
2044.11



DESIGN

74

~~Lt. Sta. 42+60.16 x 28' A.C. Turnout~~
~~Sta. Dtl. 205 Type 3 V.C.~~
~~0.02 L.F. 2" Mat Cement~~
Omitted (AB)
700' V.C.

STA. 42+85 PVI
ELEV. 2033.10
CODE 5.19

FINISH PAVEMENT PROFILE
7' LT. & 7' RT. OF CONSTRUCTION ℄

-1.85 13%

-1.3 10%

STA. 44+60.5, 30' RT.
E. 2034.27

GRADE TO DRAIN

STA. 43+52 - SKEW 15° RT. 60' LT. & 60' RT.
66" X 126" C.M.P., 3 EA.
INV. ELEV. 60' LT. = ~~2025.20~~ 2025.47
INV. ELEV. 60' RT. = 2028.35 AB
TOP OF HDWL. LT. = ~~2032.70~~ 2032.62
TOP OF HDWL. RT. = 2033.35 AB

50' RT.

2040

Deleted
~~EXISTING LIFT STATION AT STA. 45+65, 70' RT. TO STA. 45+92, 56' LT. INSTALL 128 L.F. OF 8" PVC SDR 35 CONNECT TO EXIST. LIFT STATION OR MAKE PLUG EXIST. LEFT & RIGHT PROFILE PROFILE RIGHT~~

2030

2020

"As Built"

44

46

PLATE 1-

Copy of As Built Plans, 1990

Culvert No. 6 - Unnamed Central Trib to Cave Creek - Ninth Branch

Title
CAVE CREEK ROAD IMPROVEMENTS
CAREFREE HIGHWAY TO SPUR CROSS ROAD
PROJECT NO. 68301

Description | Sheet | Of

Culvert Designer/Analyzer Report
Problem #6

Unnamed Central Tributary To Cave Creek - North Branch

Analysis Component			
Storm Event	Design	Discharge	2,462.00 cfs

Peak Discharge Method: User-Specified			
Design Discharge	2,462.00 cfs	Check Discharge	2,462.00 cfs

Tailwater properties: Irregular Channel

Roughness Segments

Start Station	End Station	Mannings Coefficient
1+72	2+44	0.040
2+44	2+56	0.028
2+56	3+00	0.040
3+00	3+38	0.028
3+38	3+91	0.040

Natural Channel Points

Station (ft)	Elevation (ft)
1+72	2,031.02
1+90	2,030.13
2+21	2,029.97
2+32	2,028.36
2+44	2,024.08
2+54	2,024.16
2+56	2,024.08
2+67	2,026.13
2+79	2,025.56
2+93	2,027.15
3+00	2,026.93
3+01	2,026.97
3+30	2,026.89
3+38	2,026.36
3+49	2,027.66
3+59	2,027.85
3+64	2,027.78
3+69	2,028.77
3+91	2,031.92

Tailwater conditions for Design Storm.

Discharge	2,462.00 cfs	Actual Depth	4.22 ft
Velocity	9.73 ft/s		

Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	3-66 inch Circular	907.84 cfs	2,038.23 ft	13.80 ft/s
Weir	Roadway	1,555.32 cfs	2,038.23 ft	N/A
Total	----------	2,463.16 cfs	2,038.23 ft	N/A

Culvert Designer/Analyzer Report
Problem #6

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	2,038.23 ft	Discharge	907.84 cfs
Inlet Control HW Elev.	2,038.23 ft	Tailwater Elevation	2,028.30 ft
Outlet Control HW Elev.	2,037.54 ft	Control Type	Inlet Control
Headwater Depth/Height	1.80		

Grades			
Upstream Invert	2,028.35 ft	Downstream Invert	2,025.47 ft
Length	126.00 ft	Constructed Slope	0.022857 ft/ft

Hydraulic Profile			
Profile	M2	Depth, Downstream	4.78 ft
Slope Type	Mild	Normal Depth	N/A ft
Flow Regime	Subcritical	Critical Depth	4.78 ft
Velocity Downstream	13.80 ft/s	Critical Slope	0.025269 ft/ft

Section			
Section Shape	Circular	Mannings Coefficient	0.024
Section Material	CMP	Span	5.50 ft
Section Size	66 inch	Rise	5.50 ft
Number Sections	3		

Outlet Control Properties			
Outlet Control HW Elev.	2,037.54 ft	Upstream Velocity Head	2.56 ft
Ke	0.50	Entrance Loss	1.28 ft

Inlet Control Properties			
Inlet Control HW Elev.	2,038.23 ft	Flow Control	Submerged
Inlet Type	Headwall	Area Full	71.3 ft^2
K	0.00780	HDS 5 Chart	2
M	2.00000	HDS 5 Scale	1
C	0.03790	Equation Form	1
Y	0.69000		

Culvert Designer/Analyzer Report
Problem #6

Component:Weir

Hydraulic Component(s): Roadway					
Discharge	1,555.32	cfs	Allowable HW Elevation	2,038.23	ft
Roadway Width	0.00	ft	Overtopping Coefficient	3.09	US
Low Point	2,036.57	ft	Headwater Elevation	2,038.23	ft
Discharge Coefficient (Cr)	3.09		Submergence Factor (Kt)	1.00	
Tailwater Elevation	2,028.30	ft			

Sta (ft)	Elev. (ft)
0.00	2,039.00
90.00	2,038.00
320.00	2,036.65
360.00	2,036.57
400.00	2,036.65
560.00	2,038.00
690.00	2,039.00

Rating Table Report
Problem #6

Unnamed Central Tributary To Cave Creek - North Branch

Range Data:

	Minimum	Maximum	Increment
Discharge	0.00	3,500.00	100.00 cfs

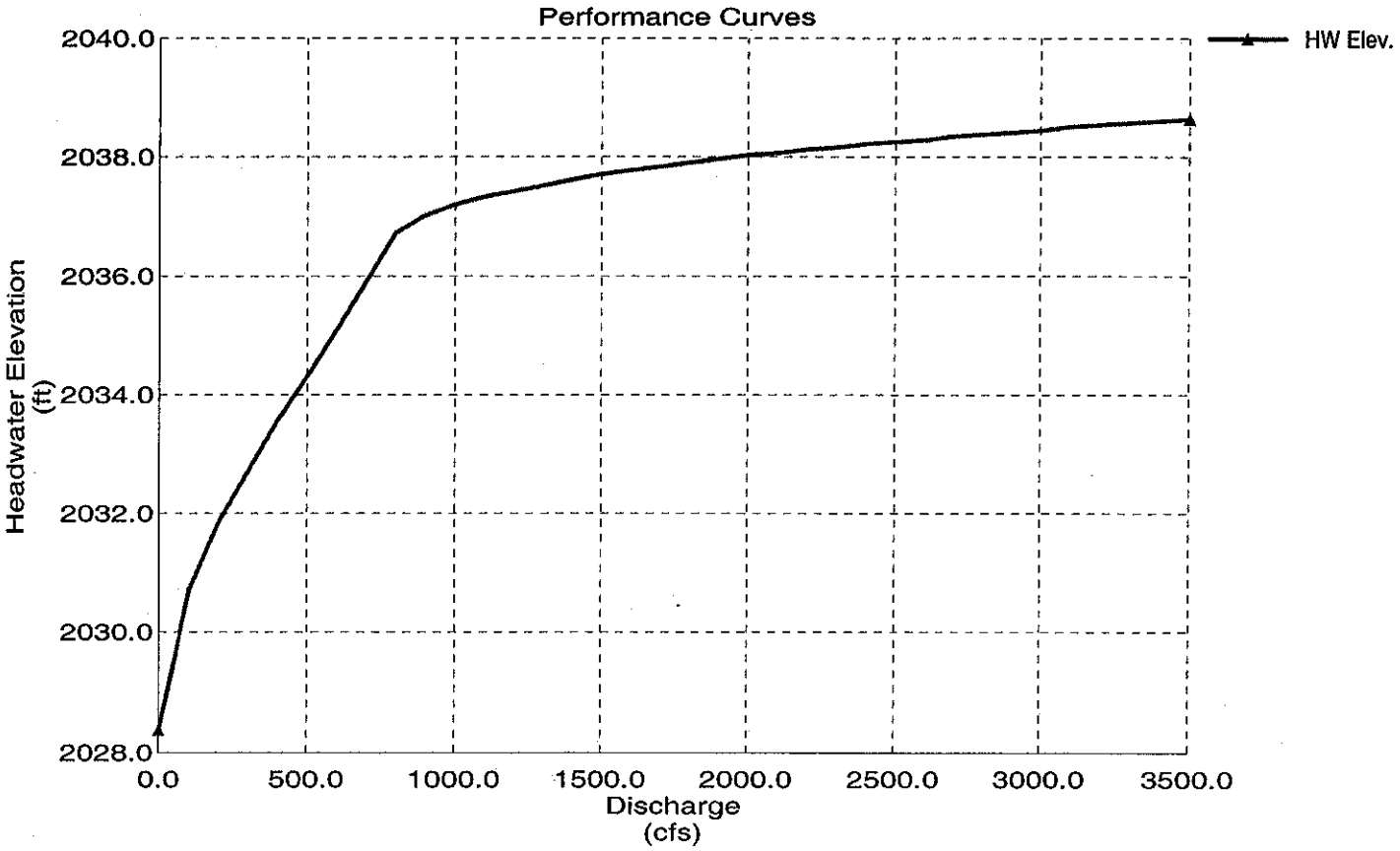
Discharge (cfs)	HW Elev. (ft)
0.00	2,028.35
100.00	2,030.75
200.00	2,031.85
300.00	2,032.74
400.00	2,033.56
500.00	2,034.33
600.00	2,035.09
700.00	2,035.86
800.00	2,036.73
900.00	2,037.01
1,000.00	2,037.18
1,100.00	2,037.32
1,200.00	2,037.43
1,300.00	2,037.53
1,400.00	2,037.62
1,500.00	2,037.70
1,600.00	2,037.77
1,700.00	2,037.84
1,800.00	2,037.90
1,900.00	2,037.96
2,000.00	2,038.02
2,100.00	2,038.07
2,200.00	2,038.11
2,300.00	2,038.16
2,400.00	2,038.20
2,500.00	2,038.25
2,600.00	2,038.29
2,700.00	2,038.33
2,800.00	2,038.37
2,900.00	2,038.41
3,000.00	2,038.45
3,100.00	2,038.48
3,200.00	2,038.52
3,300.00	2,038.55
3,400.00	2,038.59
3,500.00	2,038.62

Performance Curves Report
Problem #6

Unnamed Tributary To Cave Creek North Branch

Range Data:

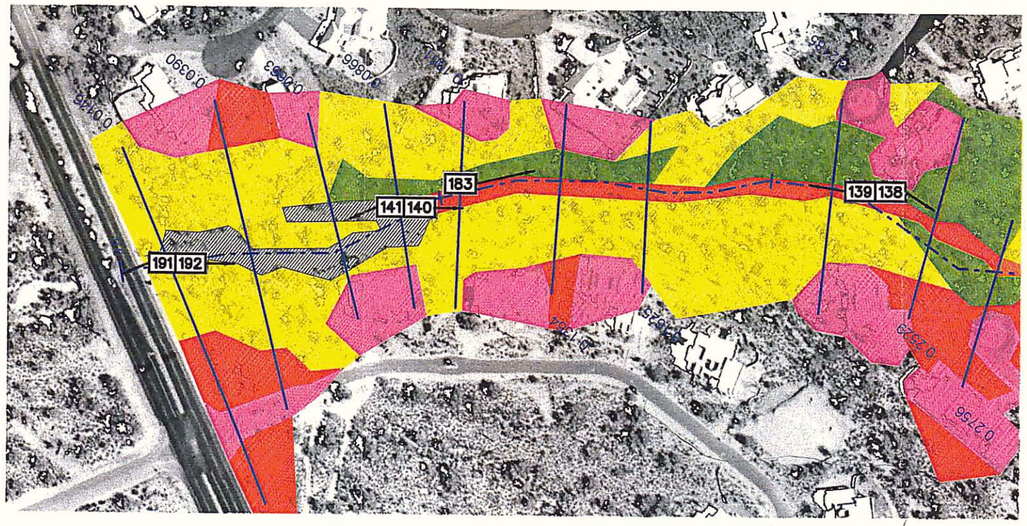
	Minimum	Maximum	Increment
Discharge	0.00	3,500.00	100.00 cfs

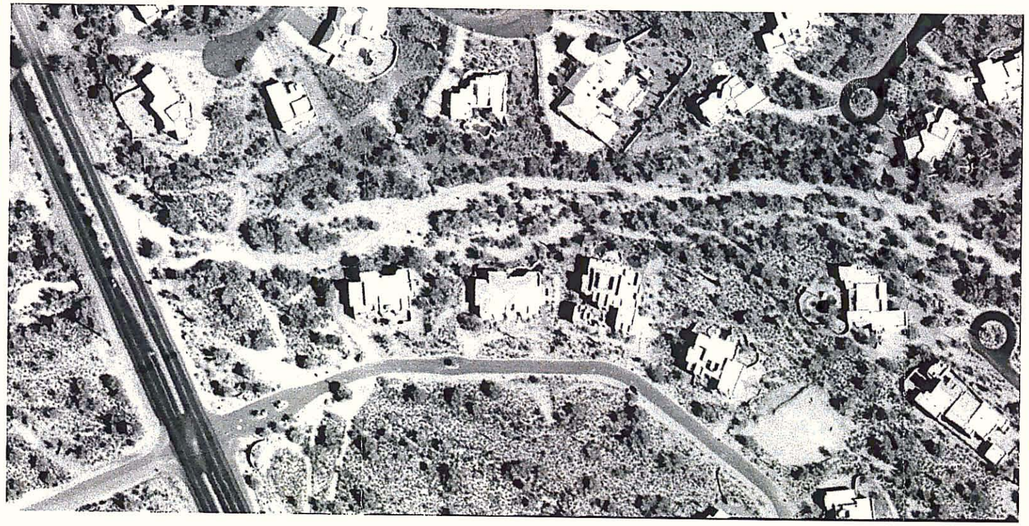


Picture 139: Unnamed Central Tributary to Cave Creek, Looking Downstream (northwest)

N Value Distribution for Unnamed Central							
Value		Normal Channel	Vegetated Channel	High Standing Vegetation Channel	Minimally Vegetated Overbanks	Vegetated Overbanks	High Standing Vegetation Overbanks
Material	N 0	0.020	0.020	0.020	0.020	0.020	0.020
Degree of Irregularities	N 1	0.005	0.005	0.005	0.005	0.005	0.005
Variation in Cross Section	N 2	0.000	0.000	0.000	0.000	0.000	0.005
Obstructions	N 3	0.000	0.000	0.000	0.002	0.000	0.000
Vegetation	N 4	0.003	0.010	0.028	0.005	0.015	0.028
Meandering	M 5	1.000	1.000	1.000	1.000	1.000	1.000
	N-Value	0.028	0.035	0.053	0.032	0.040	0.058

COWEN ROUGHNESS COEFFICIENT EQUATION:
N = (N0 + N1 + N2 + N3 + N4)*M5
N0 = BASIS VALUE FOR STRAIGHT, UNIFORM, SMOOTH CHANNEL
N1 = VALUE TO CORRECT FOR SURFACE IRREGULARITIES
N2 = VALUE FOR VARIATIONS IN SHAPE AND SIZE OF CHANNEL
N3 = VALUE FOR OBSTRUCTIONS
N4 = VALUE FOR VEGETATION AND FLOW CONDITION
M5 = CORRECTION FACTOR FOR MEANDERING CHANNEL



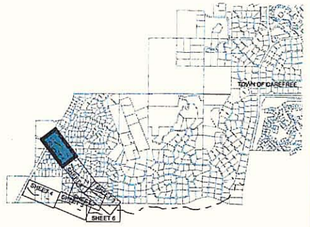


200' 0' 200' 400'
SCALE: 1"= 200 FEET
FLIGHT DATES: JUNE 2000

LEGEND

- MANNINGS "N" VALUE = 0.028
- MANNINGS "N" VALUE = 0.040
- MANNINGS "N" VALUE = 0.025
- MANNINGS "N" VALUE = 0.058
- MANNINGS "N" VALUE = 0.035
- MANNINGS "N" VALUE = 0.032
- MANNINGS "N" VALUE = 0.053
- MANNINGS "N" VALUE = 0.045
- 182 PHOTO DIRECTION AND PICTURE NUMBER
- WASH REACH
- HEC-RAS CROSS SECTION LINES

NOTES



SHEET INDEX MAP

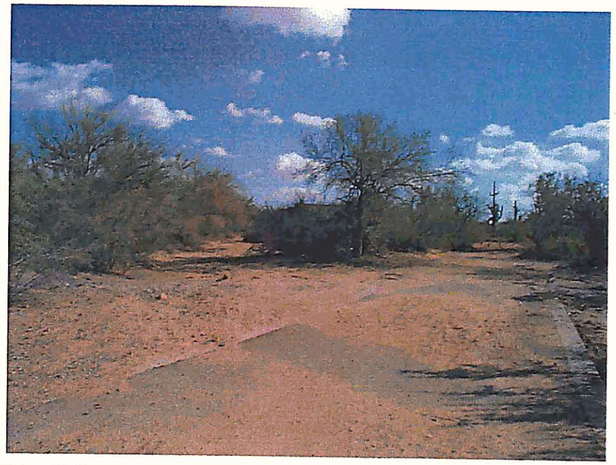
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

UNNAMED CENTRAL TRIBUTARY
TO CAVE CREEK
CAREFREE FLOODPLAIN DELINEATION
F.C.D. CONTRACT NO. 2000 C037

CH2MHILL

SHEET 01 OF 07

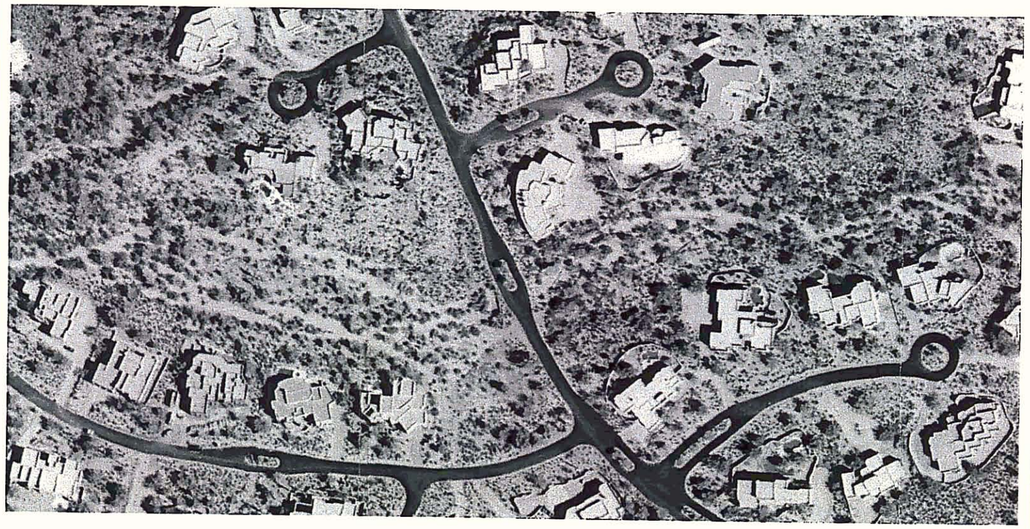
2944adhp01.dgn 04-JUN-2003



Picture 137: Unnamed Central Tributary to Cave Creek, Looking Downstream (west)

N Value Distribution for Unnamed Central							
Value		Normal Channel	Vegetated Channel	High Standing Vegetation Channel	Minimally Vegetated Overbanks	Vegetated Overbanks	High Standing Vegetation Overbanks
Material	N 0	0.020	0.020	0.020	0.020	0.020	0.020
Degree of Irregularities	N 1	0.005	0.005	0.005	0.005	0.005	0.005
Variation in Cross Section	N 2	0.000	0.000	0.000	0.000	0.000	0.005
Obstructions	N 3	0.000	0.000	0.000	0.002	0.000	0.000
Vegetation	N 4	0.003	0.010	0.028	0.005	0.015	0.028
Meandering	M 5	1.000	1.000	1.000	1.000	1.000	1.000
	N-Value	0.028	0.035	0.053	0.032	0.040	0.058

COWEN ROUGHNESS COEFFICIENT EQUATION:
N = (N0 + N1 + N2 + N3 + N4)*M5
N0 = BASIS VALUE FOR STRAIGHT, UNIFORM, SMOOTH CHANNEL
N1 = VALUE TO CORRECT FOR SURFACE IRREGULARITIES
N2 = VALUE FOR VARIATIONS IN SHAPE AND SIZE OF CHANNEL
N3 = VALUE FOR OBSTRUCTIONS
N4 = VALUE FOR VEGETATION AND FLOW CONDITION
M5 = CORRECTION FACTOR FOR MEANDERING CHANNEL

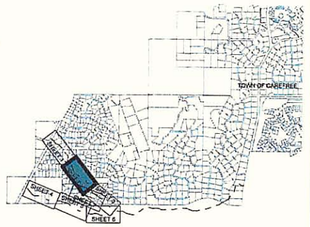


200' 0' 200' 400'
SCALE: 1"= 200 FEET
FLIGHT DATES: JUNE 2000

LEGEND

- MANNINGS "N" VALUE = 0.028
- MANNINGS "N" VALUE = 0.040
- MANNINGS "N" VALUE = 0.025
- MANNINGS "N" VALUE = 0.058
- MANNINGS "N" VALUE = 0.035
- MANNINGS "N" VALUE = 0.032
- MANNINGS "N" VALUE = 0.053
- MANNINGS "N" VALUE = 0.045
- 182 PHOTO DIRECTION AND PICTURE NUMBER
- WASH REACH
- HEC-RAS CROSS SECTION LINES

NOTES



SHEET INDEX MAP

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

UNNAMED CENTRAL TRIBUTARY
TO CAVE CREEK
CAREFREE FLOODPLAIN DELINEATION
F.C.D. CONTRACT NO. 2000 C037

CH2MHILL

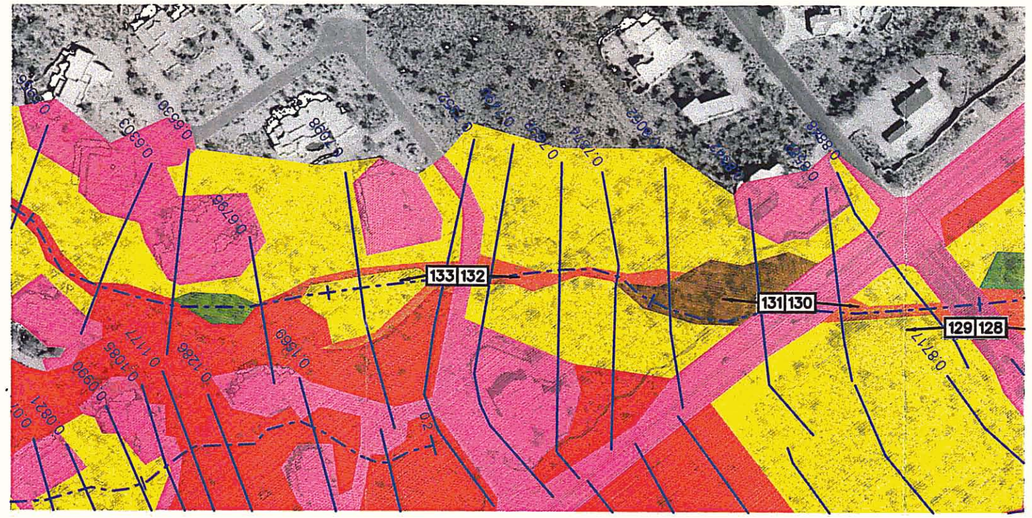
SHEET 02 OF 07

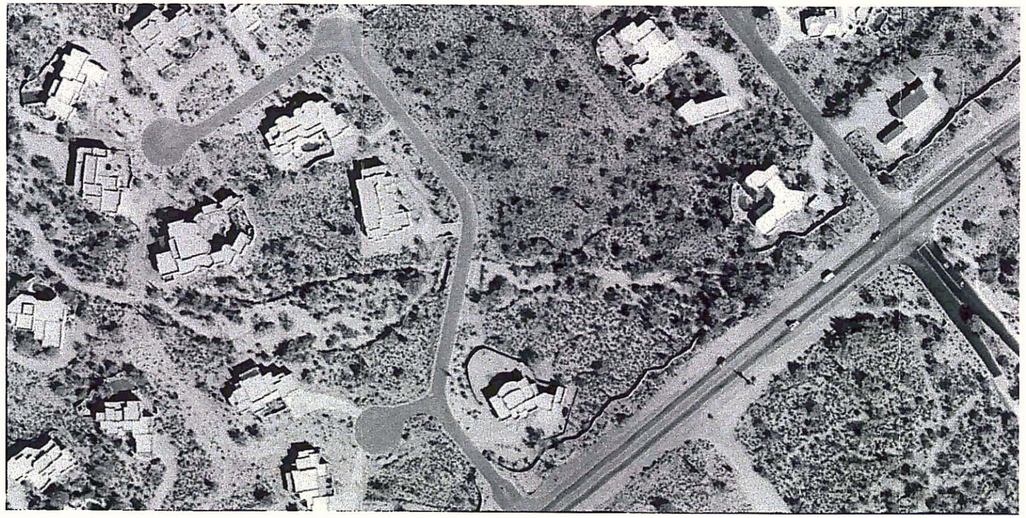
2944adnp02.dgn 04-JUN-2003

Picture 132: Unnamed Central Tributary to Cave Creek, Looking Upstream (southeast)

N Value Distribution for Unnamed Central							
Value		Normal Channel	Vegetated Channel	High Standing Vegetation Channel	Minimally Vegetated Overbanks	Vegetated Overbanks	High Standing Vegetation Overbanks
Material	N 0	0.020	0.020	0.020	0.020	0.020	0.020
Degree of Irregularities	N 1	0.005	0.005	0.005	0.005	0.005	0.005
Variation in Cross Section	N 2	0.000	0.000	0.000	0.000	0.000	0.005
Obstructions	N 3	0.000	0.000	0.000	0.002	0.000	0.000
Vegetation	N 4	0.003	0.010	0.028	0.005	0.015	0.028
Meandering	M 5	1.000	1.000	1.000	1.000	1.000	1.000
	N-Value	0.028	0.035	0.053	0.032	0.040	0.058

COWEN ROUGHNESS COEFFICIENT EQUATION:
N = (N0 + N1 + N2 + N3 + N4)*M5
N0 = BASIS VALUE FOR STRAIGHT, UNIFORM, SMOOTH CHANNEL
N1 = VALUE TO CORRECT FOR SURFACE IRREGULARITIES
N2 = VALUE FOR VARIATIONS IN SHAPE AND SIZE OF CHANNEL
N3 = VALUE FOR OBSTRUCTIONS
N4 = VALUE FOR VEGETATION AND FLOW CONDITION
M5 = CORRECTION FACTOR FOR MEANDERING CHANNEL



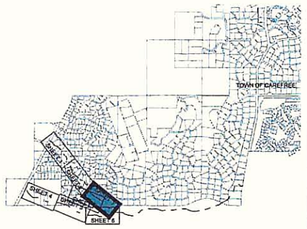


200' 0' 200' 400'
SCALE: 1"= 200 FEET
FLIGHT DATES: JUNE 2000

LEGEND

- MANNINGS "N" VALUE = 0.028
- MANNINGS "N" VALUE = 0.040
- MANNINGS "N" VALUE = 0.025
- MANNINGS "N" VALUE = 0.058
- MANNINGS "N" VALUE = 0.035
- MANNINGS "N" VALUE = 0.032
- MANNINGS "N" VALUE = 0.053
- MANNINGS "N" VALUE = 0.045
- 182 PHOTO DIRECTION AND PICTURE NUMBER
- WASH REACH
- HEC-RAS CROSS SECTION LINES

NOTES



SHEET INDEX MAP

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

UNNAMED CENTRAL TRIBUTARY
TO CAVE CREEK
CAREFREE FLOODPLAIN DELINEATION
F.C.D. CONTRACT NO. 2000 C037

CH2MHILL

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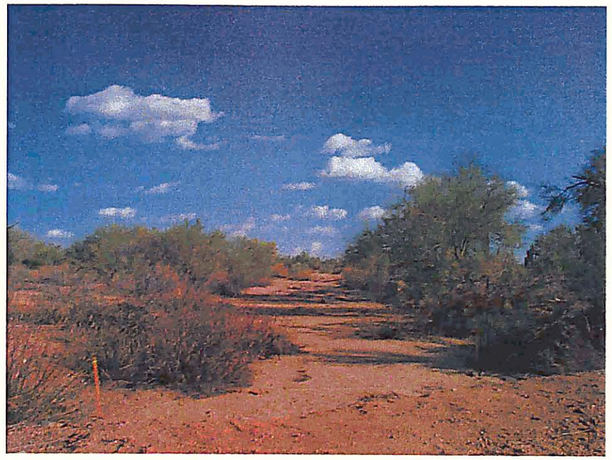
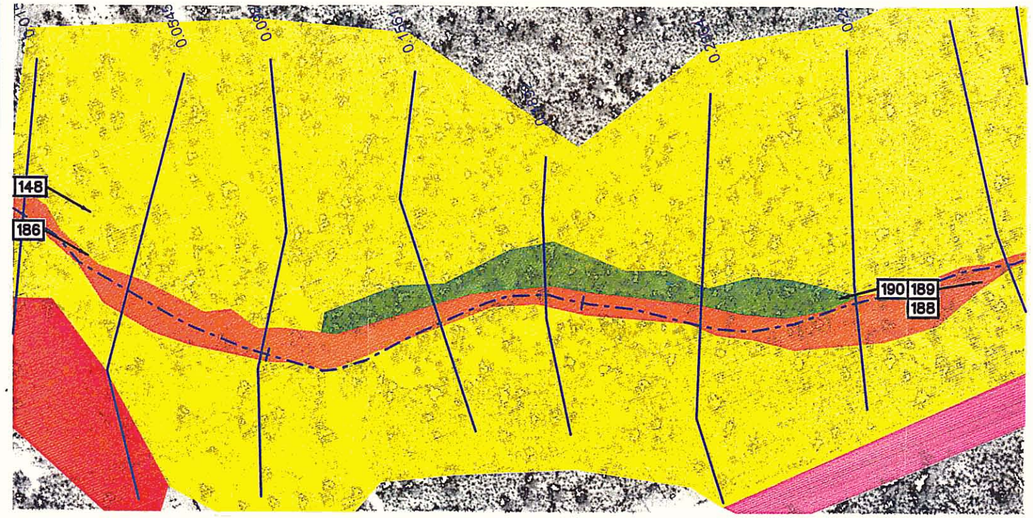
2944dnp03.dgn 04-JUN-2003



Picture 148: Unnamed Central Tributary to Cave Creek, Looking Upstream (southeast)

N Value Distribution for Unnamed Central							
Value		Normal Channel	Vegetated Channel	High Standing Vegetation Channel	Minimally Vegetated Overbanks	Vegetated Overbanks	High Standing Vegetation Overbanks
Material	N 0	0.020	0.020	0.020	0.020	0.020	0.020
Degree of Irregularities	N 1	0.005	0.005	0.005	0.005	0.005	0.005
Variation in Cross Section	N 2	0.000	0.000	0.000	0.000	0.000	0.005
Obstructions	N 3	0.000	0.000	0.000	0.002	0.000	0.000
Vegetation	N 4	0.003	0.010	0.028	0.005	0.015	0.028
Meandering	M 5	1.000	1.000	1.000	1.000	1.000	1.000
	N-Value	0.028	0.035	0.053	0.032	0.040	0.058

COWEN ROUGHNESS COEFFICIENT EQUATION:
N = (N0 + N1 + N2 + N3 + N4)*M5
N0 = BASIS VALUE FOR STRAIGHT, UNIFORM, SMOOTH CHANNEL
N1 = VALUE TO CORRECT FOR SURFACE IRREGULARITIES
N2 = VALUE FOR VARIATIONS IN SHAPE AND SIZE OF CHANNEL
N3 = VALUE FOR OBSTRUCTIONS
N4 = VALUE FOR VEGETATION AND FLOW CONDITION
M5 = CORRECTION FACTOR FOR MEANDERING CHANNEL

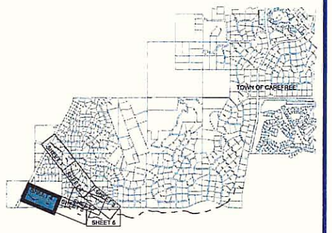


200' 0' 200' 400'
SCALE: 1"= 200 FEET
FLIGHT DATES: JUNE 2000

LEGEND

- MANNINGS "N" VALUE = 0.028
- MANNINGS "N" VALUE = 0.040
- MANNINGS "N" VALUE = 0.025
- MANNINGS "N" VALUE = 0.058
- MANNINGS "N" VALUE = 0.035
- MANNINGS "N" VALUE = 0.032
- MANNINGS "N" VALUE = 0.053
- MANNINGS "N" VALUE = 0.045
- 182 PHOTO DIRECTION AND PICTURE NUMBER
- WASH REACH
- HEC-RAS CROSS SECTION LINES

NOTES



SHEET INDEX MAP

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

UNNAMED CENTRAL TRIBUTARY
TO CAVE CREEK
CAREFREE FLOODPLAIN DELINEATION
F.C.D. CONTRACT NO. 2000 C037

CH2MHILL

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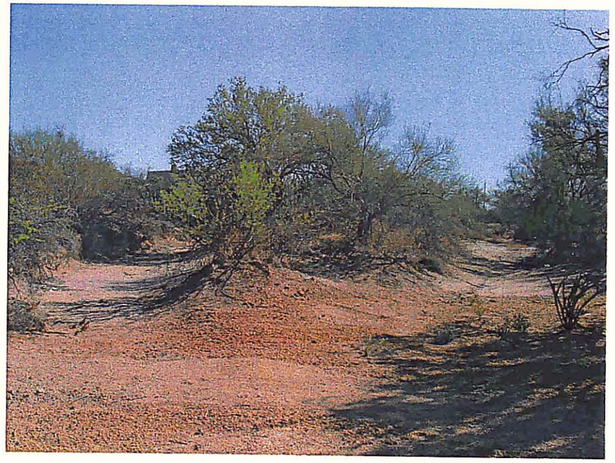
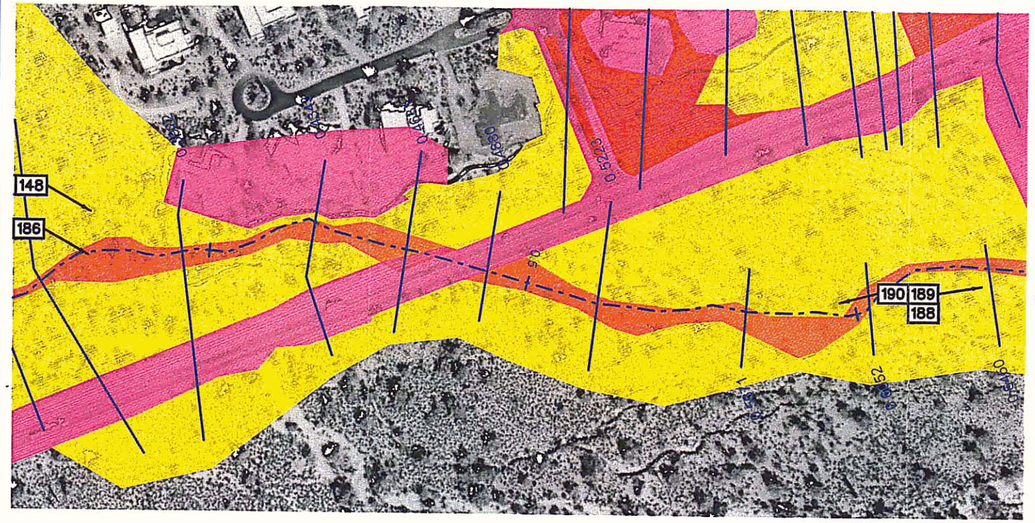
2944adnp04.dgn 04-JUN-2003

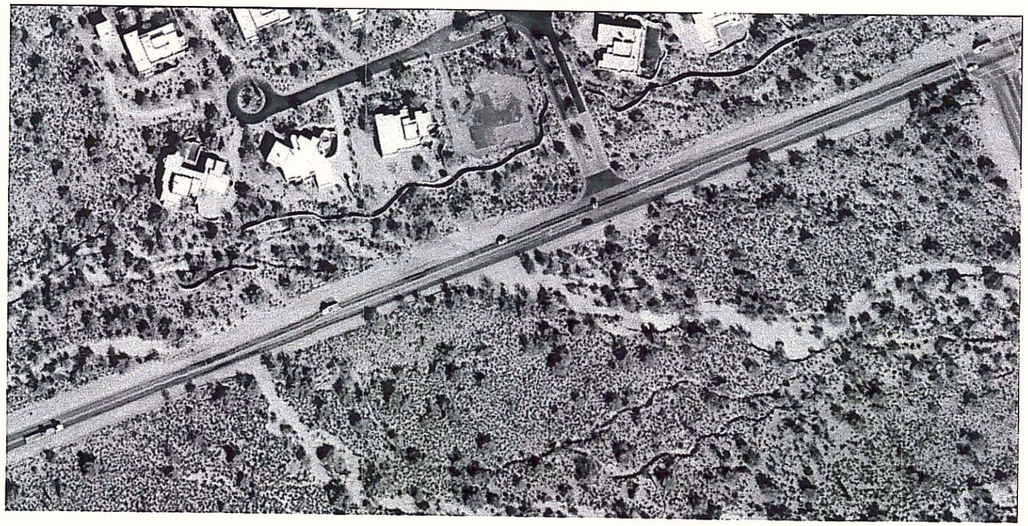


Picture 189: Unnamed Central Tributary to Cave Creek, Looking Upstream (east)

N Value Distribution for Unnamed Central							
Value		Normal Channel	Vegetated Channel	High Standing Vegetation Channel	Minimally Vegetated Overbanks	Vegetated Overbanks	High Standing Vegetation Overbanks
Material	N 0	0.020	0.020	0.020	0.020	0.020	0.020
Degree of Irregularities	N 1	0.005	0.005	0.005	0.005	0.005	0.005
Variation in Cross Section	N 2	0.000	0.000	0.000	0.000	0.000	0.005
Obstructions	N 3	0.000	0.000	0.000	0.002	0.000	0.000
Vegetation	N 4	0.003	0.010	0.028	0.005	0.015	0.028
Meandering	M 5	1.000	1.000	1.000	1.000	1.000	1.000
	N-Value	0.028	0.035	0.053	0.032	0.040	0.058

COWEN ROUGHNESS COEFFICIENT EQUATION:
N = (N0 + N1 + N2 + N3 + N4)*M5
N0 = BASIS VALUE FOR STRAIGHT, UNIFORM, SMOOTH CHANNEL
N1 = VALUE TO CORRECT FOR SURFACE IRREGULARITIES
N2 = VALUE FOR VARIATIONS IN SHAPE AND SIZE OF CHANNEL
N3 = VALUE FOR OBSTRUCTIONS
N4 = VALUE FOR VEGETATION AND FLOW CONDITION
M5 = CORRECTION FACTOR FOR MEANDERING CHANNEL



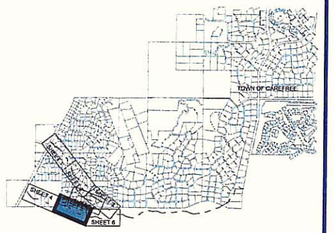


200' 0' 200' 400'
SCALE: 1"= 200 FEET
FLIGHT DATES: JUNE 2000

LEGEND

- MANNINGS "N" VALUE = 0.028
- MANNINGS "N" VALUE = 0.040
- MANNINGS "N" VALUE = 0.025
- MANNINGS "N" VALUE = 0.058
- MANNINGS "N" VALUE = 0.035
- MANNINGS "N" VALUE = 0.032
- MANNINGS "N" VALUE = 0.053
- MANNINGS "N" VALUE = 0.045
- 182 PHOTO DIRECTION AND PICTURE NUMBER
- WASH REACH
- HEC-RAS CROSS SECTION LINES

NOTES



SHEET INDEX MAP

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

UNNAMED CENTRAL TRIBUTARY
TO CAVE CREEK
CAREFREE FLOODPLAIN DELINEATION
F.C.D. CONTRACT NO. 2000 C037

CH2MHILL

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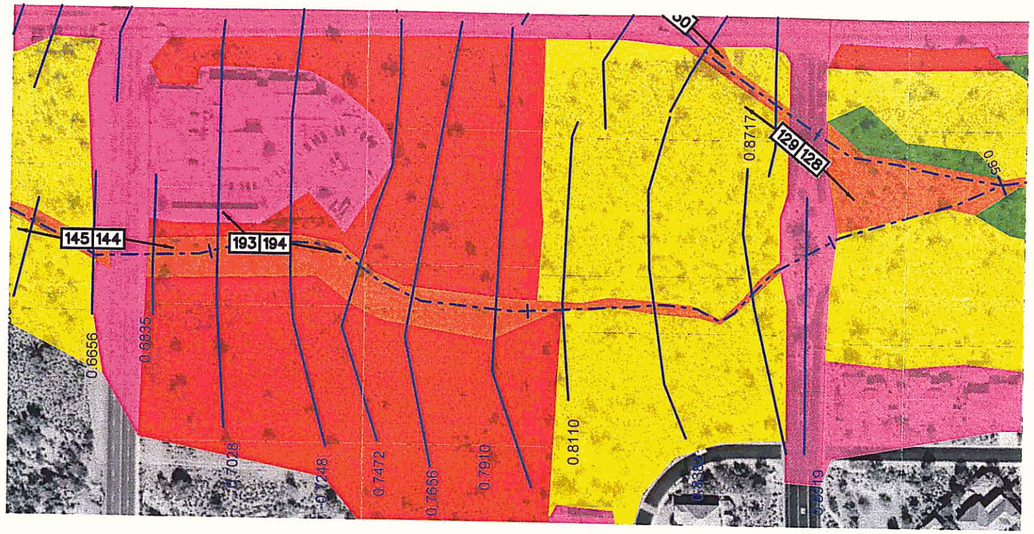
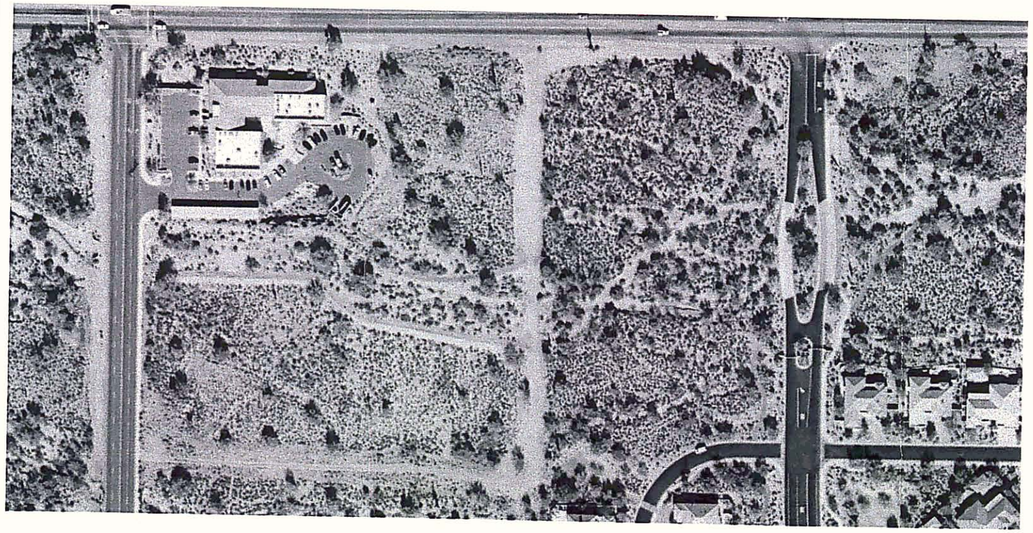
2944adnp05.dgn 04-JUN-2003

Picture 129: Unnamed Central Tributary to Cave Creek, Looking Downstream (northwest)

N Value Distribution for Unnamed Central							
Value		Normal Channel	Vegetated Channel	High Standing Vegetation Channel	Minimally Vegetated Overbanks	Vegetated Overbanks	High Standing Vegetation Overbanks
Material	N 0	0.020	0.020	0.020	0.020	0.020	0.020
Degree of Irregularities	N 1	0.005	0.005	0.005	0.005	0.005	0.005
Variation in Cross Section	N 2	0.000	0.000	0.000	0.000	0.000	0.005
Obstructions	N 3	0.000	0.000	0.000	0.002	0.000	0.000
Vegetation	N 4	0.003	0.010	0.028	0.005	0.015	0.028
Meandering	M 5	1.000	1.000	1.000	1.000	1.000	1.000
	N-Value	0.028	0.035	0.053	0.032	0.040	0.058

COWEN ROUGHNESS COEFFICIENT EQUATION:
N = (N0 + N1 + N2 + N3 + N4)*M5
N0 = BASIS VALUE FOR STRAIGHT, UNIFORM, SMOOTH CHANNEL
N1 = VALUE TO CORRECT FOR SURFACE IRREGULARITIES
N2 = VALUE FOR VARIATIONS IN SHAPE AND SIZE OF CHANNEL
N3 = VALUE FOR OBSTRUCTIONS
N4 = VALUE FOR VEGETATION AND FLOW CONDITION
M5 = CORRECTION FACTOR FOR MEANDERING CHANNEL



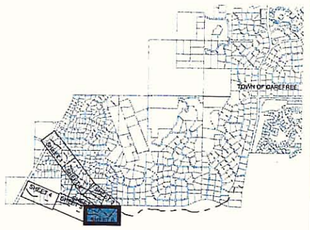


200' 0' 200' 400'
SCALE: 1"= 200 FEET
FLIGHT DATES: JUNE 2000

LEGEND

- MANNINGS "N" VALUE = 0.028
- MANNINGS "N" VALUE = 0.040
- MANNINGS "N" VALUE = 0.025
- MANNINGS "N" VALUE = 0.058
- MANNINGS "N" VALUE = 0.035
- MANNINGS "N" VALUE = 0.032
- MANNINGS "N" VALUE = 0.053
- MANNINGS "N" VALUE = 0.045
- 182 PHOTO DIRECTION AND PICTURE NUMBER
- WASH REACH
- HEC-RAS CROSS SECTION LINES

NOTES



SHEET INDEX MAP

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

UNNAMED CENTRAL TRIBUTARY
TO CAVE CREEK
CAREFREE FLOODPLAIN DELINEATION
F.C.D. CONTRACT NO. 2000 C037

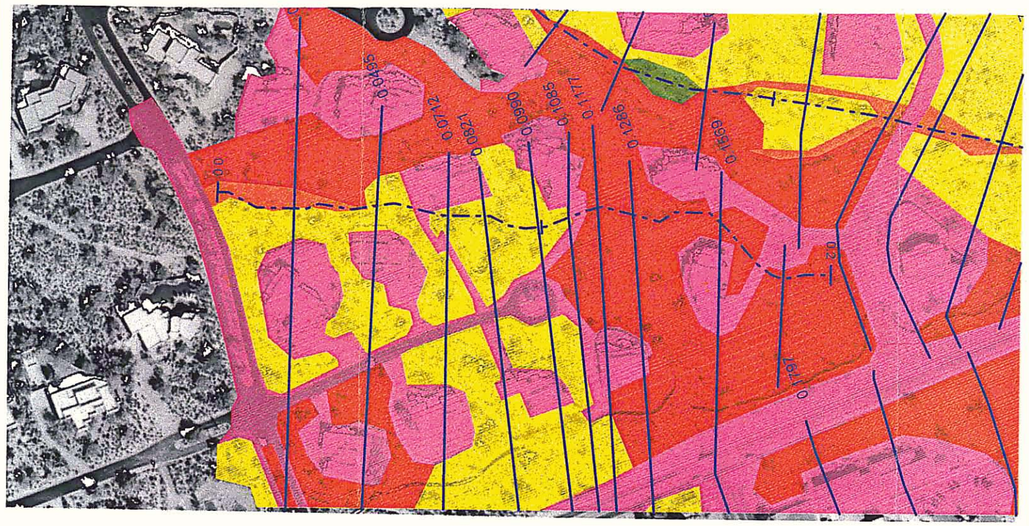
CH2MHILL

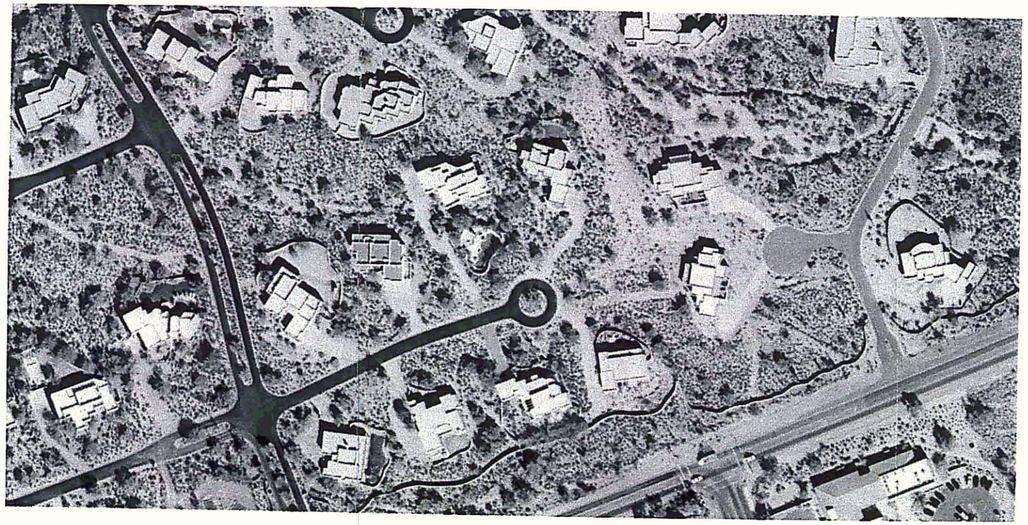
SHEET 06 OF 07

2944adnp06.dgn 04-JUN-2003

N Value Distribution for Unnamed Central							
Value		Normal Channel	Vegetated Channel	High Standing Vegetation Channel	Minimally Vegetated Overbanks	Vegetated Overbanks	High Standing Vegetation Overbanks
Material	N 0	0.020	0.020	0.020	0.020	0.020	0.020
Degree of Irregularities	N 1	0.005	0.005	0.005	0.005	0.005	0.005
Variation in Cross Section	N 2	0.000	0.000	0.000	0.000	0.000	0.005
Obstructions	N 3	0.000	0.000	0.000	0.002	0.000	0.000
Vegetation	N 4	0.003	0.010	0.028	0.005	0.015	0.028
Meandering	M 5	1.000	1.000	1.000	1.000	1.000	1.000
	N-Value	0.028	0.035	0.053	0.032	0.040	0.058

COWEN ROUGHNESS COEFFICIENT EQUATION:
N = (N0 + N1 + N2 + N3 + N4)*M5
N0 = BASIS VALUE FOR STRAIGHT, UNIFORM, SMOOTH CHANNEL
N1 = VALUE TO CORRECT FOR SURFACE IRREGULARITIES
N2 = VALUE FOR VARIATIONS IN SHAPE AND SIZE OF CHANNEL
N3 = VALUE FOR OBSTRUCTIONS
N4 = VALUE FOR VEGETATION AND FLOW CONDITION
M5 = CORRECTION FACTOR FOR MEANDERING CHANNEL





200' 0' 200' 400'
SCALE: 1"= 200 FEET
FLIGHT DATES: JUNE 2000

LEGEND

- MANNINGS "N" VALUE = 0.028
- MANNINGS "N" VALUE = 0.040
- MANNINGS "N" VALUE = 0.025
- MANNINGS "N" VALUE = 0.058
- MANNINGS "N" VALUE = 0.035
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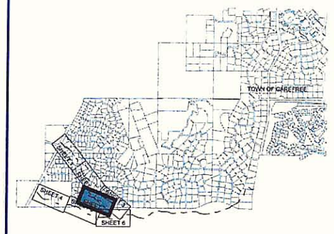
- MANNINGS "N" VALUE = 0.053
- MANNINGS "N" VALUE = 0.045
- 182 PHOTO DIRECTION AND PICTURE NUMBER
- WASH REACH
- HEC-RAS CROSS SECTION LINES

NOTES



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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

UNNAMED CENTRAL TRIBUTARY
TO CAVE CREEK
CAREFREE FLOODPLAIN DELINEATION
F.C.D. CONTRACT NO. 2000 C037

CH2MHILL

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2944adnp07.dgn 04-JUN-2003

HEC-RAS:

Unnamed Central Tributary to Cave Creek

HEC-RAS Version 3.1.1 May 2003
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X      X   X     X  X    X
X     X  X        X           X   X    X    X   X
XXXXXXX  XXXX     X       XXX XXXX     XXXXXX    XXXX
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PROJECT DATA
Project Title: Unnamed Central - PAW
Project File : UC_Final.prj
Run Date and Time: 05/03/2004 11:46:33 AM

Project in English units

Project Description:
Unnamed Central Tributary to Cave Creek
Prepared by CH2M HILL for the Flood
Control District of Maricopa County
Contract No. FCD 2000C037
Topographic
Mapping Source: M&B Aerial, Flight Date: August 2, 2001, 2'
Contour
Interval. Datum: NAD 83/NGVD29 from GDACS Control Network
(established and maintained by the Maricopa County Department of
Transportation).
Discharge information from the Carefree Drainage Master Plan
Data Collection Report, dated November 2002.
Discharge: North 2270 cfs to
2706 cfs, South 663 to 664 cfs
Study Limits: Terravita Way Upstream and Cave
Creek Road Downstream
Flow Split Information: Flow Splits at 0.8919 south,
0.8110 south, 0.6835 south, 0.6530 north

PLAN DATA

Plan Title: Plan 03
Plan File : c:\Carefree\HEC-RAS Files\Updated Flow (3-20-04)\UC_Final.p03

Geometry Title: Unnamed Central Trib to Cave Creek
Geometry File : c:\Carefree\HEC-RAS Files\Updated Flow (3-20-04)\UC_Final.g02

Flow Title : Unnamed Central Tributary to Cave Creek
Flow File : c:\Carefree\HEC-RAS Files\Updated Flow (3-20-04)\UC_Final.f01

Plan Summary Information:

Number of:	Cross Sections =	64	Mulitple Openings =	0
	Culverts =	4	Inline Structures =	0
	Bridges =	0	Lateral Structures =	1

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 20
Maximum difference tolerance = 0.3

Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: *Average Conveyance*
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: Unnamed Central Tributary to Cave Creek
Flow File : c:\Carefree\HEC-RAS Files\Updated Flow (3-20-04)\UC_Final.f01

Flow Data (cfs)

River	Reach	RS	PF 1
Unnamed Central	North	0.8848	2092
Unnamed Central	North	0.8582	2092
Unnamed Central	North	0.7698	2168
Unnamed Central	North	0.7098	1775
Unnamed Central	North	0.6303	1810
Unnamed Central	North	0.4484	1853
Unnamed Central	North	0.2756	2271
Unnamed Central	North	0.1625	2360
Unnamed Central	North	0.0663	2443
Unnamed Central	North	0.0146	2462
Unnamed Central	South	0.8919	562
Unnamed Central	South	0.8110	562
Unnamed Central	South	0.6835	233
Unnamed Central	South	0.4631	562
Unnamed Central	South	0.3922	562
Unnamed Central	South	0.3471	562
Unnamed Central	South	0.2364	562
Unnamed Central	South	0.1561	562
Unnamed Central	South	0.0545	562
Unnamed Central	South	0.0151	562

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Unnamed Central	North	PF 1	Known WS = 2141.24	Known WS = 2038.23
Unnamed Central	South	PF 1	Known WS = 2141.24	Known WS = 2044.53

GEOMETRY DATA

Geometry Title: Unnamed Central Trib to Cave Creek
Geometry File : c:\Carefree\HEC-RAS Files\Updated Flow (3-20-04)\UC_Final.g02

CROSS SECTION

RIVER: Unnamed Central
REACH: North RS: 0.8848

INPUT
Description: R.S. 0.8848 - Imm. downstream Terravita Way
Station Elevation Data num= 73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2140.24	.2	2140.23	2.51	2140.23	9.34	2140.27	20.68	2140.28
22.33	2140.29	24.87	2140.23	34.55	2140.31	45.99	2140.21	47.04	2140.19
47.06	2140.19	47.37	2140.19	57.79	2140.04	60.88	2139.68	62.51	2138.97
68.45	2138.01	69.41	2137.08	73.72	2136.09	79.93	2135.75	86.09	2135.45
87.75	2135.11	93.06	2134.21	97.79	2133.88	103.34	2133.73	111.4	2133.36

112.47	2133.32	112.49	2133.32	121.54	2133.04	123.81	2133.03	126.4	2133.32
126.67	2133.35	132.05	2133.73	132.5	2134.62	135.56	2135.4	139.4	2136.92
145.23	2139.45	150.07	2138.71	158.09	2138.61	161.02	2138.41	161.47	2138.4
176.61	2138.11	176.77	2138.1	198.95	2135.54	203.03	2135.6	207.68	2135.34
217.58	2135.43	228.15	2135.63	242.65	2135.67	246.9	2135.6	253.35	2135.66
256.05	2135.62	261.53	2135.55	264.7	2135.7	282	2139.43	285.75	2140.17
303.22	2140.7	306.94	2140.84	309.42	2140.96	311.08	2141.03	317.02	2141.21
317.91	2141.25	318.8	2141.3	327.82	2141.91	328.19	2141.9	340.92	2142.5
342.31	2142.5	348.47	2142.55	352.47	2142.82	353.28	2142.82	358.46	2143.04
364.74	2143.39	371.89	2144.09	373.34	2144.09				

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.04	103.34	.035	126.67	.04	198.95	.025	264.7	.04
318.8	.025								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
112.49	126.4	150	140.45	120	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	57	2138.79	F
162	373.34	2138.79	F

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2139.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.52	Wt. n-Val.	0.038	0.035	0.040
W.S. Elev (ft)	2137.63	Reach Len. (ft)	150.00	140.45	120.00
Crit W.S. (ft)	2137.63	Flow Area (sq ft)	123.09	62.19	38.91
E.G. Slope (ft/ft)	0.011293	Area (sq ft)	123.09	62.19	202.04
Q Total (cfs)	2092.00	Flow (cfs)	1047.16	760.76	284.07
Top Width (ft)	164.94	Top Width (ft)	43.64	13.91	107.39
Vel Total (ft/s)	9.33	Avg. Vel. (ft/s)	8.51	12.23	7.30
Max Chl Dpth (ft)	4.60	Hydr. Depth (ft)	2.82	4.47	2.66
Conv. Total (cfs)	19685.6	Conv. (cfs)	9853.7	7158.7	2673.1
Length Wtd. (ft)	141.42	Wetted Per. (ft)	44.13	13.93	15.72
Min Ch El (ft)	2133.03	Shear (lb/sq ft)	1.97	3.15	1.74
Alpha	1.12	Stream Power (lb/ft s)	16.73	38.50	12.74
Frctn Loss (ft)	1.36	Cum Volume (acre-ft)	17.10	8.91	14.67
C & E Loss (ft)	0.26	Cum SA (acres)	10.35	2.50	8.20

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	57.00	84.75	125.12	24.84	16.25	5.98	1.56	5.04
2	LOB	84.75	112.49	922.04	98.25	27.88	44.07	3.54	9.38
3	Chan	112.49	115.27	145.39	12.10	2.78	6.95	4.35	12.02
4	Chan	115.27	118.05	150.22	12.34	2.78	7.18	4.44	12.17
5	Chan	118.05	120.84	155.11	12.58	2.78	7.41	4.52	12.33
6	Chan	120.84	123.62	158.91	12.76	2.78	7.60	4.59	12.45
7	Chan	123.62	126.40	151.14	12.41	2.80	7.22	4.46	12.18
8	ROB	126.40	162.00	284.07	38.91	15.72	13.58	2.66	7.30
9	ROB	162.00	214.84	0.00	53.40	34.09	0.00	1.57	0.00
10	ROB	214.84	267.67	0.00	105.89	52.91	0.00	2.00	0.00
11	ROB	267.67	320.51	0.00	3.84	6.10	0.00	0.64	0.00

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Unnamed Central
REACH: North RS: 0.8582

INPUT
Description: R.S. 0.8582
Dip crossing on Carefree Highway
Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2134.91	17.74	2134.76	24.53	2134.94	37.14	2135.2	38.62	2135.21
48.65	2135.15	68.17	2135.05	70.13	2135.05	74.76	2135.05	82.82	2133.91
89.2	2132.91	89.63	2132.84	93.16	2132.54	107.44	2132.29	109.46	2132.34
109.47	2132.34	113.26	2132.43	116.76	2132.51	126.56	2132.56	133	2132.66
139.77	2132.49	148.38	2132.63	159.53	2132.15	162.47	2132.11	166.25	2132.02
180.28	2132.29	192.23	2132.32	205.14	2132.51	209.99	2132.51	212.4	2132.97
227.18	2135.81	237.99	2138	243.12	2138.45	259.58	2140	263.83	2140.28
266.23	2140.35	268.75	2140.43	272.82	2140.69	276.91	2140.81	286.44	2140.98
306.77	2141.53								

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.04	93.16	.035	116.76	.025	205.14	.04	259.58	.025

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
89.2	212.4	126.72	126.72	126.72	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2135.47	Element			
Vel Head (ft)	0.99	Wt. n-Val.	0.040	0.027	0.040
W.S. Elev (ft)	2134.48	Reach Len. (ft)	126.72	126.72	126.72
Crit W.S. (ft)	2134.48	Flow Area (sq ft)	7.98	254.78	5.93
E.G. Slope (ft/ft)	0.008293	Area (sq ft)	7.98	254.78	5.93
Q Total (cfs)	2092.00	Flow (cfs)	22.43	2053.12	16.45
Top Width (ft)	141.47	Top Width (ft)	10.41	123.20	7.86
Vel Total (ft/s)	7.79	Avg. Vel. (ft/s)	2.81	8.06	2.77
Max Chl Dpth (ft)	2.46	Hydr. Depth (ft)	0.77	2.07	0.76
Conv. Total (cfs)	22971.8	Conv. (cfs)	246.3	22544.8	180.6
Length Wtd. (ft)	126.72	Wetted Per. (ft)	10.53	123.29	8.00
Min Ch El (ft)	2132.02	Shear (lb/sq ft)	0.39	1.07	0.38
Alpha	1.05	Stream Power (lb/ft s)	1.10	8.62	1.06
Frctn Loss (ft)	1.10	Cum Volume (acre-ft)	16.87	8.40	14.38
C & E Loss (ft)	0.14	Cum SA (acres)	10.26	2.28	8.05

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	71.36	89.20	22.43	7.98	10.53	1.07	0.77	2.81
2	Chan	89.20	113.84	304.91	50.02	24.66	14.57	2.03	6.10
3	Chan	113.84	138.48	380.47	47.31	24.64	18.19	1.92	8.04
4	Chan	138.48	163.12	445.00	50.84	24.65	21.27	2.06	8.75
5	Chan	163.12	187.76	530.96	56.52	24.64	25.38	2.29	9.39
6	Chan	187.76	212.40	391.79	50.09	24.68	18.73	2.03	7.82
7	ROB	212.40	231.27	16.45	5.93	8.00	0.79	0.76	2.77

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Unnamed Central
REACH: North RS: 0.8342

INPUT
Description: R.S. 0.8342
Dip crossing on Carefree Highway
Station Elevation Data num= 62

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2134.02	3.94	2133.94	5.9	2133.89	30.11	2133.27	59.49	2132.65
63.29	2132.58	73.45	2132.26	74.63	2132.25	79.23	2132.12	81.42	2132.05
87.73	2132.77	90.72	2132.97	93.29	2133.27	96.83	2132.73	100.31	2132.03
105.35	2131.99	108.86	2131.99	113.59	2131.91	119.49	2131.89	137.43	2131.57
139.6	2131.4	144.85	2131.43	149.51	2131.39	150.33	2131.43	151.14	2131.47
179.74	2131.46	193.75	2131.06	196.3	2131.04	201.26	2130.99	202.18	2130.97
205.7	2130.72	213.2	2130.28	216.29	2129.68	217.9	2129.39	220	2129
223.64	2128.34	225.45	2128.07	233.15	2129.53	233.6	2129.6	243.26	2131.15
266.61	2130.34	268.51	2130.27	268.93	2130.18	276.83	2127.88	280.75	2129.07
286.54	2129.83	293.39	2129.16	295.87	2129.59	296.93	2129.89	305.43	2132.08
313.1	2134.07	319.97	2134.48	341.34	2135.81	343.73	2135.9	351.66	2136.21
356.8	2136.63	359.7	2136.71	363.6	2136.97	368.75	2137.1	391.99	2137.89
398.26	2138.14	400.17	2138.22						

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.04	144.85	.025	225.45	.053	305.43	.04	351.66	.025

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
217.9	233.6	155	148.09	145	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2133.16	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.71	Wt. n-Val.	0.027	0.034	0.053
W.S. Elev (ft)	2132.45	Reach Len. (ft)	155.00	148.09	145.00
Crit W.S. (ft)	2132.45	Flow Area (sq ft)	129.74	57.67	168.24
E.G. Slope (ft/ft)	0.009155	Area (sq ft)	129.74	57.67	168.24
Q Total (cfs)	2092.00	Flow (cfs)	738.61	567.17	786.23
Top Width (ft)	226.10	Top Width (ft)	137.15	15.70	73.25
Vel Total (ft/s)	5.88	Avg. Vel. (ft/s)	5.69	9.83	4.67
Max Chl Dpth (ft)	4.57	Hydr. Depth (ft)	0.95	3.67	2.30
Conv. Total (cfs)	21863.8	Conv. (cfs)	7719.3	5927.5	8217.0
Length Wtd. (ft)	147.86	Wetted Per. (ft)	137.34	15.96	74.39
Min Ch El (ft)	2128.07	Shear (lb/sq ft)	0.54	2.07	1.29
Alpha	1.33	Stream Power (lb/ft s)	3.07	20.31	6.04
Frctn Loss (ft)	1.05	Cum Volume (acre-ft)	16.67	7.94	14.13
C & E Loss (ft)	0.11	Cum SA (acres)	10.04	2.08	7.93

Warning: The energy equation could not be balanced within the specified number of iterations. The

program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	43.58	87.16	4.17	3.51	17.50	0.20	0.20	1.19
2	LOB	87.16	130.74	39.33	17.28	32.56	1.88	0.53	2.28
3	LOB	130.74	174.32	204.78	42.30	43.59	9.79	0.97	4.84
4	LOB	174.32	217.90	490.32	66.64	43.69	23.44	1.53	7.36
5	Chan	217.90	221.04	131.68	10.52	3.19	6.29	3.35	12.52
6	Chan	221.04	224.18	171.32	12.31	3.19	8.19	3.92	13.92
7	Chan	224.18	227.32	134.49	13.30	3.19	6.43	4.24	10.11
8	Chan	227.32	230.46	74.14	11.70	3.20	3.54	3.73	6.34
9	Chan	230.46	233.60	55.54	9.84	3.19	2.65	3.13	5.65
10	ROB	233.60	266.91	229.56	60.47	33.45	10.97	1.82	3.80
11	ROB	266.91	300.23	542.51	102.09	34.10	25.93	3.06	5.31
12	ROB	300.23	333.54	14.17	5.67	6.84	0.68	0.86	2.50

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Unnamed Central
REACH: North RS: 0.8062

INPUT
Description: R.S. 0.8062
Station Elevation Data num= 66

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2130.67	2.96	2130.74	13.76	2130.52	17.12	2130.45	18.6	2130.45
25.54	2130.53	28.7	2130.34	30.01	2130.32	33.92	2130.25	42.11	2130.27
45.79	2129.74	47.1	2129.49	50.03	2129.17	54.93	2128.5	56.3	2128.32
65.17	2128.68	67.55	2128.8	69.96	2128.82	86.67	2128.72	102.58	2128.58
121.15	2128.5	134.05	2128.46	144.31	2128.33	149.57	2126.16	151.3	2125.59
155.92	2124.07	156.24	2123.97	158.48	2124.8	162	2125.84	162.8	2126.08
163.2	2126.2	167.34	2127.43	168.24	2127.7	168.46	2127.78	169.48	2127.74
189.62	2127.06	192.52	2126.28	196.27	2124.82	199.98	2123.61	203.95	2124.47
209.84	2125.89	215.41	2126.69	218.7	2127.08	225.17	2128.14	233.22	2129.1
240.32	2129.2	242.04	2129.27	245.45	2128.88	252.3	2128.18	254.06	2128.16
259.46	2127.24	268.15	2126.83	271.74	2126.82	291.01	2126.87	293.66	2126.4
296.08	2125.9	299.51	2126.11	304.31	2126.42	320.13	2128.9	342.84	2132.39
343.5	2132.4	344.64	2132.36	355.89	2133.04	360.83	2133.06	365.27	2133.02
379.67	2132.5								

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	54.93	.04	149.57	.053	199.98	.032	218.7	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
151.3	162	105	99.5	95	.1	.3

Right Levee Station= 242.04 Elevation= 2129.27

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft) 2129.62 Element Left OB Channel Right OB

Vel Head (ft)	0.35	Wt. n-Val.	0.041	0.053	0.040
W.S. Elev (ft)	2129.28	Reach Len. (ft)	105.00	99.50	95.00
Crit W.S. (ft)	2129.28	Flow Area (sq ft)	80.80	47.12	339.93
E.G. Slope (ft/ft)	0.005665	Area (sq ft)	80.80	47.12	339.93
Q Total (cfs)	2092.00	Flow (cfs)	202.22	258.23	1631.55
Top Width (ft)	273.54	Top Width (ft)	102.26	10.70	160.59
Vel Total (ft/s)	4.47	Avg. Vel. (ft/s)	2.50	5.48	4.80
Max Chl Dpth (ft)	5.67	Hydr. Depth (ft)	0.79	4.40	2.12
Conv. Total (cfs)	27795.0	Conv. (cfs)	2686.8	3430.9	21677.3
Length Wtd. (ft)	98.39	Wetted Per. (ft)	102.85	11.26	162.42
Min Ch El (ft)	2123.97	Shear (lb/sq ft)	0.28	1.48	0.74
Alpha	1.11	Stream Power (lb/ft s)	0.70	8.11	3.55
Frctn Loss (ft)	0.63	Cum Volume (acre-ft)	16.30	7.77	13.28
C & E Loss (ft)	0.02	Cum SA (acres)	9.62	2.04	7.54

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	30.26	60.52	17.01	7.09	11.54	0.81	0.62	2.40
2	LOB	60.52	90.78	29.74	16.47	30.27	1.42	0.54	1.81
3	LOB	90.78	121.04	45.41	21.23	30.26	2.17	0.70	2.14
4	LOB	121.04	151.30	110.07	36.01	30.78	5.26	1.19	3.06
5	Chan	151.30	153.44	44.45	8.64	2.25	2.12	4.04	5.14
6	Chan	153.44	155.58	58.09	10.15	2.25	2.78	4.74	5.72
7	Chan	155.58	157.72	64.89	10.88	2.27	3.10	5.09	5.96
8	Chan	157.72	159.86	51.23	9.41	2.25	2.45	4.40	5.45
9	Chan	159.86	162.00	39.58	8.03	2.23	1.89	3.75	4.93
10	ROB	162.00	202.02	472.76	106.78	40.93	22.60	2.67	4.43
11	ROB	202.02	242.04	488.56	75.39	40.46	23.35	1.88	6.48
12	ROB	242.04	287.92	340.76	83.99	46.02	16.29	1.83	4.06
13	ROB	287.92	333.79	329.47	73.77	35.00	15.75	2.13	4.47

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Unnamed Central
REACH: North RS: 0.7874

INPUT
Description: R.S. 0.7874
Includes Supplemental Ground Survey
Station Elevation Data num= 85

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2127.93	4.07	2128.17	9.54	2127.81	11.76	2127.53	20	2127.11
20.51	2127.07	21.31	2126.97	29.24	2126.01	34.89	2125.39	35.23	2125.34
35.66	2125.3	43.99	2126.12	45.69	2126.26	52.5	2126.2	54.98	2126.15
60.14	2126.07	81.25	2125.5	85.43	2125.37	86	2125.36	106.06	2125.67
111.4	2125.56	116	2124.15	119.8	2124.19	124.9	2125.52	129.63	2125.88
135.78	2125.4	139.23	2125.01	141.66	2125.28	141.86	2125.3	142.89	2125.39
149.23	2125.94	151.23	2125.98	152.05	2126.01	157.18	2125.8	163.07	2125.84
177.35	2125.94	181.25	2125.93	182.83	2125.91	188.53	2126.16	189.51	2126.16
190.64	2126.16	208.31	2126.57	208.42	2126.57	208.62	2126.58	209.79	2126.65

210.58	2126.64	215.68	2127.22	217.8	2126.86	218.8	2126.92	221.55	2127.2
229.95	2127.07	240.24	2126.3	247.8	2125.75	251.02	2125.44	254.02	2125.24
258.96	2124.93	259.6	2125.43	265	2123.32	267.7	2122.27	269	2122.21
275.3	2121.89	278	2123.14	283.3	2125.6	286.53	2125.28	288.73	2125.98
288.79	2125.99	295.3	2125.83	311.4	2125.5	331.4	2125.25	341.1	2125.03
344.65	2124.97	347.11	2123.93	350.86	2122.46	359.35	2124.34	363.67	2125.36
376.64	2128.01	386.44	2130.04	390.95	2130.2	418.33	2131.15	426.8	2131.69
429.97	2131.84	433.93	2131.98	436.72	2132.21	438.96	2132.24	439.89	2132.27

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.032	129.63	.04	259.6	.035	286.53	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
265	278	85	92.69	99	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2127.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.57	Wt. n-Val.	0.035	0.035	0.039
W.S. Elev (ft)	2126.77	Reach Len. (ft)	85.00	92.69	99.00
Crit W.S. (ft)	2126.77	Flow Area (sq ft)	224.92	57.84	153.82
E.G. Slope (ft/ft)	0.007248	Area (sq ft)	224.92	57.84	153.82
Q Total (cfs)	2092.00	Flow (cfs)	852.88	552.05	687.07
Top Width (ft)	325.36	Top Width (ft)	219.80	13.00	92.57
Vel Total (ft/s)	4.79	Avg. Vel. (ft/s)	3.79	9.54	4.47
Max Chl Dpth (ft)	4.88	Hydr. Depth (ft)	1.02	4.45	1.66
Conv. Total (cfs)	24571.9	Conv. (cfs)	10017.6	6484.2	8070.1
Length Wtd. (ft)	90.02	Wetted Per. (ft)	221.09	13.48	94.20
Min Ch El (ft)	2121.89	Shear (lb/sq ft)	0.46	1.94	0.74
Alpha	1.59	Stream Power (lb/ft s)	1.75	18.53	3.30
Frctn Loss (ft)	0.82	Cum Volume (acre-ft)	15.93	7.65	12.75
C & E Loss (ft)	0.02	Cum SA (acres)	9.23	2.01	7.26

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	0.00	53.00	74.89	23.31	30.17	3.58	0.78	3.21
2	LOB	53.00	106.00	227.43	56.86	53.01	10.87	1.07	4.00
3	LOB	106.00	159.00	323.67	73.25	53.49	15.47	1.38	4.42
4	LOB	159.00	212.00	77.64	34.04	52.74	3.71	0.65	2.28
5	LOB	212.00	265.00	149.25	37.45	31.68	7.13	1.21	3.99
6	Chan	265.00	267.60	88.14	10.28	2.79	4.21	3.96	8.57
7	Chan	267.60	270.20	116.62	11.85	2.61	5.57	4.56	9.85
8	Chan	270.20	272.80	122.47	12.19	2.60	5.85	4.69	10.05
9	Chan	272.80	275.40	127.91	12.53	2.61	6.11	4.82	10.21
10	Chan	275.40	278.00	96.91	11.00	2.87	4.63	4.23	8.81
11	ROB	278.00	310.38	165.70	41.66	33.05	7.92	1.29	3.98
12	ROB	310.38	342.76	188.50	47.90	32.38	9.01	1.48	3.94
13	ROB	342.76	375.13	332.87	64.26	28.77	15.91	2.31	5.18

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Unnamed Central
REACH: North RS: 0.7698

INPUT
Description: R.S. 0.7698
Includes Supplemental Ground Survey
Station Elevation Data num= 79

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-55	2126	-28.7	2124	0	2123.37	5.26	2123.31	9.14	2123.3
21.19	2123.82	21.92	2123.41	23.29	2121.89	25.34	2122.12	30.85	2122.32
48.8	2122.53	60.42	2122.52	103.76	2121.93	104.14	2121.94	109.15	2121.94
113.85	2122.57	116.89	2123.03	117.96	2122.96	122.48	2122.75	125.33	2122.89
127.65	2122.87	149.27	2123.07	149.8	2123.09	151.89	2123.24	161.19	2124.01
164.8	2123.89	166.78	2124.12	173.21	2123.96	173.64	2123.95	173.84	2123.94
180.24	2126.71	180.6	2126.74	181.58	2126.52	186.06	2124.12	188.67	2123.92
189.56	2123.76	191.5	2124.24	199.29	2124.26	207.35	2120.12	213.48	2119.96
222.44	2122.4	231.4	2126.19	236.84	2126.27	241.84	2126.11	245.86	2126.12
250.88	2125.9	261.52	2121.63	263.8	2120.77	265.1	2120.28	271.23	2121.05
283.56	2122.51	286.35	2122.53	286.37	2122.53	289.79	2122.55	290.18	2122.55
293.73	2121.7	300.97	2119.93	301.63	2119.72	304.08	2120.26	306.8	2120.93
330.32	2126.69	354.87	2127.61	366.43	2127.98	368.4	2128.09	374.11	2128.3
382.21	2128.26	386.95	2128.32	394.87	2128.52	405.14	2128.49	407.05	2128.48
411.05	2128.57	418.07	2128.97	419.9	2129.07	422.47	2129.22	435.8	2129.91
444.22	2130.25	452.57	2130.78	456.24	2130.84	456.55	2130.86		

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-55	.032	9.14	.025	149.27	.04	265.1	.035	283.56	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
263.8	306.8	113	109.82	108	.3	.5

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
63.4	88.5	2132	211.5	242.2	2132

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2124.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.75	Wt. n-Val.	0.028	0.038	0.040
W.S. Elev (ft)	2123.83	Reach Len. (ft)	113.00	109.82	108.00
Crit W.S. (ft)	2123.83	Flow Area (sq ft)	193.11	106.21	17.15
E.G. Slope (ft/ft)	0.011833	Area (sq ft)	193.11	106.21	17.15
Q Total (cfs)	2168.00	Flow (cfs)	1262.62	818.36	87.01
Top Width (ft)	229.36	Top Width (ft)	174.53	43.00	11.83
Vel Total (ft/s)	6.85	Avg. Vel. (ft/s)	6.54	7.71	5.07
Max Chl Dpth (ft)	4.11	Hydr. Depth (ft)	1.11	2.47	1.45
Conv. Total (cfs)	19930.4	Conv. (cfs)	11607.3	7523.2	799.9
Length Wtd. (ft)	111.60	Wetted Per. (ft)	183.81	43.71	12.18
Min Ch El (ft)	2119.72	Shear (lb/sq ft)	0.78	1.79	1.04
Alpha	1.03	Stream Power (lb/ft s)	5.07	13.83	5.28
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)	15.52	7.47	12.55
C & E Loss (ft)	0.31	Cum SA (acres)	8.85	1.95	7.14

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Manning's n values were composited to a single value in the main channel.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	-55.00	8.76	21.05	9.17	29.62	0.97	0.31	2.30
2	LOB	8.76	72.52	423.33	62.07	56.80	19.53	1.14	6.82
3	LOB	72.52	136.28	517.84	66.35	49.56	23.89	1.39	7.80
4	LOB	136.28	200.04	67.79	14.52	23.41	3.13	0.62	4.67
5	LOB	200.04	263.80	232.60	41.01	24.42	10.73	2.14	5.67
6	Chan	263.80	272.40	242.76	26.85	8.75	11.20	3.12	9.04
7	Chan	272.40	281.00	131.86	18.32	8.66	6.08	2.13	7.20
8	Chan	281.00	289.60	56.76	11.60	8.62	2.62	1.35	4.89
9	Chan	289.60	298.20	118.26	18.74	8.83	5.45	2.18	6.31
10	Chan	298.20	306.80	268.73	30.70	8.85	12.40	3.57	8.75
11	ROB	306.80	336.75	87.01	17.15	12.18	4.01	1.45	5.07

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION

RIVER: Unnamed Central
REACH: North RS: 0.7490

INPUT
Description: R.S. 0.7490 - Imm. Upstream Low Reales Drive
Station Elevation Data num= 102

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2124.73	5.44	2124.63	8.19	2124.44	13.4	2124.22	19.78	2123.91
21.75	2123.4	26.71	2122.51	30.43	2122.83	33.4	2122.98	40.11	2123.16
49.62	2123.46	51.84	2123.52	54.32	2122.66	54.54	2122.61	54.8	2122.65
62.7	2122.42	73.13	2122.18	78.83	2122.04	82.17	2121.98	87.6	2121.83
96.74	2121.75	98.94	2122.39	104.1	2123.1	105.31	2122.94	110.96	2121.88
115.04	2121.84	120.15	2121.75	136.65	2121.57	140.37	2121.49	145.95	2121.32
149.92	2121.35	152.09	2121.38	164.01	2120.92	171.98	2120.67	175.41	2120.58
187.87	2120.54	193.85	2120.58	200.77	2120.48	209	2120.39	231.31	2120.78
235.84	2120.71	240.83	2120.69	253.89	2120.81	257.78	2120.79	262.23	2120.87
276.59	2121.18	282.55	2121.12	284.93	2121.11	287.12	2120.97	291.68	2121.45
296.14	2121.3	298.24	2121.3	308.5	2120.94	309.16	2120.97	309.27	2120.96
310.17	2120.95	323.94	2121.19	329.33	2121.04	332.96	2121.05	339.92	2121.05
346.22	2120.98	356.57	2120.98	357.41	2120.96	359.99	2120.55	361.43	2120.14
367.3	2118.8	369.9	2118.21	374.4	2118.19	383.42	2118.34	389.57	2118.24
389.59	2118.24	406.97	2117.97	413.78	2117.94	416.75	2117.96	420.2	2119.05
429.31	2121.93	432.85	2122.66	445.79	2123.06	453.74	2123.25	455.99	2123.35
465.05	2123.64	468.36	2123.89	486.49	2125.04	494.6	2125.39	496.91	2125.58
506.4	2125.78	516.34	2126.18	524.84	2126.39	528.8	2126.53	530.45	2126.56
534.06	2126.64	534.72	2126.67	539.26	2126.92	553.73	2127.57	558.53	2127.73
569.16	2128.13	573.11	2128.13	576.43	2128.16	596.11	2128.17	597.91	2128.43
600.3	2128.62	602.89	2128.9						

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	310.17	.035	374.4	.032	413.78	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
367.3	420.2	72.86	72.86	72.86	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	359	2121.02	F
429	602.89	2121.02	F

Left Levee Station= 51.84 Elevation= 2123.52

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2122.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.	0.027	0.033	0.040
W.S. Elev (ft)	2122.83	Reach Len. (ft)	72.86	72.86	72.86
Crit W.S. (ft)	2121.80	Flow Area (sq ft)	513.53	245.78	23.60
E.G. Slope (ft/ft)	0.000880	Area (sq ft)	513.53	245.78	23.60
Q Total (cfs)	2168.00	Flow (cfs)	1229.79	907.65	30.55
Top Width (ft)	380.56	Top Width (ft)	309.65	52.90	18.01
Vel Total (ft/s)	2.77	Avg. Vel. (ft/s)	2.39	3.69	1.29
Max Chl Dpth (ft)	4.89	Hydr. Depth (ft)	1.66	4.65	1.31
Conv. Total (cfs)	73097.0	Conv. (cfs)	41464.1	30602.7	1030.1
Length Wtd. (ft)	72.86	Wetted Per. (ft)	310.22	53.14	18.53
Min Ch El (ft)	2117.94	Shear (lb/sq ft)	0.09	0.25	0.07
Alpha	1.17	Stream Power (lb/ft s)	0.22	0.94	0.09
Frctn Loss (ft)		Cum Volume (acre-ft)	14.60	7.03	12.50
C & E Loss (ft)		Cum SA (acres)	8.22	1.83	7.11

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	51.84	128.63	74.39	52.64	71.23	3.43	0.74	1.41
2	LOB	128.63	205.42	378.35	143.95	76.81	17.45	1.87	2.63
3	LOB	205.42	282.21	441.00	157.81	76.80	20.34	2.06	2.79
4	LOB	282.21	359.00	270.89	133.68	76.85	12.49	1.74	2.03
5	LOB	359.00	367.30	65.17	25.45	8.52	3.01	3.07	2.56
6	Chan	367.30	377.88	170.62	48.08	10.65	7.87	4.54	3.55
7	Chan	377.88	388.46	180.59	47.92	10.58	8.33	4.53	3.77
8	Chan	388.46	399.04	188.71	49.20	10.58	8.70	4.65	3.84
9	Chan	399.04	409.62	199.70	50.90	10.58	9.21	4.81	3.92
10	Chan	409.62	420.20	168.03	49.67	10.75	7.75	4.70	3.38
11	ROB	420.20	429.00	29.63	20.98	9.23	1.37	2.38	1.41
12	ROB	429.00	463.78	0.92	2.62	9.30	0.04	0.28	0.35

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CULVERT

RIVER: Unnamed Central
REACH: North RS: 0.7415

INPUT
Description: Culvert Number 27, at Los Reales
Information obtained from survey
and as-built plans
See Appendix C in TDN for survey information
Distance from Upstream XS = 19.5
Deck/Roadway Width = 39.7
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 16

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	2124.26	2116	42.38	2123.7	2116	105.06	2121.94	2116
133.49	2121.54	2116	159.78	2121.09	2116	187.87	2121.02	2116
230.37	2121.47	2116	334.98	2123.4	2116	372.09	2123.69	2116
372.1	2123.69	2121.57	407.56	2123.96	2121.57	415.7	2123.94	2121.57
415.71	2123.94	2116	443.75	2123.88	2116	465.78	2124.1	2116
612.66	2128.28	2116						

Upstream Bridge Cross Section Data
Station Elevation Data num= 102

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2124.73	5.44	2124.63	8.19	2124.44	13.4	2124.22	19.78	2123.91
21.75	2123.4	26.71	2122.51	30.43	2122.83	33.4	2122.98	40.11	2123.16
49.62	2123.46	51.84	2123.52	54.32	2122.66	54.54	2122.61	54.8	2122.65
62.7	2122.42	73.13	2122.18	78.83	2122.04	82.17	2121.98	87.6	2121.83
96.74	2121.75	98.94	2122.39	104.1	2123.1	105.31	2122.94	110.96	2121.88
115.04	2121.84	120.15	2121.75	136.65	2121.57	140.37	2121.49	145.95	2121.32
149.92	2121.35	152.09	2121.38	164.01	2120.92	171.98	2120.67	175.41	2120.58
187.87	2120.54	193.85	2120.58	200.77	2120.48	209	2120.39	231.31	2120.78
235.84	2120.71	240.83	2120.69	253.89	2120.81	257.78	2120.79	262.23	2120.87
276.59	2121.18	282.55	2121.12	284.93	2121.11	287.12	2120.97	291.68	2121.45
296.14	2121.3	298.24	2121.3	308.5	2120.94	309.16	2120.97	309.27	2120.96
310.17	2120.95	323.94	2121.19	329.33	2121.04	332.96	2121.05	339.92	2121.05
346.22	2120.98	356.57	2120.98	357.41	2120.96	359.99	2120.55	361.43	2120.14
367.3	2118.8	369.9	2118.21	374.4	2118.19	383.42	2118.34	389.57	2118.24
389.59	2118.24	406.97	2117.97	413.78	2117.94	416.75	2117.96	420.2	2119.05
429.31	2121.93	432.85	2122.66	445.79	2123.06	453.74	2123.25	455.99	2123.35
465.05	2123.64	468.36	2123.89	486.49	2125.04	494.6	2125.39	496.91	2125.58
506.4	2125.78	516.34	2126.18	524.84	2126.39	528.8	2126.53	530.45	2126.56
534.06	2126.64	534.72	2126.67	539.26	2126.92	553.73	2127.57	558.53	2127.73
569.16	2128.13	573.11	2128.13	576.43	2128.16	596.11	2128.17	597.91	2128.43
600.3	2128.62	602.89	2128.9						

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	310.17	.035	374.4	.032	413.78	.04

Bank Sta: Left	Right	Coeff Contr.	Expan.
367.3	420.2	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	359	2121.02	F
429	602.89	2121.02	F

Left Levee Station= 51.84 Elevation= 2123.52

Downstream Deck/Roadway Coordinates
num= 13

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	2123.68	2116	111.53	2121.72	2116	172.04	2120.5	2116
221.19	2120.43	2116	244.98	2120.8	2116	274.96	2121.84	2116
377.02	2123.24	2116	378.19	2123.24	2116	378.2	2123.24	2120.81
421.8	2123.4	2120.81	421.81	2123.4	2116	494.94	2123.56	2116
625.92	2127.17	2116						

Downstream Bridge Cross Section Data
Station Elevation Data num= 105

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2122.39	3.98	2122.34	8.79	2122.21	15.37	2122.05	16.6	2121.56
22.07	2120.73	22.96	2120.62	24.09	2120.52	34.65	2120.46	41.12	2120.45
41.73	2120.43	53.59	2120.76	61.34	2120.74	80.41	2120.49	87.32	2120.47
95.06	2120.42	99.6	2120.44	102.67	2120.34	112.35	2119.98	131.28	2119.67
141.21	2119.67	147.03	2119.57	154.83	2119.49	164.22	2119.48	174.62	2119.25
179.22	2119.43	185.6	2119.31	201.54	2119.51	208.02	2119.26	212.81	2119.18
214.4	2119.14	219.22	2119.2	225.45	2119.12	230.38	2119.13	234.03	2119.08
238.79	2119.08	245.52	2119.17	250.48	2119.23	259.53	2119.23	272.31	2119.41
282.4	2119.41	293.87	2119.46	307.62	2119.47	309.05	2119.48	318.04	2119.47
319.13	2119.47	327.86	2119.6	329.42	2119.22	332.01	2119.41	344.58	2119.75
349.84	2119.47	351.58	2119.49	358.7	2119.27	366.61	2119.42	370.1	2118.13
370.7	2117.92	371	2117.82	371.3	2117.71	371.67	2117.58	372.15	2117.59
372.92	2117.3	383.15	2117.35	386.52	2117.44	388.59	2117.43	392.2	2117.39
422.53	2117	423.15	2117.07	423.7	2117.27	424.5	2117.56	425	2117.74
425.86	2118.05	427.18	2118.8	427.57	2118.9	429.91	2119.9	430.82	2120.35
433.72	2120.44	451.18	2121.15	455.51	2121.2	458.18	2121.64	460.84	2122.34
461.05	2122.53	470.4	2122.72	475.59	2122.79	482.31	2123.01	484.67	2123.2
490.58	2122.95	491.47	2122.97	496.31	2123.19	501.99	2123.54	510.02	2124.21
512.39	2124.1	518.65	2123.82	522.42	2123.72	524.79	2123.83	552.19	2124.7
568.82	2124.41	570.67	2124.41	580.25	2125.16	583.51	2125.28	585.21	2125.32
591.48	2125.52	598.7	2125.77	604.6	2125.8	616.36	2126.19	617.84	2126.25

```
Manning's n Values          num=       6
    Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
      0    .032  164.22    .025  201.54    .035  422.53     .04  522.42    .025
  552.19     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
         371.3     425             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0     360 2120.92       F
     436  617.84 2120.92       F
Left Levee      Station=   53.59      Elevation= 2120.74

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         = 2121.02
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1           Box       4      10
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
               18.5    41.7     .013     .013        0                  .4                 1
Number of Barrels =  4
Upstream   Elevation =  2117.57
Centerline Stations
    Sta.    Sta.    Sta.    Sta.
   377.1   388.3   399.5   410.7
Downstream Elevation =  2116.81
Centerline Stations
    Sta.    Sta.    Sta.    Sta.
   383.2   394.4   405.6   416.8

CULVERT OUTPUT  Profile #PF 1  Culv Group:  Culvert #1

  Q Culv Group (cfs)       1334.45    Culv Full Len (ft)         41.70
  # Barrels                      4    Culv Vel US (ft/s)          8.34
  Q Barrel (cfs)            333.61    Culv Vel DS (ft/s)          8.34
  E.G. US. (ft)            2122.97    Culv Inv El Up (ft)      2117.57
  W.S. US. (ft)            2122.83    Culv Inv El Dn (ft)      2116.81
  E.G. DS (ft)             2122.40    Culv Frctn Ls (ft)          0.25
  W.S. DS (ft)             2120.91    Culv Exit Loss (ft)
  Delta EG (ft)               0.57    Culv Entr Loss (ft)         0.43
  Delta WS (ft)               1.92    Q Weir (cfs)              833.55
  E.G. IC (ft)             2123.04    Weir Sta Lft (ft)         68.25
  E.G. OC (ft)             2122.97    Weir Sta Rgt (ft)        311.87
  Culvert Control           Outlet    Weir Submerg                0.00
  Culv WS Inlet (ft)       2121.57    Weir Max Depth (ft)         1.95
  Culv WS Outlet (ft)      2120.81    Weir Avg Depth (ft)         1.14
  Culv Nml Depth (ft)         1.80    Weir Flow Area (sq ft)    275.93
  Culv Crt Depth (ft)         3.26    Min El Weir Flow (ft)    2121.03


CROSS SECTION


RIVER: Unnamed Central
REACH: North              RS: 0.7352

INPUT
Description: R.S. 0.7352 - Imm. downstream Los Reales Drive
Diversion of 508
             cfs from north branch due to roadway geometry
```

Station Elevation Data num= 105

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2122.39	3.98	2122.34	8.79	2122.21	15.37	2122.05	16.6	2121.56
22.07	2120.73	22.96	2120.62	24.09	2120.52	34.65	2120.46	41.12	2120.45
41.73	2120.43	53.59	2120.76	61.34	2120.74	80.41	2120.49	87.32	2120.47
95.06	2120.42	99.6	2120.44	102.67	2120.34	112.35	2119.98	131.28	2119.67
141.21	2119.67	147.03	2119.57	154.83	2119.49	164.22	2119.48	174.62	2119.25
179.22	2119.43	185.6	2119.31	201.54	2119.51	208.02	2119.26	212.81	2119.18
214.4	2119.14	219.22	2119.2	225.45	2119.12	230.38	2119.13	234.03	2119.08
238.79	2119.08	245.52	2119.17	250.48	2119.23	259.53	2119.23	272.31	2119.41
282.4	2119.41	293.87	2119.46	307.62	2119.47	309.05	2119.48	318.04	2119.47
319.13	2119.47	327.86	2119.6	329.42	2119.22	332.01	2119.41	344.58	2119.75
349.84	2119.47	351.58	2119.49	358.7	2119.27	366.61	2119.42	370.1	2118.13
370.7	2117.92	371	2117.82	371.3	2117.71	371.67	2117.58	372.15	2117.59
372.92	2117.3	383.15	2117.35	386.52	2117.44	388.59	2117.43	392.2	2117.39
422.53	2117	423.15	2117.07	423.7	2117.27	424.5	2117.56	425	2117.74
425.86	2118.05	427.18	2118.8	427.57	2118.9	429.91	2119.9	430.82	2120.35
433.72	2120.44	451.18	2121.15	455.51	2121.2	458.18	2121.64	460.84	2122.34
461.05	2122.53	470.4	2122.72	475.59	2122.79	482.31	2123.01	484.67	2123.2
490.58	2122.95	491.47	2122.97	496.31	2123.19	501.99	2123.54	510.02	2124.21
512.39	2124.1	518.65	2123.82	522.42	2123.72	524.79	2123.83	552.19	2124.7
568.82	2124.41	570.67	2124.41	580.25	2125.16	583.51	2125.28	585.21	2125.32
591.48	2125.52	598.7	2125.77	604.6	2125.8	616.36	2126.19	617.84	2126.25

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.032	164.22	.025	201.54	.035	422.53	.04	522.42	.025
552.19	.04								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
371.3	425	125	133.63	140	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	360	2120.92	F
436	617.84	2120.92	F

Left Levee Station= 53.59 Elevation= 2120.74

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2122.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.49	Wt. n-Val.	0.035	0.035	0.040
W.S. Elev (ft)	2120.91	Reach Len. (ft)	125.00	133.63	140.00
Crit W.S. (ft)	2120.91	Flow Area (sq ft)	21.29	195.31	13.37
E.G. Slope (ft/ft)	0.010336	Area (sq ft)	425.09	195.31	15.11
Q Total (cfs)	2168.00	Flow (cfs)	137.68	1974.75	55.57
Top Width (ft)	424.36	Top Width (ft)	350.41	53.70	20.25
Vel Total (ft/s)	9.43	Avg. Vel. (ft/s)	6.47	10.11	4.16
Max Chl Dpth (ft)	3.91	Hydr. Depth (ft)	1.88	3.64	1.22
Conv. Total (cfs)	21325.2	Conv. (cfs)	1354.3	19424.3	546.6
Length Wtd. (ft)	131.02	Wetted Per. (ft)	11.60	53.90	11.58
Min Ch El (ft)	2117.00	Shear (lb/sq ft)	1.18	2.34	0.75
Alpha	1.08	Stream Power (lb/ft s)	7.66	23.64	3.10
Frctn Loss (ft)	1.32	Cum Volume (acre-ft)	13.82	6.66	12.47
C & E Loss (ft)	0.44	Cum SA (acres)	7.67	1.74	7.07

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Note: Manning's n values were composited to a single value in the main channel.

Profile #PF 1

Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)

1	LOB	0.00	53.59	0.00	12.06	32.73	0.00	0.37	0.00
2	LOB	53.59	130.19	0.00	43.57	76.62	0.00	0.57	0.00
3	LOB	130.19	206.80	0.00	110.12	76.62	0.00	1.44	0.00
4	LOB	206.80	283.40	0.00	128.81	76.61	0.00	1.68	0.00
5	LOB	283.40	360.00	0.00	109.25	76.67	0.00	1.43	0.00
6	LOB	360.00	371.30	137.68	21.29	11.60	6.35	1.88	6.47
7	Chan	371.30	382.04	381.13	38.18	10.82	17.58	3.55	9.98
8	Chan	382.04	392.78	374.24	37.66	10.74	17.26	3.51	9.94
9	Chan	392.78	403.52	390.21	38.61	10.74	18.00	3.60	10.11
10	Chan	403.52	414.26	415.50	40.10	10.74	19.17	3.73	10.36
11	Chan	414.26	425.00	413.67	40.77	10.86	19.08	3.80	10.15
12	ROB	425.00	436.00	55.57	13.37	11.58	2.56	1.22	4.16
13	ROB	436.00	472.37	0.00	1.74	9.26	0.00	0.19	0.00

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION

RIVER: Unnamed Central
REACH: North RS: 0.7098

INPUT
Description: R.S. 0.7098
Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-114.59	2118.43	-95.09	2118.31	-75.6	2117.5	-49.08	2116.39	-34.48	2116.79
-27.04	2116.64	-11	2116.59	0	2116.75	3.04	2116.79	20.65	2117.43
21.87	2116.67	27.66	2112.96	31.14	2113.56	41.08	2115.26	49.71	2115.3
65.32	2115.1	65.35	2115.1	71.08	2114.91	74.82	2114.77	79.8	2114.68
85.76	2114.61	92.07	2114.89	96.71	2115.12	106.34	2115.96	108.76	2116.15
112.58	2116.24	112.59	2116.24	115.22	2116.3	127.55	2116.48	132	2113
132.2	2112.85	132.4	2112.69	132.7	2112.45	133	2112.21	133.41	2111.87
133.7	2111.99	136	2112.8	136.5	2112.97	137	2113.15	145.3	2116.06
149.3	2116.15	156.14	2116.35	165.79	2116.62	167.58	2116.64	169.82	2116.46
179.32	2115.76	182.5	2115.8	186.52	2115.92	195.18	2116.65	201.05	2116.86
214.81	2117	221.8	2117.2	224.62	2117.13	232.31	2117.28	234.86	2117.26
242.72	2116.98	245.03	2116.97	247.75	2116.97	250.15	2117.22	257.01	2117.38
267.87	2117.89	271.03	2117.92	273.29	2118.1	280.84	2118.46	289.83	2119.12
292.39	2119.24	293.41	2119.28	295.19	2119.45	295.56	2119.46	296.34	2119.46

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-114.59	.025	-75.6	.032	27.66	.035	41.08	.04	127.55	.035
145.3	.04								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
132.2	136	159.74	159.74	159.74	.3	.5

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
182.5	296.34	2118	T

Left Levee Station= -114.59 Elevation= 2118.43

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2117.66	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.61	Wt. n-Val.	0.038	0.035	0.037
W.S. Elev (ft)	2117.05	Reach Len. (ft)	159.74	159.74	159.74
Crit W.S. (ft)	2117.05	Flow Area (sq ft)	235.84	17.87	54.01
E.G. Slope (ft/ft)	0.009704	Area (sq ft)	235.84	17.87	69.42
Q Total (cfs)	1775.00	Flow (cfs)	1302.44	192.89	279.68

Top Width (ft)	278.36	Top Width (ft)	186.09	3.80	88.47
Vel Total (ft/s)	5.77	Avg. Vel. (ft/s)	5.52	10.79	5.18
Max Chl Dpth (ft)	5.18	Hydr. Depth (ft)	1.27	4.70	1.16
Conv. Total (cfs)	18018.3	Conv. (cfs)	13221.2	1958.0	2839.0
Length Wtd. (ft)	159.74	Wetted Per. (ft)	188.83	4.31	47.10
Min Ch El (ft)	2111.87	Shear (lb/sq ft)	0.76	2.51	0.69
Alpha	1.18	Stream Power (lb/ft s)	4.18	27.12	3.60
Frctn Loss (ft)	1.62	Cum Volume (acre-ft)	12.87	6.33	12.33
C & E Loss (ft)	0.07	Cum SA (acres)	6.90	1.65	6.90

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	-65.23	-15.87	47.72	19.28	49.04	2.69	0.39	2.47
2	LOB	-15.87	33.48	276.92	42.20	39.64	15.60	1.10	6.56
3	LOB	33.48	82.84	625.45	101.67	49.48	35.24	2.06	6.15
4	LOB	82.84	132.20	352.35	72.69	50.67	19.85	1.47	4.85
5	Chan	132.20	132.96	32.97	3.42	0.97	1.86	4.51	9.63
6	Chan	132.96	133.72	41.37	3.83	0.92	2.33	5.05	10.79
7	Chan	133.72	134.48	43.32	3.74	0.81	2.44	4.92	11.58
8	Chan	134.48	135.24	39.46	3.54	0.81	2.22	4.65	11.16
9	Chan	135.24	136.00	35.75	3.33	0.81	2.01	4.39	10.73
10	ROB	136.00	182.50	279.68	54.01	47.10	15.76	1.16	5.18
11	ROB	182.50	210.96	0.00	14.58	28.50	0.00	0.51	0.00
12	ROB	210.96	239.42	0.00	0.32	5.67	0.00	0.06	0.00
13	ROB	239.42	267.88	0.00	0.51	7.84	0.00	0.06	0.00

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Unnamed Central
REACH: North RS: 0.6796

INPUT
Description: R.S. 0.6796
Includes Supplemental Ground Survey
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2115.17	17.35	2115.2	29.92	2115.18	33.26	2114.59	46.64	2111.25
70.26	2110.54	70.7	2110.53	71.26	2110.54	71.8	2110.55	85.23	2110.81
87.61	2110.47	97.93	2109.41	120.13	2109.41	124.66	2111.57	128.51	2111.62
131	2109.72	132	2108.96	133	2108.19	133.13	2108.09	137.51	2108.37
139.3	2108.92	146.71	2111.19	152.71	2111.31	156.86	2111.19	161.76	2111.86
165.77	2112.1	167.45	2112.11	170.23	2112.02	173.53	2110.71	174.55	2110.4
181.22	2111.45	184.99	2112.09	187.75	2112.75	189.46	2112.82	200.66	2113.04
203.77	2113.02	233.47	2113.43						

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	29.92	.032	128.51	.04	200.66	.025

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
132	139.3	145	140.45	138	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2113.21	Element			
Vel Head (ft)	0.85	Wt. n-Val.	0.032	0.040	0.040
W.S. Elev (ft)	2112.36	Reach Len. (ft)	145.00	140.45	138.00
Crit W.S. (ft)	2112.36	Flow Area (sq ft)	175.76	29.08	52.35
E.G. Slope (ft/ft)	0.010620	Area (sq ft)	175.76	29.08	52.35
Q Total (cfs)	1775.00	Flow (cfs)	1291.46	270.30	213.24
Top Width (ft)	143.94	Top Width (ft)	89.81	7.30	46.82
Vel Total (ft/s)	6.90	Avg. Vel. (ft/s)	7.35	9.29	4.07
Max Chl Dpth (ft)	4.27	Hydr. Depth (ft)	1.96	3.98	1.12
Conv. Total (cfs)	17224.0	Conv. (cfs)	12531.8	2622.9	2069.2
Length Wtd. (ft)	142.01	Wetted Per. (ft)	91.43	7.69	47.69
Min Ch El (ft)	2108.09	Shear (lb/sq ft)	1.27	2.51	0.73
Alpha	1.14	Stream Power (lb/ft s)	9.37	23.31	2.96
Frctn Loss (ft)	1.05	Cum Volume (acre-ft)	12.12	6.25	12.11
C & E Loss (ft)	0.03	Cum SA (acres)	6.39	1.63	6.65

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	26.40	52.80	43.21	9.89	10.75	2.43	0.93	4.37
2	LOB	52.80	79.20	273.83	42.90	26.41	15.43	1.62	6.38
3	LOB	79.20	105.60	497.29	61.43	26.48	28.02	2.33	8.10
4	LOB	105.60	132.00	477.12	61.54	27.79	26.88	2.33	7.75
5	Chan	132.00	133.46	48.15	5.74	1.76	2.71	3.93	8.39
6	Chan	133.46	134.92	60.79	6.14	1.46	3.42	4.20	9.91
7	Chan	134.92	136.38	58.56	6.00	1.46	3.30	4.11	9.76
8	Chan	136.38	137.84	55.78	5.85	1.48	3.14	4.01	9.53
9	Chan	137.84	139.30	47.02	5.35	1.53	2.65	3.67	8.79
10	ROB	139.30	158.13	143.52	29.75	19.19	8.09	1.58	4.82
11	ROB	158.13	176.97	45.37	14.91	19.20	2.56	0.79	3.04
12	ROB	176.97	195.80	24.36	7.68	9.29	1.37	0.84	3.17

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Unnamed Central
REACH: North RS: 0.6530

INPUT
Description: R.S. 0.6530

Includes Supplemental Ground Survey
Station Elevation Data num= 56

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2110.91	1.4	2110.99	5.38	2111.21	5.84	2111.26	9.99	2111.3
23.05	2111.45	34.97	2111.41	37.42	2111.37	46.23	2110.16	56.87	2108.7
57.54	2108	67.3	2105.31	68.54	2104.97	84	2105.51	87.67	2105.64
101.08	2109.48	107.4	2109.13	111.06	2109.33	116.24	2110.05	132.47	2109.95
139.07	2110.41	164.86	2110.81	173.68	2111.01	178.89	2111.04	185.51	2111.05
199.22	2111.38	209.65	2111.23	212.3	2111.16	213.91	2109.01	214.24	2108.08
215.08	2107.94	217.56	2107.26	218.48	2107	224.53	2107.91	228.22	2108.64
234.92	2109.45	242.37	2110.17	252.59	2110.29	258.13	2110.21	261.38	2110.1
266.37	2110.04	270.19	2110.65	274.03	2111.02	276.77	2111.12	283.27	2111.26
284.05	2111.28	284.87	2111.31	292.64	2111.87	297.5	2111.88	301.7	2112.11
305.85	2112.29	309.75	2112.56	310.09	2112.58	315.24	2112.84	317.92	2112.98
325.08	2113.05								

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.032	87.67	.04	116.24	.025	252.59	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
67.3	84	122	119.86	118	.1	.3

Left Levee Station= 23.05 Elevation= 2111.45
Right Levee Station= 199.22 Elevation= 2111.38

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2111.82	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.15	Wt. n-Val.	0.032	0.032	0.036
W.S. Elev (ft)	2110.67	Reach Len. (ft)	122.00	119.86	118.00
Crit W.S. (ft)	2110.67	Flow Area (sq ft)	54.96	90.86	95.91
E.G. Slope (ft/ft)	0.005440	Area (sq ft)	54.96	90.86	95.91
Q Total (cfs)	1775.00	Flow (cfs)	313.25	960.51	501.24
Top Width (ft)	113.56	Top Width (ft)	24.81	16.70	72.05
Vel Total (ft/s)	7.34	Avg. Vel. (ft/s)	5.70	10.57	5.23
Max Chl Dpth (ft)	5.70	Hydr. Depth (ft)	2.22	5.44	1.33
Conv. Total (cfs)	24065.9	Conv. (cfs)	4247.2	13022.9	6795.9
Length Wtd. (ft)	119.45	Wetted Per. (ft)	25.61	16.76	72.67
Min Ch El (ft)	2104.97	Shear (lb/sq ft)	0.73	1.84	0.45
Alpha	1.37	Stream Power (lb/ft s)	4.15	19.47	2.34
Frctn Loss (ft)	0.80	Cum Volume (acre-ft)	11.73	6.05	11.88
C & E Loss (ft)	0.08	Cum SA (acres)	6.20	1.59	6.46

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	37.80	52.55	15.69	6.94	10.15	0.88	0.69	2.26
2	LOB	52.55	67.30	297.56	48.02	15.45	16.76	3.26	6.20
3	Chan	67.30	70.64	201.09	18.76	3.39	11.33	5.62	10.72
4	Chan	70.64	73.98	200.17	18.61	3.34	11.28	5.57	10.76
5	Chan	73.98	77.32	193.23	18.22	3.34	10.89	5.46	10.61
6	Chan	77.32	80.66	186.39	17.83	3.34	10.50	5.34	10.45
7	Chan	80.66	84.00	179.65	17.44	3.34	10.12	5.22	10.30
8	ROB	84.00	141.61	499.61	94.29	58.23	28.15	1.64	5.30
9	ROB	141.61	199.22	1.63	1.62	14.44	0.09	0.11	1.00

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Unnamed Central
REACH: North RS: 0.6303

INPUT
Description: R.S. 0.6303
Station Elevation Data num= 56

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2107.95	7.63	2107.91	7.79	2107.91	7.88	2107.91	8.06	2107.91
8.22	2107.91	9.33	2107.9	27.09	2107.81	32.72	2107.97	34.05	2108.02
34.69	2107.94	44.81	2106.73	47.01	2106.46	47.18	2106.44	55.5	2106.05
60.42	2105.04	70.6	2103.26	78.11	2101.95	80.29	2102.3	81.4	2102.48
86.7	2103.46	97.13	2105.38	128.33	2105.1	130	2105.08	130.36	2105.07
130.63	2105.08	130.71	2105.08	130.76	2105.07	131.34	2105.07	131.85	2105.07
131.92	2105.07	165.08	2104.94	171.84	2104.14	176.73	2103.36	179.5	2104
180.05	2104.17	181.34	2104.47	187.42	2106.07	191.89	2107.3	192.85	2107.65
194.03	2107.71	196.54	2107.6	203.57	2107.78	209.09	2107.86	214.22	2108.04
232.7	2108.49	243.53	2108.76	247.06	2109.01	248.66	2109.09	252.89	2109.38
261.99	2109.84	272.04	2110.02	275.86	2110.38	284.96	2110.97	288.65	2111.17
290.92	2111.25								

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	27.09	.04	60.42	.032	81.4	.04	194.03	.025

Bnk Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
70.6	86.7	183.22	183.22	183.22	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2107.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.87	Wt. n-Val.	0.033	0.034	0.040
W.S. Elev (ft)	2106.70	Reach Len. (ft)	183.22	183.22	183.22
Crit W.S. (ft)	2106.70	Flow Area (sq ft)	35.80	65.34	183.04
E.G. Slope (ft/ft)	0.008486	Area (sq ft)	35.80	65.34	183.04
Q Total (cfs)	1810.00	Flow (cfs)	230.36	664.97	914.67
Top Width (ft)	144.70	Top Width (ft)	25.58	16.10	103.02
Vel Total (ft/s)	6.37	Avg. Vel. (ft/s)	6.44	10.18	5.00
Max Chl Dpth (ft)	4.75	Hydr. Depth (ft)	1.40	4.06	1.78
Conv. Total (cfs)	19647.9	Conv. (cfs)	2500.6	7218.3	9929.0
Length Wtd. (ft)	183.22	Wetted Per. (ft)	25.86	16.35	103.74
Min Ch El (ft)	2101.95	Shear (lb/sq ft)	0.73	2.12	0.93
Alpha	1.38	Stream Power (lb/ft s)	4.72	21.55	4.67
Frctn Loss (ft)	1.69	Cum Volume (acre-ft)	11.60	5.84	11.50
C & E Loss (ft)	0.02	Cum SA (acres)	6.13	1.55	6.23

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	42.36	56.48	9.14	4.84	11.50	0.50	0.42	1.89
2	LOB	56.48	70.60	221.22	30.96	14.36	12.22	2.19	7.15

3	Chan	70.60	73.82	121.62	11.99	3.27	6.72	3.72	10.14
4	Chan	73.82	77.04	153.70	13.80	3.27	8.49	4.29	11.14
5	Chan	77.04	80.26	173.55	14.84	3.26	9.59	4.61	11.70
6	Chan	80.26	83.48	126.75	13.31	3.27	7.00	4.13	9.53
7	Chan	83.48	86.70	89.35	11.40	3.27	4.94	3.54	7.84
8	ROB	86.70	127.54	326.42	68.23	41.02	18.03	1.67	4.78
9	ROB	127.54	168.39	340.65	69.89	40.87	18.82	1.71	4.87
10	ROB	168.39	209.23	247.60	44.92	21.85	13.68	2.11	5.51

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Unnamed Central
REACH: North RS: 0.5956

INPUT
Description: R.S. 0.5956
Station Elevation Data num= 56

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2104.82	2.94	2104.78	10.86	2104.3	12.23	2104.29	18.6	2104.19
21.13	2104.24	22.6	2104.24	30.74	2103.96	31.03	2103.93	34.98	2104.07
52.06	2103.09	53.22	2103.03	53.64	2103.02	53.91	2102.99	57.21	2102.48
60.76	2101.67	62.2	2101.47	63.98	2101.67	69.82	2102.26	76.58	2102.04
86.86	2101.73	95.47	2101.5	97.72	2101.4	106.1	2098.63	108.85	2097.72
108.9	2097.71	109.01	2097.67	109.63	2097.76	117	2098.8	123.61	2099.74
126.95	2099.16	132.81	2098.11	135.92	2098.55	142.82	2099.36	151.65	2099.7
152.81	2099.75	153.24	2099.75	159.91	2099.93	167.11	2100.82	167.24	2100.82
170.44	2100.81	176.32	2099.44	177.81	2098.99	178.87	2099.17	184.74	2100.16
188.65	2100.44	190.64	2102.68	195.52	2103.55	208.73	2105.79	209.82	2105.74
217.54	2105.68	234.89	2105.41	240.02	2105.35	241.02	2105.33	243.53	2105.92
252.01	2108.37								

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.04	18.6	.025	30.74	.04	97.72	.032	123.61	.04
209.82	.025								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
106.1	117	210	217.01	230	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2103.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.02	Wt. n-Val.	0.033	0.032	0.039
W.S. Elev (ft)	2102.04	Reach Len. (ft)	210.00	217.01	230.00
Crit W.S. (ft)	2102.04	Flow Area (sq ft)	25.90	41.67	176.52
E.G. Slope (ft/ft)	0.010073	Area (sq ft)	25.90	41.67	176.52
Q Total (cfs)	1810.00	Flow (cfs)	136.98	468.19	1204.83
Top Width (ft)	121.81	Top Width (ft)	37.84	10.90	73.07
Vel Total (ft/s)	7.42	Avg. Vel. (ft/s)	5.29	11.23	6.83
Max Chl Dpth (ft)	4.37	Hydr. Depth (ft)	0.68	3.82	2.42
Conv. Total (cfs)	18034.6	Conv. (cfs)	1364.8	4665.0	12004.8
Length Wtd. (ft)	223.44	Wetted Per. (ft)	38.38	11.13	74.47
Min Ch El (ft)	2097.67	Shear (lb/sq ft)	0.42	2.35	1.49
Alpha	1.20	Stream Power (lb/ft s)	2.24	26.44	10.17
Frctn Loss (ft)	2.43	Cum Volume (acre-ft)	11.47	5.61	10.74
C & E Loss (ft)	0.04	Cum SA (acres)	5.99	1.49	5.86

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	42.44	63.66	3.15	1.67	4.57	0.17	0.37	1.89
2	LOB	63.66	84.88	1.85	1.79	12.14	0.10	0.15	1.03
3	LOB	84.88	106.10	131.98	22.43	21.67	7.29	1.06	5.88
4	Chan	106.10	108.28	89.21	8.21	2.30	4.93	3.77	10.86
5	Chan	108.28	110.46	111.43	9.28	2.23	6.16	4.26	12.01
6	Chan	110.46	112.64	101.62	8.73	2.20	5.61	4.01	11.64
7	Chan	112.64	114.82	88.95	8.06	2.20	4.91	3.70	11.04
8	Chan	114.82	117.00	76.96	7.39	2.20	4.25	3.39	10.41
9	ROB	117.00	144.00	665.26	82.77	27.29	36.75	3.07	8.04
10	ROB	144.00	171.00	312.11	54.06	27.08	17.24	2.00	5.77
11	ROB	171.00	198.01	227.46	39.69	20.10	12.57	2.08	5.73

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Unnamed Central
REACH: North RS: 0.5545

INPUT
Description: R.S. 0.5545
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2099.06	.47	2099.07	.58	2099.07	1.19	2099.04	10.15	2098.81
12.54	2098.76	20.76	2098.79	22.65	2098.71	24.32	2098.8	31.9	2098.72
34.09	2098.51	43.7	2097.58	43.78	2097.58	53.35	2096.54	59.22	2095.32
61.28	2094.94	65.7	2094.05	69.39	2094.73	75.12	2095.27	81.01	2094.2
84.3	2093.44	88.22	2092.53	90.05	2092.84	94	2093.52	94.36	2093.58
94.4	2093.59	94.6	2093.63	102.8	2095.14	109.66	2095.2	115.71	2095.34
130.06	2095.34	139.24	2095.19	145.92	2095.17	149.82	2095.02	158.16	2093.97
158.38	2093.94	158.54	2093.93	160.74	2094.23	167.51	2095.2	168.96	2095.25
171.06	2095.45	191.19	2097.01	198.72	2097.81	205.84	2098.19		

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	10.15	.04	81.01	.035	102.8	.058	158.16	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
84.3	94	102	94.94	90	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2097.95	Element			
Vel Head (ft)	0.89	Wt. n-Val.	0.039	0.035	0.048
W.S. Elev (ft)	2097.06	Reach Len. (ft)	102.00	94.94	90.00
Crit W.S. (ft)	2097.06	Flow Area (sq ft)	69.18	39.30	177.14
E.G. Slope (ft/ft)	0.011761	Area (sq ft)	69.18	39.30	177.14
Q Total (cfs)	1810.00	Flow (cfs)	451.74	454.02	904.24
Top Width (ft)	143.09	Top Width (ft)	35.73	9.70	97.66
Vel Total (ft/s)	6.34	Avg. Vel. (ft/s)	6.53	11.55	5.10
Max Chl Dpth (ft)	4.53	Hydr. Depth (ft)	1.94	4.05	1.81
Conv. Total (cfs)	16690.3	Conv. (cfs)	4165.5	4186.6	8338.2

Length Wtd. (ft)	93.23	Wetted Per. (ft)	36.28	9.89	98.04
Min Ch El (ft)	2092.53	Shear (lb/sq ft)	1.40	2.92	1.33
Alpha	1.42	Stream Power (lb/ft s)	9.14	33.71	6.77
Frctn Loss (ft)	1.15	Cum Volume (acre-ft)	11.25	5.41	9.81
C & E Loss (ft)	0.02	Cum SA (acres)	5.82	1.44	5.41

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	33.72	50.58	0.19	0.22	2.02	0.01	0.11	0.88
2	LOB	50.58	67.44	149.79	27.92	17.15	8.28	1.66	5.36
3	LOB	67.44	84.30	301.76	41.04	17.10	16.67	2.43	7.35
4	Chan	84.30	86.24	82.64	7.46	1.99	4.57	3.84	11.08
5	Chan	86.24	88.18	99.39	8.33	1.99	5.49	4.30	11.93
6	Chan	88.18	90.12	103.18	8.48	1.97	5.70	4.37	12.17
7	Chan	90.12	92.06	90.47	7.84	1.97	5.00	4.04	11.54
8	Chan	92.06	94.00	78.35	7.19	1.97	4.33	3.71	10.90
9	ROB	94.00	116.37	304.77	48.95	22.52	16.84	2.19	6.23
10	ROB	116.37	138.74	151.16	39.08	22.37	8.35	1.75	3.87
11	ROB	138.74	161.10	260.56	51.31	22.46	14.40	2.29	5.08
12	ROB	161.10	183.47	182.77	35.11	22.48	10.10	1.57	5.21
13	ROB	183.47	205.84	4.98	2.70	8.21	0.28	0.33	1.84

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Unnamed Central
REACH: North RS: 0.5365

INPUT
Description: R.S. 0.5365
Station Elevation Data num= 68

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2096.48	.52	2096.6	2.54	2096.83	4.29	2097.08	6.2	2097.09
16.38	2096.78	23.51	2096.2	27.4	2096.31	27.62	2096.31	27.8	2096.3
37.46	2096.65	40.74	2096.88	44.92	2097.16	48.42	2097.18	53.19	2097.39
56.85	2097.56	65.28	2097.89	69.85	2098.36	70.83	2098.41	71.74	2098.4
110.69	2097.79	119.83	2097.55	125.27	2097.47	133.74	2097.39	147.62	2097.24
151.83	2097.24	156.49	2097.07	159.4	2096.84	165.28	2096.43	170.88	2095.99
173.95	2095.79	193.36	2094.07	194.24	2093.98	199.76	2093.47	201.97	2093.43
202.9	2093.28	210	2091.2	212.78	2090.39	216.43	2091.1	217	2091.22
218	2091.42	225.9	2093.05	235.19	2093.04	242.49	2092.95	257.66	2092.18
260.19	2092.14	265.13	2092.13	278.21	2092.25	280.31	2092.21	282.26	2092.23
285.11	2092.24	297.72	2092.99	310.04	2093.8	323.4	2094.61	324.42	2094.62
327.49	2094.79	330.54	2094.84	355.74	2094.97	359.91	2095.31	368.25	2095.29
368.76	2095.28	375.18	2095.48	381.41	2095.71	383	2095.78	390.8	2096.13
394.75	2095.92	394.78	2095.92	398.95	2096.43				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	133.74	.04	210	.035	225.9	.058	310.04	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
210	217	60	55.5	52	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2095.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.83	Wt. n-Val.	0.040	0.035	0.053
W.S. Elev (ft)	2094.98	Reach Len. (ft)	60.00	55.50	52.00
Crit W.S. (ft)	2094.98	Flow Area (sq ft)	36.66	29.24	233.78
E.G. Slope (ft/ft)	0.012959	Area (sq ft)	36.66	29.24	233.78
Q Total (cfs)	1810.00	Flow (cfs)	189.01	359.77	1261.22
Top Width (ft)	172.66	Top Width (ft)	26.86	7.00	138.81
Vel Total (ft/s)	6.04	Avg. Vel. (ft/s)	5.16	12.31	5.39
Max Chl Dpth (ft)	4.59	Hydr. Depth (ft)	1.37	4.18	1.68
Conv. Total (cfs)	15899.7	Conv. (cfs)	1660.4	3160.3	11079.0
Length Wtd. (ft)	53.76	Wetted Per. (ft)	27.24	7.20	139.09
Min Ch El (ft)	2090.39	Shear (lb/sq ft)	1.09	3.29	1.36
Alpha	1.46	Stream Power (lb/ft s)	5.61	40.45	7.34
Frctn Loss (ft)	0.73	Cum Volume (acre-ft)	11.12	5.34	9.38
C & E Loss (ft)	0.00	Cum SA (acres)	5.74	1.42	5.16

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	168.00	210.00	189.01	36.66	27.24	10.44	1.37	5.16
2	Chan	210.00	211.40	65.70	5.57	1.46	3.63	3.98	11.79
3	Chan	211.40	212.80	77.32	6.14	1.46	4.27	4.39	12.59
4	Chan	212.80	214.20	80.19	6.22	1.43	4.43	4.45	12.89
5	Chan	214.20	215.60	72.17	5.84	1.43	3.99	4.17	12.35
6	Chan	215.60	217.00	64.39	5.46	1.43	3.56	3.90	11.80
7	ROB	217.00	253.39	504.44	82.79	36.59	27.87	2.27	6.09
8	ROB	253.39	289.78	560.36	100.14	36.41	30.96	2.75	5.60
9	ROB	289.78	326.17	194.37	48.30	36.46	10.74	1.33	4.02
10	ROB	326.17	362.56	2.06	2.55	29.64	0.11	0.09	0.81

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Unnamed Central
REACH: North RS: 0.5260

INPUT
Description: R.S. 0.5260
Includes Supplemental Ground Survey
Station Elevation Data num= 85

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2093.97	5.4	2093.67	12.89	2093.51	12.91	2093.51	12.92	2093.51
31.94	2093.19	42.43	2093.01	46.26	2093.24	47.64	2093.43	51.21	2093.26
57.57	2093.12	62.65	2093.02	65.97	2092.93	75.92	2092.88	76.8	2092.89
77.1	2092.86	84.16	2092.77	91.49	2092.46	92.19	2092.5	92.98	2092.36
97.08	2091.88	112.86	2091.77	114.06	2091.74	118.23	2091.79	121.61	2091.72
128.04	2091.9	166.08	2092.07	172.13	2092.15	174.25	2092.18	177.49	2092.21

177.77	2092.22	179.7	2092.26	180.44	2092.3	181.22	2092.34	193.54	2092.7
206.32	2092.82	209.07	2092.82	210.94	2093.33	212.84	2093.94	214.37	2093.91
220.91	2093.93	223.41	2093.93	223.84	2093.93	236.45	2094.23	242.62	2094.43
246.13	2094.45	247.92	2094.44	260.73	2094.35	261.56	2094.34	273	2094.36
279.5	2094.2	279.83	2094.13	290.51	2091.74	292.66	2091.87	297.67	2091.63
303	2090.41	304	2090.18	305.14	2089.92	316.33	2089.88	318	2090.57
320.4	2091.56	325.22	2091.61	329.11	2091.5	329.14	2091.5	330.86	2091.49
343.07	2091.12	350.59	2090.91	354.32	2090.87	365.16	2091.04	375.27	2091.1
379.77	2091.25	397.68	2091.93	401.78	2092.06	419.42	2092.77	420.8	2092.83
423.99	2092.21	426.02	2091.81	426.59	2091.9	434.7	2093.42	436.78	2093.59
449.83	2094.66	454.29	2095.23	455.25	2095.31	468.62	2097.34	475.69	2097.78

Manning's n Values num= 7

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	42.43	.032	114.06	.025	236.45	.04	297.67	.035
316.33	.058	397.68	.04						

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
303	318	66	67.1	67	.1	.3

Left Levee Station= 246.13 Elevation= 2094.45

Blocked Obstructions num= 1

Sta L	Sta R	Elev
113.5	160	2097

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2094.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.83	Wt. n-Val.	0.037	0.038	0.055
W.S. Elev (ft)	2093.43	Reach Len. (ft)	66.00	67.10	67.00
Crit W.S. (ft)	2093.43	Flow Area (sq ft)	31.15	51.85	210.25
E.G. Slope (ft/ft)	0.014323	Area (sq ft)	31.15	51.85	210.25
Q Total (cfs)	1810.00	Flow (cfs)	208.63	548.89	1052.49
Top Width (ft)	151.87	Top Width (ft)	20.04	15.00	116.83
Vel Total (ft/s)	6.17	Avg. Vel. (ft/s)	6.70	10.59	5.01
Max Chl Dpth (ft)	3.55	Hydr. Depth (ft)	1.55	3.46	1.80
Conv. Total (cfs)	15123.8	Conv. (cfs)	1743.2	4586.3	8794.2
Length Wtd. (ft)	66.72	Wetted Per. (ft)	20.38	15.19	117.32
Min Ch El (ft)	2089.88	Shear (lb/sq ft)	1.37	3.05	1.60
Alpha	1.41	Stream Power (lb/ft s)	9.15	32.31	8.02
Frctn Loss (ft)	0.85	Cum Volume (acre-ft)	11.08	5.28	9.12
C & E Loss (ft)	0.06	Cum SA (acres)	5.71	1.41	5.01

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Manning's n values were composited to a single value in the main channel.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	246.13	303.00	208.63	31.15	20.38	11.53	1.55	6.70
2	Chan	303.00	306.00	106.90	10.01	3.06	5.91	3.34	10.68
3	Chan	306.00	309.00	118.26	10.56	3.00	6.53	3.52	11.20
4	Chan	309.00	312.00	118.86	10.59	3.00	6.57	3.53	11.22
5	Chan	312.00	315.00	119.46	10.62	3.00	6.60	3.54	11.25
6	Chan	315.00	318.00	85.41	10.07	3.14	4.72	3.36	8.48
7	ROB	318.00	349.54	333.14	66.73	31.74	18.41	2.12	4.99
8	ROB	349.54	381.08	413.45	75.77	31.54	22.84	2.40	5.46
9	ROB	381.08	412.61	229.41	48.52	31.56	12.67	1.54	4.73
10	ROB	412.61	444.15	76.48	19.23	22.47	4.23	0.87	3.98

Warning: The energy equation could not be balanced within the specified number of iterations. The

program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Manning's n values were composited to a single value in the main channel.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Unnamed Central
REACH: North RS: 0.5133

INPUT
Description: R.S. 0.5133
Includes Supplemental Ground Survey
Station Elevation Data num= 90

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-180	2093.48	-177.12	2093.62	-175.24	2093.32	-168	2092.34	-161.59	2092.27
-152.05	2092.13	-146.17	2092.52	-142.47	2092.94	-138.47	2092.66	-138.15	2092.6
-137.88	2092.61	-137.8	2092.61	-124.98	2092.41	-122.77	2092.29	-116.59	2091.87
-109.94	2091.54	-106.44	2091.25	-97.02	2090.78	-95.99	2090.73	-95	2090.69
-91.64	2090.66	-82.86	2090.38	-79.52	2090.19	-78.12	2090.1	-77.58	2090.06
-76.09	2090.26	-71.28	2090.42	-69.17	2090.94	-60.06	2090.4	-55.85	2089.99
-53.49	2089.87	-46.45	2090.19	-42.9	2090.17	-37.47	2090.25	-32.88	2090.29
-25.8	2090.4	-22.13	2090.35	-1.19	2090.56	0	2090.57	7.04	2090.65
22.24	2090.97	27.57	2090.87	32.76	2090.94	40.52	2091.13	42.98	2091.15
43.75	2091.16	46.77	2091.15	54.37	2090.69	55.35	2090.58	61.29	2090.61
76.95	2090.69	82.99	2090.63	90.31	2090.62	95.71	2090.31	109.2	2089.57
115.03	2089.75	137.07	2090.07	146.5	2088.8	148	2088.77	160	2088.5
160.35	2088.49	161	2088.74	164.37	2090.01	167.24	2089.83	172.33	2090.31
181.32	2090.81	200.19	2090.31	207.23	2090.15	208.52	2090.11	212.85	2090.25
224.06	2090.52	229.34	2090.02	233.06	2089.62	239.93	2091.03	242.55	2091.32
244.74	2091.32	255.21	2091.62	272.85	2092.6	273.16	2092.63	273.91	2092.76
285.43	2094.71	294.44	2095.5	296.84	2095.72	297.6	2095.89	298.28	2096.06
304.03	2097.41	306.37	2097.94	308.94	2098.64	310.41	2100.64	320.83	2100.67

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-180	.025	-146.17	.032	-55.85	.025	61.29	.04	137.07	.035
164.37	.04								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
148	161	207	211.73	220	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
-180	0	2094	T

Blocked Obstructions num= 1

Sta L	Sta R	Elev
-52.6	42.5	2100

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2092.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.65	Wt. n-Val.	0.037	0.035	0.039
W.S. Elev (ft)	2091.71	Reach Len. (ft)	207.00	211.73	220.00
Crit W.S. (ft)	2091.71	Flow Area (sq ft)	155.23	40.06	116.52
E.G. Slope (ft/ft)	0.011437	Area (sq ft)	219.78	40.06	116.52
Q Total (cfs)	1810.00	Flow (cfs)	885.92	384.26	539.82
Top Width (ft)	275.17	Top Width (ft)	166.31	13.00	95.87
Vel Total (ft/s)	5.80	Avg. Vel. (ft/s)	5.71	9.59	4.63
Max Chl Dpth (ft)	3.22	Hydr. Depth (ft)	1.47	3.08	1.22
Conv. Total (cfs)	16924.9	Conv. (cfs)	8284.1	3593.1	5047.7
Length Wtd. (ft)	210.17	Wetted Per. (ft)	106.21	13.05	96.37
Min Ch El (ft)	2088.49	Shear (lb/sq ft)	1.04	2.19	0.86
Alpha	1.24	Stream Power (lb/ft s)	5.96	21.02	4.00
Frctn Loss (ft)	1.80	Cum Volume (acre-ft)	10.88	5.21	8.87
C & E Loss (ft)	0.10	Cum SA (acres)	5.57	1.39	4.84

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	-120.00	-60.00	0.00	52.41	53.55	0.00	0.98	0.00
2	LOB	-60.00	0.00	0.00	12.14	9.23	0.00	1.64	0.00
3	LOB	0.00	74.00	145.99	29.69	32.09	8.07	0.94	4.92
4	LOB	74.00	148.00	739.93	125.54	74.12	40.88	1.70	5.89
5	Chan	148.00	150.60	72.47	7.73	2.60	4.00	2.97	9.38
6	Chan	150.60	153.20	74.86	7.88	2.60	4.14	3.03	9.50
7	Chan	153.20	155.80	77.28	8.03	2.60	4.27	3.09	9.62
8	Chan	155.80	158.40	79.74	8.18	2.60	4.41	3.15	9.75
9	Chan	158.40	161.00	79.90	8.25	2.65	4.41	3.17	9.69
10	ROB	161.00	192.97	223.94	44.04	32.24	12.37	1.38	5.09
11	ROB	192.97	224.93	216.35	44.50	31.98	11.95	1.39	4.86
12	ROB	224.93	256.90	99.53	27.98	32.14	5.50	0.88	3.56

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Unnamed Central
REACH: North RS: 0.4732

INPUT
Description: R.S. 0.4732
Station Elevation Data num= 62

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2090.33	2.12	2090.25	3.63	2090.48	9.66	2090.75	21.61	2090.7
24.34	2090.72	28.36	2090.69	29.47	2090.19	30.13	2090.25	35.8	2088.6
37.11	2088.62	38.49	2087.68	39.63	2087.07	40.4	2087	43.71	2086.71
55.64	2085.58	59.91	2085.24	69.3	2084.29	72.46	2083.85	79.12	2083.39
81.5	2083.34	88.41	2083.53	89.62	2083.56	106.38	2083.78	108.31	2083.79
112.18	2083.76	118.3	2083.97	135.76	2084.41	143.84	2084.67	155.26	2085.33
157.49	2084.61	164.58	2082.6	167.08	2083.29	173.37	2084.31	175.32	2083.87
186.24	2084.7	191.67	2085.1	203.32	2084.41	206.24	2084.36	211.25	2084.82
215.77	2084.54	218	2084.11	218.86	2083.95	223.46	2083.31	224.54	2083.41
231.69	2084.05	233	2084.2	236.1	2084.55	237.57	2084.37	249.39	2085.34
257.55	2085.89	257.88	2086.3	260.82	2086.46	264.82	2086.72	276.49	2087.79
278.69	2087.86	285.53	2088.47	299.45	2088.36	313.69	2089.16	317.54	2089.37
322.2	2089.45	327.9	2089.69						

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	40.4	.058	106.38	.04	211.25	.035	231.69	.04
257.55	.025								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
218	233	55	48.45	44	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2086.63	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.33	Wt. n-Val.	0.045	0.035	0.040
W.S. Elev (ft)	2086.30	Reach Len. (ft)	55.00	48.45	44.00
Crit W.S. (ft)		Flow Area (sq ft)	339.38	38.63	31.40
E.G. Slope (ft/ft)	0.006647	Area (sq ft)	339.38	38.63	31.40
Q Total (cfs)	1810.00	Flow (cfs)	1450.20	248.35	111.45
Top Width (ft)	209.84	Top Width (ft)	169.96	15.00	24.88
Vel Total (ft/s)	4.42	Avg. Vel. (ft/s)	4.27	6.43	3.55
Max Chl Dpth (ft)	3.70	Hydr. Depth (ft)	2.00	2.58	1.26
Conv. Total (cfs)	22200.2	Conv. (cfs)	17787.1	3046.0	1367.0
Length Wtd. (ft)	52.78	Wetted Per. (ft)	170.89	15.10	25.16
Min Ch El (ft)	2083.31	Shear (lb/sq ft)	0.82	1.06	0.52
Alpha	1.08	Stream Power (lb/ft s)	3.52	6.82	1.84
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	9.56	5.02	8.49
C & E Loss (ft)	0.06	Cum SA (acres)	4.77	1.32	4.54

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	43.60	87.20	208.66	69.24	39.30	11.53	1.77	3.01
2	LOB	87.20	130.80	498.28	107.45	43.61	27.53	2.46	4.64
3	LOB	130.80	174.40	409.91	87.09	44.22	22.65	2.00	4.71
4	LOB	174.40	218.00	333.36	75.61	43.76	18.42	1.73	4.41
5	Chan	218.00	221.00	45.21	7.30	3.04	2.50	2.43	6.19
6	Chan	221.00	224.00	58.79	8.53	3.03	3.25	2.84	6.89
7	Chan	224.00	227.00	57.57	8.41	3.01	3.18	2.80	6.84
8	Chan	227.00	230.00	48.67	7.61	3.01	2.69	2.54	6.40
9	Chan	230.00	233.00	38.11	6.78	3.02	2.11	2.26	5.62
10	ROB	233.00	251.98	104.57	28.00	19.06	5.78	1.48	3.73
11	ROB	251.98	270.96	6.89	3.39	6.11	0.38	0.58	2.03

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Unnamed Central
REACH: North RS: 0.4575

INPUT
Description: R.S. 0.4575
Station Elevation Data num= 60

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2089.8	8.23	2089.48	12.68	2089.34	19.4	2088.95	23.22	2088.68
34.1	2088.13	35.79	2087.88	37.5	2087.6	41.45	2087.08	45.17	2086.58
48.72	2086	56.09	2085.28	61.73	2084.87	66.42	2084.54	68.81	2084.42
93.3	2082.01	98.03	2081.69	98.56	2081.57	106.17	2082.41	112.06	2082.74
112.92	2082.73	119.35	2081.74	119.94	2081.79	126.68	2082.37	130.09	2082.87
134.92	2082.82	137.77	2082.45	138.73	2082.26	147.42	2083.05	150.58	2083.04
180.44	2083.01	185.03	2083	192	2082.08	195.52	2081.62	199.6	2081.25
205.37	2081.99	206	2082.05	212.04	2082.57	215.78	2082.64	218.28	2082.69
230.27	2082.78	239.35	2084.86	249.05	2085.82	254.36	2085.86	256.24	2085.91
265.53	2086.34	271.27	2086.59	276.73	2086.77	283.43	2086.8	289.03	2086.99
342.78	2089.44	350.61	2090.09	355.12	2090.43	360.32	2089.94	370.3	2089.05
372.04	2089	374.99	2088.98	380.3	2089.03	388.53	2089.13	394.08	2089.18

Manning's n Values num= 8

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	37.5	.04	93.3	.058	119.35	.04	185.03	.035
212.04	.04	256.24	.025	380.3	.04				

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
192	206	76	82.8	88	.3	.5

Blocked Obstructions num= 1

Sta L	Sta R	Elev
256	367	2091

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2086.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.	0.043	0.035	0.039
W.S. Elev (ft)	2086.31	Reach Len. (ft)	76.00	82.80	88.00
Crit W.S. (ft)		Flow Area (sq ft)	464.63	65.41	125.42
E.G. Slope (ft/ft)	0.001189	Area (sq ft)	464.63	65.41	125.42
Q Total (cfs)	1810.00	Flow (cfs)	1230.81	266.38	312.81
Top Width (ft)	209.20	Top Width (ft)	145.20	14.00	50.00
Vel Total (ft/s)	2.76	Avg. Vel. (ft/s)	2.65	4.07	2.49
Max Chl Dpth (ft)	5.06	Hydr. Depth (ft)	3.20	4.67	2.51
Conv. Total (cfs)	52494.8	Conv. (cfs)	35696.7	7725.7	9072.4
Length Wtd. (ft)	80.04	Wetted Per. (ft)	145.77	14.10	50.72
Min Ch El (ft)	2081.25	Shear (lb/sq ft)	0.24	0.34	0.18
Alpha	1.09	Stream Power (lb/ft s)	0.63	1.40	0.46
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	9.05	4.96	8.41
C & E Loss (ft)	0.03	Cum SA (acres)	4.57	1.30	4.50

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	38.40	76.80	66.97	42.47	30.13	3.70	1.42	1.58
2	LOB	76.80	115.20	365.66	147.80	38.59	20.20	3.85	2.47
3	LOB	115.20	153.60	419.84	144.54	38.59	23.20	3.76	2.90
4	LOB	153.60	192.00	378.34	129.82	38.46	20.90	3.38	2.91
5	Chan	192.00	194.80	48.40	12.37	2.82	2.67	4.42	3.91
6	Chan	194.80	197.60	54.79	13.31	2.81	3.03	4.75	4.12
7	Chan	197.60	200.40	59.34	13.96	2.81	3.28	4.98	4.25
8	Chan	200.40	203.20	55.26	13.39	2.82	3.05	4.78	4.13
9	Chan	203.20	206.00	48.59	12.39	2.82	2.68	4.43	3.92
10	ROB	206.00	243.62	306.86	118.05	37.90	16.95	3.14	2.60
11	ROB	243.62	281.23	5.96	7.37	12.82	0.33	0.60	0.81

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Unnamed Central
REACH: North RS: 0.4484

INPUT
Description: R.S. 0.4484 - Imm. upstream of Carefree Mtn. Drive
Station Elevation Data num= 90

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2088.41	8.5	2088.01	9.06	2087.99	9.73	2087.94	9.83	2087.9
11.53	2087.58	18.6	2086.23	20	2086.01	26.58	2084.83	27.3	2084.68
27.78	2084.65	40.08	2083.19	42.06	2083.04	45.79	2083.09	46.65	2083.11
55.15	2083.37	65.72	2082.42	67.64	2082.47	76.56	2082	77.61	2081.95
83.56	2081.73	93.64	2081.48	93.95	2081.46	94.29	2081.47	107.14	2081.26
107.16	2081.26	117.31	2081.4	117.52	2081.4	128.26	2081.79	129.59	2081.82
137.06	2082.55	140.29	2082.65	146.39	2082.42	150	2081.63	150.33	2081.56
150.5	2081.47	151.99	2080.71	152.93	2080.7	155.82	2080.82	158.11	2080.97
166.29	2080.47	168.44	2080.58	171.86	2080.85	180.64	2080.98	181.2	2081
181.21	2081	185.89	2081.16	189.01	2081.25	190.1	2081.33	194.08	2081.64
196.22	2082.33	198.49	2082.37	203.04	2082.97	203.65	2083.06	211.34	2082.97
214.41	2082.96	223.87	2083.28	227.13	2083.28	235.63	2083.59	240.1	2083.55
246.81	2083.34	250.04	2083.33	257.93	2083.14	259	2083.22	259.32	2083.27
269.79	2083.95	276.42	2084.33	278.37	2084.4	287.98	2084.69	289.77	2084.75
296.57	2084.77	301.54	2085.01	303.78	2085.03	313.34	2085.86	319.23	2085.99

320.75	2085.76	326.07	2085.94	332.11	2086.17	342.27	2086.26	345.33	2086.33
349.25	2086.44	351.68	2086.65	358.94	2086.5	359.21	2086.5	359.9	2086.54
368.87	2087.38	372.87	2087.54	374.89	2087.61	392.88	2087.98	394.71	2088.02

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.04	93.64	.058	137.06	.04	155.82	.035	194.08	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
150.5	190.1	83.42	83.42	83.42	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	148	2084.97	F
193	394.71	2084.97	F

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2086.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.047	0.036	0.039
W.S. Elev (ft)	2086.29	Reach Len. (ft)	83.42	83.42	83.42
Crit W.S. (ft)	2084.73	Flow Area (sq ft)	499.52	214.37	326.04
E.G. Slope (ft/ft)	0.000451	Area (sq ft)	499.52	214.37	326.04
Q Total (cfs)	1853.00	Flow (cfs)	830.07	583.59	439.34
Top Width (ft)	325.42	Top Width (ft)	132.23	39.60	153.59
Vel Total (ft/s)	1.78	Avg. Vel. (ft/s)	1.66	2.72	1.35
Max Chl Dpth (ft)	5.82	Hydr. Depth (ft)	3.78	5.41	2.12
Conv. Total (cfs)	87276.1	Conv. (cfs)	39096.4	27487.0	20692.7
Length Wtd. (ft)	83.42	Wetted Per. (ft)	132.70	39.83	153.89
Min Ch El (ft)	2080.47	Shear (lb/sq ft)	0.11	0.15	0.06
Alpha	1.26	Stream Power (lb/ft s)	0.18	0.41	0.08
Frctn Loss (ft)		Cum Volume (acre-ft)	8.21	4.70	7.96
C & E Loss (ft)		Cum SA (acres)	4.33	1.25	4.30

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	0.00	29.60	8.21	11.07	11.48	0.44	0.98	0.74
2	LOB	29.60	59.20	131.77	85.59	29.70	7.11	2.89	1.54
3	LOB	59.20	88.80	238.81	122.19	29.65	12.89	4.13	1.95
4	LOB	88.80	118.40	235.24	145.25	29.61	12.69	4.91	1.62
5	LOB	118.40	148.00	193.20	124.18	29.69	10.43	4.20	1.56
6	LOB	148.00	150.50	22.84	11.25	2.58	1.23	4.50	2.03
7	Chan	150.50	158.42	107.93	43.01	8.11	5.82	5.43	2.51
8	Chan	158.42	166.34	125.23	44.22	7.93	6.76	5.58	2.83
9	Chan	166.34	174.26	125.15	44.20	7.93	6.75	5.58	2.83
10	Chan	174.26	182.18	116.58	42.34	7.92	6.29	5.35	2.75
11	Chan	182.18	190.10	108.70	40.60	7.93	5.87	5.13	2.68
12	ROB	190.10	193.00	31.18	14.06	2.91	1.68	4.85	2.22
13	ROB	193.00	233.34	206.15	134.98	40.51	11.12	3.35	1.53
14	ROB	233.34	273.68	150.67	112.31	40.38	8.13	2.78	1.34
15	ROB	273.68	314.03	49.48	57.59	40.40	2.67	1.43	0.86
16	ROB	314.03	354.37	1.86	7.11	29.69	0.10	0.24	0.26

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CULVERT

RIVER: Unnamed Central
REACH: North RS: 0.4415

INPUT
Description: Culvert No. 20, at Carefree Mountain Drive
Information obtained

from field survey
See Appendix C of TDN for survey info
Distance from Upstream XS = 7.7
Deck/Roadway Width = 58
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 15

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	2087.16	2070	6.89	2087.12	2070	132.9	2085.04	2070
147.27	2084.97	2070	154.56	2085.09	2070	171.5	2085.1	2070
181.44	2085.02	2070	212.14	2085.12	2070	233.38	2085.41	2070
291.06	2085.59	2070	300.06	2085.59	2070	367.24	2086.1	2070
384.23	2086.39	2070	391.28	2086.39	2070	401.33	2086.26	2070

Upstream Bridge Cross Section Data
Station Elevation Data num= 90

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2088.41	8.5	2088.01	9.06	2087.99	9.73	2087.94	9.83	2087.9
11.53	2087.58	18.6	2086.23	20	2086.01	26.58	2084.83	27.3	2084.68
27.78	2084.65	40.08	2083.19	42.06	2083.04	45.79	2083.09	46.65	2083.11
55.15	2083.37	65.72	2082.42	67.64	2082.47	76.56	2082	77.61	2081.95
83.56	2081.73	93.64	2081.48	93.95	2081.46	94.29	2081.47	107.14	2081.26
107.16	2081.26	117.31	2081.4	117.52	2081.4	128.26	2081.79	129.59	2081.82
137.06	2082.55	140.29	2082.65	146.39	2082.42	150	2081.63	150.33	2081.56
150.5	2081.47	151.99	2080.71	152.93	2080.7	155.82	2080.82	158.11	2080.97
166.29	2080.47	168.44	2080.58	171.86	2080.85	180.64	2080.98	181.2	2081
181.21	2081	185.89	2081.16	189.01	2081.25	190.1	2081.33	194.08	2081.64
196.22	2082.33	198.49	2082.37	203.04	2082.97	203.65	2083.06	211.34	2082.97
214.41	2082.96	223.87	2083.28	227.13	2083.28	235.63	2083.59	240.1	2083.55
246.81	2083.34	250.04	2083.33	257.93	2083.14	259	2083.22	259.32	2083.27
269.79	2083.95	276.42	2084.33	278.37	2084.4	287.98	2084.69	289.77	2084.75
296.57	2084.77	301.54	2085.01	303.78	2085.03	313.34	2085.86	319.23	2085.99
320.75	2085.76	326.07	2085.94	332.11	2086.17	342.27	2086.26	345.33	2086.33
349.25	2086.44	351.68	2086.65	358.94	2086.5	359.21	2086.5	359.9	2086.54
368.87	2087.38	372.87	2087.54	374.89	2087.61	392.88	2087.98	394.71	2088.02

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.04	93.64	.058	137.06	.04	155.82	.035	194.08	.04

Bank Sta: Left	Right	Coeff Contr.	Expan.
150.5	190.1	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	148	2084.97	F
193	394.71	2084.97	F

Downstream Deck/Roadway Coordinates
num= 16

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	2087.05	2070	42.1	2086.78	2070	130.34	2084.94	2070
163.69	2084.6	2070	167.63	2084.66	2070	195.22	2084.63	2070
203.31	2084.55	2070	206.11	2084.59	2070	216.04	2084.61	2070
231.63	2084.57	2070	252.17	2084.59	2070	304.89	2084.79	2070
317.65	2085.03	2070	395.22	2085.65	2070	397.59	2085.7	2070
425.67	2085.81	2070						

Downstream Bridge Cross Section Data
Station Elevation Data num= 73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2083.6	22.67	2083.13	27.6	2082.86	33.3	2082.71	40.87	2082.65
44.72	2082.64	55.54	2082.18	61.06	2082.06	69.06	2081.49	71.6	2081.25
81.52	2080.4	88.74	2079.9	99.42	2079.28	106.03	2078.68	111.31	2078.89
118.91	2079.46	123.62	2079.57	128.91	2079.88	133.01	2080.03	137.97	2080.06
147.67	2080.25	150.52	2080.28	152.94	2080.22	160.08	2080.27	167.5	2079.78
169.93	2079.31	172.5	2078.27	173	2078.07	173.5	2077.87	174.62	2077.42
178.93	2077.81	180.31	2077.7	182.2	2078.29	182.5	2078.38	182.81	2078.48
184.57	2078.94	191.14	2078.9	194.06	2079.23	197.04	2079.56	200.19	2079.97
204.8	2080.16	209.91	2078.42	209.97	2078.4	210.45	2078.46	223.05	2079.83
227.37	2080.34	227.73	2080.41	236.08	2080.33	238.59	2080.45	249.93	2080.51
262.09	2080.63	265.64	2080.68	273.64	2080.53	285.92	2080.42	287.69	2080.39

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  306.41 2081.35  308.89 2081.38   319.8 2081.81  320.93 2081.82  331.49 2082.66
  338.46 2083.24  338.75 2083.25  339.26 2083.27  350.85 2083.99  359.35 2084.37
  365.72 2084.79  371.24 2084.98  376.51 2085.18  382.55  2085.7  394.39 2086.03
  397.14 2085.98  399.81 2085.99  409.82 2086.22

Manning's n Values        num=       1
     Sta   n Val
       0    .032

Bank Sta: Left   Right    Coeff Contr.   Expan.
         172.5   182.2             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0     141    2083       F
     214  409.82    2083       F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         = 2083.57
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1           Box       3       8
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                6.7      60     .013     .013        0                  .4                 1
Number of Barrels =  4
Upstream   Elevation =  2080.82
Centerline Stations
   Sta.    Sta.    Sta.    Sta.
  159.9   168.7   177.5   186.3
Downstream Elevation =  2078.9
Centerline Stations
   Sta.    Sta.    Sta.    Sta.
  180.7   189.5   198.3   207.1

CULVERT OUTPUT  Profile #PF 1  Culv Group:  Culvert #1

  Q Culv Group (cfs)       1210.21    Culv Full Len (ft)        60.00
  # Barrels                      4    Culv Vel US (ft/s)        12.61
  Q Barrel (cfs)            302.55    Culv Vel DS (ft/s)        12.61
  E.G. US. (ft)            2086.35    Culv Inv El Up (ft)     2080.82
  W.S. US. (ft)            2086.29    Culv Inv El Dn (ft)     2078.90
  E.G. DS (ft)             2083.56    Culv Frctn Ls (ft)         1.58
  W.S. DS (ft)             2082.24    Culv Exit Loss (ft)        1.15
  Delta EG (ft)               2.79    Culv Entr Loss (ft)        0.99
  Delta WS (ft)               4.05    Q Weir (cfs)             642.79
  E.G. IC (ft)             2086.60    Weir Sta Lft (ft)         54.11
  E.G. OC (ft)             2086.35    Weir Sta Rgt (ft)        345.71
  Culvert Control           Outlet    Weir Submerg               0.00
  Culv WS Inlet (ft)       2083.82    Weir Max Depth (ft)        1.37
  Culv WS Outlet (ft)      2081.90    Weir Avg Depth (ft)        0.85
  Culv Nml Depth (ft)         1.66    Weir Flow Area (sq ft)   248.98
  Culv Crt Depth (ft)         3.00    Min El Weir Flow (ft)   2084.98


Note:    Culvert critical depth exceeds the height of the culvert.

CROSS SECTION


RIVER: Unnamed Central
REACH: North              RS: 0.4326
```

INPUT
Description: R.S. 0.4326 - Imm. downstream of Carefree Mountain Drive
Station Elevation Data num= 73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2083.6	22.67	2083.13	27.6	2082.86	33.3	2082.71	40.87	2082.65
44.72	2082.64	55.54	2082.18	61.06	2082.06	69.06	2081.49	71.6	2081.25
81.52	2080.4	88.74	2079.9	99.42	2079.28	106.03	2078.68	111.31	2078.89
118.91	2079.46	123.62	2079.57	128.91	2079.88	133.01	2080.03	137.97	2080.06
147.67	2080.25	150.52	2080.28	152.94	2080.22	160.08	2080.27	167.5	2079.78
169.93	2079.31	172.5	2078.27	173	2078.07	173.5	2077.87	174.62	2077.42
178.93	2077.81	180.31	2077.7	182.2	2078.29	182.5	2078.38	182.81	2078.48
184.57	2078.94	191.14	2078.9	194.06	2079.23	197.04	2079.56	200.19	2079.97
204.8	2080.16	209.91	2078.42	209.97	2078.4	210.45	2078.46	223.05	2079.83
227.37	2080.34	227.73	2080.41	236.08	2080.33	238.59	2080.45	249.93	2080.51
262.09	2080.63	265.64	2080.68	273.64	2080.53	285.92	2080.42	287.69	2080.39
306.41	2081.35	308.89	2081.38	319.8	2081.81	320.93	2081.82	331.49	2082.66
338.46	2083.24	338.75	2083.25	339.26	2083.27	350.85	2083.99	359.35	2084.37
365.72	2084.79	371.24	2084.98	376.51	2085.18	382.55	2085.7	394.39	2086.03
397.14	2085.98	399.81	2085.99	409.82	2086.22				

Manning's n Values num= 1

Sta	n Val
0	.032

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
172.5	182.2	155	151.54	150	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	141	2083	F
214	409.82	2083	F

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2083.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.32	Wt. n-Val.	0.032	0.032	0.032
W.S. Elev (ft)	2082.24	Reach Len. (ft)	155.00	151.54	150.00
Crit W.S. (ft)	2082.24	Flow Area (sq ft)	70.38	43.50	95.95
E.G. Slope (ft/ft)	0.008450	Area (sq ft)	250.80	43.50	273.26
Q Total (cfs)	1853.00	Flow (cfs)	510.54	495.63	846.84
Top Width (ft)	272.23	Top Width (ft)	118.47	9.70	144.06
Vel Total (ft/s)	8.83	Avg. Vel. (ft/s)	7.25	11.39	8.83
Max Chl Dpth (ft)	4.82	Hydr. Depth (ft)	2.23	4.48	3.02
Conv. Total (cfs)	20158.2	Conv. (cfs)	5554.0	5391.8	9212.4
Length Wtd. (ft)	151.51	Wetted Per. (ft)	31.77	9.98	32.27
Min Ch El (ft)	2077.42	Shear (lb/sq ft)	1.17	2.30	1.57
Alpha	1.09	Stream Power (lb/ft s)	8.48	26.21	13.84
Frctn Loss (ft)	1.41	Cum Volume (acre-ft)	7.49	4.45	7.38
C & E Loss (ft)	0.31	Cum SA (acres)	4.09	1.20	4.01

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	35.25	70.50	0.00	5.67	16.50	0.00	0.34	0.00
2	LOB	70.50	105.75	0.00	79.16	35.35	0.00	2.25	0.00
3	LOB	105.75	141.00	0.00	95.59	35.29	0.00	2.71	0.00
4	LOB	141.00	172.50	510.54	70.38	31.77	27.55	2.23	7.25
5	Chan	172.50	174.44	91.59	8.46	2.09	4.94	4.36	10.82

6	Chan	174.44	176.38	110.06	9.21	1.96	5.94	4.75	11.95
7	Chan	176.38	178.32	103.99	8.88	1.95	5.61	4.58	11.71
8	Chan	178.32	180.26	100.35	8.69	1.95	5.42	4.48	11.55
9	Chan	180.26	182.20	89.64	8.26	2.03	4.84	4.26	10.85
10	ROB	182.20	214.00	846.84	95.95	32.27	45.70	3.02	8.83
11	ROB	214.00	262.96	0.00	98.36	49.05	0.00	2.01	0.00
12	ROB	262.96	311.91	0.00	72.68	48.98	0.00	1.48	0.00
13	ROB	311.91	360.87	0.00	6.27	14.38	0.00	0.44	0.00

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: Unnamed Central
REACH: North RS: 0.4039

INPUT
Description: R.S. 0.4039
Station Elevation Data num= 55

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2078.27	7.39	2078.31	16.66	2078.31	39.66	2078.5	40.82	2078.49
52.01	2077.42	55.52	2077.11	63.35	2076.77	68.14	2076.18	71.18	2076.07
82.5	2074.86	87.83	2074.04	96.58	2074.8	98.65	2074.92	100.18	2075
108.98	2074.33	109.35	2074.23	109.57	2074.18	111.46	2074.27	121.48	2074.77
124.17	2074.6	126.17	2074.51	127	2074.38	130.18	2073.89	130.5	2073.86
130.51	2073.86	133.47	2073.55	139.48	2074.39	140.1	2074.52	144.18	2075.34
151.64	2075.4	169.87	2075.5	179.47	2074.65	189.36	2073.95	196.57	2074.21
202.98	2074.41	205.6	2074.3	219.41	2073.75	228.18	2073.3	233.53	2073.61
243.6	2074.05	246.47	2073.92	253.31	2073.7	262.95	2073.61	274.5	2074.81
285.25	2075.91	298.7	2076.86	305.94	2077.79	313.03	2078.63	328.35	2080.45
329.04	2080.51	330.67	2080.72	339.27	2081.15	344.67	2081.26	364.65	2082.56

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	169.87	.04	179.47	.032	233.53	.035	298.7	.032

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
127	140.1	105.07	105.07	105.07	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2076.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.69	Wt. n-Val.	0.025	0.025	0.033
W.S. Elev (ft)	2075.80	Reach Len. (ft)	105.07	105.07	105.07
Crit W.S. (ft)	2075.80	Flow Area (sq ft)	60.10	24.00	200.57
E.G. Slope (ft/ft)	0.010336	Area (sq ft)	60.10	24.00	200.57
Q Total (cfs)	1853.00	Flow (cfs)	392.18	215.74	1245.08
Top Width (ft)	210.52	Top Width (ft)	53.32	13.10	144.10
Vel Total (ft/s)	6.51	Avg. Vel. (ft/s)	6.53	8.99	6.21
Max Chl Dpth (ft)	2.50	Hydr. Depth (ft)	1.13	1.83	1.39
Conv. Total (cfs)	18226.3	Conv. (cfs)	3857.5	2122.1	12246.7
Length Wtd. (ft)	105.07	Wetted Per. (ft)	53.55	13.23	144.42
Min Ch El (ft)	2073.55	Shear (lb/sq ft)	0.72	1.17	0.90
Alpha	1.05	Stream Power (lb/ft s)	4.73	10.52	5.56
Frctn Loss (ft)	1.22	Cum Volume (acre-ft)	6.94	4.33	6.57
C & E Loss (ft)	0.06	Cum SA (acres)	3.79	1.16	3.52

Warning: The energy equation could not be balanced within the specified number of iterations. The

program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	50.80	76.20	0.52	0.34	2.53	0.03	0.13	1.54
2	LOB	76.20	101.60	170.67	27.58	25.54	9.21	1.09	6.19
3	LOB	101.60	127.00	220.99	32.17	25.47	11.93	1.27	6.87
4	Chan	127.00	129.62	34.93	4.26	2.65	1.88	1.62	8.20
5	Chan	129.62	132.24	48.93	5.20	2.64	2.64	1.99	9.41
6	Chan	132.24	134.86	56.76	5.69	2.64	3.06	2.17	9.98
7	Chan	134.86	137.48	44.42	4.91	2.65	2.40	1.88	9.04
8	Chan	137.48	140.10	30.70	3.94	2.65	1.66	1.50	7.79
9	ROB	140.10	185.01	107.40	27.68	45.04	5.80	0.62	3.88
10	ROB	185.01	229.92	560.29	81.97	44.96	30.24	1.83	6.84
11	ROB	229.92	274.83	565.90	86.43	45.00	30.54	1.92	6.55
12	ROB	274.83	319.74	11.49	4.49	9.42	0.62	0.48	2.56

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Unnamed Central
REACH: North RS: 0.3840

INPUT
Description: R.S. 0.3840
Station Elevation Data num= 55

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2076.14	15.86	2076.08	20.38	2076.03	22.85	2076.07	37.26	2075.29
53.7	2073.13	56.2	2073.17	57.96	2073.1	62.74	2072.98	70.15	2072.9
74.04	2072.81	82.51	2072.55	95.23	2072.24	99.3	2071.84	101.5	2071.62
104.85	2071.27	107.27	2071.37	113.55	2071.65	115.03	2071.7	115.77	2071.69
133.37	2071.45	139.4	2071.84	145.3	2072.22	146.9	2072.31	148.88	2072.39
167.03	2072.51	191.3	2072.73	196.92	2072.71	208.35	2071.79	209.47	2071.69
212.3	2071.96	218.14	2072.36	219.2	2072.37	221.48	2072.19	224.63	2072
235.42	2071.07	241.76	2071.54	244.43	2071.59	256.07	2072.18	259.56	2071.99
265.28	2071.87	267.96	2071.75	272.73	2072	285.5	2072.75	299.62	2072.59
308.69	2072.39	313.27	2072.86	319.24	2073.54	323.04	2074	327.54	2074.34
342.82	2076.33	346.84	2076.96	352.98	2077.81	357.81	2079.05	364.1	2079.34

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	15.86	.04	104.85	.035	212.3	.032	244.43	.035
346.84	.025								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
99.3	139.4	139	135.84	133	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2074.01	Element			
Vel Head (ft)	0.57	Wt. n-Val.	0.040	0.036	0.034
W.S. Elev (ft)	2073.43	Reach Len. (ft)	139.00	135.84	133.00
Crit W.S. (ft)	2073.43	Flow Area (sq ft)	34.59	75.04	209.22
E.G. Slope (ft/ft)	0.013123	Area (sq ft)	34.59	75.04	209.22
Q Total (cfs)	1853.00	Flow (cfs)	118.41	544.13	1190.46

Top Width (ft)	266.90	Top Width (ft)	47.90	40.10	178.90
Vel Total (ft/s)	5.81	Avg. Vel. (ft/s)	3.42	7.25	5.69
Max Chl Dpth (ft)	2.36	Hydr. Depth (ft)	0.72	1.87	1.17
Conv. Total (cfs)	16175.5	Conv. (cfs)	1033.6	4749.9	10391.9
Length Wtd. (ft)	134.05	Wetted Per. (ft)	47.96	40.15	179.17
Min Ch El (ft)	2071.27	Shear (lb/sq ft)	0.59	1.53	0.96
Alpha	1.10	Stream Power (lb/ft s)	2.02	11.10	5.44
Frctn Loss (ft)	1.73	Cum Volume (acre-ft)	6.82	4.21	6.07
C & E Loss (ft)	0.01	Cum SA (acres)	3.66	1.10	3.13

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	39.72	59.58	3.38	2.15	8.21	0.18	0.26	1.57
2	LOB	59.58	79.44	28.53	11.01	19.87	1.54	0.55	2.59
3	LOB	79.44	99.30	86.50	21.43	19.88	4.67	1.08	4.04
4	Chan	99.30	107.32	108.71	15.62	8.05	5.87	1.95	6.96
5	Chan	107.32	115.34	111.94	15.11	8.03	6.04	1.88	7.41
6	Chan	115.34	123.36	102.98	14.37	8.02	5.56	1.79	7.17
7	Chan	123.36	131.38	113.67	15.25	8.02	6.13	1.90	7.46
8	Chan	131.38	139.40	106.84	14.70	8.03	5.77	1.83	7.27
9	ROB	139.40	184.34	211.00	44.73	44.96	11.39	1.00	4.72
10	ROB	184.34	229.28	286.55	52.08	45.04	15.46	1.16	5.50
11	ROB	229.28	274.22	544.96	76.52	45.01	29.41	1.70	7.12
12	ROB	274.22	319.16	147.94	35.89	44.16	7.98	0.81	4.12

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Unnamed Central
REACH: North RS: 0.3583

INPUT
Description: R.S. 0.3583
Station Elevation Data num= 67

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2072.87	5.16	2073.01	14.18	2072.8	19.34	2073.07	34.42	2072.39
35.99	2072.1	41.24	2072.02	46.47	2071.18	48.02	2070.97	51.43	2070.52
60.41	2069.59	68.84	2069.73	81.9	2069.64	90.97	2069.03	91.25	2069.01
91.84	2069.04	99.47	2069.54	101.22	2069.59	103.3	2069.55	106.36	2069.77
115	2068.96	121.71	2068.33	122.2	2068.29	123.98	2068.45	123.99	2068.45
128.5	2068.85	129.72	2068.96	129.87	2068.96	136.12	2068.6	144.07	2068.72
147.18	2068.71	153.12	2068.62	162.15	2068.77	163.46	2068.74	164.87	2068.93
179.2	2068.91	203.08	2069.09	209.08	2068.73	217.94	2068.24	222.37	2068.26
228.94	2068.25	235.5	2067.92	237.07	2067.97	242.73	2068.24	256.98	2070.07
279.56	2073.69	283.89	2074.31	290.45	2075.05	294.65	2075.58	300.13	2076.23
300.58	2077.93	301.03	2078.99	302.46	2079.28	310.58	2079.54	311.71	2079.6
311.93	2079.6	312.04	2079.61	312.13	2079.61	312.2	2079.6	313.52	2079.57
320.32	2079.4	323.55	2079.3	325.15	2079.06	330.21	2078.37	336.75	2078.58
341.47	2078.65	343.47	2078.7						

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	19.34	.04	103.3	.035	144.07	.032	217.94	.035
256.98	.04								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
115	128.5	137.5	137.5	137.5	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2071.08	Element			
Vel Head (ft)	0.71	Wt. n-Val.	0.039	0.035	0.033
W.S. Elev (ft)	2070.38	Reach Len. (ft)	137.50	137.50	137.50
Crit W.S. (ft)	2070.38	Flow Area (sq ft)	51.15	24.04	212.83
E.G. Slope (ft/ft)	0.012632	Area (sq ft)	51.15	24.04	212.83
Q Total (cfs)	1853.00	Flow (cfs)	193.87	168.06	1491.07
Top Width (ft)	206.11	Top Width (ft)	62.21	13.50	130.41
Vel Total (ft/s)	6.43	Avg. Vel. (ft/s)	3.79	6.99	7.01
Max Chl Dpth (ft)	2.46	Hydr. Depth (ft)	0.82	1.78	1.63
Conv. Total (cfs)	16487.1	Conv. (cfs)	1725.0	1495.4	13266.8
Length Wtd. (ft)	137.50	Wetted Per. (ft)	62.33	13.56	130.62
Min Ch El (ft)	2068.29	Shear (lb/sq ft)	0.65	1.40	1.28
Alpha	1.10	Stream Power (lb/ft s)	2.45	9.78	9.00
Frctn Loss (ft)	1.85	Cum Volume (acre-ft)	6.69	4.06	5.43
C & E Loss (ft)	0.01	Cum SA (acres)	3.49	1.02	2.65

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	46.00	69.00	25.67	9.17	16.25	1.39	0.57	2.80
2	LOB	69.00	92.00	73.55	19.82	23.02	3.97	0.86	3.71
3	LOB	92.00	115.00	94.65	22.16	23.06	5.11	0.96	4.27
4	Chan	115.00	117.70	26.41	4.17	2.71	1.43	1.55	6.33
5	Chan	117.70	120.40	34.01	4.86	2.71	1.84	1.80	7.00
6	Chan	120.40	123.10	41.35	5.46	2.71	2.23	2.02	7.57
7	Chan	123.10	125.80	36.87	5.10	2.71	1.99	1.89	7.23
8	Chan	125.80	128.50	29.41	4.45	2.71	1.59	1.65	6.61
9	ROB	128.50	171.49	490.22	70.16	43.03	26.46	1.63	6.99
10	ROB	171.49	214.49	420.26	62.75	43.01	22.68	1.46	6.70
11	ROB	214.49	257.48	580.42	79.75	43.14	31.32	1.86	7.28
12	ROB	257.48	300.48	0.16	0.16	1.44	0.01	0.11	0.97

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Unnamed Central
REACH: North RS: 0.3322

INPUT
Description: R.S. 0.3322
Station Elevation Data num= 49

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2065.33	4.1	2065.32	12.15	2065.35	39.4	2065.31	51.51	2065.66

54.03	2065.48	54.26	2066.21	54.81	2067.58	64.82	2068.71	83.95	2070.2
85.74	2070.33	113.78	2068.61	123.4	2067.97	133.2	2065.84	133.77	2065.72
137.8	2064.91	140.13	2065.04	150.53	2065.93	150.54	2065.93	153.82	2066.21
164.2	2066.06	187.09	2065.81	195.47	2065.71	196.04	2065.58	205.99	2064.56
208.48	2064.78	214.99	2065.37	220.06	2065.43	225.39	2065.41	229.83	2065.35
238.72	2065.24	240.12	2065.13	251.76	2065.98	254.86	2066.08	262.23	2066.1
265.45	2066.1	272.89	2066.05	278.04	2066	280.28	2066.16	287.39	2066.66
299.12	2067.68	315.64	2067.94	318.47	2068.16	320.31	2068.39	327.27	2069.25
349.77	2072.04	361.42	2073.28	372.4	2073.82	381.11	2074.09		

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	54.26	.04	164.2	.035	187.09	.032	238.72	.035
254.86	.04								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
133.2	150.54	148	151.01	155	.1	.3

Left Levee Station= 85.74 Elevation= 2070.33

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2068.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.80	Wt. n-Val.	0.040	0.040	0.034
W.S. Elev (ft)	2067.33	Reach Len. (ft)	148.00	151.01	155.00
Crit W.S. (ft)	2067.33	Flow Area (sq ft)	5.09	33.66	221.56
E.G. Slope (ft/ft)	0.014389	Area (sq ft)	5.09	33.66	221.56
Q Total (cfs)	1853.00	Flow (cfs)	18.35	232.17	1602.49
Top Width (ft)	168.72	Top Width (ft)	6.85	17.34	144.53
Vel Total (ft/s)	7.12	Avg. Vel. (ft/s)	3.60	6.90	7.23
Max Chl Dpth (ft)	2.77	Hydr. Depth (ft)	0.74	1.94	1.53
Conv. Total (cfs)	15447.3	Conv. (cfs)	152.9	1935.5	13358.9
Length Wtd. (ft)	152.19	Wetted Per. (ft)	7.01	17.47	144.74
Min Ch El (ft)	2064.91	Shear (lb/sq ft)	0.65	1.73	1.38
Alpha	1.01	Stream Power (lb/ft s)	2.35	11.94	9.95
Frctn Loss (ft)	2.57	Cum Volume (acre-ft)	6.60	3.97	4.74
C & E Loss (ft)	0.04	Cum SA (acres)	3.38	0.97	2.22

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	109.47	133.20	18.35	5.09	7.01	0.99	0.74	3.60
2	Chan	133.20	136.67	41.72	6.39	3.54	2.25	1.84	6.53
3	Chan	136.67	140.14	62.59	8.10	3.49	3.38	2.34	7.72
4	Chan	140.14	143.60	54.14	7.42	3.48	2.92	2.14	7.30
5	Chan	143.60	147.07	42.21	6.39	3.48	2.28	1.84	6.61
6	Chan	147.07	150.54	31.50	5.36	3.48	1.70	1.55	5.88
7	ROB	150.54	196.65	396.31	63.58	46.15	21.39	1.38	6.23
8	ROB	196.65	242.77	882.25	97.89	46.21	47.61	2.12	9.01
9	ROB	242.77	288.88	320.88	58.42	46.17	17.32	1.27	5.49
10	ROB	288.88	335.00	3.05	1.67	6.21	0.16	0.27	1.83

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Unnamed Central
REACH: North RS: 0.3036

INPUT
Description: R.S. 0.3036
Includes Supplemental Ground Survey
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2064.76	.75	2064.76	2.21	2064.78	9.34	2064.45	40.57	2063.05
46.92	2062.42	54.56	2061.54	71.07	2061.83	88.06	2062.15	90.07	2062.13
94.52	2061.99	107.34	2061.84	116.62	2061.78	122.17	2061.81	137.1	2061.5
146.77	2060.91	149.49	2061.25	158.1	2061.82	163.38	2061.6	165.78	2061.28
167.8	2060.93	167.94	2061.61	171	2061.11	173	2060.79	173.77	2060.67
175	2060.68	181.6	2060.72	200	2060.84	214.52	2060.94	216	2061.19
254.85	2067.7	283.88	2070.73	286.76	2071.01	291.95	2070.74		

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.032	54.56	.025	149.49	.04	173.77	.058	214.52	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
171	216	147.84	147.84	147.84	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	100	2066	T

Blocked Obstructions num= 1

Sta L	Sta R	Elev
65	137.9	2071

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2064.86	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.22	Wt. n-Val.	0.032	0.056	0.040
W.S. Elev (ft)	2063.64	Reach Len. (ft)	147.84	147.84	147.84
Crit W.S. (ft)	2063.64	Flow Area (sq ft)	74.80	127.03	17.91
E.G. Slope (ft/ft)	0.020085	Area (sq ft)	118.07	127.03	17.91
Q Total (cfs)	1853.00	Flow (cfs)	789.49	956.55	106.96
Top Width (ft)	130.31	Top Width (ft)	70.69	45.00	14.62
Vel Total (ft/s)	8.43	Avg. Vel. (ft/s)	10.56	7.53	5.97
Max Chl Dpth (ft)	2.97	Hydr. Depth (ft)	2.26	2.82	1.22
Conv. Total (cfs)	13074.9	Conv. (cfs)	5570.7	6749.5	754.7
Length Wtd. (ft)	147.84	Wetted Per. (ft)	36.00	45.06	14.82
Min Ch El (ft)	2060.67	Shear (lb/sq ft)	2.61	3.54	1.51
Alpha	1.11	Stream Power (lb/ft s)	27.50	26.62	9.05
Frctn Loss (ft)	3.05	Cum Volume (acre-ft)	6.39	3.69	4.32
C & E Loss (ft)	0.13	Cum SA (acres)	3.25	0.86	1.94

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	0.00	33.33	0.00	0.79	5.93	0.00	0.13	0.00
2	LOB	33.33	66.67	0.00	42.49	33.67	0.00	1.34	0.00
3	LOB	66.67	100.00						
4	LOB	100.00	135.50						

5	LOB	135.50	171.00	789.49	74.80	36.00	42.61	2.26	10.56
6	Chan	171.00	180.00	215.20	25.99	9.03	11.61	2.89	8.28
7	Chan	180.00	189.00	192.75	26.11	9.00	10.40	2.90	7.38
8	Chan	189.00	198.00	186.28	25.58	9.00	10.05	2.84	7.28
9	Chan	198.00	207.00	179.82	25.04	9.00	9.70	2.78	7.18
10	Chan	207.00	216.00	182.50	24.31	9.02	9.85	2.70	7.51
11	ROB	216.00	231.19	106.96	17.91	14.82	5.77	1.22	5.97

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Unnamed Central
REACH: North RS: 0.2756

INPUT
Description: R.S. 0.2756
Includes Supplemental Ground Survey
508 cfs added
back into north branch from diversion at Los Reales
Station Elevation Data num= 51

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2061.97	.72	2061.96	4.5	2061.45	19.83	2059.44	26.1	2059.68
33.64	2059.88	40.05	2059.77	48.85	2059.55	59.82	2059.37	67.21	2059.38
70.34	2059.32	74.83	2059.24	76.22	2059.21	80.86	2059.15	82.96	2059.11
84.58	2059.08	89.31	2059.02	90.51	2059	95.46	2058.94	96.99	2058.92
101.56	2058.86	104.32	2058.81	109.48	2058.72	112.86	2058.67	119.92	2058.54
125.91	2058.49	133.21	2058.43	138.04	2058.83	144.64	2058.91	148.77	2058.89
157.08	2058.4	166.44	2058.2	169.71	2057.95	172.72	2057.82	173.8	2057.78
176.76	2058.06	179	2057.58	180.74	2057.2	195	2056.08	198	2055.84
200	2055.69	204.3	2055.35	209.06	2054.97	210	2055.5	213.94	2057.7
215.04	2058.38	237.32	2058.09	245.16	2057.91	246.94	2058.18	250.47	2058.65
272.27	2062.33								

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	4.5	.032	59.82	.04	101.56	.058	138.04	.032
157.08	.058								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
200	210	125	119.86	117	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	67.33	2062	F

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2060.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.79	Wt. n-Val.	0.053	0.058	0.058
W.S. Elev (ft)	2059.97	Reach Len. (ft)	125.00	119.86	117.00
Crit W.S. (ft)	2059.97	Flow Area (sq ft)	215.61	46.47	83.52
E.G. Slope (ft/ft)	0.021123	Area (sq ft)	234.34	46.47	83.52
Q Total (cfs)	2271.00	Flow (cfs)	1352.05	476.50	442.45
Top Width (ft)	242.49	Top Width (ft)	184.20	10.00	48.28
Vel Total (ft/s)	6.57	Avg. Vel. (ft/s)	6.27	10.25	5.30
Max Chl Dpth (ft)	5.00	Hydr. Depth (ft)	1.63	4.65	1.73
Conv. Total (cfs)	15625.7	Conv. (cfs)	9302.9	3278.6	3044.3
Length Wtd. (ft)	120.38	Wetted Per. (ft)	132.89	10.17	49.21
Min Ch El (ft)	2054.97	Shear (lb/sq ft)	2.14	6.03	2.24
Alpha	1.18	Stream Power (lb/ft s)	13.42	61.80	11.86
Frctn Loss (ft)	2.78	Cum Volume (acre-ft)	5.79	3.40	4.15
C & E Loss (ft)	0.00	Cum SA (acres)	2.81	0.77	1.83

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	0.00	33.67	0.00	5.06	17.91	0.00	0.28	0.00
2	LOB	33.67	67.33	0.00	13.68	33.67	0.00	0.41	0.00
3	LOB	67.33	111.55	196.61	41.75	44.23	8.66	0.94	4.71
4	LOB	111.55	155.78	330.13	58.17	44.25	14.54	1.32	5.67
5	LOB	155.78	200.00	825.32	115.69	44.41	36.34	2.62	7.13
6	Chan	200.00	202.00	86.34	8.72	2.01	3.80	4.36	9.91
7	Chan	202.00	204.00	91.63	9.03	2.01	4.03	4.52	10.14
8	Chan	204.00	206.00	97.05	9.35	2.01	4.27	4.67	10.38
9	Chan	206.00	208.00	102.64	9.67	2.01	4.52	4.83	10.62
10	Chan	208.00	210.00	98.84	9.70	2.14	4.35	4.85	10.19
11	ROB	210.00	222.45	160.74	27.53	13.22	7.08	2.21	5.84
12	ROB	222.45	234.91	115.06	22.00	12.46	5.07	1.77	5.23
13	ROB	234.91	247.36	133.75	24.10	12.48	5.89	1.93	5.55
14	ROB	247.36	259.82	32.89	9.89	11.06	1.45	0.91	3.32

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Unnamed Central
REACH: North RS: 0.2529

INPUT
Description: R.S. 0.2529
Station Elevation Data num= 62

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2057.4	5.12	2057.63	8.28	2057.39	12.79	2058.17	12.91	2058.18
19.32	2057.87	21.76	2057.8	24.25	2057.71	25.43	2057.64	26.73	2057.66
40.72	2056.49	47.03	2055.94	48.41	2056.01	54.71	2055.29	57.4	2054.72
59.98	2054.87	75.47	2056.38	75.95	2056.39	76.73	2056.4	82.98	2056.26
87.6	2055.86	95	2054.91	98.15	2054.5	100.4	2054.11	106.56	2054.54
111.93	2054.93	112	2054.93	117.01	2055.15	117.02	2055.15	126.52	2055.57
130.11	2055.33	132.71	2055.42	142.97	2054.96	147.64	2054.7	154.56	2054.31
157.63	2053.88	157.89	2053.82	158.85	2053.8	186.08	2053.54	189.3	2053.89
196.15	2054.47	205.43	2055.05	221.44	2056.28	225.31	2056.11	231.93	2055.41
237.32	2055.46	238.93	2056.07	242.86	2056.91	249.1	2058.68	251.41	2059.32
251.76	2060.15	259.31	2060.72	262.59	2061.08	270.13	2061.64	273.49	2061.62
278.86	2061.47	279.42	2061.48	288.55	2061.08	294.09	2061.04	306.53	2060.82
316.45	2060.75	326.19	2060.71						

Manning's n Values num= 7

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	5.12	.032	59.98	.04	100.4	.058	132.71	.032
158.85	.058	249.1	.025						

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
95	112	177	181.63	186	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2057.44	Element			
Vel Head (ft)	0.78	Wt. n-Val.	0.036	0.051	0.049
W.S. Elev (ft)	2056.66	Reach Len. (ft)	177.00	181.63	186.00
Crit W.S. (ft)	2056.66	Flow Area (sq ft)	49.97	36.23	235.60
E.G. Slope (ft/ft)	0.025413	Area (sq ft)	49.97	36.23	235.60
Q Total (cfs)	2271.00	Flow (cfs)	299.62	278.61	1692.78
Top Width (ft)	202.94	Top Width (ft)	56.27	17.00	129.67
Vel Total (ft/s)	7.06	Avg. Vel. (ft/s)	6.00	7.69	7.19
Max Chl Dpth (ft)	3.12	Hydr. Depth (ft)	0.89	2.13	1.82
Conv. Total (cfs)	14246.0	Conv. (cfs)	1879.5	1747.7	10618.8
Length Wtd. (ft)	182.40	Wetted Per. (ft)	56.56	17.09	130.09
Min Ch El (ft)	2054.11	Shear (lb/sq ft)	1.40	3.36	2.87
Alpha	1.01	Stream Power (lb/ft s)	8.40	25.87	20.64
Frctn Loss (ft)	2.32	Cum Volume (acre-ft)	5.38	3.28	3.72
C & E Loss (ft)	0.02	Cum SA (acres)	2.47	0.73	1.59

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	38.00	57.00	81.63	13.91	18.39	3.59	0.76	5.87
2	LOB	57.00	76.00	150.58	21.67	19.09	6.63	1.14	6.95
3	LOB	76.00	95.00	67.41	14.39	19.08	2.97	0.76	4.69
4	Chan	95.00	98.40	61.50	6.69	3.43	2.71	1.97	9.19
5	Chan	98.40	101.80	75.31	8.24	3.43	3.32	2.42	9.14
6	Chan	101.80	105.20	56.44	7.92	3.41	2.49	2.33	7.13
7	Chan	105.20	108.60	47.12	7.11	3.41	2.07	2.09	6.63
8	Chan	108.60	112.00	38.24	6.27	3.41	1.68	1.84	6.10
9	ROB	112.00	154.84	521.89	67.20	42.89	22.98	1.57	7.77
10	ROB	154.84	197.68	985.04	121.67	42.92	43.37	2.84	8.10
11	ROB	197.68	240.51	185.71	46.59	43.09	8.18	1.09	3.99
12	ROB	240.51	283.35	0.13	0.14	1.18	0.01	0.12	0.93

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Unnamed Central
REACH: North RS: 0.2185

INPUT
Description: R.S. 0.2185
Station Elevation Data num= 54

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2056.17	9.75	2056.08	20.23	2056.04	22.15	2056.03	22.22	2056.03
23.14	2055.82	25.8	2054.29	31.67	2054.11	34.59	2054.07	41.32	2053.87
46.59	2053.37	55.22	2053.46	71.36	2054.32	88.28	2054.93	116.17	2052.61
121.63	2052.12	127.58	2052.05	132.96	2052.02	136.61	2051.78	147.17	2051.15
151.12	2051.39	160.16	2051.85	169.32	2051.62	181.68	2051.28	184.92	2050.61
187	2049.97	188.45	2049.52	199.07	2049.34	199.08	2049.34	200.45	2049.32
203.13	2049.27	206.1	2049.65	207	2049.81	215.71	2051.33	223.44	2051.53
226.37	2051.46	238.52	2052.34	241.45	2052.29	260.9	2052.82	261.52	2052.88
261.87	2052.88	275.02	2053.87	284.73	2054.84	292.7	2055.67	309.09	2058.93
310.51	2059.46	311.12	2059.68	319.73	2060.29	321.84	2060.42	326.28	2060.69
328.94	2060.81	336.16	2061.1	336.78	2061.14	340.3	2061.28		

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	71.36	.04	184.92	.032	206.1	.058	309.09	.025

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
187	207	295.68	295.68	295.68	.1	.3

Left Levee Station= 88.28 Elevation= 2054.93

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2054.91	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.97	Wt. n-Val.	0.039	0.033	0.058
W.S. Elev (ft)	2053.93	Reach Len. (ft)	295.68	295.68	295.68
Crit W.S. (ft)	2053.93	Flow Area (sq ft)	173.25	89.74	120.40
E.G. Slope (ft/ft)	0.007634	Area (sq ft)	173.25	89.74	120.40
Q Total (cfs)	2271.00	Flow (cfs)	910.63	969.25	391.12
Top Width (ft)	175.38	Top Width (ft)	86.73	20.00	68.65
Vel Total (ft/s)	5.92	Avg. Vel. (ft/s)	5.26	10.80	3.25
Max Chl Dpth (ft)	4.66	Hydr. Depth (ft)	2.00	4.49	1.75
Conv. Total (cfs)	25991.6	Conv. (cfs)	10422.2	11093.1	4476.4
Length Wtd. (ft)	295.68	Wetted Per. (ft)	87.03	20.11	68.86
Min Ch El (ft)	2049.27	Shear (lb/sq ft)	0.95	2.13	0.83
Alpha	1.79	Stream Power (lb/ft s)	4.99	22.97	2.71
Frctn Loss (ft)	2.38	Cum Volume (acre-ft)	4.93	3.02	2.96
C & E Loss (ft)	0.02	Cum SA (acres)	2.18	0.65	1.17

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	88.28	121.19	51.27	18.28	20.99	2.26	0.87	2.80
2	LOB	121.19	154.09	384.50	73.33	32.95	16.93	2.23	5.24
3	LOB	154.09	187.00	474.86	81.64	33.09	20.91	2.48	5.82
4	Chan	187.00	191.00	185.56	17.38	4.07	8.17	4.34	10.68
5	Chan	191.00	195.00	198.20	17.96	4.00	8.73	4.49	11.04
6	Chan	195.00	199.00	203.21	18.23	4.00	8.95	4.56	11.15
7	Chan	199.00	203.00	208.17	18.50	4.00	9.17	4.62	11.26
8	Chan	203.00	207.00	174.12	17.67	4.04	7.67	4.42	9.85
9	ROB	207.00	233.66	276.33	71.88	26.81	12.17	2.70	3.84
10	ROB	233.66	260.32	102.14	39.48	26.68	4.50	1.48	2.59
11	ROB	260.32	286.98	12.65	9.04	15.37	0.56	0.59	1.40

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Unnamed Central
REACH: North RS: 0.1625

INPUT
Description: R.S. 0.1625
Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2049.76	5.31	2049.77	10.12	2049.79	10.84	2049.8	22.63	2049.85
24.2	2049.78	27.16	2049.62	43.53	2048.6	62.18	2047.59	75.95	2046.55
77.02	2046.51	79.01	2046.43	84.3	2045.42	89.18	2044.25	103.17	2046.05
105.15	2046.19	107.72	2046.38	122.05	2046.23	130.58	2046.29	144.48	2044.29
145.09	2044.2	145.36	2044.24	145.76	2044.17	147.5	2044.03	151.61	2043.71
162.63	2043.54	162.64	2043.54	168.42	2043.46	169.3	2043.43	169.5	2043.46
170.56	2043.71	171.7	2044	180.65	2046.24	181.68	2046.28	191.58	2049.13
215.25	2055.87	222.48	2055.91	235.56	2055.22	245.93	2054.9	260.29	2054.84
265.45	2054.99	270.01	2054.89						

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.04	130.58	.032	170.56	.058	215.25	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
147.5	171.7	137.99	137.99	137.99	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2049.17	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.17	Wt. n-Val.	0.037	0.033	0.058
W.S. Elev (ft)	2048.00	Reach Len. (ft)	137.99	137.99	137.99
Crit W.S. (ft)	2048.00	Flow Area (sq ft)	182.02	105.62	32.74
E.G. Slope (ft/ft)	0.008509	Area (sq ft)	182.02	105.62	32.74
Q Total (cfs)	2360.00	Flow (cfs)	1085.22	1152.51	122.27
Top Width (ft)	133.09	Top Width (ft)	92.93	24.20	15.96
Vel Total (ft/s)	7.37	Avg. Vel. (ft/s)	5.96	10.91	3.73
Max Chl Dpth (ft)	4.57	Hydr. Depth (ft)	1.96	4.36	2.05
Conv. Total (cfs)	25583.7	Conv. (cfs)	11764.3	12493.9	1325.5
Length Wtd. (ft)	137.99	Wetted Per. (ft)	93.51	24.28	16.48
Min Ch El (ft)	2043.43	Shear (lb/sq ft)	1.03	2.31	1.06
Alpha	1.39	Stream Power (lb/ft s)	6.17	25.21	3.94
Frctn Loss (ft)	1.41	Cum Volume (acre-ft)	3.72	2.36	2.44
C & E Loss (ft)	0.01	Cum SA (acres)	1.57	0.50	0.88

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Manning's n values were composited to a single value in the main channel.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	29.50	59.00	0.43	0.53	4.44	0.02	0.12	0.80
2	LOB	59.00	88.50	177.76	42.45	29.76	7.53	1.44	4.19
3	LOB	88.50	118.00	388.69	67.77	29.65	16.47	2.30	5.74
4	LOB	118.00	147.50	518.33	71.27	29.66	21.96	2.42	7.27
5	Chan	147.50	152.34	216.66	20.12	4.85	9.18	4.16	10.77
6	Chan	152.34	157.18	233.23	21.01	4.84	9.88	4.34	11.10

7	Chan	157.18	162.02	239.95	21.37	4.84	10.17	4.42	11.23
8	Chan	162.02	166.86	246.47	21.72	4.84	10.44	4.49	11.35
9	Chan	166.86	171.70	216.20	21.40	4.91	9.16	4.42	10.10
10	ROB	171.70	191.36	122.27	32.74	16.48	5.18	2.05	3.73

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION

RIVER: Unnamed Central
REACH: North RS: 0.1364

INPUT
Description: R.S. 0.1364
Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2046.04	3.32	2045.97	10.17	2045.96	28.88	2045.66	29.33	2045.65
30.3	2045.57	47.21	2045.47	59.08	2044.99	65.01	2044.69	68.08	2044.16
69.35	2043.78	77.59	2041.29	95.87	2041.6	98.31	2041.67	98.61	2041.74
100.15	2041.95	113.54	2043.57	120.81	2043.92	132.21	2044.29	134.62	2044.11
137.5	2043.78	145.82	2042.65	150.58	2043.02	156.78	2043.47	159.33	2042.57
162	2041.72	162.3	2041.62	163.48	2041.24	175.45	2041.33	178.29	2041.39
178.31	2041.39	179.73	2041.42	182	2041.96	183.45	2042.31	195.46	2046.93
212.58	2054.22	213.59	2054.31	216.12	2054.35	244.73	2054.71	256.43	2054.72
269.94	2054.55	288.7	2054.78	298.09	2054.7				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.032	47.21	.04	150.58	.032	179.73	.058	244.73	.025

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
162	182	158	159.98	164	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2046.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.15	Wt. n-Val.	0.039	0.035	0.058
W.S. Elev (ft)	2045.08	Reach Len. (ft)	158.00	159.98	164.00
Crit W.S. (ft)	2045.08	Flow Area (sq ft)	214.77	74.32	14.25
E.G. Slope (ft/ft)	0.012564	Area (sq ft)	214.77	74.32	14.25
Q Total (cfs)	2360.00	Flow (cfs)	1471.84	833.42	54.73
Top Width (ft)	133.81	Top Width (ft)	105.16	20.00	8.65
Vel Total (ft/s)	7.78	Avg. Vel. (ft/s)	6.85	11.21	3.84
Max Chl Dpth (ft)	3.84	Hydr. Depth (ft)	2.04	3.72	1.65
Conv. Total (cfs)	21054.6	Conv. (cfs)	13131.0	7435.3	488.3
Length Wtd. (ft)	158.63	Wetted Per. (ft)	106.20	20.14	9.21
Min Ch El (ft)	2041.24	Shear (lb/sq ft)	1.59	2.89	1.21
Alpha	1.22	Stream Power (lb/ft s)	10.87	32.46	4.66
Frctn Loss (ft)	1.21	Cum Volume (acre-ft)	3.09	2.07	2.36
C & E Loss (ft)	0.20	Cum SA (acres)	1.26	0.43	0.84

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is

not a valid subcritical answer. The program defaulted to critical depth.
Note: Manning's n values were composited to a single value in the main channel.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	32.40	64.80	1.80	1.45	7.97	0.08	0.18	1.24
2	LOB	64.80	97.20	753.08	95.54	32.87	31.91	2.95	7.88
3	LOB	97.20	129.60	344.67	59.53	32.53	14.60	1.84	5.79
4	LOB	129.60	162.00	372.30	58.25	32.82	15.78	1.80	6.39
5	Chan	162.00	166.00	175.01	14.99	4.08	7.42	3.75	11.68
6	Chan	166.00	170.00	182.00	15.23	4.00	7.71	3.81	11.95
7	Chan	170.00	174.00	179.60	15.11	4.00	7.61	3.78	11.89
8	Chan	174.00	178.00	176.34	14.94	4.00	7.47	3.74	11.80
9	Chan	178.00	182.00	120.48	14.06	4.06	5.10	3.52	8.57
10	ROB	182.00	205.22	54.73	14.25	9.21	2.32	1.65	3.84

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION

RIVER: Unnamed Central
REACH: North RS: 0.1061

INPUT
Description: R.S. 0.1061
Station Elevation Data num= 58

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2044.27	9.32	2044.52	17.55	2044.25	25.77	2044.17	37.58	2042.22
38.24	2042.05	41.79	2041.44	47.31	2041.46	49.78	2040.84	56.64	2040.03
59.58	2039.92	60.91	2040.01	66.78	2039.1	71.98	2038.86	74.39	2038.55
76.61	2038.45	80.63	2038.3	86.4	2037.94	88.98	2037.98	89.08	2037.92
89.28	2037.89	101.09	2038.08	111.87	2038.17	112.89	2038.16	115.46	2038.39
127.04	2038.55	128.53	2038.52	134.42	2038.37	156.01	2038.19	161.92	2038.31
170.93	2038.61	171	2038.61	181.06	2038.34	181.07	2038.34	187.22	2038.18
192.99	2038.07	193	2038.07	194	2038.48	195	2038.88	196.96	2039.67
209.27	2043.62	220.18	2047.6	235.43	2047.51	252.48	2047.44	253.8	2047.46
263.03	2047.09	264.66	2046.93	266.3	2047.08	278.5	2050.2	279.13	2050.35
286.46	2050.53	287.9	2050.71	293.8	2050.63	301.82	2050.53	305.97	2050.97
308.34	2051.04	314.42	2051.1	325.36	2051.14				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.04	156.01	.032	187.22	.058	209.27	.04	278.5	.025

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
171	194	100	102.6	106	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2041.90	Element			
Vel Head (ft)	0.48	Wt. n-Val.	0.039	0.037	0.058
W.S. Elev (ft)	2041.42	Reach Len. (ft)	100.00	102.60	106.00
Crit W.S. (ft)		Flow Area (sq ft)	348.34	71.27	11.71
E.G. Slope (ft/ft)	0.005095	Area (sq ft)	348.34	71.27	11.71
Q Total (cfs)	2360.00	Flow (cfs)	1905.28	429.03	25.69
Top Width (ft)	154.94	Top Width (ft)	123.53	23.00	8.41

Vel Total (ft/s)	5.47	Avg. Vel. (ft/s)	5.47	6.02	2.19
Max Chl Dpth (ft)	3.53	Hydr. Depth (ft)	2.82	3.10	1.39
Conv. Total (cfs)	33061.5	Conv. (cfs)	26691.2	6010.4	359.9
Length Wtd. (ft)	101.26	Wetted Per. (ft)	123.81	23.09	8.92
Min Ch El (ft)	2038.07	Shear (lb/sq ft)	0.90	0.98	0.42
Alpha	1.03	Stream Power (lb/ft s)	4.90	5.91	0.92
Frctn Loss (ft)	0.66	Cum Volume (acre-ft)	2.07	1.80	2.31
C & E Loss (ft)	0.08	Cum SA (acres)	0.84	0.35	0.81

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	34.20	68.40	88.76	28.37	21.13	3.76	1.36	3.13
2	LOB	68.40	102.60	603.67	108.74	34.26	25.58	3.18	5.55
3	LOB	102.60	136.80	571.24	105.14	34.21	24.21	3.07	5.43
4	LOB	136.80	171.00	641.61	106.10	34.21	27.19	3.10	6.05
5	Chan	171.00	175.60	88.36	13.21	4.60	3.74	2.87	6.69
6	Chan	175.60	180.20	94.78	13.78	4.60	4.02	2.99	6.88
7	Chan	180.20	184.80	101.31	14.34	4.60	4.29	3.12	7.07
8	Chan	184.80	189.40	84.48	14.87	4.60	3.58	3.23	5.68
9	Chan	189.40	194.00	60.11	15.08	4.68	2.55	3.28	3.99
10	ROB	194.00	220.27	25.69	11.71	8.92	1.09	1.39	2.19

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Unnamed Central
REACH: North RS: 0.0866

INPUT
Description: R.S. 0.0866
Station Elevation Data num= 49

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2042.5	.67	2042.52	9.14	2043.01	10.3	2043.05	19.79	2042.83
22.35	2042.79	24.88	2042.75	28.3	2042.75	39.44	2042.77	49.59	2042.74
49.68	2042.73	61.66	2041.41	64.65	2041.17	77.22	2040.03	91.9	2037.36
95.81	2036.65	108.67	2036.84	109.06	2036.85	113.92	2036.92	121.63	2037.03
122.73	2037.04	127.2	2036.94	141.78	2036.63	141.79	2036.63	145.73	2036.54
146.81	2036.53	152.5	2036.96	159.51	2037.49	159.87	2037.51	160.49	2037.51
180.37	2037.5	197.56	2041.27	211.24	2044.42	215.15	2044.34	221.3	2044.37
223.5	2044.08	230.84	2043.16	243.65	2043.69	243.78	2043.7	243.9	2043.7
250.15	2044.12	260.75	2043.52	273.02	2044.7	274.86	2044.9	285.29	2045.5
296.61	2046.09	298.9	2046.18	302.39	2046.35	324.17	2047.24		

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	64.65	.04	95.81	.028	160.49	.058	211.24	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
127.2	152.5	107.32	107.32	107.32	.1	.3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
0	79.5	2041.22

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2041.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.29	Wt. n-Val.	0.029	0.028	0.044
W.S. Elev (ft)	2039.86	Reach Len. (ft)	107.32	107.32	107.32
Crit W.S. (ft)	2039.86	Flow Area (sq ft)	121.92	79.02	80.19
E.G. Slope (ft/ft)	0.008781	Area (sq ft)	121.92	79.02	80.19
Q Total (cfs)	2360.00	Flow (cfs)	1105.44	839.10	415.46

Top Width (ft)	111.62	Top Width (ft)	47.70	25.30	38.62
Vel Total (ft/s)	8.39	Avg. Vel. (ft/s)	9.07	10.62	5.18
Max Chl Dpth (ft)	3.33	Hydr. Depth (ft)	2.56	3.12	2.08
Conv. Total (cfs)	25185.4	Conv. (cfs)	11797.0	8954.7	4433.7
Length Wtd. (ft)	107.32	Wetted Per. (ft)	48.21	25.32	38.89
Min Ch El (ft)	2036.53	Shear (lb/sq ft)	1.39	1.71	1.13
Alpha	1.18	Stream Power (lb/ft s)	12.57	18.17	5.86
Frctn Loss (ft)	0.98	Cum Volume (acre-ft)	1.53	1.63	2.20
C & E Loss (ft)	0.02	Cum SA (acres)	0.64	0.30	0.75

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	76.32	101.76	339.56	46.96	22.77	14.39	2.11	7.23
2	LOB	101.76	127.20	765.87	74.97	25.44	32.45	2.95	10.22
3	Chan	127.20	132.26	154.38	15.03	5.06	6.54	2.97	10.27
4	Chan	132.26	137.32	163.81	15.58	5.06	6.94	3.08	10.52
5	Chan	137.32	142.38	173.46	16.12	5.06	7.35	3.19	10.76
6	Chan	142.38	147.44	183.05	16.65	5.06	7.76	3.29	10.99
7	Chan	147.44	152.50	164.39	15.63	5.07	6.97	3.09	10.52
8	ROB	152.50	186.83	412.68	78.18	34.51	17.49	2.28	5.28
9	ROB	186.83	221.17	2.79	2.01	4.39	0.12	0.47	1.39

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Unnamed Central
REACH: North RS: 0.0663

INPUT
Description: R.S. 0.0663
Station Elevation Data num= 57

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2042.59	5.46	2042.66	9.34	2042.52	21.98	2042.56	28.4	2042.54
31.43	2042.56	50.3	2042.53	52.63	2042.5	60.46	2042.39	68.6	2039.42
72.15	2038.98	76.06	2037.3	79.71	2037.07	87.09	2036.45	93.49	2035.33
95	2035.05	97.95	2034.51	104.11	2034.48	109.42	2034.68	112.66	2034.8
112.67	2034.8	119	2035.04	119.44	2035.06	125.82	2035.07	134.24	2035.07
143.13	2035.23	147.84	2035.61	154.66	2035.96	179.92	2035.78	180.01	2035.77
180.02	2035.77	180.11	2035.8	185.98	2037.55	186.48	2037.57	199.89	2037.55
206.39	2038.68	220.95	2041.12	231.46	2040.91	233.98	2040.81	238.84	2040.22
245.88	2039.1	251.96	2040.05	260.53	2041.24	262.2	2041.52	264.04	2041.79
273.09	2042	279.5	2042.23	281.06	2042.63	290.46	2044.55	293.12	2044.71
293.83	2044.76	308.71	2045.56	313.27	2045.8	314.14	2045.83	314.63	2045.83
315.16	2045.84	332.53	2045.67						

Manning's n Values num= 8

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	97.95	.04	112.66	.028	154.66	.04	186.48	.028
220.95	.058	233.98	.04	308.71	.025				

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

```
          95     119              146  144.46     142             .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0      87 2039.33
```

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2039.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.21	Wt. n-Val.	0.025	0.034	0.031
W.S. Elev (ft)	2038.13	Reach Len. (ft)	146.00	144.46	142.00
Crit W.S. (ft)	2038.13	Flow Area (sq ft)	18.93	82.47	176.94
E.G. Slope (ft/ft)	0.009473	Area (sq ft)	18.93	82.47	176.94
Q Total (cfs)	2443.00	Flow (cfs)	169.90	794.78	1478.32
Top Width (ft)	116.23	Top Width (ft)	8.00	24.00	84.23
Vel Total (ft/s)	8.78	Avg. Vel. (ft/s)	8.98	9.64	8.35
Max Chl Dpth (ft)	3.65	Hydr. Depth (ft)	2.37	3.44	2.10
Conv. Total (cfs)	25099.8	Conv. (cfs)	1745.6	8165.7	15188.5
Length Wtd. (ft)	143.70	Wetted Per. (ft)	9.80	24.06	84.57
Min Ch El (ft)	2034.48	Shear (lb/sq ft)	1.14	2.03	1.24
Alpha	1.01	Stream Power (lb/ft s)	10.26	19.54	10.34
Frctn Loss (ft)	0.27	Cum Volume (acre-ft)	1.36	1.43	1.89
C & E Loss (ft)	0.28	Cum SA (acres)	0.58	0.23	0.60

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	76.00	95.00	169.90	18.93	9.80	6.95	2.37	8.98
2	Chan	95.00	99.80	183.80	16.59	4.85	7.52	3.46	11.08
3	Chan	99.80	104.60	149.45	17.47	4.80	6.12	3.64	8.55
4	Chan	104.60	109.40	142.71	17.00	4.80	5.84	3.54	8.39
5	Chan	109.40	114.20	148.33	16.14	4.80	6.07	3.36	9.19
6	Chan	114.20	119.00	170.50	15.27	4.80	6.98	3.18	11.16
7	ROB	119.00	161.71	1154.42	117.41	42.73	47.25	2.75	9.83
8	ROB	161.71	204.41	323.89	59.52	41.83	13.26	1.43	5.44

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Unnamed Central
REACH: North RS: 0.0390

INPUT
Description: R.S. 0.0390
Station Elevation Data num= 68

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2042.65	2.74	2042.73	2.76	2042.81	2.84	2043.13	5.47	2043.14
12.1	2043.2	12.2	2042.8	24.93	2042.25	30.58	2042	36.78	2041.26
47.29	2040.1	64.72	2040.12	77.7	2040.05	94.37	2040.05	94.87	2040.05

95.76	2040.05	110.62	2039.76	113.38	2039.63	116.35	2039.47	120.18	2039.21
137.13	2038.37	149.65	2037.66	152.89	2037.45	171.14	2036.73	171.98	2036.84
172.08	2036.84	191.87	2035.53	207.92	2033.9	216.54	2033.26	218.35	2033.53
223.7	2032.6	225.42	2032.3	228.41	2031.98	251.67	2031.77	257.76	2031.71
257.79	2031.71	257.99	2031.71	273.64	2031.84	275.2	2031.85	277.1	2032.26
278.32	2032.53	289.83	2034.2	294	2034.43	304.37	2034.99	325.07	2035.93
337.53	2037.26	351.95	2038.85	360.55	2039.22	366.83	2039.67	374.71	2040.88
375.31	2040.96	375.72	2041.01	376.39	2040.82	387.46	2038.42	392.67	2038
406.65	2037.88	409.37	2037.93	413.5	2038.11	426.75	2038.34	429.48	2038.25
434.73	2038.64	442.9	2039.6	463.95	2042.41	468.16	2043.02	482.13	2044.53
490.18	2045.52	498.86	2046.08	499.34	2046.09				

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	30.58	.032	94.37	.04	218.35	.028	273.64	.04
426.75	.032								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
223.7	277.1	122	128.83	133	.1	.3

Right Levee Station= 375.72 Elevation= 2041.01

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2038.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.27	Wt. n-Val.	0.037	0.029	0.040
W.S. Elev (ft)	2038.14	Reach Len. (ft)	122.00	128.83	133.00
Crit W.S. (ft)	2035.64	Flow Area (sq ft)	193.31	335.06	191.93
E.G. Slope (ft/ft)	0.000772	Area (sq ft)	193.31	335.06	191.93
Q Total (cfs)	2443.00	Flow (cfs)	402.55	1647.61	392.84
Top Width (ft)	204.40	Top Width (ft)	82.57	53.40	68.44
Vel Total (ft/s)	3.39	Avg. Vel. (ft/s)	2.08	4.92	2.05
Max Chl Dpth (ft)	6.43	Hydr. Depth (ft)	2.34	6.27	2.80
Conv. Total (cfs)	87906.2	Conv. (cfs)	14484.8	59285.8	14135.6
Length Wtd. (ft)	128.38	Wetted Per. (ft)	82.86	53.49	68.75
Min Ch El (ft)	2031.71	Shear (lb/sq ft)	0.11	0.30	0.13
Alpha	1.54	Stream Power (lb/ft s)	0.23	1.49	0.28
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	1.00	0.74	1.28
C & E Loss (ft)	0.06	Cum SA (acres)	0.42	0.11	0.35

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	134.22	178.96	30.46	34.98	37.88	1.25	0.92	0.87
2	LOB	178.96	223.70	372.09	158.33	44.97	15.23	3.54	2.35
3	Chan	223.70	234.38	316.13	64.69	10.72	12.94	6.06	4.89
4	Chan	234.38	245.06	335.27	66.91	10.68	13.72	6.27	5.01
5	Chan	245.06	255.74	343.98	67.95	10.68	14.08	6.36	5.06
6	Chan	255.74	266.42	347.71	68.39	10.68	14.23	6.40	5.08
7	Chan	266.42	277.10	304.52	67.12	10.72	12.47	6.28	4.54
8	ROB	277.10	326.41	373.49	171.97	49.51	15.29	3.49	2.17
9	ROB	326.41	375.72	19.36	19.95	19.24	0.79	1.04	0.97

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Unnamed Central
REACH: North RS: 0.0146

INPUT
Description: R.S. 0.0146 - Farthest Downstream
Imm. upstream of Cave Creek Road
Station Elevation Data num= 75

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-145	2040	0	2038.28	.68	2038.28	5.49	2038.28	24.44	2037.99
27.9	2037.6	29.25	2037.61	32.86	2036.27	41.16	2036.16	50.74	2035.49
55.45	2035.35	61.27	2035.57	69.12	2036.12	74.78	2036.25	81.59	2036.06
99.55	2036.59	110.59	2036.43	114.63	2036.54	122.43	2036.38	136.98	2036.43
141.03	2036.45	162.04	2036.72	165.01	2036.58	182.04	2036.15	185.87	2035.91
207.25	2033.77	211.22	2033.02	216.01	2032.17	222.11	2030.27	222.64	2030.26
223.97	2030.18	228.5	2029.92	233.15	2029.65	240.9	2029.2	245.73	2029
247	2029.88	247.8	2030.43	248.5	2030.91	251.98	2033.31	256.92	2035.8
257.56	2035.82	261.14	2035.88	266.16	2035.7	275.13	2035.2	298.58	2033.81
299.9	2033.69	300.64	2033.64	301.29	2033.52	305.07	2032.48	311.86	2032.41
322.67	2032.25	324.16	2032.44	326.93	2032.91	332.28	2033.81	333.9	2033.82
353.31	2033.87	353.54	2033.87	356.5	2033.9	383.94	2034.15	386.48	2034.21
387.18	2034.25	387.79	2034.3	387.98	2034.31	388.41	2034.39	388.66	2034.45
388.92	2034.53	389.42	2034.62	390.42	2034.81	426.17	2041.39	426.8	2041.47
427.45	2041.53	428.02	2041.58	428.43	2041.62	429.12	2041.7	430.41	2041.78

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-145	.032	99.55	.025	162.04	.032	275.13	.04	390.42	.028

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
228.5	247	0	0	0	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2038.30	Element			
Vel Head (ft)	0.07	Wt. n-Val.	0.031	0.032	0.038
W.S. Elev (ft)	2038.23	Reach Len. (ft)			
Crit W.S. (ft)	2035.33	Flow Area (sq ft)	523.09	162.77	649.63
E.G. Slope (ft/ft)	0.000284	Area (sq ft)	523.09	162.77	649.63
Q Total (cfs)	2462.00	Flow (cfs)	828.85	537.07	1096.08
Top Width (ft)	400.24	Top Width (ft)	219.74	18.50	162.00
Vel Total (ft/s)	1.84	Avg. Vel. (ft/s)	1.58	3.30	1.69
Max Chl Dpth (ft)	9.23	Hydr. Depth (ft)	2.38	8.80	4.01
Conv. Total (cfs)	146088.2	Conv. (cfs)	49181.6	31868.2	65038.5
Length Wtd. (ft)		Wetted Per. (ft)	220.64	18.80	164.38
Min Ch El (ft)	2029.00	Shear (lb/sq ft)	0.04	0.15	0.07
Alpha	1.32	Stream Power (lb/ft s)	0.07	0.51	0.12
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	4.40	79.10	128.28	117.12	70.66	5.21	1.67	1.10
2	LOB	79.10	153.80	186.91	134.86	74.71	7.59	1.81	1.39
3	LOB	153.80	228.50	513.66	271.11	75.27	20.86	3.63	1.89
4	Chan	228.50	232.20	100.69	31.14	3.71	4.09	8.42	3.23
5	Chan	232.20	235.90	105.01	31.94	3.71	4.27	8.63	3.29
6	Chan	235.90	239.60	109.41	32.73	3.71	4.44	8.85	3.34
7	Chan	239.60	243.30	113.64	33.48	3.70	4.62	9.05	3.39
8	Chan	243.30	247.00	108.32	33.47	3.98	4.40	9.05	3.24
9	ROB	247.00	283.68	208.11	126.54	38.37	8.45	3.45	1.64
10	ROB	283.68	320.36	323.84	180.66	36.87	13.15	4.93	1.79
11	ROB	320.36	357.05	300.01	172.45	36.81	12.19	4.70	1.74
12	ROB	357.05	393.73	240.48	148.51	36.80	9.77	4.05	1.62
13	ROB	393.73	430.41	23.64	21.47	15.53	0.96	1.41	1.10

CROSS SECTION

RIVER: Unnamed Central
REACH: South RS: *0.8919*

INPUT
Description: R.S. 0.8919 Centerline of Terravita Way Dip Section
Diversion of
130 cfs to south through Terravita development
City of Scottsdale
Station Elevation Data num= 69

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2140.96	3.77	2140.92	5.06	2140.92	6.2	2140.9	36.59	2140.86
38.83	2140.87	40.81	2140.77	63.34	2140.57	92.99	2140.48	128.28	2140.56
135.08	2140.53	135.17	2140.53	135.26	2140.54	143.88	2141.49	144.38	2141.51
149.21	2141.32	154.12	2141.22	165.83	2140.97	170.42	2140.79	172.82	2140.83
173	2140.82	173.19	2140.8	179.77	2140.05	198.78	2139.88	205.86	2139.81
207.78	2139.93	210.96	2140.12	212.24	2140.17	213.03	2140.19	213.65	2140.2
215.75	2140.33	218.18	2140.33	226.17	2140.3	230.34	2140.27	238.03	2140.33
240.27	2140.25	248.78	2140.2	250.88	2140.07	258.32	2140.24	261.52	2140.29
271.12	2140.49	274.12	2140.56	280.72	2140.66	284.32	2140.75	286.57	2140.78
295.86	2139.93	297.73	2139.91	302.5	2139.59	307.73	2139.23	309.72	2139.16
312.45	2139.09	320.49	2138.89	321.17	2138.9	326.81	2138.98	327.87	2139.01
338.82	2139.43	339.23	2139.42	342	2139.68	349.74	2140.41	350.03	2140.43
357.23	2140.55	358.58	2140.54	364.76	2140.75	367.24	2140.78	378.88	2141.07
380.58	2141.17	389.09	2141.58	402.3	2142.43	402.85	2142.43		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	198.78	.035	226.17	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
302.5	342	101	106.73	110	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2141.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.27	Wt. n-Val.	0.032	0.040	0.040
W.S. Elev (ft)	2140.74	Reach Len. (ft)	101.00	106.73	110.00
Crit W.S. (ft)	2140.74	Flow Area (sq ft)	83.61	62.18	8.09
E.G. Slope (ft/ft)	0.009985	Area (sq ft)	83.61	62.18	8.09
Q Total (cfs)	562.00	Flow (cfs)	234.69	312.12	15.19
Top Width (ft)	280.18	Top Width (ft)	218.27	39.50	22.42
Vel Total (ft/s)	3.65	Avg. Vel. (ft/s)	2.81	5.02	1.88
Max Chl Dpth (ft)	1.85	Hydr. Depth (ft)	0.38	1.57	0.36
Conv. Total (cfs)	5624.3	Conv. (cfs)	2348.7	3123.6	152.0
Length Wtd. (ft)	104.99	Wetted Per. (ft)	218.39	39.54	22.45
Min Ch El (ft)	2138.89	Shear (lb/sq ft)	0.24	0.98	0.22
Alpha	1.30	Stream Power (lb/ft s)	0.67	4.92	0.42
Frctn Loss (ft)	0.83	Cum Volume (acre-ft)	5.26	3.34	6.42
C & E Loss (ft)	0.02	Cum SA (acres)	7.31	2.43	8.84

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	0.00	60.50	1.17	1.15	16.11	0.21	0.07	1.02
2	LOB	60.50	121.00	27.97	13.11	60.50	4.98	0.22	2.13
3	LOB	121.00	181.50	14.80	6.17	23.88	2.63	0.26	2.40
4	LOB	181.50	242.00	136.20	37.78	60.52	24.24	0.62	3.61
5	LOB	242.00	302.50	54.54	25.40	57.38	9.70	0.44	2.15
6	Chan	302.50	310.40	51.21	11.10	7.91	9.11	1.40	4.62
7	Chan	310.40	318.30	70.13	13.39	7.90	12.48	1.70	5.24
8	Chan	318.30	326.20	78.32	14.31	7.90	13.94	1.81	5.47
9	Chan	326.20	334.10	66.26	12.95	7.91	11.79	1.64	5.12

10	Chan	334.10	342.00	46.20	10.43	7.92	8.22	1.32	4.43
11	ROB	342.00	354.17	13.88	6.59	12.21	2.47	0.54	2.11
12	ROB	354.17	366.34	1.31	1.49	10.25	0.23	0.15	0.88

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

LATERAL STRUCTURE

RIVER: Unnamed Central
REACH: South RS: 0.880

INPUT
Description:
Lateral structure position = Right overbank
Distance from Upstream XS = 60
Deck/Roadway Width = 20
Weir Coefficient = 2.6
Weir Flow Reference = Water Surface
Weir Embankment Coordinates num = 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2140	49	2139.65	206	2136.2	300	2134.2

Weir crest shape = Broad Crested

LATERAL STRUCTURE OUTPUT Profile #PF 1 Lat Struct

E.G. US. (ft)	2140.19	Weir Sta US (ft)	
W.S. US. (ft)	2139.79	Weir Sta DS (ft)	
E.G. DS (ft)	2134.17	Weir Max Depth (ft)	
W.S. DS (ft)	2133.87	Weir Avg Depth (ft)	
Q US (cfs)	562.00	Weir Submerg	
Q Leaving Total (cfs)	0.00	Min El Weir Flow (ft)	2134.20
Q DS (cfs)	562.00	Wr Top Wdth (ft)	
Perc Q Leaving	0.00	Q Gate Group (cfs)	
Q Weir (cfs)		Gate Open Ht (ft)	
Q Gates (cfs)		Gate #Open	
Q Culv (cfs)		Gate Area (sq ft)	
Q Lat RC (cfs)		Gate Submerg	
Weir Flow Area (sq ft)		Gate Invert (ft)	

CROSS SECTION

RIVER: Unnamed Central
REACH: South RS: 0.8717

INPUT
Description: R.S. 0.8717
Imm. Downstream of Terravita Way
City of Scottsdale
Station Elevation Data num= 66

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2140.59	.5	2140.58	5.73	2140.42	8.55	2140.39	8.77	2140.39
9.7	2140.41	12.01	2140.44	24.65	2140.29	26.51	2140.45	27.25	2140.48
30.69	2140.7	37.89	2140.45	38.38	2140.39	57.89	2140.06	58.19	2140.05
58.35	2140.05	68.65	2139.91	76.57	2140.01	86.86	2139.85	87.04	2139.84
97.58	2139.13	98.53	2139.11	110.26	2138.71	118.91	2138.11	122.58	2138.05
131.03	2137.93	140.02	2138.16	144.77	2138.34	159.17	2138.86	171.07	2139.02
190.67	2139.32	194.51	2139.34	198.07	2139.37	201.98	2139.45	235.25	2139.42
235.83	2139.43	236.4	2139.42	237.51	2139.39	248.72	2136.21	252.5	2135.11

254.68	2134.48	255.94	2134.84	257	2135.15	260.28	2136.09	268.66	2137.96
270.13	2138.34	270.78	2138.48	274.73	2138.57	278.38	2138.92	288.56	2139.39
296.13	2138.54	299.37	2138.17	302.81	2138.34	311.8	2138.87	313.39	2138.87
319.58	2138.95	339.58	2139.24	351.97	2139.42	357.39	2139.52	372.47	2139.8
380.83	2139.17	391.85	2138.37	395.94	2138.53	404.52	2139.03	428.84	2139.38
447.11	2139.61								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	248.72	.035	270.78	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
252.5	257	185	176.72	171	.1	.3

Right Levee Station= 372.47 Elevation= 2139.8

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2139.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.50	Wt. n-Val.	0.038	0.035	0.036
W.S. Elev (ft)	2139.01	Reach Len. (ft)	185.00	176.72	171.00
Crit W.S. (ft)	2139.01	Flow Area (sq ft)	63.79	18.91	42.51
E.G. Slope (ft/ft)	0.006430	Area (sq ft)	63.79	18.91	42.51
Q Total (cfs)	562.00	Flow (cfs)	218.04	163.24	180.72
Top Width (ft)	141.46	Top Width (ft)	82.17	4.50	54.79
Vel Total (ft/s)	4.49	Avg. Vel. (ft/s)	3.42	8.63	4.25
Max Chl Dpth (ft)	4.53	Hydr. Depth (ft)	0.78	4.20	0.78
Conv. Total (cfs)	7008.5	Conv. (cfs)	2719.1	2035.7	2253.7
Length Wtd. (ft)	179.23	Wetted Per. (ft)	82.76	4.68	55.28
Min Ch El (ft)	2134.48	Shear (lb/sq ft)	0.31	1.62	0.31
Alpha	1.59	Stream Power (lb/ft s)	1.06	13.99	1.31
Frctn Loss (ft)	1.25	Cum Volume (acre-ft)	5.09	3.24	6.35
C & E Loss (ft)	0.04	Cum SA (acres)	6.96	2.37	8.75

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	101.00	151.50	76.85	34.36	49.98	13.67	0.69	2.24
2	LOB	151.50	202.00	2.54	2.99	18.59	0.45	0.16	0.85
3	LOB	202.00	252.50	138.65	26.44	14.19	24.67	1.94	5.24
4	Chan	252.50	253.40	30.37	3.62	0.94	5.40	4.03	8.38
5	Chan	253.40	254.30	33.72	3.86	0.94	6.00	4.29	8.74
6	Chan	254.30	255.20	36.03	4.01	0.94	6.41	4.46	8.98
7	Chan	255.20	256.10	33.24	3.82	0.94	5.91	4.25	8.69
8	Chan	256.10	257.00	29.88	3.59	0.94	5.32	3.99	8.32
9	ROB	257.00	295.49	166.95	33.00	27.22	29.71	1.23	5.06
10	ROB	295.49	333.98	13.77	9.51	28.06	2.45	0.34	1.45

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: Unnamed Central
REACH: South RS: 0.8382

INPUT
Description: R.S. 0.8382
Diversion - Side Weir into north branch of model
61cfs diverted to north
City of Scottsdale
Station Elevation Data num= 69

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2136.47	9.99	2136.49	13.45	2136.49	26.49	2135.92	40.88	2135.18
45.31	2134.99	53.73	2134.45	61.56	2134.72	67.16	2134.92	73.78	2134.93
78.06	2134.75	88.2	2135.15	91.98	2135.21	95.95	2135.33	118.23	2136.12
123.47	2135.56	126.4	2135.26	137.98	2134.28	142.77	2133.87	143.37	2133.93
145.86	2134.2	156.82	2135.43	159.1	2135.65	186.69	2136.02	194.34	2136.11
211.6	2133.01	214.18	2132.55	216.25	2132.2	216.57	2132.25	216.59	2132.25
218.66	2132.57	221.7	2133.1	231.8	2134.88	244.3	2135.2	248.87	2135.14
250.49	2134.64	254.52	2134.98	267.43	2135.44	272.7	2135.62	275.7	2135.45
283.76	2135.03	291.29	2134.95	292.98	2135.06	297.59	2135.28	308.6	2135.77
312.02	2136.08	318.35	2136.06	319.09	2136.06	320.06	2135.99	329.48	2135.22
336.78	2135.52	340.92	2135.58	345.27	2135.74	348.73	2135.46	360.1	2135.43
363.9	2135.37	371.36	2135.48	377.25	2135.68	378.3	2135.8	395.83	2135.58
426.16	2135.57	435.46	2135.56	449.79	2135.31	452.4	2135.34	454.43	2135.33
461.58	2134.74	462.97	2134.62	463.62	2134.68	473.13	2135.86		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.032	194.34	.035	218.66	.058

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
211.6	221.7	144	143.65	142	.1	.3

Right Levee Station= 312.02 Elevation= 2136.08

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2135.91	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.35	Wt. n-Val.	0.033	0.039	0.058
W.S. Elev (ft)	2135.56	Reach Len. (ft)	144.00	143.65	142.00
Crit W.S. (ft)	2135.56	Flow Area (sq ft)	86.66	29.68	43.38
E.G. Slope (ft/ft)	0.007629	Area (sq ft)	86.66	29.68	43.38
Q Total (cfs)	562.00	Flow (cfs)	293.83	200.46	67.71
Top Width (ft)	206.96	Top Width (ft)	117.67	10.10	79.20
Vel Total (ft/s)	3.52	Avg. Vel. (ft/s)	3.39	6.75	1.56
Max Chl Dpth (ft)	3.36	Hydr. Depth (ft)	0.74	2.94	0.55
Conv. Total (cfs)	6434.3	Conv. (cfs)	3364.1	2295.0	775.2
Length Wtd. (ft)	143.19	Wetted Per. (ft)	118.12	10.24	79.49
Min Ch El (ft)	2132.20	Shear (lb/sq ft)	0.35	1.38	0.26
Alpha	1.82	Stream Power (lb/ft s)	1.18	9.32	0.41
Frctn Loss (ft)	1.70	Cum Volume (acre-ft)	4.77	3.14	6.18
C & E Loss (ft)	0.03	Cum SA (acres)	6.54	2.34	8.48

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	0.00	42.32	2.81	1.98	8.80	0.50	0.22	1.42
2	LOB	42.32	84.64	102.31	32.03	42.36	18.20	0.76	3.19
3	LOB	84.64	126.96	8.90	5.61	21.22	1.58	0.26	1.59
4	LOB	126.96	169.28	105.88	28.98	31.33	18.84	0.93	3.65
5	LOB	169.28	211.60	73.93	18.07	14.41	13.16	1.27	4.09
6	Chan	211.60	213.62	39.38	5.51	2.05	7.01	2.73	7.15
7	Chan	213.62	215.64	48.33	6.23	2.05	8.60	3.08	7.76
8	Chan	215.64	217.66	53.31	6.60	2.05	9.49	3.27	8.08
9	Chan	217.66	219.68	37.02	6.02	2.05	6.59	2.98	6.15
10	Chan	219.68	221.70	22.42	5.32	2.05	3.99	2.63	4.21
11	ROB	221.70	266.86	56.33	32.59	45.42	10.02	0.72	1.73
12	ROB	266.86	312.02	11.38	10.80	34.07	2.02	0.32	1.05

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Unnamed Central
REACH: South RS: 0.8110

INPUT
Description: R.S. 0.8110
Imm. upstream of health care facility berm system
Berm not considered engineered, flow flanks upstream end of berm system
City of Scottsdale, Scottsdale Health Center (Del Webb)
Station Elevation Data num= 58

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
12.69	2133.12	40.38	2132.33	50.48	2132.03	63.96	2131.42	66.45	2131.34
83.79	2132.39	86.28	2132.53	97.78	2132.53	121.1	2132.21	129.94	2132.35
131.65	2132.36	134.31	2132.36	142.6	2131.78	142.61	2131.78	146.91	2131.48
148.62	2131.36	150.35	2131.53	150.75	2131.56	153	2131.79	164.45	2132.97
184.33	2132.77	197.79	2132.52	205.74	2132.4	214.35	2132.38	221.08	2132.57
223.85	2132.64	227.86	2132.64	238.45	2132.59	270.2	2132.37	272.06	2132.04
277.22	2131.23	286.56	2131.19	288.21	2131.24	291.36	2131.59	300.52	2132.28
301.34	2132.28	303.73	2132.23	304.62	2132.23	305.76	2132.23	312.08	2132.12
323.46	2131.93	341.2	2131.7	359.7	2131.58	364.09	2131.39	366.6	2131.33
368.2	2131.14	372.43	2131.84	376.74	2132.47	378.74	2132.4	387.46	2132.24
388.99	2132.21	389.75	2132.21	409.1	2132.7	414.32	2132.84	422.93	2133.14
423.93	2133.17	426.15	2133.22	438.63	2133.12				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
12.69	.032	142.6	.035	150.75	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
142.6	153	105.88	105.88	105.88	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2132.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.	0.032	0.036	0.040
W.S. Elev (ft)	2132.53	Reach Len. (ft)	105.88	105.88	105.88

Crit W.S. (ft)	2132.53	Flow Area (sq ft)	40.14	9.97	94.29
E.G. Slope (ft/ft)	0.020883	Area (sq ft)	40.14	9.97	94.29
Q Total (cfs)	562.00	Flow (cfs)	161.87	58.10	342.03
Top Width (ft)	292.89	Top Width (ft)	97.70	10.40	184.79
Vel Total (ft/s)	3.89	Avg. Vel. (ft/s)	4.03	5.83	3.63
Max Chl Dpth (ft)	1.39	Hydr. Depth (ft)	0.41	0.96	0.51
Conv. Total (cfs)	3889.0	Conv. (cfs)	1120.2	402.0	2366.8
Length Wtd. (ft)	105.88	Wetted Per. (ft)	97.78	10.44	185.11
Min Ch El (ft)	2131.36	Shear (lb/sq ft)	0.54	1.25	0.66
Alpha	1.07	Stream Power (lb/ft s)	2.16	7.26	2.41
Frctn Loss (ft)	1.73	Cum Volume (acre-ft)	4.56	3.08	5.96
C & E Loss (ft)	0.01	Cum SA (acres)	6.18	2.31	8.05

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	12.69	38.67	0.45	0.40	5.29	0.08	0.08	1.13
2	LOB	38.67	64.65	69.33	15.46	26.00	12.34	0.59	4.48
3	LOB	64.65	90.64	64.71	13.79	21.66	11.51	0.64	4.69
4	LOB	90.64	116.62	3.94	2.43	18.82	0.70	0.13	1.62
5	LOB	116.62	142.60	23.44	8.06	26.00	4.17	0.31	2.91
6	Chan	142.60	144.68	9.13	1.71	2.09	1.62	0.82	5.34
7	Chan	144.68	146.76	11.97	2.01	2.09	2.13	0.97	5.95
8	Chan	146.76	148.84	15.07	2.31	2.09	2.68	1.11	6.53
9	Chan	148.84	150.92	13.55	2.18	2.09	2.41	1.05	6.22
10	Chan	150.92	153.00	8.37	1.76	2.09	1.49	0.85	4.76
11	ROB	153.00	210.13	6.00	3.80	20.08	1.07	0.19	1.58
12	ROB	210.13	267.25	2.16	2.41	29.63	0.38	0.08	0.90
13	ROB	267.25	324.38	145.15	39.13	57.27	25.83	0.68	3.71
14	ROB	324.38	381.50	182.01	44.81	57.25	32.39	0.78	4.06
15	ROB	381.50	438.63	6.70	4.13	20.88	1.19	0.20	1.62

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Unnamed Central
REACH: South RS: 0.7910

INPUT
Description: R.S. 0.7910
Unengineered berm system (ignored)
City of
Scottsdale, health center
Station Elevation Data num= 75

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-120	2130.5	-71.68	2129.9	-71.3	2129.87	-61.91	2129.93	-41.05	2130.12
-35.58	2130.23	-24.9	2130.38	-8.4	2130.46	13.09	2130.51	26.24	2130.69
31.11	2130.62	40.45	2130.57	41.3	2130.58	41.65	2130.57	42.04	2130.56
61.36	2130.26	65.28	2130.21	77.1	2130.1	100.02	2129.92	105	2130.29
115.03	2131.6	125.74	2130.26	127.27	2130.13	139.5	2129.98	160.31	2129.72

170.21	2129.54	171.82	2129.55	174.45	2129.42	174.46	2129.42	174.6	2129.42
184.07	2129.73	188.7	2129.91	189.73	2129.95	207.33	2129.96	210.18	2129.94
213.52	2130.47	224.44	2132.15	229.38	2130.96	234.84	2129.55	238.56	2129.53
242.16	2129.41	249.86	2129.23	256.97	2129.1	277.16	2128.83	295.02	2128.78
297.37	2128.76	297.83	2128.74	301.15	2128.76	310.91	2129.25	313.98	2129.28
320.8	2129.45	325.81	2129.34	331.67	2129.39	363.02	2128.93	364.42	2128.91
366.25	2128.9	367.91	2128.8	375.57	2128.41	376.18	2128.38	376.28	2128.39
382.81	2128.65	388.69	2128.82	412.27	2129.74	415.06	2129.72	426.16	2129.8
430.77	2129.86	440.89	2129.73	465.77	2129.63	473.7	2129.59	483.45	2129.72
490.4	2129.75	497.36	2129.63	503.2	2129.59	610	2129.7	623	2130.6

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-120	.032	127.27	.035	207.33	.032

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
139.5	188.7	138	133.85	130	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2129.99	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.		0.035	0.032
W.S. Elev (ft)	2129.79	Reach Len. (ft)	138.00	133.85	130.00
Crit W.S. (ft)	2129.79	Flow Area (sq ft)		5.01	150.78
E.G. Slope (ft/ft)	0.013161	Area (sq ft)		5.01	150.78
Q Total (cfs)	562.00	Flow (cfs)		7.31	554.69
Top Width (ft)	395.69	Top Width (ft)		30.55	365.14
Vel Total (ft/s)	3.61	Avg. Vel. (ft/s)		1.46	3.68
Max Chl Dpth (ft)	1.41	Hydr. Depth (ft)		0.16	0.41
Conv. Total (cfs)	4898.9	Conv. (cfs)		63.7	4835.1
Length Wtd. (ft)	130.05	Wetted Per. (ft)		30.56	365.24
Min Ch El (ft)	2129.42	Shear (lb/sq ft)		0.13	0.34
Alpha	1.03	Stream Power (lb/ft s)		0.20	1.25
Frctn Loss (ft)	1.77	Cum Volume (acre-ft)	4.52	3.06	5.66
C & E Loss (ft)	0.00	Cum SA (acres)	6.06	2.26	7.38

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	Chan	149.34	159.18	0.04	0.11	4.20	0.01	0.03	0.37
2	Chan	159.18	169.02	1.48	1.34	9.84	0.26	0.14	1.10
3	Chan	169.02	178.86	5.01	2.78	9.85	0.89	0.28	1.80
4	Chan	178.86	188.70	0.78	0.78	6.67	0.14	0.12	1.00
5	ROB	188.70	275.56	98.96	25.25	41.67	17.61	0.61	3.92
6	ROB	275.56	362.42	263.93	61.03	86.88	46.96	0.70	4.32
7	ROB	362.42	449.28	159.96	42.54	74.71	28.46	0.57	3.76
8	ROB	449.28	536.14	19.29	12.70	86.86	3.43	0.15	1.52
9	ROB	536.14	623.00	12.55	9.26	75.11	2.23	0.12	1.36

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Unnamed Central
REACH: South RS: 0.7656

INPUT
Description: R.S. 0.7656
Unengineered berm system
City of Scottsdale, health
center

Station Elevation Data num= 81

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-14.63	2127.37	26.37	2127.17	26.62	2127.17	26.93	2127.17	27.28	2127.17
27.52	2127.17	27.77	2127.16	28.19	2127.16	29.17	2127.17	29.71	2127.17
31.07	2127.15	34.27	2127.14	90.48	2127.04	93.68	2126.86	95.15	2126.8
99.98	2127.44	104.17	2128.06	108.94	2129.58	113.77	2127.97	118	2127.23
120.77	2126.75	140.78	2127.42	149	2127.63	157.47	2127.84	159	2127.67
162.96	2127.22	163.97	2127.14	163.99	2127.14	165.86	2127.01	172.73	2127.43
175.35	2127.54	176	2127.61	178.51	2127.89	187.78	2129.44	189	2129.6
190.27	2129.26	195.64	2127.94	209.17	2127.59	213.96	2127.49	218.66	2127.34
220.94	2127.31	223.9	2127.22	241.55	2126.64	252.4	2126.46	263.48	2126.23
282.92	2126.02	284.84	2126	298.26	2125.97	312.23	2125.94	314.63	2125.98
329.54	2126.28	336.23	2126.54	341.7	2126.79	349.56	2126.75	360.44	2126.68
362.16	2126.62	364.08	2126.49	367.29	2126.3	372.02	2125.91	374.4	2125.77
392.57	2126.69	395.11	2126.82	395.66	2126.83	418.81	2127.13	446.85	2127.03
473.03	2126.88	496.89	2126.83	526.92	2126.9	532.05	2126.74	550.82	2127.37
555.49	2127.5	571.83	2128.04	575.72	2128.15	576.29	2128.17	576.43	2128.17
576.92	2128.2	577.06	2128.2	590.94	2128.66	596.68	2128.65	601.3	2128.71
602.38	2128.69								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-14.63	.032	120.77	.035	178.51	.032

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
159	176	101	97.21	94	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2127.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.	0.034	0.035	0.032
W.S. Elev (ft)	2127.06	Reach Len. (ft)	101.00	97.21	94.00
Crit W.S. (ft)	2127.06	Flow Area (sq ft)	2.86	0.04	141.75
E.G. Slope (ft/ft)	0.014116	Area (sq ft)	2.86	0.04	141.75
Q Total (cfs)	562.00	Flow (cfs)	3.50	0.02	558.48
Top Width (ft)	321.40	Top Width (ft)	30.73	1.63	289.04
Vel Total (ft/s)	3.89	Avg. Vel. (ft/s)	1.22	0.45	3.94
Max Chl Dpth (ft)	1.29	Hydr. Depth (ft)	0.09	0.03	0.49
Conv. Total (cfs)	4730.2	Conv. (cfs)	29.4	0.2	4700.6
Length Wtd. (ft)	95.93	Wetted Per. (ft)	30.78	1.63	289.14
Min Ch El (ft)	2127.01	Shear (lb/sq ft)	0.08	0.02	0.43
Alpha	1.02	Stream Power (lb/ft s)	0.10	0.01	1.70
Frctn Loss (ft)	1.56	Cum Volume (acre-ft)	4.51	3.05	5.22
C & E Loss (ft)	0.01	Cum SA (acres)	6.01	2.21	6.41

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	54.82	89.55	0.03	0.13	11.99	0.00	0.01	0.22

2	LOB	89.55	124.27	2.97	2.16	12.95	0.53	0.17	1.38
3	LOB	124.27	159.00	0.50	0.57	5.85	0.09	0.10	0.87
4	Chan	159.00	162.40						
5	Chan	162.40	165.80	0.01	0.02	0.70	0.00	0.02	0.42
6	Chan	165.80	169.20	0.01	0.03	0.93	0.00	0.03	0.46
7	Chan	169.20	172.60						
8	Chan	172.60	176.00						
9	ROB	176.00	261.28	44.23	14.46	32.61	7.87	0.44	3.06
10	ROB	261.28	346.55	374.00	76.48	85.29	66.55	0.90	4.89
11	ROB	346.55	431.83	114.26	34.12	67.15	20.33	0.51	3.35
12	ROB	431.83	517.10	18.33	12.18	79.51	3.26	0.15	1.51
13	ROB	517.10	602.38	7.67	4.51	24.58	1.36	0.18	1.70

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Unnamed Central
REACH: South RS: 0.7472

INPUT
Description: R.S. 0.7472
Unengineered berm system
City of Scottsdale, health center

ation Elevation Data num= 105

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-44.53	2125.65	-36.99	2125.51	-9.01	2124.97	-3	2125	-2.99	2125
-2.98	2125	-2.94	2125	-2.84	2124.99	14.7	2124.75	34.04	2124.66
39.37	2124.76	50.13	2124.89	56.5	2124.97	61.22	2125.02	70.11	2125.07
86.98	2125.1	94.51	2125.1	98.83	2125.02	112.26	2125.13	116.4	2125.84
124.35	2127.3	137.24	2125.42	138.62	2125.23	161.9	2125.17	162.08	2125.17
180.65	2125.09	185.29	2125.07	189.62	2125.08	192.31	2124.66	196.38	2124.31
197.95	2124.36	197.96	2124.36	199.35	2124.39	202.29	2124.63	205.4	2125.14
207.01	2125.4	216.26	2127.33	218.46	2126.85	224.17	2125.32	225.88	2125.31
230.93	2125.42	236.56	2125.53	238.82	2125.43	245.74	2124.74	247.93	2124.35
257.39	2124.28	260.2	2124.37	261.49	2124.43	267.44	2124.91	268.35	2124.95
269.29	2124.95	279.25	2125.01	285.05	2125.05	288.11	2125.02	292	2124.98
301.24	2124.97	305.99	2125.07	315.93	2125.24	317.14	2125.23	319.41	2125.32
329.87	2125.14	331.65	2125.17	338.46	2125.35	340.08	2125.39	347.74	2125.36
352.27	2125.45	358.25	2125.62	361.49	2125.57	364.22	2125.79	366.32	2125.95
367.54	2126.03	370.57	2125.83	372.95	2125.35	378.66	2125.07	380.02	2125.14
384.54	2125.19	386.61	2125.37	394.97	2125.87	396.96	2125.9	398.82	2126.07
401.79	2126.02	405.27	2126	406.24	2125.97	417.28	2125.88	420.15	2125.85
423.18	2125.82	433.61	2125.41	444.8	2125.32	449.76	2125.24	459.98	2125.19
482.96	2125.54	495.52	2125.41	501.01	2125.37	506.09	2125.35	539.89	2125.22
554	2125.77	556.12	2125.96	559.33	2126.18	562.81	2126.15	565.76	2126.2
569.33	2126.26	578.98	2126.43	586.69	2126.47	588.04	2126.45	592.66	2126.37

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-44.53	.032	138.62	.035	207.01	.032	565.76	.025

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
161.9	205.4	112	118.09	127	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2125.63	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.	0.032	0.035	0.032
W.S. Elev (ft)	2125.44	Reach Len. (ft)	112.00	118.09	127.00

Crit W.S. (ft)	2125.44	Flow Area (sq ft)	73.18	22.15	66.22
E.G. Slope (ft/ft)	0.018926	Area (sq ft)	73.18	22.15	66.22
Q Total (cfs)	562.00	Flow (cfs)	268.55	82.36	211.09
Top Width (ft)	450.55	Top Width (ft)	172.21	43.50	234.84
Vel Total (ft/s)	3.48	Avg. Vel. (ft/s)	3.67	3.72	3.19
Max Chl Dpth (ft)	1.16	Hydr. Depth (ft)	0.42	0.51	0.28
Conv. Total (cfs)	4085.1	Conv. (cfs)	1952.0	598.7	1534.4
Length Wtd. (ft)	122.25	Wetted Per. (ft)	172.26	43.60	235.02
Min Ch El (ft)	2124.31	Shear (lb/sq ft)	0.50	0.60	0.33
Alpha	1.01	Stream Power (lb/ft s)	1.84	2.23	1.06
Frctn Loss (ft)	1.32	Cum Volume (acre-ft)	4.42	3.03	5.00
C & E Loss (ft)	0.02	Cum SA (acres)	5.78	2.16	5.84

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	-44.53	-3.24	21.48	8.34	30.11	3.82	0.28	2.58
2	LOB	-3.24	38.04	125.96	27.35	41.29	22.41	0.66	4.61
3	LOB	38.04	79.33	73.03	19.72	41.29	12.99	0.48	3.70
4	LOB	79.33	120.61	35.92	12.03	34.77	6.39	0.35	2.99
5	LOB	120.61	161.90	12.15	5.74	24.81	2.16	0.23	2.12
6	Chan	161.90	170.60	5.74	2.50	8.70	1.02	0.29	2.29
7	Chan	170.60	179.30	7.03	2.83	8.70	1.25	0.33	2.49
8	Chan	179.30	188.00	8.32	3.13	8.70	1.48	0.36	2.66
9	Chan	188.00	196.70	27.07	6.36	8.75	4.82	0.73	4.25
10	Chan	196.70	205.40	34.20	7.32	8.75	6.09	0.84	4.67
11	ROB	205.40	282.85	138.28	32.02	54.41	24.61	0.59	4.32
12	ROB	282.85	360.30	45.87	18.25	68.91	8.16	0.26	2.51
13	ROB	360.30	437.76	6.96	3.60	20.20	1.24	0.18	1.93
14	ROB	437.76	515.21	11.22	7.48	61.18	2.00	0.12	1.50
15	ROB	515.21	592.66	8.77	4.87	30.32	1.56	0.16	1.80

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Unnamed Central
REACH: South RS: 0.7248

INPUT
Description: R.S. 0.7248, Detention Basin Removed, SHC building
Scottsdale
Health Care building and parking lot
ineffective flow in parking
lot due to downstream roadway grade
Station Elevation Data num= 88

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

-28.84	2123.67	-24.25	2123.51	-17.02	2123.57	-14.15	2123.54	-6.13	2123.66
15.51	2123.58	18.47	2123.56	23.2	2123.56	28.74	2123.44	32.4	2123.39
90.62	2122.65	94.4	2122.62	95.15	2122.59	95.8	2122.54	101.53	2122.42
103.37	2122.46	103.97	2122.49	104.38	2122.49	107.28	2122.54	125.25	2122.95
172.85	2123.21	176.93	2123.13	179.02	2123.1	220.4	2122.99	225.09	2122.97
229.93	2123.78	232.42	2124.23	234.38	2124.59	238.3	2123.87	246.6	2121.98
247.98	2121.67	259.01	2121.61	276.14	2121.68	297.29	2121.74	298.17	2121.73
301.76	2121.71	304	2122.02	305.05	2122.16	314.19	2124.33	319.07	2122.16
322.97	2120.89	329.77	2119.19	366.99	2119.44	369.9	2119.6	371.97	2119.68
372.93	2119.69	380.43	2119.49	395.96	2119.18	402.93	2119.33	406.08	2119.44
416.26	2119.73	417.26	2119.72	421.95	2119.92	424.04	2120.05	429.44	2120.2
444.76	2120.69	483.77	2120.9	494.6	2121.08	502.09	2121.21	554.6	2120.9
556.44	2120.87	562.63	2119.61	563.75	2119.35	566.09	2119.78	573.9	2120.8
576.21	2121.11	577.49	2121.24	579.62	2121.44	583.15	2121.9	584.72	2122.01
592.71	2122.7	596.59	2122.69	603.53	2122.1	612.41	2120.97	612.91	2120.91
613.43	2120.95	620.22	2121.43	621.29	2121.51	621.74	2121.55	621.97	2121.57
622.96	2121.67	623.9	2121.68	635.13	2121.56	635.63	2121.56	652.29	2122.07
657.32	2121.78	662.32	2121.87	668.08	2122.5				

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-28.84	.032	238.3	.035	305.05	.032	366.99	.025	566.09	.025
620.22	.032								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
246.6	304	112	116.51	120	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
315	510	2124	T

Blocked Obstructions num= 1

Sta L	Sta R	Elev
480	540	2126

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2122.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.37	Wt. n-Val.	0.035	0.035	0.026
W.S. Elev (ft)	2122.19	Reach Len. (ft)	112.00	116.51	120.00
Crit W.S. (ft)	2122.19	Flow Area (sq ft)	0.09	28.74	97.69
E.G. Slope (ft/ft)	0.007002	Area (sq ft)	0.09	28.74	462.25
Q Total (cfs)	562.00	Flow (cfs)	0.07	64.35	497.57
Top Width (ft)	329.98	Top Width (ft)	0.91	57.40	271.66
Vel Total (ft/s)	4.44	Avg. Vel. (ft/s)	0.77	2.24	5.09
Max Chl Dpth (ft)	3.01	Hydr. Depth (ft)	0.10	0.50	0.88
Conv. Total (cfs)	6716.4	Conv. (cfs)	0.9	769.1	5946.5
Length Wtd. (ft)	119.07	Wetted Per. (ft)	0.94	57.46	112.37
Min Ch El (ft)	2121.61	Shear (lb/sq ft)	0.04	0.22	0.38
Alpha	1.19	Stream Power (lb/ft s)	0.03	0.49	1.94
Frctn Loss (ft)	0.88	Cum Volume (acre-ft)	4.33	2.96	4.23
C & E Loss (ft)	0.02	Cum SA (acres)	5.56	2.02	5.10

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	191.51	246.60	0.07	0.09	0.94	0.01	0.10	0.77
2	Chan	246.60	258.08	13.77	6.01	11.51	2.45	0.52	2.29
3	Chan	258.08	269.56	15.35	6.40	11.48	2.73	0.56	2.40
4	Chan	269.56	281.04	13.33	5.88	11.48	2.37	0.51	2.27
5	Chan	281.04	292.52	11.85	5.48	11.48	2.11	0.48	2.16
6	Chan	292.52	304.00	10.05	4.97	11.50	1.79	0.43	2.02

7	ROB	304.00	315.00	0.08	0.10	1.18	0.01	0.09	0.75
8	ROB	315.00	380.00	0.00	157.88	61.42	0.00	2.59	0.00
9	ROB	380.00	445.00	0.00	157.60	65.03	0.00	2.42	0.00
10	ROB	445.00	510.00	0.00	49.08	36.31	0.00	1.40	0.00
11	ROB	510.00	589.04	397.35	64.94	48.32	70.70	1.39	6.12
12	ROB	589.04	668.08	100.15	32.64	62.87	17.82	0.52	3.07

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Unnamed Central
REACH: South RS: 0.7028

INPUT
Description: R.S. 0.7028, SHC building
Diversion of flow across Carefree
Highway to the north
418 cfs diverted (70% of total flow)
Station Elevation Data num= 79

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-21.66	2120.9	-12.31	2120.4	15.94	2120.3	26.55	2120.94	38.46	2120.9
51.96	2120.89	69.87	2120.83	71.2	2120.64	74.89	2120.4	77.5	2120.34
83.74	2120.13	84.93	2120.16	123.1	2119.15	144.37	2118.82	158.6	2119.08
160.71	2119.1	163.46	2119.02	167.44	2119.05	176.85	2119.03	189.46	2119.12
194.04	2119.15	207.84	2119.34	217.39	2121.06	218.54	2120.87	220.64	2120.55
229.6	2119.3	230.7	2119.15	231.38	2119.05	241.56	2118.91	268.15	2119.02
285.97	2119.09	289.87	2119.25	290	2119.27	290.3	2119.32	294.6	2120.07
298.72	2121.2	305.79	2119.6	310.7	2118.95	328.54	2118.61	334.84	2118.49
344.2	2118.27	345.79	2118.3	346.11	2118.31	346.59	2118.34	351.32	2118.51
370.43	2119.17	372.83	2119.3	380.53	2120.28	384.62	2120.74	390.33	2120.68
394.71	2120.58	423.42	2120.31	437.08	2120.15	477.61	2120.23	503.39	2119.78
510.04	2119.96	521.02	2120.05	526.72	2120.18	532.21	2120.83	536.59	2120.57
537.42	2120.53	538.86	2120	547.19	2117.31	552.59	2117.71	556.64	2117.96
565.16	2118.26	568.82	2118.49	571.79	2118.61	578.48	2119.21	580.75	2119.01
587.26	2118.46	595.35	2117.81	596.56	2117.98	605.32	2118.45	613.46	2118.82
618.01	2118.85	622.63	2119.16	628.04	2119.25	629.02	2119.51		

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-21.66	.032	220.64	.035	289.87	.032	310.7	.025	556.64	.032
605.32	.025								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
229.6	290	101.92	101.92	101.92	.3	.5

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
300	455	2121	T

Blocked Obstructions num= 1

Sta L	Sta R	Elev
382	530	2126

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2119.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.29	Wt. n-Val.	0.032	0.035	0.029
W.S. Elev (ft)	2119.46	Reach Len. (ft)	101.92	101.92	101.92
Crit W.S. (ft)	2119.46	Flow Area (sq ft)	36.33	27.04	88.56
E.G. Slope (ft/ft)	0.007748	Area (sq ft)	36.33	27.04	137.81
Q Total (cfs)	562.00	Flow (cfs)	76.77	59.15	426.08
Top Width (ft)	315.46	Top Width (ft)	98.37	60.40	156.69
Vel Total (ft/s)	3.70	Avg. Vel. (ft/s)	2.11	2.19	4.81

Max Chl Dpth (ft)	2.15	Hydr. Depth (ft)	0.37	0.45	0.99
Conv. Total (cfs)	6384.8	Conv. (cfs)	872.1	672.0	4840.7
Length Wtd. (ft)	101.92	Wetted Per. (ft)	98.40	60.42	89.97
Min Ch El (ft)	2118.91	Shear (lb/sq ft)	0.18	0.22	0.48
Alpha	1.36	Stream Power (lb/ft s)	0.38	0.47	2.29
Frctn Loss (ft)	0.97	Cum Volume (acre-ft)	4.28	2.88	3.40
C & E Loss (ft)	0.09	Cum SA (acres)	5.43	1.87	4.51

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	78.84	129.10	5.75	3.99	17.79	1.02	0.22	1.44
2	LOB	129.10	179.35	56.80	23.89	50.26	10.11	0.48	2.38
3	LOB	179.35	229.60	14.22	8.45	30.35	2.53	0.28	1.68
4	Chan	229.60	241.68	11.97	5.48	12.10	2.13	0.45	2.18
5	Chan	241.68	253.76	15.36	6.36	12.08	2.73	0.53	2.42
6	Chan	253.76	265.84	13.01	5.76	12.08	2.31	0.48	2.26
7	Chan	265.84	277.92	10.85	5.16	12.08	1.93	0.43	2.10
8	Chan	277.92	290.00	7.97	4.29	12.08	1.42	0.35	1.86
9	ROB	290.00	300.00	0.09	0.11	1.13	0.02	0.10	0.85
10	ROB	300.00	377.50	0.00	49.25	67.34	0.00	0.73	0.00
11	ROB	377.50	455.00						
12	ROB	455.00	513.01						
13	ROB	513.01	571.01	245.67	41.83	30.86	43.71	1.37	5.87
14	ROB	571.01	629.02	180.32	46.62	57.98	32.08	0.81	3.87

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Unnamed Central
REACH: South RS: 0.6835

INPUT
Description: R.S. 0.6835 Imm. Upstream 60th Street Culverts
Imm. upstream 60th
Street
City of Scottsdale
Station Elevation Data num= 54

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-200	2119	0	2117.14	.29	2117.13	1.41	2117.04	3.07	2117.01
12.88	2117.12	13.86	2117.15	22.85	2117.23	32.37	2117.32	34.16	2117.37
34.43	2117.38	39.62	2117.64	43.21	2117.77	45.49	2117.91	54.12	2118.59
54.31	2118.6	70.83	2118.52	71.84	2118.42	72.14	2118.39	73.71	2118.3
78.18	2116.34	78.2	2116.33	81.4	2115.18	81.8	2115.03	82.43	2114.8
87.85	2114.91	90.03	2114.92	94.44	2114.9	98.38	2114.89	99.65	2114.9
107.98	2114.84	110.44	2115	112.08	2115.13	112.1	2115.16	112.8	2116.09

113.85	2117.49	117.77	2117.06	128.42	2118.49	128.99	2118.49	141.78	2118.15
148.06	2118.44	150.04	2118.54	150.92	2118.55	151.81	2118.56	157.97	2118.59
158.73	2118.3	184.26	2117.96	194.16	2117.98	196.21	2117.99	196.48	2118
196.85	2117.99	200.12	2118.39	204.42	2118.59	210.71	2118.66		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-200	.032	54.12	.035	117.77	.032	150.04	.025

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
81.4	112.1	94.29	94.29	94.29	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-200	78	2117.69	F
116	210.71	2117.69	F

Left Levee Station= 54.31 Elevation= 2118.6

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2116.69	Element			
Vel Head (ft)	0.60	Wt. n-Val.	0.035	0.035	0.035
W.S. Elev (ft)	2116.08	Reach Len. (ft)	94.29	94.29	94.29
Crit W.S. (ft)	2116.08	Flow Area (sq ft)	1.14	36.37	0.32
E.G. Slope (ft/ft)	0.017562	Area (sq ft)	1.14	36.37	0.32
Q Total (cfs)	233.00	Flow (cfs)	3.62	228.62	0.77
Top Width (ft)	33.91	Top Width (ft)	2.51	30.70	0.70
Vel Total (ft/s)	6.16	Avg. Vel. (ft/s)	3.18	6.29	2.40
Max Chl Dpth (ft)	1.28	Hydr. Depth (ft)	0.45	1.18	0.46
Conv. Total (cfs)	1758.2	Conv. (cfs)	27.3	1725.1	5.8
Length Wtd. (ft)	94.29	Wetted Per. (ft)	2.67	30.80	1.16
Min Ch El (ft)	2114.80	Shear (lb/sq ft)	0.47	1.29	0.30
Alpha	1.03	Stream Power (lb/ft s)	1.48	8.14	0.73
Frctn Loss (ft)		Cum Volume (acre-ft)	4.24	2.81	3.24
C & E Loss (ft)		Cum SA (acres)	5.31	1.76	4.33

Warning: During subcritical analysis, the water surface upstream of culvert went to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	78.00	81.40	3.62	1.14	2.67	1.55	0.45	3.18
2	Chan	81.40	87.54	47.03	7.42	6.21	20.19	1.21	6.34
3	Chan	87.54	93.68	44.94	7.19	6.14	19.29	1.17	6.25
4	Chan	93.68	99.82	46.02	7.29	6.14	19.75	1.19	6.31
5	Chan	99.82	105.96	47.27	7.41	6.14	20.29	1.21	6.38
6	Chan	105.96	112.10	43.36	7.05	6.17	18.61	1.15	6.15
7	ROB	112.10	116.00	0.77	0.32	1.16	0.33	0.46	2.39

Warning: During subcritical analysis, the water surface upstream of culvert went to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CULVERT

RIVER: Unnamed Central
REACH: South RS: 0.6750

INPUT
Description: South of Medical Building
Information obtained from As-Built Plans
Distance from Upstream XS = 20
Deck/Roadway Width = 45
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 16

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-200	2120	2110	0	2118.67	2110	17.5	2118.52	2110
72.92	2118.18	2110	93.16	2118	2110	129.14	2117.6	2110
153.1	2117.37	2110	195.48	2117.13	2110	222.2	2116.98	2110
295.48	2116.38	2110	297.99	2116.37	2110	369.62	2115.61	2110
419.87	2115.36	2110	431.58	2115.07	2110	442	2114.81	2110
459.14	2114.89	2110						

Upstream Bridge Cross Section Data
Station Elevation Data num= 54

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-200	2119	0	2117.14	.29	2117.13	1.41	2117.04	3.07	2117.01
12.88	2117.12	13.86	2117.15	22.85	2117.23	32.37	2117.32	34.16	2117.37
34.43	2117.38	39.62	2117.64	43.21	2117.77	45.49	2117.91	54.12	2118.59
54.31	2118.6	70.83	2118.52	71.84	2118.42	72.14	2118.39	73.71	2118.3
78.18	2116.34	78.2	2116.33	81.4	2115.18	81.8	2115.03	82.43	2114.8
87.85	2114.91	90.03	2114.92	94.44	2114.9	98.38	2114.89	99.65	2114.9
107.98	2114.84	110.44	2115	112.08	2115.13	112.1	2115.16	112.8	2116.09
113.85	2117.49	117.77	2117.06	128.42	2118.49	128.99	2118.49	141.78	2118.15
148.06	2118.44	150.04	2118.54	150.92	2118.55	151.81	2118.56	157.97	2118.59
158.73	2118.3	184.26	2117.96	194.16	2117.98	196.21	2117.99	196.48	2118
196.85	2117.99	200.12	2118.39	204.42	2118.59	210.71	2118.66		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-200	.032	54.12	.035	117.77	.032	150.04	.025

Bank Sta: Left	Right	Coeff Contr.	Expan.
81.4	112.1	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-200	78	2117.69	F
116	210.71	2117.69	F

Left Levee Station= 54.31 Elevation= 2118.6

Downstream Deck/Roadway Coordinates
num= 15

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	2118.67	2110	17.5	2118.52	2110	72.92	2118.18	2110
93.16	2118	2110	129.14	2117.6	2110	153.1	2117.37	2110
195.48	2117.13	2110	222.2	2116.98	2110	295.48	2116.38	2110
297.99	2116.37	2110	369.62	2115.61	2110	419.87	2115.36	2110
431.58	2115.07	2110	442	2114.81	2110	459.14	2114.89	2110

Downstream Bridge Cross Section Data
Station Elevation Data num= 66

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2116.14	4.38	2116.14	7.43	2116.21	18.91	2116.23	21.32	2116.18
23	2116.14	31.91	2116.17	42.78	2116.24	42.99	2116.22	52.46	2116.18
53.49	2116.24	54.03	2116.28	63.99	2116.46	70.11	2115.88	73.87	2115.53
77.13	2115.32	81.32	2112.62	81.36	2112.61	86	2112.2	86.39	2112.17
86.94	2112	87	2112	94.37	2111.75	97.53	2111.64	108.17	2111.29
108.6	2111.51	109	2111.71	109.5	2111.97	109.52	2111.98	109.61	2112.02
110.11	2112.21	111.56	2112.64	118.74	2113.98	128.93	2114.79	133.31	2114.79
144.61	2115.15	145.19	2115.17	145.69	2115.15	153	2115.09	157.76	2115.04
160.64	2115	167.66	2114.86	170.7	2114.95	175.61	2115.06	182.96	2115.28
186.96	2115.29	190.7	2115.21	197.13	2115.32	204.77	2115.38	207.64	2115.43
216.58	2115.34	218.6	2115.38	228.07	2115.45	229.22	2115.44	239.1	2115.28
240.47	2115.28	242	2115.27	250.47	2115.18	259.84	2115.25	261.8	2115.26
269.75	2115.41	274.37	2115.43	280.64	2115.52	290.37	2115.46	299.47	2115.7
308.09	2116.08								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	86.39	.035	118.74	.025

Bank Sta: Left	Right	Coeff Contr.	Expan.
87	109.5	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	75	2114.31	F

121 308.09 2114.31 F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 2114.81
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert Name	Shape	Rise	Span
Culvert #1	Box	4	10

FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG

Culvert	Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
	9	76	.015	.015	0	.4	1

Number of Barrels = 2
Upstream Elevation = 2113.3
Centerline Stations
Sta. Sta.
89.3 101.3
Downstream Elevation = 2112.02
Centerline Stations
Sta. Sta.
89.7 101.7

CULVERT OUTPUT Profile #PF 1 Culv Group: Culvert #1

Q Culv Group (cfs)	233.00	Culv Full Len (ft)	
# Barrels	2	Culv Vel US (ft/s)	7.21
Q Barrel (cfs)	116.50	Culv Vel DS (ft/s)	10.79
E.G. US. (ft)	2116.05	Culv Inv El Up (ft)	2113.30
W.S. US. (ft)	2116.08	Culv Inv El Dn (ft)	2112.02
E.G. DS (ft)	2113.70	Culv Frctn Ls (ft)	0.82
W.S. DS (ft)	2113.10	Culv Exit Loss (ft)	1.21
Delta EG (ft)	2.35	Culv Entr Loss (ft)	0.32
Delta WS (ft)	2.98	Q Weir (cfs)	
E.G. IC (ft)	2115.84	Weir Sta Lft (ft)	
E.G. OC (ft)	2116.05	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	2114.92	Weir Max Depth (ft)	
Culv WS Outlet (ft)	2113.10	Weir Avg Depth (ft)	
Culv Nml Depth (ft)	1.02	Weir Flow Area (sq ft)	
Culv Crt Depth (ft)	1.62	Min El Weir Flow (ft)	2117.70

Warning: During subcritical analysis, the water surface upstream of culvert went to critical depth.

CROSS SECTION

RIVER: Unnamed Central
REACH: South RS: 0.6656

INPUT
Description: R.S. 0.6656 Imm. Downstream 60th Street Culverts
Imm. Downstream
60th Street
City of Scottsdale
Station Elevation Data num= 66

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2116.14	4.38	2116.14	7.43	2116.21	18.91	2116.23	21.32	2116.18
23	2116.14	31.91	2116.17	42.78	2116.24	42.99	2116.22	52.46	2116.18
53.49	2116.24	54.03	2116.28	63.99	2116.46	70.11	2115.88	73.87	2115.53
77.13	2115.32	81.32	2112.62	81.36	2112.61	86	2112.2	86.39	2112.17
86.94	2112	87	2112	94.37	2111.75	97.53	2111.64	108.17	2111.29
108.6	2111.51	109	2111.71	109.5	2111.97	109.52	2111.98	109.61	2112.02
110.11	2112.21	111.56	2112.64	118.74	2113.98	128.93	2114.79	133.31	2114.79

144.61	2115.15	145.19	2115.17	145.69	2115.15	153	2115.09	157.76	2115.04
160.64	2115	167.66	2114.86	170.7	2114.95	175.61	2115.06	182.96	2115.28
186.96	2115.29	190.7	2115.21	197.13	2115.32	204.77	2115.38	207.64	2115.43
216.58	2115.34	218.6	2115.38	228.07	2115.45	229.22	2115.44	239.1	2115.28
240.47	2115.28	242	2115.27	250.47	2115.18	259.84	2115.25	261.8	2115.26
269.75	2115.41	274.37	2115.43	280.64	2115.52	290.37	2115.46	299.47	2115.7
308.09	2116.08								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	86.39	.035	118.74	.025

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
87	109.5	112	108.61	105	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	75	2114.31	F
121	308.09	2114.31	F

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2113.70	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.60	Wt. n-Val.	0.039	0.035	0.035
W.S. Elev (ft)	2113.10	Reach Len. (ft)	112.00	108.61	105.00
Crit W.S. (ft)	2113.10	Flow Area (sq ft)	4.41	32.84	2.16
E.G. Slope (ft/ft)	0.014004	Area (sq ft)	4.41	32.84	2.16
Q Total (cfs)	233.00	Flow (cfs)	15.36	211.14	6.50
Top Width (ft)	33.45	Top Width (ft)	6.43	22.50	4.53
Vel Total (ft/s)	5.91	Avg. Vel. (ft/s)	3.48	6.43	3.00
Max Chl Dpth (ft)	1.81	Hydr. Depth (ft)	0.69	1.46	0.48
Conv. Total (cfs)	1968.9	Conv. (cfs)	129.8	1784.2	54.9
Length Wtd. (ft)	108.69	Wetted Per. (ft)	6.61	22.68	4.68
Min Ch El (ft)	2111.29	Shear (lb/sq ft)	0.58	1.27	0.40
Alpha	1.10	Stream Power (lb/ft s)	2.03	8.14	1.21
Frctn Loss (ft)	1.43	Cum Volume (acre-ft)	4.23	2.73	3.24
C & E Loss (ft)	0.04	Cum SA (acres)	5.30	1.70	4.32

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	75.00	87.00	15.36	4.41	6.61	6.59	0.69	3.48
2	Chan	87.00	91.50	29.41	5.30	4.50	12.62	1.18	5.55
3	Chan	91.50	96.00	36.05	5.98	4.50	15.47	1.33	6.02
4	Chan	96.00	100.50	43.28	6.68	4.50	18.58	1.48	6.48
5	Chan	100.50	105.00	50.74	7.35	4.50	21.78	1.63	6.91
6	Chan	105.00	109.50	51.66	7.53	4.67	22.17	1.67	6.86
7	ROB	109.50	121.00	6.50	2.16	4.68	2.79	0.48	3.00

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: Unnamed Central
REACH: South RS: 0.6450

INPUT
Description: R.S. 0.6450
City of Scottsdale
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2113.05	5.35	2113.07	8.94	2113.09	13.48	2111.14	16.99	2109.67
23.52	2112.05	27.1	2113.04	28.85	2113.24	38.79	2113.25	44.56	2113.14
59.61	2112.95	64.75	2111.65	65.34	2111.42	71.43	2111.7	80.06	2112.14
81.97	2112.14	92.61	2112.09	103.18	2112.08	105.18	2112.06	109.25	2111.83
113.01	2111.62	114.98	2111.52	115.54	2111.25	118.1	2109.36	118.4	2109.14
118.42	2109.12	122.5	2109.01	122.51	2109.01	129.88	2108.83	131.35	2108.81
133.3	2109.43	141.12	2111.93	142.9	2113				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	114.98	.035	141.12	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
118.1	133.3	200	210.22	222	.3	.5

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2111.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.72	Wt. n-Val.	0.038	0.035	0.035
W.S. Elev (ft)	2110.87	Reach Len. (ft)	200.00	210.22	222.00
Crit W.S. (ft)	2110.87	Flow Area (sq ft)	5.23	28.68	3.24
E.G. Slope (ft/ft)	0.012407	Area (sq ft)	5.23	28.68	3.24
Q Total (cfs)	233.00	Flow (cfs)	15.58	205.52	11.90
Top Width (ft)	27.90	Top Width (ft)	8.20	15.20	4.50
Vel Total (ft/s)	6.27	Avg. Vel. (ft/s)	2.98	7.17	3.68
Max Chl Dpth (ft)	2.06	Hydr. Depth (ft)	0.64	1.89	0.72
Conv. Total (cfs)	2091.8	Conv. (cfs)	139.8	1845.1	106.9
Length Wtd. (ft)	208.53	Wetted Per. (ft)	9.15	15.38	4.73
Min Ch El (ft)	2108.81	Shear (lb/sq ft)	0.44	1.44	0.53
Alpha	1.18	Stream Power (lb/ft s)	1.32	10.35	1.95
Frctn Loss (ft)	2.87	Cum Volume (acre-ft)	4.22	2.66	3.23
C & E Loss (ft)	0.15	Cum SA (acres)	5.28	1.65	4.31

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	0.00	23.62	10.35	3.69	6.60	4.44	0.60	2.81
2	LOB	23.62	47.24						
3	LOB	47.24	70.86						
4	LOB	70.86	94.48						
5	LOB	94.48	118.10	5.23	1.54	2.54	2.24	0.75	3.39
6	Chan	118.10	121.14	36.48	5.38	3.12	15.66	1.77	6.78
7	Chan	121.14	124.18	40.44	5.66	3.04	17.35	1.86	7.14
8	Chan	124.18	127.22	43.18	5.89	3.04	18.53	1.94	7.33
9	Chan	127.22	130.26	45.97	6.11	3.04	19.73	2.01	7.52
10	Chan	130.26	133.30	39.45	5.65	3.14	16.93	1.86	6.99
11	ROB	133.30	135.22	9.31	2.17	2.02	4.00	1.13	4.28
12	ROB	135.22	137.14	2.53	1.00	2.02	1.09	0.52	2.54
13	ROB	137.14	139.06	0.06	0.07	0.69	0.03	0.11	0.88

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Unnamed Central
REACH: South RS: 0.6052

INPUT
Description: R.S. 0.6052
City of Scottsdale
Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2108.34	7.95	2108.44	9.41	2108.45	10.56	2108.19	20.37	2106.08
22.03	2105.72	23.86	2106.27	32.94	2108.43	37.11	2108.01	39.72	2107.63
40.3	2107.82	42.25	2107.6	48.48	2106.48	52.64	2107.12	57.06	2107.73
60.65	2108.08	65.75	2107.23	70.62	2106.16	73.87	2106.2	75	2106.21
75.01	2106.21	75.73	2106.21	79.96	2106.33	80.7	2106.24	82.13	2106.05
82.78	2105.99	83.55	2105.98	83.66	2105.98	84.31	2105.97	93.32	2105.89
101.53	2105.77	102.7	2106.23	104.67	2106.99	108.47	2108.8	124.91	2108.88
132.06	2108.84	134.29	2108.82	135.97	2108.85	136.91	2108.85		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	70.62	.035	104.67	.04

Bnk Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
80.7	102.7	204	201.22	199	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2107.52	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.42	Wt. n-Val.	0.037	0.035	0.035
W.S. Elev (ft)	2107.09	Reach Len. (ft)	204.00	201.22	199.00
Crit W.S. (ft)	2107.09	Flow Area (sq ft)	20.78	25.91	0.97
E.G. Slope (ft/ft)	0.015329	Area (sq ft)	20.78	25.91	0.97
Q Total (cfs)	233.00	Flow (cfs)	78.63	151.41	2.96
Top Width (ft)	57.60	Top Width (ft)	33.41	22.00	2.19
Vel Total (ft/s)	4.89	Avg. Vel. (ft/s)	3.78	5.84	3.07
Max Chl Dpth (ft)	1.37	Hydr. Depth (ft)	0.62	1.18	0.44
Conv. Total (cfs)	1881.9	Conv. (cfs)	635.1	1222.9	23.9
Length Wtd. (ft)	201.75	Wetted Per. (ft)	33.95	22.10	2.35
Min Ch El (ft)	2105.77	Shear (lb/sq ft)	0.59	1.12	0.39
Alpha	1.14	Stream Power (lb/ft s)	2.22	6.56	1.20
Frctn Loss (ft)	3.08	Cum Volume (acre-ft)	4.16	2.53	3.22
C & E Loss (ft)	0.01	Cum SA (acres)	5.19	1.56	4.30

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	0.00	16.14	0.02	0.03	0.50	0.01	0.05	0.63

2	LOB	16.14	32.28	27.40	7.79	11.50	11.76	0.70	3.52
3	LOB	32.28	48.42	2.06	1.01	3.41	0.88	0.30	2.03
4	LOB	48.42	64.56	2.63	1.26	4.10	1.13	0.31	2.08
5	LOB	64.56	80.70	46.53	10.69	14.44	19.97	0.75	4.35
6	Chan	80.70	85.10	25.26	4.65	4.42	10.84	1.06	5.43
7	Chan	85.10	89.50	29.18	5.06	4.40	12.52	1.15	5.76
8	Chan	89.50	93.90	30.86	5.24	4.40	13.24	1.19	5.89
9	Chan	93.90	98.30	33.26	5.48	4.40	14.27	1.24	6.07
10	Chan	98.30	102.70	32.86	5.48	4.49	14.10	1.25	6.00
11	ROB	102.70	109.54	2.96	0.97	2.35	1.27	0.44	3.07

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Unnamed Central
REACH: South RS: 0.5671

INPUT
Description: R.S. 0.5671
City of Scottsdale
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2104.55	13.91	2104.69	16.6	2104.52	19.74	2104.48	47.58	2103.57
52.49	2103.43	56.35	2102.54	61.57	2101.29	64.3	2101.23	64.6	2101.22
74.83	2101	84.62	2100.72	87.13	2100.73	87.53	2100.84	87.54	2100.84
88	2100.96	88.5	2101.09	88.63	2101.12	89	2101.2	96.21	2102.8
113.84	2103.15	114.68	2103.16	115.3	2103.18	157.83	2103.89		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	56.35	.035	96.21	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
64.3	89	236.61	236.61	236.61	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2102.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.57	Wt. n-Val.	0.035	0.035	0.035
W.S. Elev (ft)	2102.28	Reach Len. (ft)	236.61	236.61	236.61
Crit W.S. (ft)	2102.28	Flow Area (sq ft)	4.82	32.51	2.62
E.G. Slope (ft/ft)	0.015239	Area (sq ft)	4.82	32.51	2.62
Q Total (cfs)	233.00	Flow (cfs)	19.77	204.26	8.97
Top Width (ft)	36.42	Top Width (ft)	6.86	24.70	4.86
Vel Total (ft/s)	5.83	Avg. Vel. (ft/s)	4.10	6.28	3.42
Max Chl Dpth (ft)	1.56	Hydr. Depth (ft)	0.70	1.32	0.54
Conv. Total (cfs)	1887.4	Conv. (cfs)	160.1	1654.7	72.6
Length Wtd. (ft)	236.61	Wetted Per. (ft)	6.98	24.77	4.98
Min Ch El (ft)	2100.72	Shear (lb/sq ft)	0.66	1.25	0.50
Alpha	1.07	Stream Power (lb/ft s)	2.70	7.85	1.71
Frctn Loss (ft)	3.73	Cum Volume (acre-ft)	4.10	2.39	3.21
C & E Loss (ft)	0.02	Cum SA (acres)	5.09	1.46	4.28

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	51.44	64.30	19.77	4.82	6.98	8.48	0.70	4.10
2	Chan	64.30	69.24	30.41	5.46	4.94	13.05	1.11	5.57
3	Chan	69.24	74.18	35.45	5.99	4.94	15.21	1.21	5.92
4	Chan	74.18	79.12	41.45	6.58	4.94	17.79	1.33	6.30
5	Chan	79.12	84.06	49.02	7.27	4.94	21.04	1.47	6.74
6	Chan	84.06	89.00	47.93	7.21	5.00	20.57	1.46	6.65
7	ROB	89.00	102.77	8.97	2.62	4.98	3.85	0.54	3.42

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Unnamed Central
REACH: South RS: 0.5223

INPUT
Description: R.S. 0.5223
City of Scottsdale
Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2098.94	31.51	2099.38	31.83	2099.34	32.3	2099.35	33.05	2099.4
39.27	2099.31	42.13	2099.31	49.74	2099.21	82.96	2098.86	86.34	2098.6
88.81	2097.66	93.4	2095.94	93.8	2095.79	94.68	2095.46	105.95	2095.38
106.91	2095.37	110.42	2095.34	110.68	2095.4	111.47	2095.4	118.66	2095.69
118.9	2095.72	124.65	2096.36	131.16	2097.34	132.46	2096.95	139.24	2095.01
145.04	2096.65	150.59	2098.11	166.52	2097.9	174.6	2097.78	179.21	2097.8
183.66	2097.85	185.66	2097.02	187.67	2096.53	189.76	2096.79	197.54	2098.14
209.87	2099.72	215.47	2099.76	221.66	2099.88	237.79	2100.34	246.3	2100.41
263.25	2100.92	267.46	2100.93						

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.04	82.96	.035	118.66	.04	237.79	.025

Bank Sta: Left 93.8 Right 118.9 Lengths: Left 180.96 Channel 180.96 Right 180.96 Coeff Contr. .1 Expan. .3
Right Levee Station= 150.59 Elevation= 2098.11

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2097.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.49	Wt. n-Val.	0.035	0.035	0.040
W.S. Elev (ft)	2096.64	Reach Len. (ft)	180.96	180.96	180.96
Crit W.S. (ft)	2096.64	Flow Area (sq ft)	0.97	29.86	13.12
E.G. Slope (ft/ft)	0.016299	Area (sq ft)	0.97	29.86	13.12
Q Total (cfs)	233.00	Flow (cfs)	2.86	181.30	48.84
Top Width (ft)	46.50	Top Width (ft)	2.28	25.10	19.12
Vel Total (ft/s)	5.30	Avg. Vel. (ft/s)	2.94	6.07	3.72
Max Chl Dpth (ft)	1.63	Hydr. Depth (ft)	0.43	1.19	0.69
Conv. Total (cfs)	1825.0	Conv. (cfs)	22.4	1420.1	382.5
Length Wtd. (ft)	180.96	Wetted Per. (ft)	2.43	25.17	19.63
Min Ch El (ft)	2095.34	Shear (lb/sq ft)	0.41	1.21	0.68
Alpha	1.13	Stream Power (lb/ft s)	1.20	7.33	2.53
Frctn Loss (ft)	1.88	Cum Volume (acre-ft)	4.08	2.22	3.17
C & E Loss (ft)	0.08	Cum SA (acres)	5.07	1.32	4.22

Warning: The energy equation could not be balanced within the specified number of iterations. The

program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	75.04	93.80	2.86	0.97	2.43	1.23	0.43	2.94
2	Chan	93.80	98.82	34.82	5.86	5.08	14.95	1.17	5.95
3	Chan	98.82	103.84	38.37	6.18	5.02	16.47	1.23	6.21
4	Chan	103.84	108.86	40.35	6.37	5.02	17.32	1.27	6.34
5	Chan	108.86	113.88	38.72	6.22	5.03	16.62	1.24	6.23
6	Chan	113.88	118.90	29.04	5.24	5.03	12.46	1.04	5.54
7	ROB	118.90	150.59	48.84	13.12	19.63	20.96	0.69	3.72

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Unnamed Central
REACH: South RS: 0.4880

INPUT
Description: R.S. 0.4880 Carefree/Scottsdale Boundary
Carefree Highway in
cross section - dip crossing
Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2095.49	7.48	2095.5	20.72	2095.54	25.49	2094.97	33.97	2093.97
39.26	2094.42	43.42	2094.72	54.11	2092.58	54.3	2092.54	57.1	2092.01
74.75	2092.11	78.99	2092.13	81.15	2092.14	85.17	2092.21	90.95	2092.1
98.56	2092.17	107.29	2092.07	110.62	2092.09	119.95	2092.24	124.82	2092.37
125.33	2092.36	127.8	2092.56	132.69	2092.94	133.83	2093.07	135.02	2093.29
144.02	2094.99	145.5	2095.04	151.03	2094.97	151.26	2094.96	151.82	2094.96
166.31	2095	168.56	2094.99	173.45	2095.09	181.24	2095.17	186.97	2095.17
190.29	2095.13	192.17	2094.68	194.79	2094.17	196.1	2094	199.57	2093.87
205.81	2094.06								

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.04	57.1	.035	74.75	.025	135.02	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
54.3 127.8 131.84 131.84 131.84 .1 .3
Right Levee Station= 186.97 Elevation= 2095.17

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft) 2093.19 Element Left OB Channel Right OB

Vel Head (ft)	0.24	Wt. n-Val.	0.040	0.028	0.025
W.S. Elev (ft)	2092.95	Reach Len. (ft)	131.84	131.84	131.84
Crit W.S. (ft)	2092.83	Flow Area (sq ft)	0.41	58.56	0.96
E.G. Slope (ft/ft)	0.007203	Area (sq ft)	0.41	58.56	0.96
Q Total (cfs)	233.00	Flow (cfs)	0.43	230.96	1.61
Top Width (ft)	80.45	Top Width (ft)	2.01	73.50	4.94
Vel Total (ft/s)	3.89	Avg. Vel. (ft/s)	1.07	3.94	1.68
Max Chl Dpth (ft)	0.94	Hydr. Depth (ft)	0.20	0.80	0.19
Conv. Total (cfs)	2745.3	Conv. (cfs)	5.1	2721.3	19.0
Length Wtd. (ft)	131.84	Wetted Per. (ft)	2.05	73.56	4.95
Min Ch El (ft)	2092.01	Shear (lb/sq ft)	0.09	0.36	0.09
Alpha	1.02	Stream Power (lb/ft s)	0.10	1.41	0.15
Frctn Loss (ft)	0.92	Cum Volume (acre-ft)	4.08	2.04	3.14
C & E Loss (ft)	0.02	Cum SA (acres)	5.06	1.12	4.17

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	43.44	54.30	0.43	0.41	2.05	0.19	0.20	1.07
2	Chan	54.30	69.00	40.42	12.61	14.75	17.35	0.86	3.21
3	Chan	69.00	83.70	47.45	12.14	14.70	20.37	0.83	3.91
4	Chan	83.70	98.40	50.59	11.71	14.70	21.71	0.80	4.32
5	Chan	98.40	113.10	54.78	12.28	14.70	23.51	0.84	4.46
6	Chan	113.10	127.80	37.72	9.82	14.71	16.19	0.67	3.84
7	ROB	127.80	142.59	1.61	0.96	4.95	0.69	0.19	1.68

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Unnamed Central
REACH: South RS: 0.4631

INPUT
Description: R.S. 0.4631
Addition of 380 cfs back into south branch from
diversion at 60th Street
Carefree Highway in cross section
Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2092.37	1.45	2092.32	5.46	2092.31	7.46	2092.3	28.46	2092.92
31.01	2092.78	31.78	2092.69	41.54	2092.3	43.32	2092.22	45.66	2092.15
49.14	2091.76	60.83	2091.37	61.64	2091.35	62.17	2091.36	63.2	2091.36
72.03	2091.4	87.16	2091.42	87.74	2091.38	89.62	2091.34	98.4	2091.01
106.55	2090.71	107.63	2090.67	116.7	2089.57	119.29	2089.25	124.54	2088.79
126.39	2089.24	127.6	2089.59	131.13	2090.62	131.14	2090.62	135.05	2091.74
136.06	2091.46	142.38	2089.33	154.16	2090.71	159.8	2091.58	163.75	2091.72
171.07	2091.97	173.34	2091.93	179.74	2091.84	184.69	2091.66	185.14	2091.65
190.58	2091.73	207.48	2091.75	235.38	2092	243.52	2094	287.48	2094

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.04	41.54	.025	98.4	.035	154.16	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
116.7	127.6	152.02	152.02	152.02	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2092.25	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.40	Wt. n-Val.	0.031	0.035	0.035
W.S. Elev (ft)	2091.85	Reach Len. (ft)	152.02	152.02	152.02
Crit W.S. (ft)	2091.85	Flow Area (sq ft)	47.33	29.35	48.54
E.G. Slope (ft/ft)	0.006912	Area (sq ft)	47.33	29.35	48.54
Q Total (cfs)	562.00	Flow (cfs)	172.74	198.74	190.52
Top Width (ft)	158.42	Top Width (ft)	68.35	10.90	79.17
Vel Total (ft/s)	4.49	Avg. Vel. (ft/s)	3.65	6.77	3.93
Max Chl Dpth (ft)	3.06	Hydr. Depth (ft)	0.69	2.69	0.61
Conv. Total (cfs)	6759.7	Conv. (cfs)	2077.7	2390.5	2291.6
Length Wtd. (ft)	152.02	Wetted Per. (ft)	68.44	11.04	80.02
Min Ch El (ft)	2088.79	Shear (lb/sq ft)	0.30	1.15	0.26
Alpha	1.27	Stream Power (lb/ft s)	1.09	7.77	1.03
Frctn Loss (ft)	1.17	Cum Volume (acre-ft)	4.01	1.90	3.07
C & E Loss (ft)	0.01	Cum SA (acres)	4.95	0.99	4.04

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	46.68	70.02	18.96	7.73	21.68	3.37	0.36	2.45
2	LOB	70.02	93.36	31.92	10.88	23.34	5.68	0.47	2.93
3	LOB	93.36	116.70	121.86	28.73	23.42	21.68	1.23	4.24
4	Chan	116.70	118.88	33.12	5.26	2.20	5.89	2.41	6.30
5	Chan	118.88	121.06	38.95	5.79	2.19	6.93	2.66	6.73
6	Chan	121.06	123.24	43.79	6.21	2.19	7.79	2.85	7.0[illegible]
7	Chan	123.24	125.42	46.91	6.50	2.21	8.35	2.98	7.22
8	Chan	125.42	127.60	35.97	5.59	2.26	6.40	2.56	6.44
9	ROB	127.60	159.58	187.15	43.65	32.81	33.30	1.37	4.29
10	ROB	159.58	191.55	2.06	2.64	20.32	0.37	0.13	0.78
11	ROB	191.55	223.53	1.31	2.25	26.88	0.23	0.08	0.58

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Unnamed Central
REACH: South RS: 0.4343

INPUT
Description: R.S. 0.4343
Carefree Highway in cross section
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-130	2088.98	-100	2088	-92.6	2088	-60	2088.19	-15.2	2088.46
0	2088.34	14.55	2088.36	19.58	2084.95	20.32	2084.47	21.23	2084.82
28.58	2087.76	36.51	2086.81	37.23	2086.72	40.64	2087.18	44.95	2087.73
45.9	2087.62	51.58	2086.92	55.61	2086.84	63.07	2086.79	70.51	2087.28
77.57	2087.71	83.04	2085.33	83.8	2085.02	85.93	2084.16	87.52	2084.8
88.4	2085.15	88.6	2085.23	88.88	2085.34	95.72	2088.5	100.69	2088.16
100.79	2088.16	101.05	2088.16	111.69	2088.35	117.14	2088.69	118.38	2088.77
122.03	2089.06	130.92	2089.88	139.5	2090.48	145.18	2090.83	148.32	2091

148.57 2091 150.51 2091.02 154.46 2091.01 184.74 2091.03

ning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-130	.04	-92.6	.025	-60	.04	55.61	.035	88.88	.04
100.69	.025								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
83.8	88.4	222.33	222.33	222.33	.1	.3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
154.46	184.74	2093

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2088.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.49	Wt. n-Val.	0.038	0.035	0.039
W.S. Elev (ft)	2088.18	Reach Len. (ft)	222.33	222.33	222.33
Crit W.S. (ft)	2088.18	Flow Area (sq ft)	92.76	16.33	10.13
E.G. Slope (ft/ft)	0.008572	Area (sq ft)	92.76	16.33	10.13
Q Total (cfs)	562.00	Flow (cfs)	373.67	142.12	46.22
Top Width (ft)	124.69	Top Width (ft)	111.98	4.60	8.12
Vel Total (ft/s)	4.71	Avg. Vel. (ft/s)	4.03	8.70	4.56
Max Chl Dpth (ft)	4.02	Hydr. Depth (ft)	0.83	3.55	1.25
Conv. Total (cfs)	6070.2	Conv. (cfs)	4036.0	1535.0	499.2
Length Wtd. (ft)	222.33	Wetted Per. (ft)	114.51	4.96	8.78
Min Ch El (ft)	2084.16	Shear (lb/sq ft)	0.43	1.76	0.62
Alpha	1.42	Stream Power (lb/ft s)	1.75	15.34	2.82
Frctn Loss (ft)	1.60	Cum Volume (acre-ft)	3.76	1.83	2.96
C & E Loss (ft)	0.00	Cum SA (acres)	4.64	0.96	3.89

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
ning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	-130.00	-87.24	3.00	2.64	18.15	0.53	0.15	1.14
2	LOB	-87.24	-44.48	1.70	1.80	24.85	0.30	0.07	0.94
3	LOB	-44.48	-1.72						
4	LOB	-1.72	41.04	171.85	39.97	28.08	30.58	1.52	4.30
5	LOB	41.04	83.80	197.12	48.35	43.43	35.07	1.13	4.08
6	Chan	83.80	84.72	25.61	3.07	0.99	4.56	3.34	8.33
7	Chan	84.72	85.64	30.53	3.42	0.99	5.43	3.71	8.94
8	Chan	85.64	86.56	33.29	3.60	0.99	5.92	3.91	9.25
9	Chan	86.56	87.48	28.70	3.29	0.99	5.11	3.58	8.72
10	Chan	87.48	88.40	23.97	2.95	0.99	4.27	3.21	8.12
11	ROB	88.40	107.67	46.22	10.13	8.78	8.22	1.25	4.56

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

IVER: Unnamed Central

REACH: South RS: 0.3922

INPUT
Description: R.S. 0.3922
Carefree Highway in cross section
Station Elevation Data num= 55

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-190	2085.39	-118	2084	-110	2083.55	-52.1	2082	-38.2	2080
-25.6	2082	-5.5	2084	0	2084.1	1.36	2084.1	1.51	2084.1
11.32	2084.45	27.81	2083.73	29.1	2083.71	33.67	2083.72	40.34	2083.63
43.75	2083.66	57.26	2084.15	60.37	2084.22	62.34	2084.22	68.86	2084.12
75.63	2083.69	77.71	2083.55	83.81	2081.25	84.82	2080.92	86.13	2081.26
94.93	2083.47	97.03	2082.83	100.06	2082.15	105.81	2080.69	107.9	2080.15
109.19	2079.81	110.42	2079.49	113.5	2080.4	117.28	2081.51	122.71	2083.18
141.31	2083.37	143.78	2083.41	146.3	2083.44	146.6	2083.45	147.16	2083.43
148.17	2083.41	154.78	2083.42	166.95	2083.37	170.24	2083.39	172.55	2083.83
182.71	2085.37	184.07	2085.32	184.87	2085.31	185.63	2085.31	191.77	2085.09
194.93	2085.14	199.02	2085.01	205.4	2084.78	211.95	2084.78	221.76	2084.89

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-190	.04	-110	.025	-52.1	.04	77.71	.035	117.28	.04
182.71	.025								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
107.9	113.5	230	238.1	252	.3	.5

Left Levee Station= 11.32 Elevation= 2084.45
Blocked Obstructions num= 1

Sta L	Sta R	Elev
182	221.76	2086

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2084.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.50	Wt. n-Val.	0.035	0.035	0.037
W.S. Elev (ft)	2083.81	Reach Len. (ft)	230.00	238.10	252.00
Crit W.S. (ft)	2083.81	Flow Area (sq ft)	56.65	21.95	40.84
E.G. Slope (ft/ft)	0.006107	Area (sq ft)	56.65	21.95	40.84
Q Total (cfs)	562.00	Flow (cfs)	257.42	176.54	128.04
Top Width (ft)	120.48	Top Width (ft)	55.94	5.60	58.93
Vel Total (ft/s)	4.71	Avg. Vel. (ft/s)	4.54	8.04	3.13
Max Chl Dpth (ft)	4.32	Hydr. Depth (ft)	1.01	3.92	0.69
Conv. Total (cfs)	7191.3	Conv. (cfs)	3293.9	2259.0	1638.4
Length Wtd. (ft)	238.43	Wetted Per. (ft)	57.17	5.82	59.39
Min Ch El (ft)	2079.49	Shear (lb/sq ft)	0.38	1.44	0.26
Alpha	1.45	Stream Power (lb/ft s)	1.72	11.57	0.82
Frctn Loss (ft)	0.32	Cum Volume (acre-ft)	3.38	1.73	2.83
C & E Loss (ft)	0.23	Cum SA (acres)	4.21	0.94	3.71

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	11.32	59.61	1.55	2.36	21.82	0.28	0.11	0.66
2	LOB	59.61	107.90	255.86	54.29	35.35	45.53	1.59	4.71
3	Chan	107.90	109.02	33.65	4.26	1.16	5.99	3.81	7.89
4	Chan	109.02	110.14	38.10	4.59	1.16	6.78	4.10	8.30

5	Chan	110.14	111.26	39.75	4.72	1.17	7.07	4.22	8.42
6	Chan	111.26	112.38	34.92	4.37	1.17	6.21	3.90	7.98
7	Chan	112.38	113.50	30.13	4.00	1.17	5.36	3.57	7.53
8	ROB	113.50	135.15	104.84	25.75	22.06	18.65	1.19	4.07
9	ROB	135.15	156.80	14.06	8.99	21.65	2.50	0.42	1.56
10	ROB	156.80	178.46	9.14	6.10	15.67	1.63	0.39	1.50

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Unnamed Central
REACH: South RS: 0.3471

INPUT
Description: R.S. 0.3471 Imm. Upstream Mountain Side Drive Culverts
Imm.
Upstream of new culverts in new subdivision
Station Elevation Data num= 97

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2083.56	1.79	2083.51	21.59	2082.86	31.79	2082.61	41.19	2082.38
56.49	2081.95	66.54	2081.86	66.77	2081.86	66.95	2081.86	71.73	2081.92
74.03	2081.88	80.86	2081.84	87.09	2081.63	92.8	2081.35	97.61	2081.38
105.4	2081.43	107.25	2081.44	115.01	2081.47	119.34	2081.51	128.57	2081.23
132.12	2080.68	139.95	2079.85	144.04	2079.87	147.69	2079.97	152.69	2079.93
156.85	2079.99	158.36	2079.64	168.73	2078.16	169.04	2078.18	169.59	2078.22
181.37	2079.13	193.89	2077.3	197.02	2076.88	200.11	2077.83	208.31	2080.53
220.17	2079.98	237.25	2079.16	250.94	2079.15	266.68	2079.16	282	2079.2
292.7	2079.04	301.42	2078.18	306	2077.42	306.5	2077.34	307	2077.26
307.5	2077.18	310.91	2076.61	316.72	2075.94	322	2076.91	322.5	2077
322.86	2077.07	323	2077.1	323.5	2077.21	330.2	2078.7	338.09	2078.98
342.12	2079.15	346.12	2079.3	350.87	2078.06	354.92	2076.93	355.86	2077.05
357.78	2077.46	363.63	2079.06	373.17	2079.01	379.82	2078.9	386.02	2078.52
397.17	2078.78	398.81	2078.84	405.84	2079.18	434.3	2080.65	454.01	2080.5
495.91	2080.06	504.28	2080.47	519.1	2080.72	534.9	2080.38	542.96	2080.11
547	2079.89	550.27	2079.84	560.65	2078.96	571.33	2078.48	577.71	2078.59
588.97	2078.3	592.09	2078.35	595.52	2078.54	597.19	2078.33	607.15	2076.81
608.57	2076.95	610.91	2077.27	631.33	2079.93	650.02	2080.17	658.3	2080.35
678.63	2080.72	703.7	2081.16	706.34	2081.22	720.15	2080.88	720.22	2080.88
720.4	2080.88	738.46	2080.88						

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.04	80.86	.025	107.25	.04	310.91	.035	322.86	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
307.5	323.5	84	81.84	80	.3	.5

Ineffective Flow num= 3

Sta L	Sta R	Elev	Permanent
0	162	2080.06	F
231	298	2080.06	F
333	738.46	2080.06	F

Right Levee Station= 519.1 Elevation= 2080.72

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2080.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.040	0.036	0.040

W.S. Elev (ft)	2080.37	Reach Len. (ft)	84.00	81.84	80.00
Crit W.S. (ft)	2079.26	Flow Area (sq ft)	217.68	61.46	162.42
E.G. Slope (ft/ft)	0.000581	Area (sq ft)	217.68	61.46	162.42
Q Total (cfs)	562.00	Flow (cfs)	230.97	147.50	183.53
Top Width (ft)	325.93	Top Width (ft)	168.56	16.00	141.38
Vel Total (ft/s)	1.27	Avg. Vel. (ft/s)	1.06	2.40	1.13
Max Chl Dpth (ft)	4.43	Hydr. Depth (ft)	1.29	3.84	1.15
Conv. Total (cfs)	23315.5	Conv. (cfs)	9582.2	6119.2	7614.1
Length Wtd. (ft)	81.84	Wetted Per. (ft)	169.63	16.20	142.20
Min Ch El (ft)	2075.94	Shear (lb/sq ft)	0.05	0.14	0.04
Alpha	1.48	Stream Power (lb/ft s)	0.05	0.33	0.05
Frctn Loss (ft)		Cum Volume (acre-ft)	2.66	1.50	2.25
C & E Loss (ft)		Cum SA (acres)	3.62	0.88	3.14

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	108.00	162.00	6.96	13.28	27.07	1.24	0.49	0.52
2	LOB	162.00	231.00	108.68	98.60	65.93	19.34	1.51	1.10
3	LOB	231.00	298.00	79.86	82.50	67.03	14.21	1.23	0.97
4	LOB	298.00	307.50	35.47	23.30	9.60	6.31	2.45	1.52
5	Chan	307.50	310.70	22.13	11.07	3.24	3.94	3.46	2.00
6	Chan	310.70	313.90	31.09	12.55	3.22	5.53	3.92	2.48
7	Chan	313.90	317.10	36.28	13.71	3.23	6.46	4.28	2.65
8	Chan	317.10	320.30	33.08	13.02	3.25	5.89	4.07	2.54
9	Chan	320.30	323.50	24.91	11.13	3.26	4.43	3.48	2.24
10	ROB	323.50	333.00	30.09	20.73	9.67	5.35	2.18	1.45
11	ROB	333.00	426.05	151.99	135.89	93.69	27.04	1.46	1.12
12	ROB	426.05	519.10	1.44	5.80	38.84	0.26	0.15	0.25

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CULVERT

RIVER: Unnamed Central
REACH: South RS: 0.3394

INPUT
Description: Culvert No. 242, in new subdivision
Information obtained from
field survey of culverts
See Section C of TDN for Suvey Notes
Distance from Upstream XS = 11.8
Deck/Roadway Width = 62
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 5

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	2080.85	2074	150.2	2080.16	2074	306.05	2080.06	2074
327.06	2080.05	2074	750	2080.95	2074			

Upstream Bridge Cross Section Data
Station Elevation Data num= 97

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2083.56	1.79	2083.51	21.59	2082.86	31.79	2082.61	41.19	2082.38
56.49	2081.95	66.54	2081.86	66.77	2081.86	66.95	2081.86	71.73	2081.92
74.03	2081.88	80.86	2081.84	87.09	2081.63	92.8	2081.35	97.61	2081.38
105.4	2081.43	107.25	2081.44	115.01	2081.47	119.34	2081.51	128.57	2081.23
132.12	2080.68	139.95	2079.85	144.04	2079.87	147.69	2079.97	152.69	2079.93
156.85	2079.99	158.36	2079.64	168.73	2078.16	169.04	2078.18	169.59	2078.22
181.37	2079.13	193.89	2077.3	197.02	2076.88	200.11	2077.83	208.31	2080.53
220.17	2079.98	237.25	2079.16	250.94	2079.15	266.68	2079.16	282	2079.2
292.7	2079.04	301.42	2078.18	306	2077.42	306.5	2077.34	307	2077.26

307.5	2077.18	310.91	2076.61	316.72	2075.94	322	2076.91	322.5	2077
322.86	2077.07	323	2077.1	323.5	2077.21	330.2	2078.7	338.09	2078.98
342.12	2079.15	346.12	2079.3	350.87	2078.06	354.92	2076.93	355.86	2077.05
357.78	2077.46	363.63	2079.06	373.17	2079.01	379.82	2078.9	386.02	2078.52
397.17	2078.78	398.81	2078.84	405.84	2079.18	434.3	2080.65	454.01	2080.5
495.91	2080.06	504.28	2080.47	519.1	2080.72	534.9	2080.38	542.96	2080.11
547	2079.89	550.27	2079.84	560.65	2078.96	571.33	2078.48	577.71	2078.59
588.97	2078.3	592.09	2078.35	595.52	2078.54	597.19	2078.33	607.15	2076.81
608.57	2076.95	610.91	2077.27	631.33	2079.93	650.02	2080.17	658.3	2080.35
678.63	2080.72	703.7	2081.16	706.34	2081.22	720.15	2080.88	720.22	2080.88
720.4	2080.88	738.46	2080.88						

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.04	80.86	.025	107.25	.04	310.91	.035	322.86	.04

Bank Sta: Left Right Coeff Contr. Expan.
307.5 323.5 .3 .5

Ineffective Flow num= 3

Sta L	Sta R	Elev	Permanent
0	162	2080.06	F
231	298	2080.06	F
333	738.46	2080.06	F

Right Levee Station= 519.1 Elevation= 2080.72

Downstream Deck/Roadway Coordinates
num= 5

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	2080.85	2074	102.2	2080.16		198.7	2080.06	2074
219.71	2080.05	2074	612.97	2080.87	2074			

Downstream Bridge Cross Section Data
Station Elevation Data num= 77

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2079.5	.39	2079.49	11.88	2079.81	13.69	2079.85	16.23	2079.8
18.6	2079.73	28.64	2079.3	36.48	2078.58	42.49	2078.08	50.6	2078.81
51.7	2078.9	52.12	2078.89	74.47	2077.87	76.25	2077.37	85.9	2074.8
101.12	2077.31	104	2077.72	106.8	2078.11	128.15	2078.06	130.96	2078.07
132.38	2078.04	153.21	2077.66	170.85	2077.35	171.73	2077.34	172.14	2077.32
181.72	2077.17	199.59	2076.9	200.14	2076.76	207	2075.35	210.53	2074.62
215.96	2074.91	217.07	2075.08	218	2075.22	219	2075.36	220	2075.51
224.12	2076.11	232.38	2077.32	243.96	2077.24	246.51	2077.21	249.57	2076.68
255.37	2075.48	261.62	2076.3	268.27	2077.5	269.29	2077.49	278.45	2077.42
297.4	2076.96	303.97	2076.79	305.95	2076.71	312.65	2076.39	321.47	2076.51
325.31	2076.64	342.02	2077.28	344.47	2077.37	372.14	2078.11	379.65	2078.25
384.26	2078.22	392.97	2078.02	405.07	2077.74	426.95	2077.24	436.54	2077.49
448.98	2077.69	467.56	2077.86	471.62	2077.75	482.23	2076.08	490.29	2074.86
492.68	2074.96	494.33	2075.2	510.92	2077.3	515.53	2077.61	516.54	2077.67
530.94	2077.83	550.87	2078.26	555.77	2078.44	584.13	2078.41	601.8	2078.34
606.59	2078.23	612.97	2078.23						

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	16.23	.04	85.9	.035	106.8	.04

Bank Sta: Left Right Coeff Contr. Expan.
207 219 .3 .5

Ineffective Flow num= 3

Sta L	Sta R	Elev	Permanent
0	68	2077	F
101	196	2077	F
230	612.97	2077	F

Right Levee Station= 379.65 Elevation= 2078.25

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 2079.5
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert Name	Shape	Rise	Span
Culvert #1	Circular	3	

FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 2 - Groove end entrance with headwall
Solution Criteria = Highest U.S. EG

Culvert	Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
	10.8	64	.013	.013	0	.2	1

Number of Barrels = 8
Upstream Elevation = 2076.11
Centerline Stations

Sta.	Sta.	Sta.	Sta.	Sta.	Sta.	Sta.	Sta.
184.8	188.8	192.8	196.8	310.1	314.4	318.7	323

Downstream Elevation = 2076.05
Centerline Stations

Sta.	Sta.	Sta.	Sta.	Sta.	Sta.	Sta.	Sta.
79.9	83.9	87.9	91.9	202.75	207.05	211.35	215.65

CULVERT OUTPUT Profile #PF 1 Culv Group: Culvert #1

Q Culv Group (cfs)	449.26	Culv Full Len (ft)	19.62
# Barrels	8	Culv Vel US (ft/s)	7.94
Q Barrel (cfs)	56.16	Culv Vel DS (ft/s)	9.16
E.G. US. (ft)	2080.41	Culv Inv El Up (ft)	2076.11
W.S. US. (ft)	2080.37	Culv Inv El Dn (ft)	2076.05
E.G. DS (ft)	2077.70	Culv Frctn Ls (ft)	0.43
W.S. DS (ft)	2077.21	Culv Exit Loss (ft)	2.09
Delta EG (ft)	2.71	Culv Entr Loss (ft)	0.20
Delta WS (ft)	3.16	Q Weir (cfs)	112.74
E.G. IC (ft)	2080.37	Weir Sta Lft (ft)	134.67
E.G. OC (ft)	2080.41	Weir Sta Rgt (ft)	496.18
Culvert Control	Outlet	Weir Submerg	0.00
Culv WS Inlet (ft)	2079.11	Weir Max Depth (ft)	0.36
Culv WS Outlet (ft)	2078.48	Weir Avg Depth (ft)	0.25
Culv Nml Depth (ft)	3.00	Weir Flow Area (sq ft)	81.99
Culv Crt Depth (ft)	2.43	Min El Weir Flow (ft)	2080.06

Note: The normal depth exceeds the height of the culvert. The program assumes that the normal depth is equal to the height of the culvert.

CROSS SECTION

RIVER: Unnamed Central
REACH: South RS: 0.3316

INPUT
Description: R.S. 0.3316 Imm. Downstream Mountain Side Drive Culverts
Imm.
downstream of new culverts in new subdivision
Station Elevation Data num= 77

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2079.5	.39	2079.49	11.88	2079.81	13.69	2079.85	16.23	2079.8
18.6	2079.73	28.64	2079.3	36.48	2078.58	42.49	2078.08	50.6	2078.81
51.7	2078.9	52.12	2078.89	74.47	2077.87	76.25	2077.37	85.9	2074.8
101.12	2077.31	104	2077.72	106.8	2078.11	128.15	2078.06	130.96	2078.07
132.38	2078.04	153.21	2077.66	170.85	2077.35	171.73	2077.34	172.14	2077.32
181.72	2077.17	199.59	2076.9	200.14	2076.76	207	2075.35	210.53	2074.62
215.96	2074.91	217.07	2075.08	218	2075.22	219	2075.36	220	2075.51
224.12	2076.11	232.38	2077.32	243.96	2077.24	246.51	2077.21	249.57	2076.68
255.37	2075.48	261.62	2076.3	268.27	2077.5	269.29	2077.49	278.45	2077.42
297.4	2076.96	303.97	2076.79	305.95	2076.71	312.65	2076.39	321.47	2076.51
325.31	2076.64	342.02	2077.28	344.47	2077.37	372.14	2078.11	379.65	2078.25
384.26	2078.22	392.97	2078.02	405.07	2077.74	426.95	2077.24	436.54	2077.49
448.98	2077.69	467.56	2077.86	471.62	2077.75	482.23	2076.08	490.29	2074.86
492.68	2074.96	494.33	2075.2	510.92	2077.3	515.53	2077.61	516.54	2077.67
530.94	2077.83	550.87	2078.26	555.77	2078.44	584.13	2078.41	601.8	2078.34
606.59	2078.23	612.97	2078.23						

nning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	16.23	.04	85.9	.035	106.8	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
207	219	255	248.3	244	.3	.5

Ineffective Flow num= 3

Sta L	Sta R	Elev	Permanent
0	68	2077	F
101	196	2077	F
230	612.97	2077	F

Right Levee Station= 379.65 Elevation= 2078.25

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2077.70	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.48	Wt. n-Val.	0.037	0.040	0.040
W.S. Elev (ft)	2077.21	Reach Len. (ft)	255.00	248.30	244.00
Crit W.S. (ft)	2077.21	Flow Area (sq ft)	39.96	27.46	52.02
E.G. Slope (ft/ft)	0.013915	Area (sq ft)	39.96	27.46	52.02
Q Total (cfs)	562.00	Flow (cfs)	179.57	207.58	174.85
Top Width (ft)	150.01	Top Width (ft)	51.69	12.00	86.31
Vel Total (ft/s)	4.71	Avg. Vel. (ft/s)	4.49	7.56	3.36
Max Chl Dpth (ft)	2.59	Hydr. Depth (ft)	0.77	2.29	0.60
Conv. Total (cfs)	4764.2	Conv. (cfs)	1522.3	1759.7	1482.2
Length Wtd. (ft)	250.71	Wetted Per. (ft)	52.37	12.12	86.78
Min Ch El (ft)	2074.62	Shear (lb/sq ft)	0.66	1.97	0.52
Alpha	1.40	Stream Power (lb/ft s)	2.98	14.88	1.75
Frctn Loss (ft)	3.59	Cum Volume (acre-ft)	2.41	1.42	2.05
C & E Loss (ft)	0.02	Cum SA (acres)	3.40	0.85	2.93

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
ning: Divided flow computed for this cross-section.
ning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	68.00	101.00	143.88	28.57	24.20	25.60	1.21	5.04
2	LOB	101.00	148.50						
3	LOB	148.50	196.00	2.35	2.21	17.01	0.42	0.13	1.06
4	LOB	196.00	207.00	33.34	9.18	11.16	5.93	0.83	3.63
5	Chan	207.00	209.40	35.87	5.07	2.45	6.38	2.11	7.08
6	Chan	209.40	211.80	48.51	6.05	2.43	8.63	2.52	8.02
7	Chan	211.80	214.20	46.92	5.91	2.40	8.35	2.46	7.95
8	Chan	214.20	216.60	42.58	5.58	2.41	7.58	2.32	7.63
9	Chan	216.60	219.00	33.70	4.86	2.43	6.00	2.03	6.93
10	ROB	219.00	230.00	53.48	11.51	11.12	9.52	1.05	4.65
11	ROB	230.00	304.83	67.22	22.07	40.20	11.96	0.55	3.05
12	ROB	304.83	379.65	54.15	18.44	35.46	9.64	0.52	2.94

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
ote: Multiple critical depths were found at this location. The critical depth with the lowest, valid,

energy was used.

CROSS SECTION

RIVER: Unnamed Central
REACH: South RS: 0.2845

INPUT
Description: R.S. 0.2845
Station Elevation Data num= 82

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2073.09	7.67	2073.02	31.38	2072.93	42.94	2072.88	71.57	2072.39
79.05	2072.39	90.03	2072.05	97.95	2070.52	100.28	2070.09	102.48	2069.94
114.95	2069.2	115.34	2069.27	125.52	2071.22	131.01	2071.92	133.65	2072.04
138.85	2071.91	139.5	2071.81	145.53	2070.88	153.31	2071.51	155.51	2071.64
156.32	2071.7	159.1	2071.09	162.6	2070.33	162.9	2070.26	165.21	2069.75
166.15	2069.46	167.83	2069.78	170.3	2070.25	171	2070.38	171.3	2070.44
171.5	2070.48	182.37	2072.55	182.68	2072.6	183.42	2072.6	197.31	2072.45
221.16	2072.24	230.45	2071.74	237.12	2072.1	241.95	2072.09	244.87	2072.26
246.65	2072.14	255.16	2069.57	255.32	2069.61	262.53	2071.72	298.29	2072.79
307.92	2073.1	309.96	2073.08	317.13	2073	318.8	2072.99	351.26	2072.63
381.5	2072.75	384.28	2072.55	390.56	2071.77	399.83	2072.34	405.36	2072.72
408.18	2072.88	428.93	2073.85	430.42	2073.78	440.93	2073.42	446.15	2073.29
449.36	2072.76	460.11	2070.87	467.18	2071.74	476.95	2072.92	487.17	2073.27
491.42	2073.31	499.49	2072.06	499.85	2072.01	500.25	2072.02	510.24	2072.78
512.41	2072.93	512.53	2072.95	512.84	2072.96	519.81	2073.33	526.69	2072.68
527.9	2072.59	541.15	2073.7	546.81	2074.15	550.26	2074.32	553.95	2074.35
564.79	2074.87	567.13	2075.02						

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.04	100.28	.035	167.83	.058	182.37	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
162.6	171	270	254.27	245	.3	.5

Right Levee Station= 307.92 Elevation= 2073.1

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2072.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.54	Wt. n-Val.	0.035	0.040	0.042
W.S. Elev (ft)	2071.69	Reach Len. (ft)	270.00	254.27	245.00
Crit W.S. (ft)	2071.69	Flow Area (sq ft)	63.66	14.81	19.55
E.G. Slope (ft/ft)	0.014735	Area (sq ft)	63.66	14.81	19.55
Q Total (cfs)	562.00	Flow (cfs)	387.02	95.91	79.07
Top Width (ft)	88.78	Top Width (ft)	59.29	8.40	21.09
Vel Total (ft/s)	5.73	Avg. Vel. (ft/s)	6.08	6.48	4.04
Max Chl Dpth (ft)	2.49	Hydr. Depth (ft)	1.07	1.76	0.93
Conv. Total (cfs)	4629.8	Conv. (cfs)	3188.3	790.1	651.4
Length Wtd. (ft)	257.72	Wetted Per. (ft)	59.93	8.59	21.83
Min Ch El (ft)	2069.46	Shear (lb/sq ft)	0.98	1.59	0.82
Alpha	1.06	Stream Power (lb/ft s)	5.94	10.27	3.33
Frctn Loss (ft)	3.82	Cum Volume (acre-ft)	2.11	1.30	1.85
C & E Loss (ft)	0.02	Cum SA (acres)	3.08	0.79	2.63

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

Profile #PF 1

Pos	Left Sta	Right Sta	Flow	Area	W.P.	Percent	Hydr	Velocity

		(ft)	(ft)	(cfs)	(sq ft)	(ft)	Conv	Depth(ft)	(ft/s)
1	LOB	65.04	97.56	9.10	3.08	5.75	1.62	0.55	2.96
2	LOB	97.56	130.08	345.81	50.18	31.91	61.53	1.59	6.89
3	LOB	130.08	162.60	32.11	10.40	22.27	5.71	0.47	3.09
4	Chan	162.60	164.28	17.45	2.59	1.72	3.10	1.54	6.72
5	Chan	164.28	165.96	25.15	3.24	1.74	4.47	1.93	7.75
6	Chan	165.96	167.64	29.09	3.52	1.72	5.18	2.10	8.26
7	Chan	167.64	169.32	14.56	2.99	1.71	2.59	1.78	4.86
8	Chan	169.32	171.00	9.66	2.46	1.71	1.72	1.46	3.93
9	ROB	171.00	239.46	10.25	4.44	6.95	1.82	0.65	2.31
10	ROB	239.46	307.92	68.82	15.11	14.87	12.25	1.06	4.56

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Unnamed Central
REACH: South RS: 0.2364

INPUT
Description: R.S. 0.2364
Station Elevation Data num= 58

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-140	2068	-126.4	2068	0	2067.06	5.37	2067.06	17.71	2066.99
80	2067.13	97.6	2067.19	107.44	2066.94	121.38	2066.77	139.34	2065.23
139.5	2065.22	146.41	2064.6	146.6	2064.59	151.72	2064.92	155.04	2065.24
159.1	2065.31	159.37	2065.31	162.17	2066.1	167.96	2066.09	181.1	2065.57
184.12	2065.59	198.98	2065.61	199.59	2065.57	201.25	2065.74	212.32	2066.74
235.21	2066.89	238.02	2066.91	242.37	2066.88	256.2	2066.79	259.51	2065.68
262.6	2065.03	269.72	2066.15	273.6	2066.98	279.88	2067.16	294.25	2067.3
312.27	2068.27	319.03	2068.45	328.25	2068.51	331.35	2068.51	334.12	2068.46
335.92	2068.36	342.92	2068.01	354.14	2066.37	356.27	2065.97	360.18	2066.59
366.25	2067.6	367.99	2067.67	373.28	2067.87	394.08	2068.68	408.48	2069.25
434.3	2070.34	435.38	2070.3	453.86	2069.67	456.94	2069.81	466.21	2070.37
473.22	2070.63	497.12	2071.7	511.04	2072.17				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-140	.04	146.41	.035	181.1	.058	212.32	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
139.5	159.1	245	249.01	255	.1	.3

Right Levee Station= 328.25 Elevation= 2068.51

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2067.28	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.51	Wt. n-Val.	0.040	0.037	0.045
W.S. Elev (ft)	2066.77	Reach Len. (ft)	245.00	249.01	255.00
Crit W.S. (ft)	2066.77	Flow Area (sq ft)	14.13	35.32	64.78
E.G. Slope (ft/ft)	0.014920	Area (sq ft)	14.13	35.32	64.78
Q Total (cfs)	562.00	Flow (cfs)	53.72	258.22	250.06
Top Width (ft)	112.59	Top Width (ft)	18.36	19.60	74.63
Vel Total (ft/s)	4.92	Avg. Vel. (ft/s)	3.80	7.31	3.86
Max Chl Dpth (ft)	2.18	Hydr. Depth (ft)	0.77	1.80	0.87
Conv. Total (cfs)	4601.1	Conv. (cfs)	439.8	2114.1	2047.3
Length Wtd. (ft)	249.28	Wetted Per. (ft)	18.43	19.65	75.21
Min Ch El (ft)	2064.59	Shear (lb/sq ft)	0.71	1.67	0.80
Alpha	1.35	Stream Power (lb/ft s)	2.72	12.24	3.10
Frctn Loss (ft)	3.90	Cum Volume (acre-ft)	1.87	1.15	1.61

C & E Loss (ft) 0.02 Cum SA (acres) 2.84 0.71 2.36

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	83.60	139.50	53.72	14.13	18.43	9.56	0.77	3.80
2	Chan	139.50	143.42	43.85	6.78	3.94	7.80	1.73	6.47
3	Chan	143.42	147.34	61.32	8.11	3.93	10.91	2.07	7.56
4	Chan	147.34	151.26	64.45	7.87	3.93	11.47	2.01	8.18
5	Chan	151.26	155.18	49.09	6.69	3.94	8.74	1.71	7.33
6	Chan	155.18	159.10	39.51	5.87	3.92	7.03	1.50	6.73
7	ROB	159.10	243.68	183.41	49.29	58.43	32.64	0.85	3.72
8	ROB	243.68	328.25	66.65	15.49	16.78	11.86	0.95	4.30

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Unnamed Central
REACH: South RS: 0.1892

INPUT
Description: R.S. 0.1892
Station Elevation Data num= 63

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2063.16	51.25	2062.67	53.65	2062.45	62.72	2061.23	65.06	2060.91
65.54	2060.86	66.93	2060.96	80.08	2062.21	96.9	2062.45	97.93	2062.49
98.9	2062.4	114.91	2061.17	127.94	2062.75	128.97	2062.91	130.29	2062.87
143.83	2062.37	151.88	2061.52	153.15	2061.38	156.61	2061.3	178.64	2060.76
181.97	2060.93	185.75	2060.9	186.31	2060.88	194.63	2060.52	196.08	2060.49
197.07	2060.43	203.03	2060.5	211.58	2060.7	212.3	2060.67	212.4	2060.66
213.93	2060.6	224.82	2060.32	229.38	2060.2	231.3	2060.53	231.5	2060.57
231.8	2060.62	233.32	2060.88	239.73	2062.61	252.58	2062	259.73	2061.47
265.66	2060.62	267.48	2060.44	269.64	2060.81	287.2	2062.38	302.13	2062.52
305.64	2062.47	306.96	2062.62	307.57	2062.65	313.04	2062.83	318.33	2063.16
343.79	2064.53	350.31	2064.88	356.77	2064.94	366.79	2065.07	374.52	2065.09
387.13	2064.79	404.41	2063.9	405.97	2063.81	406.73	2063.85	412.43	2064.08
431.72	2064.95	437.12	2065.16	442.15	2065.29				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.04	203.03	.035	239.73	.058	307.57	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
212.3	231.8	170	174.97	182	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2062.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.42	Wt. n-Val.	0.039	0.035	0.052
W.S. Elev (ft)	2061.83	Reach Len. (ft)	170.00	174.97	182.00
Crit W.S. (ft)	2061.83	Flow Area (sq ft)	73.36	27.51	19.70
E.G. Slope (ft/ft)	0.016390	Area (sq ft)	73.36	27.51	19.70
Q Total (cfs)	562.00	Flow (cfs)	321.66	187.84	52.49
Top Width (ft)	146.11	Top Width (ft)	95.33	19.50	31.28
Vel Total (ft/s)	4.66	Avg. Vel. (ft/s)	4.38	6.83	2.66
Max Chl Dpth (ft)	1.63	Hydr. Depth (ft)	0.77	1.41	0.63
Conv. Total (cfs)	4389.9	Conv. (cfs)	2512.6	1467.3	410.0
Length Wtd. (ft)	176.48	Wetted Per. (ft)	95.55	19.54	31.59
Min Ch El (ft)	2060.20	Shear (lb/sq ft)	0.79	1.44	0.64
Alpha	1.25	Stream Power (lb/ft s)	3.44	9.83	1.70
Frctn Loss (ft)	3.15	Cum Volume (acre-ft)	1.62	0.97	1.36
C & E Loss (ft)	0.02	Cum SA (acres)	2.52	0.60	2.05

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	42.46	84.92	25.53	8.87	17.97	4.54	0.50	2.88
2	LOB	84.92	127.38	10.25	4.66	14.15	1.82	0.33	2.20
3	LOB	127.38	169.84	37.27	11.84	20.95	6.63	0.57	3.15
4	LOB	169.84	212.30	248.61	47.98	42.48	44.24	1.13	5.18
5	Chan	212.30	216.20	30.05	4.82	3.90	5.35	1.24	6.24
6	Chan	216.20	220.10	34.43	5.23	3.90	6.13	1.34	6.59
7	Chan	220.10	224.00	38.83	5.62	3.90	6.91	1.44	6.91
8	Chan	224.00	227.90	43.47	6.01	3.90	7.74	1.54	7.23
9	Chan	227.90	231.80	41.05	5.83	3.94	7.30	1.50	7.04
10	ROB	231.80	273.87	49.06	17.38	24.36	8.73	0.72	2.82
11	ROB	273.87	315.94	3.44	2.32	7.23	0.61	0.32	1.48

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Unnamed Central
REACH: South RS: 0.1561

INPUT
Description: R.S. 0.1561
Station Elevation Data num= 71

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2060.23	12.88	2060.41	27.76	2060.17	53.4	2059.69	66.72	2059.34
76.06	2059.23	81.85	2058.31	86.64	2057.29	92.92	2057.64	101.89	2058.21
109.91	2058.26	115.71	2058.38	124.22	2058.44	127.38	2058.45	132.19	2058.42
135.03	2058.37	138.89	2058.13	148.48	2057.54	150.51	2057.66	156.17	2058.05
161.44	2058.27	167.69	2057.74	169.17	2057.67	176	2057.15	176.56	2057.11
179.15	2057.05	179.18	2057.05	183.01	2056.96	185.57	2056.96	201.22	2056.65
204.8	2057.09	210.94	2057.84	216.6	2058.59	234.85	2058.3	242.92	2058.17
244.72	2058.1	250.18	2058.06	260.12	2057.98	263.56	2057.79	275.55	2057.38

292.93	2058.05	310.5	2058.11	313.02	2057.92	318.37	2057.31	337.47	2055.82
364.54	2057.57	371.23	2058.02	376.46	2057.54	384.69	2057.25	391.99	2056.81
397.13	2055.82	400.56	2056.18	419.79	2057.9	436.02	2059.26	444.56	2059.06
453.26	2058.37	453.75	2058.32	456.41	2058.33	482.82	2058.39	488.9	2057.86
495.24	2057.28	499.4	2056.96	505.02	2057.41	512.93	2058.12	527.65	2059.1
536.89	2059.3	554.59	2060.59	556.82	2060.68	562.13	2061.04	579.02	2061.93
586.98	2061.98								

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.04	169.17	.035	210.94	.058	244.72	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
176	204.8	330	303.5	280	.1	.3

Right Levee Station= 436.02 Elevation= 2059.26

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2058.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.36	Wt. n-Val.	0.037	0.035	0.040
W.S. Elev (ft)	2057.73	Reach Len. (ft)	330.00	303.50	280.00
Crit W.S. (ft)	2057.73	Flow Area (sq ft)	4.88	24.20	90.40
E.G. Slope (ft/ft)	0.019560	Area (sq ft)	4.88	24.20	90.40
Q Total (cfs)	562.00	Flow (cfs)	10.57	127.88	423.56
Top Width (ft)	172.19	Top Width (ft)	23.64	28.80	119.75
Vel Total (ft/s)	4.70	Avg. Vel. (ft/s)	2.16	5.28	4.69
Max Chl Dpth (ft)	1.91	Hydr. Depth (ft)	0.21	0.84	0.75
Conv. Total (cfs)	4018.4	Conv. (cfs)	75.6	914.3	3028.5
Length Wtd. (ft)	298.59	Wetted Per. (ft)	23.73	28.83	120.15
Min Ch El (ft)	2056.65	Shear (lb/sq ft)	0.25	1.03	0.92
Alpha	1.04	Stream Power (lb/ft s)	0.54	5.42	4.30
Frctn Loss (ft)	2.32	Cum Volume (acre-ft)	1.47	0.87	1.13
C & E Loss (ft)	0.07	Cum SA (acres)	2.29	0.50	1.73

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	70.40	105.60	4.05	2.14	9.72	0.72	0.22	1.90
2	LOB	105.60	140.80						
3	LOB	140.80	176.00	6.52	2.75	14.01	1.16	0.20	2.37
4	Chan	176.00	181.76	17.26	3.84	5.76	3.07	0.67	4.49
5	Chan	181.76	187.52	21.84	4.43	5.76	3.89	0.77	4.93
6	Chan	187.52	193.28	26.38	4.96	5.76	4.69	0.86	5.32
7	Chan	193.28	199.04	32.47	5.62	5.76	5.78	0.97	5.78
8	Chan	199.04	204.80	29.93	5.36	5.79	5.33	0.93	5.59
9	ROB	204.80	281.87	9.84	4.80	21.66	1.75	0.22	2.05
10	ROB	281.87	358.95	258.42	49.05	46.98	45.98	1.05	5.27
11	ROB	358.95	436.02	155.29	36.55	51.52	27.63	0.71	4.25

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Unnamed Central
REACH: South RS: 0.0986

INPUT
Description: R.S. 0.0986
Station Elevation Data num= 86

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-50	2052.5	-16.53	2052.11	-11.12	2051.74	5.71	2050.5	11.18	2050.78
25.35	2051.49	25.77	2051.49	37.06	2051.45	41.53	2051.4	49.68	2051.47
52.92	2051.5	54.94	2051.3	59.42	2051.63	70.8	2051.52	80.83	2052.39
82.01	2052.01	84.34	2051.12	88.54	2051.65	92.63	2052.03	97.07	2051.87
105.23	2051.48	113.77	2051.85	127.76	2052.37	131.26	2052.61	152.14	2052.36
152.15	2052.36	156.28	2052.29	168.8	2050.92	169.69	2050.82	170.32	2050.68
171.48	2050.71	177.38	2050.73	177.4	2050.73	182.48	2050.75	199.25	2050.83
200.85	2050.82	201.5	2050.9	201.89	2050.94	211.11	2051.65	235.35	2052.66
242.88	2052.79	268.3	2052.03	268.74	2052.02	268.86	2052.01	268.93	2052.02
284.48	2052.65	287.47	2052.82	293.09	2053.02	295.06	2053.04	313.9	2051.53
316.71	2051.4	322.28	2051.35	335.88	2051.66	342.87	2051.75	346.98	2051.7
351.99	2051.65	356.12	2051.71	372.54	2052.61	376.21	2052.79	376.24	2052.79
376.28	2052.79	376.52	2052.8	399.42	2053.71	411.54	2054.38	431.81	2053.91
457.19	2053.55	460.27	2053.7	492.57	2055.78	496.46	2055.91	501.8	2055.87
511.89	2055.84	539.68	2054.83	541.56	2054.75	541.82	2054.75	544.81	2054.25
559.68	2051.74	563.47	2052.09	584.16	2053.61	596.83	2052.66	600.36	2052.47
604.22	2052.34	617.43	2051.77	624.89	2052.76	629.58	2053.48	634.04	2053.76
644.6	2054.26								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-50	.04	169.69	.035	211.11	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
168.8	201.5	233.04	233.04	233.04	.1	.3

Left Levee Station= 152.15 Elevation= 2052.36
Right Levee Station= 496.46 Elevation= 2055.91

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2052.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.	0.040	0.035	0.039
W.S. Elev (ft)	2052.36	Reach Len. (ft)	233.04	233.04	233.04
Crit W.S. (ft)	2052.36	Flow Area (sq ft)	131.35	51.98	61.14
E.G. Slope (ft/ft)	0.004134	Area (sq ft)	131.35	51.98	61.14
Q Total (cfs)	562.00	Flow (cfs)	256.71	192.60	112.70
Top Width (ft)	325.64	Top Width (ft)	181.76	32.70	111.18
Vel Total (ft/s)	2.30	Avg. Vel. (ft/s)	1.95	3.71	1.84
Max Chl Dpth (ft)	1.86	Hydr. Depth (ft)	0.72	1.59	0.55
Conv. Total (cfs)	8740.4	Conv. (cfs)	3992.4	2995.3	1752.7
Length Wtd. (ft)	233.04	Wetted Per. (ft)	182.28	32.73	111.30
Min Ch El (ft)	2050.68	Shear (lb/sq ft)	0.19	0.41	0.14
Alpha	1.35	Stream Power (lb/ft s)	0.36	1.52	0.26
Frctn Loss (ft)	1.31	Cum Volume (acre-ft)	0.95	0.60	0.65
C & E Loss (ft)	0.02	Cum SA (acres)	1.51	0.29	0.99

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	-50.00	-9.57	4.63	6.09	28.46	0.82	0.21	0.76
2	LOB	-9.57	30.86	128.23	51.44	40.50	22.82	1.27	2.49
3	LOB	30.86	71.29	68.92	35.43	40.46	12.26	0.88	1.95
4	LOB	71.29	111.72	36.48	24.15	40.32	6.49	0.60	1.51
5	LOB	111.72	152.15	4.35	4.64	15.82	0.77	0.29	0.94
6	LOB	152.15	168.80	14.10	9.60	16.73	2.51	0.58	1.47
7	Chan	168.80	175.34	39.38	10.62	6.56	7.01	1.62	3.71
8	Chan	175.34	181.88	40.10	10.63	6.54	7.14	1.63	3.77
9	Chan	181.88	188.42	38.97	10.45	6.54	6.93	1.60	3.73
10	Chan	188.42	194.96	37.71	10.24	6.54	6.71	1.57	3.68
11	Chan	194.96	201.50	36.45	10.04	6.54	6.49	1.54	3.63
12	ROB	201.50	299.82	39.19	19.91	46.80	6.97	0.43	1.97
13	ROB	299.82	398.14	73.50	41.23	64.50	13.08	0.64	1.78

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Unnamed Central
REACH: South RS: 0.0545

INPUT
Description: R.S. 0.0545
Station Elevation Data num= 91

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-210	2048.2	-186.01	2048.39	-183.91	2048.33	-177.71	2048.11	-174.86	2048.1
-170.03	2048.09	-163.24	2047.94	-155.11	2047.96	-148.98	2047.06	-145.59	2046.41
-140.05	2048.05	-137.89	2048.66	-134.7	2048.56	-116.5	2047.55	-113.45	2047.47
-111.2	2047.16	-98.64	2045.83	-83.49	2047.15	-77.03	2047.66	-71.3	2047.77
-57.56	2047.8	-49.39	2046.83	-46.88	2046.65	-41.51	2046.99	-36.59	2047.3
-33.28	2047.39	-27.15	2047.28	-16.1	2046.55	-8.64	2046.94	0	2046.99
.7	2046.98	8.76	2047.28	18.34	2047.57	31.53	2048.12	54.23	2049.07
59.89	2049.54	66.94	2048.89	75.23	2049.5	77.1	2049.45	80.01	2049.01
86.39	2047.5	101.99	2047.39	114.81	2047.45	123.76	2046.07	124.8	2045.91
129.89	2045.11	129.96	2045.1	142.24	2045.47	151.44	2045.83	152.3	2045.96
153.5	2046.14	162.03	2047.58	163.16	2047.57	163.49	2047.58	165.59	2046.34
166.84	2045.41	167.49	2045.55	174.89	2047.7	193.55	2048.54	198.12	2048.69
209.24	2048.19	222.86	2047.57	245.54	2046.85	253.26	2046.63	256.03	2046.55
259.11	2046.66	269.27	2047.05	280.39	2047.3	288.8	2047.47	301.04	2048.07
303.44	2048.17	304.15	2048.2	304.92	2048.26	305.91	2048.32	329.43	2049.17
349.13	2050.29	355.11	2050.43	359.01	2050.54	363.57	2050.29	385.39	2049.01
393.55	2048.5	397.02	2048.34	405.44	2048.14	417.06	2049.09	422.61	2049.47
435.76	2050.05	438.41	2050.22	447.59	2050.95	459.86	2051.68	465.79	2051.91
483.07	2052.92								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-210	.04	86.39	.035	151.44	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
124.8 152.3 200 207.66 220 .1 .3
Right Levee Station= 359.01 Elevation= 2050.54

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2047.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.35	Wt. n-Val.	0.039	0.035	0.040
W.S. Elev (ft)	2047.41	Reach Len. (ft)	200.00	207.66	220.00
Crit W.S. (ft)	2047.41	Flow Area (sq ft)	63.39	53.46	40.03
E.G. Slope (ft/ft)	0.008148	Area (sq ft)	63.39	53.46	40.03
Q Total (cfs)	562.00	Flow (cfs)	151.48	317.98	92.55
Top Width (ft)	231.20	Top Width (ft)	126.79	27.50	76.91
Vel Total (ft/s)	3.58	Avg. Vel. (ft/s)	2.39	5.95	2.31
Max Chl Dpth (ft)	2.31	Hydr. Depth (ft)	0.50	1.94	0.52
Conv. Total (cfs)	6226.1	Conv. (cfs)	1678.1	3522.7	1025.3
Length Wtd. (ft)	208.14	Wetted Per. (ft)	127.40	27.59	77.94
Min Ch El (ft)	2045.10	Shear (lb/sq ft)	0.25	0.99	0.26
Alpha	1.75	Stream Power (lb/ft s)	0.60	5.86	0.60
Frctn Loss (ft)	0.52	Cum Volume (acre-ft)	0.43	0.32	0.38
C & E Loss (ft)	0.08	Cum SA (acres)	0.68	0.13	0.49

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	-210.00	-143.04	9.61	4.31	8.53	1.71	0.52	2.23
2	LOB	-143.04	-76.08	77.93	26.24	33.87	13.87	0.78	2.97
3	LOB	-76.08	-9.12	35.92	18.51	45.26	6.39	0.41	1.94
4	LOB	-9.12	57.84	11.26	6.94	22.23	2.00	0.31	1.62
5	LOB	57.84	124.80	16.77	7.40	17.50	2.98	0.43	2.27
6	Chan	124.80	130.30	62.38	10.62	5.56	11.10	1.93	5.87
7	Chan	130.30	135.80	79.15	12.20	5.50	14.08	2.22	6.49
8	Chan	135.80	141.30	69.54	11.29	5.50	12.37	2.05	6.16
9	Chan	141.30	146.80	59.52	10.28	5.50	10.59	1.87	5.79
10	Chan	146.80	152.30	47.38	9.06	5.51	8.43	1.65	5.23
11	ROB	152.30	221.20	49.27	16.53	19.85	8.77	0.88	2.98
12	ROB	221.20	290.11	43.28	23.50	58.08	7.70	0.40	1.84

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Unnamed Central
REACH: South RS: 0.0151

INPUT
Description: R.S. 0.0151 - Farthest Downstream in model
Imm. upstream of Cave
Creek Road
Station Elevation Data num= 68

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2044.38	4.81	2044.38	10.41	2044.35	15.7	2044.24	28.48	2043.9
41.21	2044.19	59.67	2044.43	66.19	2044.39	80.91	2044.41	89.27	2044.75
94.5	2044.72	115.48	2044.22	122.28	2044.27	128.79	2044.13	142.23	2044.02
151.26	2041.94	155.43	2041.2	157.49	2041.39	158.33	2041.52	168.61	2042.55
172.17	2044.67	175.78	2044.69	188.03	2044.79	213.56	2044.54	227.33	2044.64
229.06	2044.6	229.44	2044.6	237.94	2043.18	247.1	2041.63	247.3	2041.6
248.07	2041.46	252.75	2041.48	254.93	2041.55	255.19	2041.48	256.54	2041.48
257.16	2041.47	257.18	2041.47	260.85	2041.4	270.78	2041.17	272.5	2041.47
272.8	2041.52	272.81	2041.52	280.81	2043.69	285.77	2043.59	312.35	2043.49
318.87	2043.38	326.91	2043.5	336.25	2043.47	352.36	2043.71	375.55	2043.89
378.67	2043.82	383.3	2044.2	389.6	2044.63	391.83	2044.76	393.43	2044.81
408.29	2045.71	417.25	2046.1	430.56	2045.3	439.27	2044.7	447.05	2044.31
452.26	2043.87	455.9	2043.91	481.46	2046.15	481.7	2046.17	493.3	2046.07
493.65	2046.05	503.29	2045.1	503.74	2045.07				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	229.44	.035	312.35	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
247.3	272.8	0	0	0	.1	.3

Right Levee Station= 417.25 Elevation= 2046.1

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2044.61	Element			
Vel Head (ft)	0.08	Wt. n-Val.	0.039	0.035	0.037
W.S. Elev (ft)	2044.53	Reach Len. (ft)			
Crit W.S. (ft)	2043.26	Flow Area (sq ft)	124.13	80.07	109.21
E.G. Slope (ft/ft)	0.001197	Area (sq ft)	124.13	80.07	109.21
Q Total (cfs)	562.00	Flow (cfs)	163.75	251.81	146.44
Top Width (ft)	311.60	Top Width (ft)	170.77	25.50	115.34
Vel Total (ft/s)	1.79	Avg. Vel. (ft/s)	1.32	3.14	1.34
Max Chl Dpth (ft)	3.36	Hydr. Depth (ft)	0.73	3.14	0.95
Conv. Total (cfs)	16245.8	Conv. (cfs)	4733.6	7279.1	4233.2
Length Wtd. (ft)		Wetted Per. (ft)	172.10	25.56	115.66
Min Ch El (ft)	2041.17	Shear (lb/sq ft)	0.05	0.23	0.07
Alpha	1.68	Stream Power (lb/ft s)	0.07	0.74	0.09
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Warning: Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	0.00	49.46	8.84	17.31	49.62	1.57	0.35	0.51
2	LOB	49.46	98.92	1.23	4.57	34.40	0.22	0.13	0.27
3	LOB	98.92	148.38	11.54	19.71	46.08	2.05	0.43	0.59
4	LOB	148.38	197.84	103.80	57.03	24.31	18.47	2.42	1.82
5	LOB	197.84	247.30	38.35	25.50	17.69	6.82	1.46	1.50
6	Chan	247.30	252.40	47.99	15.56	5.11	8.54	3.05	3.08
7	Chan	252.40	257.50	47.56	15.48	5.11	8.46	3.03	3.07
8	Chan	257.50	262.60	49.76	15.89	5.10	8.85	3.12	3.13
9	Chan	262.60	267.70	52.82	16.47	5.10	9.40	3.23	3.21
10	Chan	267.70	272.80	53.68	16.67	5.13	9.55	3.27	3.22
11	ROB	272.80	320.95	86.45	55.66	48.44	15.38	1.16	1.55
12	ROB	320.95	369.10	52.30	43.95	48.15	9.31	0.91	1.19

13	ROB	369.10	417.25	7.69	9.60	19.06	1.37	0.50	0.80

Warning: Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

SUMMARY OF MANNING'S N VALUES

River:Unnamed Central

Reach	River Sta.	n1	n2	n3	n4	n5	n6	n7	n8
North	0.8848	.04	.035	.04	.025	.04	.025		
North	0.8582	.04	.035	.025	.04	.025			
North	0.8342	.04	.025	.053	.04	.025			
North	0.8062	.025	.04	.053	.032	.04			
North	0.7874	.032	.04	.035	.04				
North	0.7698	.032	.025	.04	.035	.04			
North	0.7490	.025	.035	.032	.04				
North	0.7415	Culvert							
North	0.7352	.032	.025	.035	.04	.025	.04		
North	0.7098	.025	.032	.035	.04	.035	.04		
North	0.6796	.025	.032	.04	.025				
North	0.6530	.032	.04	.025	.04				
North	0.6303	.025	.04	.032	.04	.025			
North	0.5956	.04	.025	.04	.032	.04	.025		
North	0.5545	.025	.04	.035	.058	.04			
North	0.5365	.025	.04	.035	.058	.04			
North	0.5260	.025	.032	.025	.04	.035	.058	.04	
North	0.5133	.025	.032	.025	.04	.035	.04		
North	0.4732	.025	.058	.04	.035	.04	.025		
North	0.4575	.025	.04	.058	.04	.035	.04	.025	.04
North	0.4484	.04	.058	.04	.035	.04			
North	0.4415	Culvert							
North	0.4326	.032							
North	0.4039	.025	.04	.032	.035	.032			
North	0.3840	.025	.04	.035	.032	.035	.025		
North	0.3583	.025	.04	.035	.032	.035	.04		
North	0.3322	.025	.04	.035	.032	.035	.04		
North	0.3036	.032	.025	.04	.058	.04			
North	0.2756	.025	.032	.04	.058	.032	.058		
North	0.2529	.025	.032	.04	.058	.032	.058	.025	
North	0.2185	.025	.04	.032	.058	.025			
North	0.1625	.04	.032	.058	.04				
North	0.1364	.032	.04	.032	.058	.025			
North	0.1061	.04	.032	.058	.04	.025			
North	0.0866	.025	.04	.028	.058	.04			
North	0.0663	.025	.04	.028	.04	.028	.058	.04	.025
North	0.0390	.025	.032	.04	.028	.04	.032		
North	0.0146	.032	.025	.032	.04	.028			
South	0.8919	.025	.035	.04					
South	0.880	Lat Struct							
South	0.8717	.04	.035	.04					
South	0.8382	.032	.035	.058					
South	0.8110	.032	.035	.04					
South	0.7910	.032	.035	.032					
South	0.7656	.032	.035	.032					
South	0.7472	.032	.035	.032	.025				
South	0.7248	.032	.035	.032	.025	.025	.032		
South	0.7028	.032	.035	.032	.025	.032	.025		
South	0.6835	.032	.035	.032	.025				
South	0.6750	Culvert							
South	0.6656	.04	.035	.025					
South	0.6450	.04	.035	.04					
South	0.6052	.04	.035	.04					
South	0.5671	.04	.035	.04					
South	0.5223	.04	.035	.04	.025				
South	0.4880	.04	.035	.025	.04				

South	0.4631	.04	.025	.035	.04		
South	0.4343	.04	.025	.04	.035	.04	.025
South	0.3922	.04	.025	.04	.035	.04	.025
South	0.3471	.04	.025	.04	.035	.04	
South	0.3394	Culvert					
South	0.3316	.025	.04	.035	.04		
South	0.2845	.04	.035	.058	.04		
South	0.2364	.04	.035	.058	.04		
South	0.1892	.04	.035	.058	.04		
South	0.1561	.04	.035	.058	.04		
South	0.0986	.04	.035	.04			
South	0.0545	.04	.035	.04			
South	0.0151	.04	.035	.04			

SUMMARY OF REACH LENGTHS

River: Unnamed Central

Reach	River Sta.	Left	Channel	Right
North	0.8848	150	140.45	120
North	0.8582	126.72	126.72	126.72
North	0.8342	155	148.09	145
North	0.8062	105	99.5	95
North	0.7874	85	92.69	99
North	0.7698	113	109.82	108
North	0.7490	72.86	72.86	72.86
North	0.7415	Culvert		
North	0.7352	125	133.63	140
North	0.7098	159.74	159.74	159.74
North	0.6796	145	140.45	138
North	0.6530	122	119.86	118
North	0.6303	183.22	183.22	183.22
North	0.5956	210	217.01	230
North	0.5545	102	94.94	90
North	0.5365	60	55.5	52
North	0.5260	66	67.1	67
North	0.5133	207	211.73	220
North	0.4732	55	48.45	44
North	0.4575	76	82.8	88
North	0.4484	83.42	83.42	83.42
North	0.4415	Culvert		
North	0.4326	155	151.54	150
North	0.4039	105.07	105.07	105.07
North	0.3840	139	135.84	133
North	0.3583	137.5	137.5	137.5
North	0.3322	148	151.01	155
North	0.3036	147.84	147.84	147.84
North	0.2756	125	119.86	117
North	0.2529	177	181.63	186
North	0.2185	295.68	295.68	295.68
North	0.1625	137.99	137.99	137.99
North	0.1364	158	159.98	164
North	0.1061	100	102.6	106
North	0.0866	107.32	107.32	107.32
North	0.0663	146	144.46	142
North	0.0390	122	128.83	133
North	0.0146	0	0	0
South	0.8919	101	106.73	110
South	0.880	Lat Struct		
South	0.8717	185	176.72	171
South	0.8382	144	143.65	142
South	0.8110	105.88	105.88	105.88
South	0.7910	138	133.85	130
South	0.7656	101	97.21	94
South	0.7472	112	118.09	127
South	0.7248	112	116.51	120
South	0.7028	101.92	101.92	101.92

South	0.6835	94.29	94.29	94.29
South	0.6750	Culvert		
South	0.6656	112	108.61	105
South	0.6450	200	210.22	222
South	0.6052	204	201.22	199
South	0.5671	236.61	236.61	236.61
South	0.5223	180.96	180.96	180.96
South	0.4880	131.84	131.84	131.84
South	0.4631	152.02	152.02	152.02
South	0.4343	222.33	222.33	222.33
South	0.3922	230	238.1	252
South	0.3471	84	81.84	80
South	0.3394	Culvert		
South	0.3316	255	248.3	244
South	0.2845	270	254.27	245
South	0.2364	245	249.01	255
South	0.1892	170	174.97	182
South	0.1561	330	303.5	280
South	0.0986	233.04	233.04	233.04
South	0.0545	200	207.66	220
South	0.0151	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Unnamed Central

Reach	River Sta.	Contr.	Expan.
North	0.8848	.3	.5
North	0.8582	.3	.5
North	0.8342	.1	.3
North	0.8062	.1	.3
North	0.7874	.1	.3
North	0.7698	.3	.5
North	0.7490	.3	.5
North	0.7415	Culvert	
North	0.7352	.3	.5
North	0.7098	.3	.5
North	0.6796	.1	.3
North	0.6530	.1	.3
North	0.6303	.1	.3
North	0.5956	.1	.3
North	0.5545	.1	.3
North	0.5365	.1	.3
North	0.5260	.1	.3
North	0.5133	.1	.3
North	0.4732	.1	.3
North	0.4575	.3	.5
North	0.4484	.3	.5
North	0.4415	Culvert	
North	0.4326	.3	.5
North	0.4039	.3	.5
North	0.3840	.1	.3
North	0.3583	.1	.3
North	0.3322	.1	.3
North	0.3036	.1	.3
North	0.2756	.1	.3
North	0.2529	.1	.3
North	0.2185	.1	.3
North	0.1625	.1	.3
North	0.1364	.1	.3
North	0.1061	.1	.3
North	0.0866	.1	.3
North	0.0663	.1	.3
North	0.0390	.1	.3
North	0.0146	.1	.3
South	0.8919	.1	.3
South	0.880	Lat Struct	

South	0.8717		.1	.3
South	0.8382		.1	.3
South	0.8110		.1	.3
South	0.7910		.1	.3
South	0.7656		.1	.3
South	0.7472		.1	.3
South	0.7248		.1	.3
South	0.7028		.3	.5
South	0.6835		.3	.5
South	0.6750	Culvert		
South	0.6656		.3	.5
South	0.6450		.3	.5
South	0.6052		.1	.3
South	0.5671		.1	.3
South	0.5223		.1	.3
South	0.4880		.1	.3
South	0.4631		.1	.3
South	0.4343		.1	.3
South	0.3922		.3	.5
South	0.3471		.3	.5
South	0.3394	Culvert		
South	0.3316		.3	.5
South	0.2845		.3	.5
South	0.2364		.1	.3
South	0.1892		.1	.3
South	0.1561		.1	.3
South	0.0986		.1	.3
South	0.0545		.1	.3
South	0.0151		.1	.3

ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : Plan 02

River: Unnamed Central Reach: South RS: 0.8919 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Central Reach: South RS: 0.880 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Central Reach: South RS: 0.8717 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.

Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Unnamed Central Reach: South RS: 0.8382 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was
used.
River: Unnamed Central Reach: South RS: 0.8110 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Central Reach: South RS: 0.7910 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Central Reach: South RS: 0.7656 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water
surface that had the least amount of error between computed and assumed values.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Central Reach: South RS: 0.7472 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.

Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Central Reach: South RS: 0.7248 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Central Reach: South RS: 0.7028 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Central Reach: South RS: 0.6835 Profile: PF 1
Warning:During subcritical analysis, the water surface upstream of culvert went to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Unnamed Central Reach: South RS: 0.6750 Profile: PF 1
Warning:During subcritical analysis, the water surface upstream of culvert went to critical depth.
River: Unnamed Central Reach: South RS: 0.6656 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Unnamed Central Reach: South RS: 0.6450 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated

water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Central Reach: South RS: 0.6052 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Central Reach: South RS: 0.5671 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Central Reach: South RS: 0.5223 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was
used.
River: Unnamed Central Reach: South RS: 0.4880 Profile: PF 1
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was
used.
River: Unnamed Central Reach: South RS: 0.4631 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Central Reach: South RS: 0.4343 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.

Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Central Reach: South RS: 0.3922 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was
used.
River: Unnamed Central Reach: South RS: 0.3471 Profile: PF 1
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Unnamed Central Reach: South RS: 0.3394 Profile: PF 1 Culv: Culvert #1
Note: The normal depth exceeds the height of the culvert. The program assumes that the normal depth is equal to the height
of the culvert.
River: Unnamed Central Reach: South RS: 0.3316 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program u critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Unnamed Central Reach: South RS: 0.2845 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was
used.
River: Unnamed Central Reach: South RS: 0.2364 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.

Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was
used.
River: Unnamed Central Reach: South RS: 0.1892 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Central Reach: South RS: 0.1561 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was
used.
River: Unnamed Central Reach: South RS: 0.0986 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was
used.
River: Unnamed Central Reach: South RS: 0.0545 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was
used.
River: Unnamed Central Reach: South RS: 0.0151 Profile: PF 1
Warning:Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was
used.
River: Unnamed Central Reach: North RS: 0.8848 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was
used.
River: Unnamed Central Reach: North RS: 0.8582 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Central Reach: North RS: 0.8342 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Central Reach: North RS: 0.8062 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.

River: Unnamed Central Reach: North RS: 0.7874 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Central Reach: North RS: 0.7698 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Manning's n values were composited to a single value in the main channel.
River: Unnamed Central Reach: North RS: 0.7490 Profile: PF 1
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Unnamed Central Reach: North RS: 0.7352 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Manning's n values were composited to a single value in the main channel.
River: Unnamed Central Reach: North RS: 0.7098 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was
used.
River: Unnamed Central Reach: North RS: 0.6796 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water
surface that had the least amount of error between computed and assumed values.

Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Central Reach: North RS: 0.6530 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was
used.
River: Unnamed Central Reach: North RS: 0.6303 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Central Reach: North RS: 0.5956 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Central Reach: North RS: 0.5545 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Central Reach: North RS: 0.5365 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The

program defaulted to critical depth.
River: Unnamed Central Reach: North RS: 0.5260 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Manning's n values were composited to a single value in the main channel.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was
used.
River: Unnamed Central Reach: North RS: 0.5133 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Central Reach: North RS: 0.4732 Profile: PF 1
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Unnamed Central Reach: North RS: 0.4575 Profile: PF 1
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Unnamed Central Reach: North RS: 0.4484 Profile: PF 1
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Unnamed Central Reach: North RS: 0.4415 Profile: PF 1 Culv: Culvert #1
Note: Culvert critical depth exceeds the height of the culvert.
River: Unnamed Central Reach: North RS: 0.4326 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Unnamed Central Reach: North RS: 0.4039 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.

River: Unnamed Central Reach: North RS: 0.3840 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Central Reach: North RS: 0.3583 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Central Reach: North RS: 0.3322 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was
used.
River: Unnamed Central Reach: North RS: 0.3036 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Central Reach: North RS: 0.2756 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was
used.
River: Unnamed Central Reach: North RS: 0.2529 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water
surface that had the least amount of error between computed and assumed values.

Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Central Reach: North RS: 0.2185 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was
used.
River: Unnamed Central Reach: North RS: 0.1625 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Manning's n values were composited to a single value in the main channel.
River: Unnamed Central Reach: North RS: 0.1364 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Manning's n values were composited to a single value in the main channel.
River: Unnamed Central Reach: North RS: 0.1061 Profile: PF 1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: Unnamed Central Reach: North RS: 0.0866 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The

program defaulted to critical depth.
River: Unnamed Central Reach: North RS: 0.0663 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Central Reach: North RS: 0.0390 Profile: PF 1
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was
used.

HEC-RAS Model Summary Tables

Unnamed Central Tributary to Cave Creek

HEC-RAS Plan: Plan 02 Profile: PF 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
South	0.8919	PF 1	562.00	2138.89	2140.74	2140.74	2141.01	0.009985	5.02	153.88	280.18	0.71
South	0.866		Lat Struct									
South	0.8717	PF 1	562.00	2134.48	2139.01	2139.01	2139.50	0.006430	8.63	125.21	141.46	0.74
South	0.8382	PF 1	562.00	2132.20	2135.56	2135.56	2135.91	0.007629	6.75	159.72	206.96	0.69
South	0.8110	PF 1	562.00	2131.36	2132.53	2132.53	2132.78	0.020883	5.83	144.39	292.89	1.05
South	0.7910	PF 1	562.00	2129.42	2129.79	2129.79	2129.99	0.013181	1.46	155.79	395.69	0.63
South	0.7656	PF 1	562.00	2127.01	2127.06	2127.06	2127.30	0.014116	0.45	144.65	321.40	0.48
South	0.7472	PF 1	562.00	2124.31	2125.44	2125.44	2125.63	0.018926	3.72	161.55	450.55	0.92
South	0.7248	PF 1	562.00	2121.61	2122.19	2122.19	2122.55	0.007002	2.24	126.53	329.98	0.56
South	0.7028	PF 1	562.00	2118.91	2119.46	2119.46	2119.75	0.007748	2.19	151.93	315.46	0.58
South	0.6835	PF 1	233.00	2114.80	2116.08	2116.08	2116.69	0.017562	6.29	37.83	33.91	1.02
South	0.6750		Culvert									
South	0.6656	PF 1	233.00	2111.29	2113.10	2113.10	2113.70	0.014004	6.43	39.41	33.45	0.94
South	0.6450	PF 1	233.00	2108.81	2110.87	2110.87	2111.59	0.012407	7.17	37.15	27.90	0.92
South	0.6052	PF 1	233.00	2105.77	2107.09	2107.09	2107.52	0.015329	5.84	47.66	57.60	0.95
South	0.5871	PF 1	233.00	2100.72	2102.28	2102.28	2102.85	0.015239	6.28	39.96	36.42	0.97
South	0.5223	PF 1	233.00	2095.34	2096.64	2096.64	2097.14	0.016299	6.07	43.96	46.50	0.98
South	0.4860	PF 1	233.00	2092.01	2092.95	2092.83	2093.19	0.007203	3.94	59.92	80.45	0.78
South	0.4631	PF 1	562.00	2088.79	2091.85	2091.85	2092.25	0.006912	6.77	125.22	158.42	0.73
South	0.4343	PF 1	562.00	2084.16	2088.18	2088.18	2088.67	0.008572	8.70	119.21	124.69	0.81
South	0.3922	PF 1	562.00	2079.49	2083.81	2083.81	2084.31	0.006107	8.04	119.44	120.48	0.72
South	0.3471	PF 1	562.00	2075.94	2080.37	2079.26	2080.41	0.000581	2.40	441.56	325.93	0.22
South	0.3394		Culvert									
South	0.3316	PF 1	562.00	2074.62	2077.21	2077.21	2077.70	0.013915	7.56	119.43	150.01	0.88
South	0.2845	PF 1	562.00	2069.46	2071.69	2071.69	2072.23	0.014735	6.48	98.02	88.78	0.86
South	0.2364	PF 1	562.00	2064.59	2066.77	2066.77	2067.28	0.014920	7.31	114.23	112.59	0.96
South	0.1892	PF 1	562.00	2060.20	2061.83	2061.83	2062.26	0.016390	6.83	120.57	146.11	1.01
South	0.1561	PF 1	562.00	2056.65	2057.73	2057.73	2058.08	0.019560	5.28	119.49	172.19	1.02
South	0.0986	PF 1	562.00	2050.68	2052.36	2052.36	2052.47	0.004134	3.71	244.48	325.64	0.52
South	0.0545	PF 1	562.00	2045.10	2047.41	2047.41	2047.76	0.008148	5.95	156.89	231.20	0.75
South	0.0151	PF 1	562.00	2041.17	2044.53	2043.26	2044.61	0.001197	3.14	313.41	311.60	0.31
North	0.8648	PF 1	2092.00	2133.03	2137.63	2137.63	2139.15	0.011293	12.23	224.19	164.94	1.02
North	0.8582	PF 1	2092.00	2132.02	2134.48	2134.48	2135.47	0.008293	8.06	268.70	141.47	0.99
North	0.8342	PF 1	2092.00	2128.07	2132.45	2132.45	2133.16	0.009155	9.83	355.64	226.10	0.90
North	0.8062	PF 1	2092.00	2123.97	2129.28	2129.28	2129.62	0.005665	5.48	467.85	273.54	0.46
North	0.7874	PF 1	2092.00	2121.89	2126.77	2126.77	2127.34	0.007248	9.54	436.58	325.36	0.80
North	0.7698	PF 1	2168.00	2119.72	2123.83	2123.83	2124.58	0.011833	7.71	316.47	229.36	0.86
North	0.7490	PF 1	2168.00	2117.94	2122.83	2121.80	2122.97	0.000880	3.69	782.90	380.56	0.30
North	0.7415		Culvert									
North	0.7352	PF 1	2168.00	2117.00	2120.91	2120.91	2122.40	0.010336	10.11	229.97	424.36	0.93
North	0.7098	PF 1	1775.00	2111.87	2117.05	2117.05	2117.66	0.009704	10.79	307.71	278.36	0.88
North	0.6796	PF 1	1775.00	2108.09	2112.36	2112.36	2113.21	0.010620	9.29	257.19	143.94	0.82
North	0.6530	PF 1	1775.00	2104.97	2110.67	2110.67	2111.82	0.005440	10.57	241.73	113.56	0.80
North	0.6303	PF 1	1810.00	2101.95	2106.70	2106.70	2107.57	0.008486	10.18	284.18	144.70	0.89
North	0.5956	PF 1	1810.00	2097.67	2102.04	2102.04	2103.06	0.010073	11.23	244.09	121.81	1.01
North	0.5545	PF 1	1810.00	2092.53	2097.06	2097.06	2097.95	0.011761	11.55	285.63	143.09	1.01
North	0.5365	PF 1	1810.00	2090.39	2094.98	2094.98	2095.80	0.012959	12.31	299.68	172.66	1.06
North	0.5260	PF 1	1810.00	2089.88	2093.43	2093.43	2094.27	0.014323	10.59	293.25	151.87	1.00
North	0.5133	PF 1	1810.00	2088.49	2091.71	2091.71	2092.36	0.011437	9.59	311.81	275.17	0.96
North	0.4732	PF 1	1810.00	2083.31	2086.30		2086.63	0.006647	6.43	409.41	209.84	0.71
North	0.4575	PF 1	1810.00	2081.25	2086.31		2086.44	0.001189	4.07	655.46	209.20	0.33
North	0.4484	PF 1	1853.00	2080.47	2086.29	2084.73	2086.36	0.000451	2.72	1039.93	325.42	0.21
North	0.4415		Culvert									
North	0.4326	PF 1	1853.00	2077.42	2082.24	2082.24	2083.56	0.008450	11.39	209.83	272.23	0.95
North	0.4039	PF 1	1853.00	2073.55	2075.80	2075.80	2076.49	0.010336	8.99	284.66	210.52	1.17
North	0.3840	PF 1	1853.00	2071.27	2073.43	2073.43	2074.01	0.013123	7.25	318.85	266.90	0.93
North	0.3583	PF 1	1853.00	2068.29	2070.38	2070.38	2071.08	0.012632	6.99	288.02	206.11	0.92
North	0.3322	PF 1	1853.00	2064.91	2067.33	2067.33	2068.13	0.014389	6.90	260.30	168.72	0.87
North	0.3036	PF 1	1853.00	2060.67	2063.64	2063.64	2064.86	0.020085	7.53	219.74	130.31	0.79
North	0.2758	PF 1	2271.00	2054.97	2059.97	2059.97	2060.76	0.021123	10.25	345.60	242.49	0.84
North	0.2529	PF 1	2271.00	2054.11	2056.66	2056.66	2057.44	0.025413	7.69	321.80	202.94	0.93
North	0.2185	PF 1	2271.00	2049.27	2053.93	2053.93	2054.91	0.007634	10.80	383.38	175.38	0.90
North	0.1625	PF 1	2360.00	2043.43	2048.00	2048.00	2049.17	0.008509	10.91	320.38	133.09	0.92
North	0.1364	PF 1	2360.00	2041.24	2045.08	2045.08	2046.23	0.012564	11.21	303.33	133.81	1.03
North	0.1061	PF 1	2360.00	2038.07	2041.42		2041.90	0.005095	6.02	431.33	154.94	0.60
North	0.0866	PF 1	2360.00	2036.53	2039.86	2039.86	2041.15	0.008781	10.62	281.13	111.62	1.06
North	0.0563	PF 1	2443.00	2034.48	2038.13	2038.13	2039.34	0.009473	9.64	278.34	116.23	0.92
North	0.0390	PF 1	2443.00	2031.71	2038.14	2035.64	2038.42	0.000772	4.92	720.29	204.40	0.35
North	0.0146	PF 1	2462.00	2029.00	2038.23	2035.33	2038.30	0.000284	3.30	1335.49	400.24	0.20

HEC-RAS:

Unnamed Central Tributary to Cave Creek – Diversion Branch

HEC-RAS Version 3.1.1 May 2003
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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

PROJECT DATA
Project Title: UC Trib to Cave Creek - Diversion PAW
Project File : UCdiv_Final.prj
Run Date and Time: 03/25/2004 12:35:06 PM

Project in English units

Project Description:
Diversion off of Unnamed Tributary to Cave Creek
Diversion of 663 cfs due to
overtopping at Los Reales Drive into this model
Prepared by CH2M HILL for the
Flood Control District of Maricopa County
Contract No. FCD
2000C037.
Topographic Mapping Source: Flown and Mapped by M&B Aerial, Flight
Date: 8/2/2001
2' Contour Interval, Datum: NAD 83/NGVD29 from GDACS Control
Network (established and maintained by MCDOT).
Discharge information obtained
from the Carefree Drainage Master Plan Final Data Collection Report, dated
November 2002 (addendum February 2003).
Upstream limit of model = diversion
from Unnamed Central Tributary
Downstream limit of model = limit of available
topographic mapping

PLAN DATA

Plan Title: Plan 01
Plan File : C:\Carefree\HEC-RAS Files\Updated Flow (3-20-04)\UCdiv_Final.p01

Geometry Title: UC Trib to Cave Creek - Diversion Branch
Geometry File : C:\Carefree\HEC-RAS Files\Updated Flow (3-20-04)\UCdiv_Final.g01

Flow Title : Flow Data
Flow File : C:\Carefree\HEC-RAS Files\Updated Flow (3-20-04)\UCdiv_Final.f01

Plan Summary Information:

Number of:	Cross Sections =	10	Mulitple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 20
Maximum difference tolerance = 0.3

Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: Flow Data
Flow File : C:\Carefree\HEC-RAS Files\Updated Flow (3-20-04)\UCdiv_Final.f01

Flow Data (cfs)

River	Reach	RS	PF 1
UC-div	Main	0.1797	494
UC-div	Main	0.1569	894

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
UC-div	Main	PF 1	Critical	Critical

GEOMETRY DATA

Geometry Title: UC Trib to Cave Creek - Diversion Branch
Geometry File : C:\Carefree\HEC-RAS Files\Updated Flow (3-20-04)\UCdiv_Final.g01

CROSS SECTION

RIVER: UC-div
REACH: Main RS: 0.1797

INPUT
Description: R.S. 0.1797
Includes Supplemental Ground Survey
Station Elevation Data num= 58

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2118.4	.55	2118.15	.77	2118.19	.87	2118.19	.89	2118.19
1.23	2118.18	18.43	2118.08	26.49	2117.93	31.09	2117.84	34.2	2117.8
56.41	2117.63	62.03	2117.49	71.71	2117.3	85.2	2117.24	88.29	2117.22
93.7	2117.24	98.44	2117.24	99.59	2117.34	104.54	2117.79	104.57	2117.79
104.61	2117.79	113.85	2117.76	121.9	2117.57	123.12	2117.56	124.71	2117.52
129.39	2117.63	146.55	2116.68	146.69	2116.68	146.78	2116.67	151.66	2116.25
153.62	2116.38	157.57	2116.47	167.36	2116.93	174.63	2117.04	180.62	2117.28
182.42	2116.81	183.62	2116.02	189.51	2118.04	190.96	2118.65	193.28	2119
197.3	2118.68	199	2118.3	199.31	2118.23	200.48	2118.15	202.46	2117.67
211.47	2117.87	223.58	2118.14	233	2118.27	234.1	2118.28	236.65	2118.31
236.86	2118.31	237.59	2118.31	238.18	2118.32	238.71	2118.32	239.18	2118.33
239.63	2118.33	240.08	2118.34	240.14	2118.34				

Manning's n Values num= 2

Sta	n Val	Sta	n Val
0	.032	200.48	.025

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
199	233	119.95	119.95	119.95	.1	.3

CROSS SECTION

RIVER: UC-div
REACH: Main RS: 0.1569

INPUT
Description: R.S. 0.1569
Includes Supplemental Ground Survey
Station Elevation Data num= 72

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-220	2116.5	-99.45	2114.46	-81.85	2114.63	-76.92	2114.75	-60.87	2115.39
-57.79	2115.22	-56.09	2115.27	-52.76	2114.96	-51.63	2115.07	-45.08	2115.65
-43.51	2115.48	-38.09	2114.84	-32.99	2114.57	-23.59	2115.11	-13.47	2115.92
-13.4	2115.92	-13.36	2115.93	0	2115.55	5.06	2115.41	8.11	2115.37
17.37	2115.36	20.48	2115.24	43.37	2114.97	46.29	2114.91	47.15	2114.87
49.14	2114.81	52.54	2113.73	56.68	2112.58	58.63	2112.55	62.84	2113.7
64.94	2113.2	67.63	2112.68	78.32	2114.61	80.12	2114.84	102.01	2114.82
110.82	2115.02	117.67	2115.18	122.85	2115.02	125.82	2115.13	130.01	2115.2
132.69	2115.22	133.74	2115.24	141.91	2115.33	143.08	2115.33	149.63	2115.52
150.67	2115.54	151.33	2115.55	152.01	2115.56	152.35	2115.56	183.55	2115.46
189.22	2115.39	239.75	2115.63	241.49	2115.63	242.84	2115.64	244.61	2115.64
245.35	2115.63	247.6	2115.6	248.48	2115.59	267	2115.27	284.35	2114.96
287.37	2114.91	289.31	2114.82	295.45	2114.79	307.67	2114.73	313.34	2115.11
316.01	2115.15	317	2115.19	319.58	2115.3	346.32	2115.1	350.84	2115
360.25	2114.97	375.07	2114.93						

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-220	.04	-23.59	.032	117.67	.025	267	.032	316.01	.025

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
267	317	145	149.51	155	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
321	375.07	2117	T

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
152	260	2117	357	376	2117

CROSS SECTION

RIVER: UC-div
REACH: Main RS: 0.1286

INPUT
Description: R.S. 0.1286
Includes Supplemental Ground Survey
Station Elevation Data num= 112

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-220	2112.7	-218.73	2112.67	-214.31	2112.53	-207.79	2112.33	-198.1	2112.06
-196.92	2112.01	-193.68	2111.91	-192.77	2111.86	-182.89	2111.48	-181.58	2111.43
-181.21	2111.42	-171.81	2111.2	-156.82	2110.33	-155.2	2111.18	-152.14	2111.22
-140.32	2111.1	-139.27	2111.22	-131.95	2112.15	-131.23	2112.23	-130.46	2112.31
-127.94	2112.3	-115.91	2112.18	-107.19	2112.22	-104.44	2112.45	-92.94	2112.48
-89.12	2112.54	-87.72	2112.49	-86.73	2112.47	-78.85	2112.61	-78.14	2112.61
-67.34	2112.46	-60.61	2111.07	-60.02	2110.95	-46.41	2112.41	-46.12	2112.44
-44.66	2112.46	-12.69	2112.74	-6.8	2112.7	0	2112.6	10.17	2112.45
23.31	2112.34	25.45	2112.32	26.55	2112.26	37.34	2111.77	44.56	2111.71
62.67	2111.58	70.28	2111.53	79.67	2111.49	102.45	2111.53	104.57	2111.52
112.18	2111.55	112.37	2111.53	120.56	2111.33	122.5	2111.2	128.49	2111.11
129.62	2110.73	137.17	2109.15	140.08	2109.1	149.13	2110.63	149.33	2110.38
149.87	2110.43	150.4	2110.45	159.04	2110.78	166.2	2110.85	169.64	2110.09
171.71	2109.49	181.16	2110.93	183.41	2111.25	183.77	2111.24	199.15	2111.14
210.78	2111.05	212.36	2111.05	212.85	2110.93	217.92	2109.85	223.05	2111.21
225.87	2111.93	232.86	2111.69	238.37	2111.51	256.12	2111.56	256.51	2111.55
256.65	2111.55	257.53	2111.54	282.8	2111.57	291.52	2111.26	293	2111.21
294	2111.18	295	2111.14	295.87	2111.11	300.21	2110.96	302.58	2110.86
312.43	2110.69	317.01	2110.68	321	2110.88	321.02	2110.88	321.2	2110.89
322.5	2110.89	329.6	2110.79	335.61	2110.88	345	2111.1	346.31	2111.13
352.23	2111.23	357.12	2111.3	361.21	2111.35	365.95	2111.41	370.26	2111.47
374.15	2111.33	377.52	2111.32	381.43	2111.16	395.93	2111.31	401.79	2111.25
404.84	2111.3	405.69	2111.27						

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-220	.04	-139.27	.025	-67.34	.032	62.67	.032	122.5	.032

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
295	345	57.44	57.44	57.44	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
373	405.69	2113	T

Blocked Obstructions num= 1

Sta L	Sta R	Elev
68	113	2113

CROSS SECTION

RIVER: UC-div
REACH: Main RS: 0.1177

INPUT
Description: R.S. 0.1177
Includes Supplemental Ground Survey
Station Elevation Data num= 110

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-210	2110.55	-197.49	2110.71	-189.13	2110.78	-177.29	2109.6	-163.78	2107.75
-162.39	2107.83	-159.46	2107.95	-156.46	2109.24	-153.91	2109.89	-152.07	2110.39
-151.47	2110.45	-146.89	2111.19	-141.2	2111.21	-131.6	2111.25	-123.77	2111.21
-120.34	2111.23	-112.61	2111.25	-105.38	2111.44	-98.96	2111.21	-95.88	2111.14
-94.13	2111.02	-88.25	2110.65	-85.92	2110.51	-85.67	2110.5	-84.3	2110.37
-74.96	2109.42	-67.5	2110.44	-63.35	2110.95	-61.04	2111.25	-49.94	2110.91
-37.13	2110.34	-36.26	2110.42	-29.59	2111.05	-26.71	2110.89	-22.75	2110.74
-3.74	2111.07	0	2111.09	8.8	2111.15	19.84	2111.23	24.8	2111.08
28.65	2110.94	40.47	2110.71	45.7	2110.61	73.86	2110.81	126.69	2110.86
132.93	2110.71	136.3	2110.6	142.09	2110.48	145.6	2110.48	146.73	2110.48
149.23	2110.19	152.95	2109.76	156.57	2109.38	163.39	2107.92	165.41	2107.83
170.05	2109.16	173.89	2109.39	174.49	2109.4	176.4	2109.34	178.45	2109.38
181.27	2108.6	183.4	2108.93	188.57	2109.58	189.51	2109.73	189.79	2109.83
196.69	2110.39	209.23	2109.71	211.03	2109.54	213.59	2109.01	215.83	2109.45
222.09	2110.67	228.22	2110.55	244.2	2110.12	296.82	2109.44	301.28	2109.46
303.73	2109.52	310.02	2109.56	312.56	2109.16	317.16	2108.03	323.88	2108.79
331	2108.68	333.2	2108.65	334	2108.42	335	2108.13	337.5	2107.4
341.66	2108.79	342	2108.21	344	2108.68	348.04	2109.64	351.81	2109.63
363.97	2109.93	373.9	2109.89	376.9	2109.86	380.04	2109.86	386.62	2109.85
390.99	2109.85	398.92	2109.86	411.59	2109.32	413.81	2109.32	415.61	2109.33
421.09	2109.27	431.24	2109.25	431.91	2109.25	435.5	2109.29	440.45	2109.53
441.45	2109.53	448.44	2109.59	452.17	2109.65	454.34	2109.66	467.54	2110.06

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-210	.04	-189.13	.025	-88.25	.04	0	.025	132.93	.032

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
335	342	48.5	48.5	48.5	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
362	467.54	2112	T

Blocked Obstructions num= 1

Sta L	Sta R	Elev
52.9	114.4	2113

CROSS SECTION

RIVER: UC-div
REACH: Main RS: 0.1085

INPUT
Description: R.S. 0.1085
Includes Supplemental Ground Survey
Station Elevation Data num= 114

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2110.22	25.64	2110.42	28.18	2110.4	30.08	2110.41	31.42	2110.39
36.37	2109.76	43.21	2108.28	50.17	2109.43	53.33	2110.03	57.22	2110.43
59.8	2110.57	61.11	2110.79	71.82	2110.81	75.87	2110.79	76.47	2110.78
86.85	2110.67	94.02	2111.01	101.39	2111.2	105.86	2111.04	109.19	2110.91
111.08	2110.89	112.37	2110.7	120.47	2110.06	120.73	2110.03	121.04	2109.99
128.64	2109	132.79	2108.54	138.7	2109.28	145.08	2110.35	156.61	2110.08
161.22	2109.99	166.77	2109.84	170.87	2110.03	176.47	2110.33	184.27	2110.15
186.81	2110.11	186.95	2110.05	194.62	2110.05	203.22	2110.05	216.41	2110.14
218.22	2110.19	221.02	2110.61	225.93	2110.33	226.71	2110.34	227.64	2110.36
227.95	2110.36	257.36	2110.03	271.87	2109.74	303.86	2109.14	325.98	2109.25
331.23	2109.61	353.5	2109.37	354.35	2109.34	354.93	2109.24	355.49	2109.15
364.46	2109.17	364.76	2109.16	364.77	2109.16	364.79	2109.16	376.02	2108.84
378.58	2108.9	382.46	2108.77	394.55	2109	398.6	2109.17	402.77	2109.58
403.59	2109.61	407.86	2109.65	411.06	2109.66	415.66	2109.65	417.51	2109.71
419.91	2108.97	423.91	2107.82	428.42	2109.23	431.22	2109.8	435.35	2109.56
436.86	2109.61	438.96	2109.64	441.08	2109.67	449.24	2109.62	458.41	2109.57
472.41	2109.45	496.93	2109.15	498.34	2109.05	505.24	2108.59	505.43	2108.58
505.45	2108.57	530.59	2108.12	530.86	2108.12	531.17	2108.11	532.08	2107.77
533.1	2107.97	535	2107.33	537.05	2106.63	539.55	2106.38	540	2106.56
542	2107.35	542.77	2107.66	545.36	2108.08	545.38	2108.09	548.18	2108.06
551.36	2108.06	553.42	2108.07	564.59	2107.93	590.43	2107.66	598.71	2107.78
607.79	2107.78	616.64	2108.01	622.8	2108.16	637.92	2108.53	647.61	2108.72
648.04	2108.75	665.75	2108.76	674.42	2109.01	675.94	2109.01		

Manning's n Values num= 11

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.04	28.18	.025	120.47	.04	216.41	.025	257.36	.04
303.86	.025	394.55	.032	498.34	.025	530.59	.04	551.36	.025
648.04	.032								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
535	542	50.3	50.3	50.3	.1	.3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
564	653	2113

CROSS SECTION

RIVER: UC-div
REACH: Main RS: 0.0990

INPUT
Description: R.S. 0.0990
Includes Supplemental Ground Survey
Station Elevation Data num= 123

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-240	2108.77	-231.59	2108.68	-225.96	2108.71	-219.19	2108.88	-202.71	2108.59
-202.59	2108.54	-198.65	2107.98	-195.65	2108.42	-191.64	2109.06	-190.22	2109.08
-182.21	2109.76	-174.91	2109.81	-168.18	2109.77	-160.51	2109.63	-156.91	2109.6
-151.12	2109.87	-142.65	2110.33	-135.52	2110.36	-131.58	2110.11	-130.48	2110.15
-122.45	2108.71	-115.3	2107.17	-113.26	2107.16	-104.6	2108.23	-98.23	2109.08
-92.86	2109.05	-54.41	2109.05	-42.1	2109.2	-40.59	2109.27	-37.42	2109.23
-31.49	2108.83	-30.3	2108.74	-27.33	2108.96	-21.04	2109.47	-13.86	2109.31
-2.88	2109.24	0	2109.16	.36	2109.15	10	2109.1	30.83	2108.99
35.82	2108.98	39.39	2108.96	49.55	2109	72.83	2108.31	99.56	2107.84
100.3	2107.83	102.03	2107.71	104.18	2107.63	104.67	2107.58	108.43	2107.22
113.33	2107.19	119.35	2106.23	121.92	2106.3	126.24	2107.1	131.43	2107.53
140.2	2107.69	148.65	2107.78	149.52	2107.65	150.98	2107.53	156.85	2107.17
161.86	2107.1	163.42	2107.04	167.27	2106.88	169.98	2106.82	172.22	2106.74
174.55	2106.69	175.82	2106.66	179.54	2106.59	180.08	2106.58	184.13	2106.53
184.25	2106.52	188.36	2106.48	188.37	2106.48	192.37	2106.45	192.74	2106.45
196.9	2106.44	197.62	2106.42	201.47	2106.4	203.2	2106.35	206.38	2106.32
209.71	2106.22	216.85	2106.04	217.53	2106.02	218.9	2105.99	220.37	2106.14
229.32	2107	231.56	2107.14	234.78	2107.26	240.34	2108.05	247	2108.19
247.37	2108.2	283.87	2106.87	293.68	2106.47	294.18	2106.43	296.4	2105.82
299.22	2105.05	302.44	2105.05	304.4	2105.51	305	2105.65	306	2105.89
308.94	2106.59	310.16	2107.51	311.15	2107.54	312.12	2107.62	317.91	2107.6
322.61	2107.46	324.83	2107.41	333.23	2107.15	338.49	2106.77	340.56	2106.69
352.75	2106.53	354.28	2106.55	355.91	2106.54	393.58	2107.46	422.85	2108.12

422.97	2108.13	423.04	2108.13	424.54	2108.24	426.86	2108.36	430.58	2108.36
431.38	2108.4	432.26	2108.42	434.13	2108.47				

Manning's n Values num= 10

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-240	.04	-202.71	.025	-130.48	.04	-92.86	.04	0	.04
10	.025	72.83	.04	156.85	.025	247.37	.04	393.58	.025

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
296.4	306	89	89	89	.1	.3

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
15	60	2110	385	423	2110

CROSS SECTION

RIVER: UC-div
REACH: Main RS: 0.0821

INPUT
Description: R.S. 0.0821
Includes Supplemental Ground Survey
Station Elevation Data num= 108

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2106.66	.5	2106.75	3.68	2107.29	4.24	2107.29	6.73	2107.62
17.93	2107.62	20.06	2107.63	21.5	2107.61	31.32	2107.42	38.74	2107.58
43.72	2107.7	46.76	2107.85	48.41	2108.12	57.89	2107.91	64.6	2107.64
65.63	2107.5	77.22	2106.11	84.57	2106.74	86.13	2106.8	88.64	2106.77
90.84	2106.81	120.74	2107.35	125.11	2107.44	130.01	2107.57	132.9	2107.46
136.91	2107.18	141.17	2107.32	150.53	2107.56	157.13	2107.6	157.72	2107.59
159.03	2107.57	193.21	2107.03	205.67	2106.71	208.86	2106.7	219.29	2106.84
223.02	2106.8	226.33	2106.86	232.6	2106.9	241.66	2107.25	251.82	2108.18
260.21	2108.65	262.59	2108.67	273.13	2108.98	273.93	2108.96	273.99	2108.96
286.9	2108.36	295.78	2107.82	296.79	2107.78	302.67	2106.97	304.61	2107.04
312.96	2106.92	314.95	2107	319.62	2106.98	328.89	2106.62	330.47	2106.59
337.35	2106.73	341.57	2106.69	345.71	2106.84	350.06	2106.83	355.58	2106.59
358.46	2106.57	362.15	2106.32	365.89	2106	371.6	2106	375.36	2105.95
376.03	2105.91	387.25	2105.43	395.81	2105.03	399.95	2105.33	402.5	2105.51
403.13	2105.52	411.73	2105.64	415.63	2105.48	416.17	2105.46	416.83	2105.53
422.36	2106.2	427.12	2106.29	431.18	2106.39	443.25	2106.43	444.38	2106.43
452.23	2106.4	458.18	2106.37	458.85	2106.36	461.63	2106.25	462.47	2106.24
464.16	2106.23	464.82	2106.21	474.57	2106.16	478.19	2106.17	485.75	2106.09
494.4	2106.04	519.75	2105.58	521.28	2105.59	526.22	2105.36	528.71	2104.91
532	2103.92	534.94	2103.03	539.18	2103	542	2103.92	543.53	2104.42
547.13	2104.84	550.14	2105.12	550.56	2105.1	561.56	2105.1	589.22	2105.5
599.39	2105.6	607.21	2105.67	614.28	2105.75				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.025	65.63	.04	251.82	.025	402.5	.04	561.56	.025

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
532	542	57.96	57.96	57.96	.1	.3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
575	614.28	2111

CROSS SECTION

RIVER: UC-div
REACH: Main RS: 0.0712

INPUT
Description: R.S. 0.0712
Includes Supplemental Ground Survey
Station Elevation Data num= 117

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-136.73	2105.39	-135.46	2105.43	-133.49	2105.39	-131.63	2105.38	-120.17	2105.14
-116.63	2105.01	-114.18	2104.93	-112.14	2104.94	-102.89	2104.96	-102.14	2104.96

-102	2104.96	-100.69	2104.91	-83.86	2104.25	-81.5	2103.78	-74.51	2102.43
-70.99	2103.42	-67.33	2103.98	-66.72	2104.01	-64.56	2103.94	-64.22	2103.98
-59.53	2104.23	-51	2104.47	-50.15	2104.44	-42.8	2104.56	-36.51	2104.6
-31.88	2104.71	-21.94	2105.2	-18.79	2105.43	-16.83	2105.45	0	2105.28
11.63	2105.16	31.43	2104.89	34.63	2104.87	37.52	2104.82	38.86	2104.79
39.69	2104.83	40.43	2104.83	40.76	2104.82	41.17	2104.83	41.56	2104.82
41.91	2104.82	42.28	2104.82	47.6	2104.78	50.03	2104.76	55.85	2104.71
66.85	2104.66	122.48	2104.25	126.07	2104.24	131.58	2104.72	132.88	2104.83
133.59	2104.84	143.65	2104.94	145.05	2105.03	147.49	2104.95	150.03	2104.9
164.46	2104.63	166.78	2103.37	172.66	2101.07	179.47	2102.48	184.93	2104.07
191.99	2101.03	193.54	2101.15	199.02	2102.77	200.49	2103.99	203.77	2104.27
204.37	2104.33	205.85	2104.33	216.97	2103.79	227.61	2103.35	231.16	2103.84
236.37	2104.47	238.06	2104.42	247.42	2104.09	248.88	2104.12	250.41	2104.05
253.73	2104.43	258.74	2104.99	269.63	2104.54	272.3	2104.41	274.19	2104.05
278.45	2103.28	283.22	2104.34	283.42	2104.39	284.17	2104.38	301.98	2104.61
315.38	2104.77	320.41	2104.75	328.48	2104.7	331.78	2104.67	337.45	2104.71
347.82	2104.63	355.89	2104.63	357.68	2104.66	359.66	2104.67	366.66	2104.73
376.32	2104.59	379.93	2104.45	386.08	2103.9	390.8	2103.04	391	2102.99
394.84	2101.92	395.49	2102.12	395.51	2102.13	398	2102.86	398.5	2103.01
401.44	2103.87	403.18	2104.5	403.66	2104.5	405.33	2104.06	410.79	2102.24
414.01	2102.11	420.16	2104.01	446.92	2105.1	486.01	2105.55	487.54	2105.55
490.16	2105.24	494.02	2104.65						

Manning's n Values num= 11

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-136.73	.04	-120.17	.032	-74.51	.04	0	.04	11.63	.025
126.07	.04	205.85	.025	227.61	.04	337.45	.025	359.66	.04
403.66	.025								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
391	398.5	114.65	114.65	114.65	.1	.3

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
20	110	2106	410	480	2106

CROSS SECTION

RIVER: UC-div
REACH: Main RS: 0.0495

INPUT
Description: R.S. 0.0495
Includes Supplemental Ground Survey
Station Elevation Data num= 130

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-220	2102.09	-207.95	2102.14	-207.23	2102.21	-204.38	2102.35	-200.59	2102.43
-197.98	2102.37	-194.38	2102.27	-192.99	2102.12	-186.81	2101.26	-183.77	2101.36
-182.06	2101.35	-174.25	2101.32	-171.96	2101.47	-166.47	2101.97	-160.93	2102.05
-152.77	2102.09	-147.16	2101.91	-142.52	2101.77	-142.04	2101.76	-132.34	2101.6
-126.33	2101.91	-121.6	2102.04	-121.09	2101.73	-119.25	2102.05	-95.73	2101.99
-93.12	2101.99	-89.55	2101.99	-85.97	2102.06	-76.39	2101.72	-66.81	2099.73
-59.9	2101.23	-54.91	2102.07	-45.16	2102.32	-43.11	2102.36	-42.17	2102.34
-36.26	2101.96	-33.44	2102.11	-1.46	2102.02	0	2102.03	9.88	2102.14
64.49	2101.59	67.48	2101.61	77.41	2101.54	77.42	2101.54	77.48	2101.54
77.58	2101.55	78.21	2101.61	90.48	2102.73	92.24	2102.82	99.85	2102.61
102.21	2102.57	108.66	2102.23	116.13	2101.99	127.19	2101.7	136.54	2101.87
137.82	2101.92	138.13	2101.91	139.15	2101.89	142.37	2101.81	159.92	2101.46
165.21	2101.35	171.18	2101.62	174.48	2101.9	176.32	2102.41	178.09	2102.63
185.55	2102.45	190.38	2102.2	192.3	2102.15	196.29	2100.79	203.35	2098.34
208.41	2099.75	213.09	2101.25	217.87	2101.67	231.32	2102.09	234.56	2102.21
241.07	2102.24	245.55	2102.49	248.49	2102.62	249.82	2102.68	250.61	2102.66
256.21	2102.69	263.25	2102.6	263.99	2102.44	271.01	2100.85	272.04	2101.17
277.46	2102.73	278.65	2102.85	279.78	2102.86	284.28	2102.62	287.42	2102.62
308.06	2102.8	314.63	2102.74	340.26	2102.68	346.16	2102.69	356.78	2102.66
358.37	2102.65	362.5	2102.59	371.07	2101.6	371.2	2101.59	371.67	2101.57
388.72	2100.74	389.73	2100.85	392	2100.4	395.82	2099.64	399.31	2099.52
401.9	2100.19	404.73	2100.92	406.06	2101.52	412.8	2101.49	414.66	2101.45
415.63	2101.07	424.63	2100.03	426.85	2100.43	431.06	2101.45	432.24	2101.5
437.07	2101.54	458.83	2102.09	484.03	2101.87	510.85	2101.76	514.72	2102.14
519.4	2101.85	520.44	2101.73	527.64	2102.35	530.45	2102.65	532.1	2102.32

533.93	2102.05	541.66	2102.09	544.06	2102.1	554.72	2102.11	556.27	2102.11

Manning's n Values num= 11

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-220	.025	-194.38	.032	-42.17	.025	0	.025	64.49	.032
139.15	.025	165.21	.04	279.78	.032	362.5	.04	437.07	.032
514.72	.025								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
392	401.9	134.21	134.21	134.21	.1	.3

Blocked Obstructions num= 3

Sta L	Sta R	Elev	Sta L	Sta R	Elev	Sta L	Sta R	Elev
0	37	2103	302	354	2103	540.6	556.27	2103

CROSS SECTION

RIVER: UC-div
REACH: Main RS: 0.0241

INPUT
Description: R.S. 0.0241
Includes Supplemental Ground Survey
Station Elevation Data num= 155

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-338.48	2098.49	-332.09	2098.66	-329.48	2098.7	-325.69	2098.81	-323.59	2098.91
-316.05	2098.47	-308.56	2097.67	-307.1	2097.41	-303.74	2097.21	-302.83	2097.16
-302.03	2097.14	-301.93	2097.16	-301.28	2097.31	-297.63	2096.96	-295.47	2096.76
-289.6	2096.99	-280.18	2097.2	-275.15	2097.15	-268.84	2097.08	-266.1	2097.32
-259.76	2097.64	-253.35	2097.56	-253.25	2097.56	-253.1	2097.57	-252.36	2097.65
-235.91	2099.28	-234.95	2099.36	-234.14	2099.35	-217.56	2099.27	-213.05	2099.14
-209.48	2098.92	-207.01	2098.92	-200.55	2098.83	-198.23	2098.93	-190.48	2099.15
-186.12	2099	-174.29	2099.02	-169.26	2099.08	-158.41	2099.14	-148.48	2099.21
-128.48	2099.21	-127.77	2099.22	-123.78	2099.2	-105.42	2099.76	-100.63	2099.85
-86.46	2099.45	-81.3	2099.6	-54.85	2099.66	-47.54	2099.72	-46.97	2099.72
-45.95	2099.71	-33.74	2099.39	-19.62	2099.19	-17.54	2099.16	-16.63	2099.14
-15.68	2099.13	-14.6	2099.12	-5.18	2099.02	-2.72	2099.01	0	2098.99
1.7	2098.97	4.43	2098.98	7.77	2099.02	9.42	2099.11	10.2	2099.12
18.1	2098.92	28.34	2098.74	32.06	2098.69	42.49	2098.59	49.45	2099.15
54.94	2099.52	66.73	2099.55	70.49	2099.52	78.06	2099.59	79.99	2099.58
92.58	2098.56	93.54	2098.54	96.96	2098.35	98.51	2099.14	99.28	2098.96
106.92	2097.36	107	2097.38	118.34	2098.86	127.31	2100.73	127.85	2100.82
128.47	2100.95	135.94	2100.99	143.73	2100.85	154.21	2100.9	190.88	2100.57
198.89	2100.52	206.18	2100.51	229.83	2100.31	230.77	2100.39	235.06	2100.33
239.03	2100.28	243.41	2099.51	247.22	2098.66	260.17	2099.03	262.08	2099.06
271.59	2099.48	274.38	2099.63	291.5	2099.33	302.96	2099.12	311.92	2098.67
315	2097.8	315.5	2097.66	316	2097.52	316.97	2097.24	333.99	2097.51
334	2097.51	336.8	2097.82	339.06	2097.82	343.37	2097.44	346.6	2097.68
353.12	2098.15	359.97	2098.4	365.24	2096.74	365.99	2096.53	367.32	2096.78
376.93	2098.6	388.28	2098.29	403.22	2097.89	409.88	2097.7	411.95	2097.08
412.11	2097.02	413.44	2097.17	428.58	2098.59	435.71	2098.59	439.01	2098.53
447.59	2098.25	453.13	2098.32	464.66	2098.37	468.91	2098.17	469.88	2098.18
477.27	2098.07	479.62	2098.07	542.47	2097.22	550.83	2097.12	551.08	2097.12
552	2097.12	556.46	2097.08	564.75	2097.21	568.16	2097.18	573	2097.31
582.92	2097.7	594.94	2098.44	599.66	2098.59	605.07	2098.82	608.42	2098.92
619.99	2099.18	620.24	2099.19	620.96	2099.21	635.16	2098.87	636.03	2098.85

Manning's n Values num= 12

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-338.48	.025	-332.09	.04	-174.29	.025	-128.48	.032	-105.42	.025
-54.85	.032	18.1	.025	42.49	.04	99.28	.032	291.5	.04
336.8	.035	367.32	.032						

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
315.5	346.6	0	0	0	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
503	636.03	2100	F

Left Levee Station= -100.63 Elevation= 2099.85
Right Levee Station= 620.96 Elevation= 2099.21
Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
140	240	2102	493.1	522.5	2102

SUMMARY OF MANNING'S N VALUES

River:UC-div

Reach	River Sta.	n1	n2	n3	n4	n5	n6	n7	n8	n9	n10	n11	n12
Main	0.1797	.032	.025										
Main	0.1569	.04	.032	.025	.032	.025							
Main	0.1286	.04	.025	.032	.032	.032							
Main	0.1177	.04	.025	.04	.025	.032							
Main	0.1085	.04	.025	.04	.025	.04	.025	.032	.025	.04	.025	.032	
Main	0.0990	.04	.025	.04	.04	.04	.025	.04	.025	.04	.025		
Main	0.0821	.025	.04	.025	.04	.025							
Main	0.0712	.04	.032	.04	.04	.025	.04	.025	.04	.025	.04	.025	
Main	0.0495	.025	.032	.025	.025	.032	.025	.04	.032	.04	.032	.025	
Main	0.0241	.025	.04	.025	.032	.025	.032	.025	.04	.032	.04	.035	.032

SUMMARY OF REACH LENGTHS

River: UC-div

Reach	River Sta.	Left	Channel	Right
Main	0.1797	119.95	119.95	119.95
Main	0.1569	145	149.51	155
Main	0.1286	57.44	57.44	57.44
Main	0.1177	48.5	48.5	48.5
Main	0.1085	50.3	50.3	50.3
Main	0.0990	89	89	89
Main	0.0821	57.96	57.96	57.96
Main	0.0712	114.65	114.65	114.65
Main	0.0495	134.21	134.21	134.21
Main	0.0241	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: UC-div

Reach	River Sta.	Contr.	Expan.
Main	0.1797	.1	.3
Main	0.1569	.1	.3
Main	0.1286	.1	.3
Main	0.1177	.1	.3
Main	0.1085	.1	.3
Main	0.0990	.1	.3
Main	0.0821	.1	.3
Main	0.0712	.1	.3
Main	0.0495	.1	.3
Main	0.0241	.1	.3

ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : Plan 01

River: UC-div Reach: Main RS: 0.1797 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: UC-div Reach: Main RS: 0.1569 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: UC-div Reach: Main RS: 0.1286 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: UC-div Reach: Main RS: 0.1177 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water
surface that had the least amount of error between computed and assumed values.
Warning:Divided flow computed for this cross-section.
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: UC-div Reach: Main RS: 0.1085 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.

River: UC-div Reach: Main RS: 0.0990 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water
surface that had the least amount of error between computed and assumed values.
Warning:Divided flow computed for this cross-section.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: UC-div Reach: Main RS: 0.0821 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: UC-div Reach: Main RS: 0.0712 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water
surface that had the least amount of error between computed and assumed values.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: UC-div Reach: Main RS: 0.0495 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: UC-div Reach: Main RS: 0.0241 Profile: PF 1
Warning:Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was
used.

HEC-RAS Model Summary Tables

Unnamed Central Tributary to Cave Creek – Diversion Branch

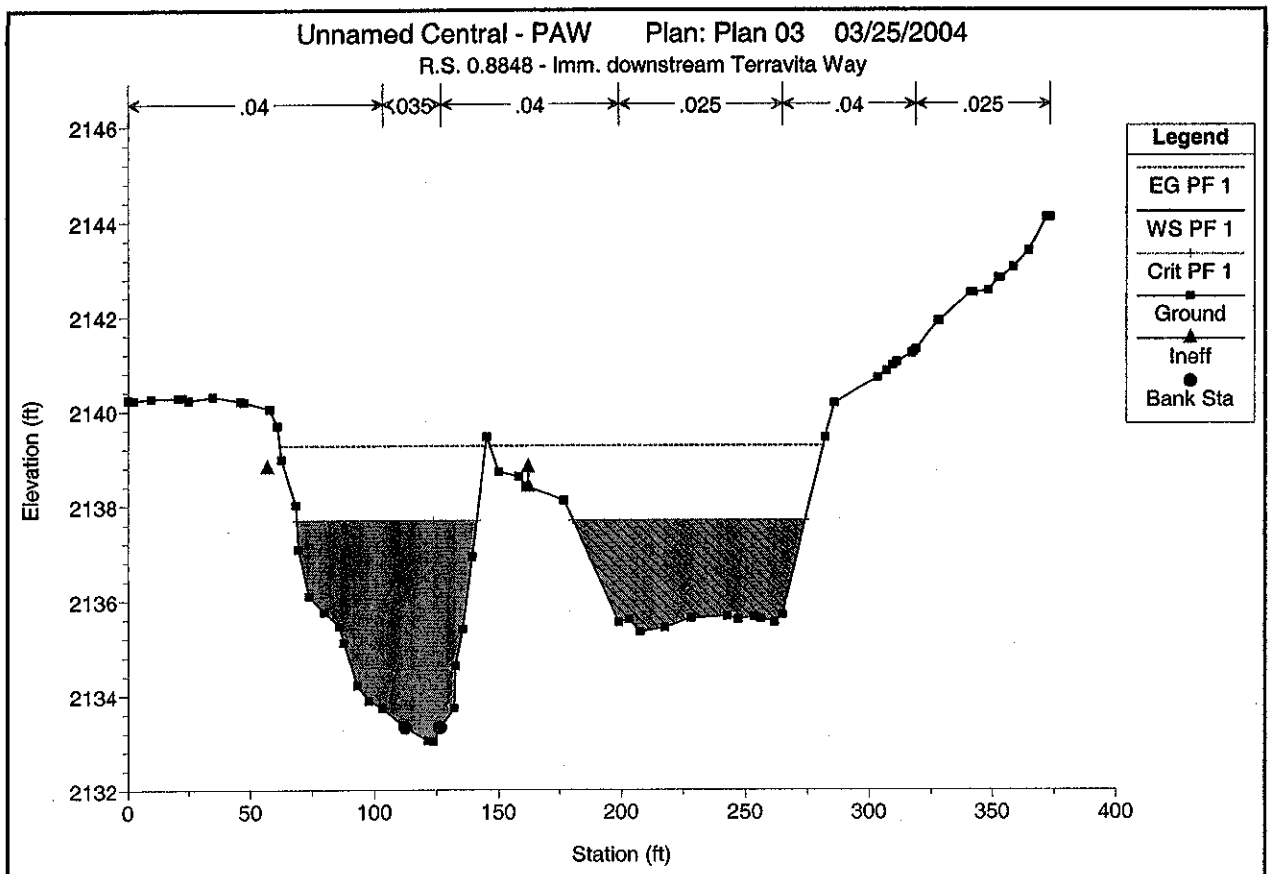
HEC-RAS Plan: Plan 01 River: UC-div Reach: Main Profile: PF 1

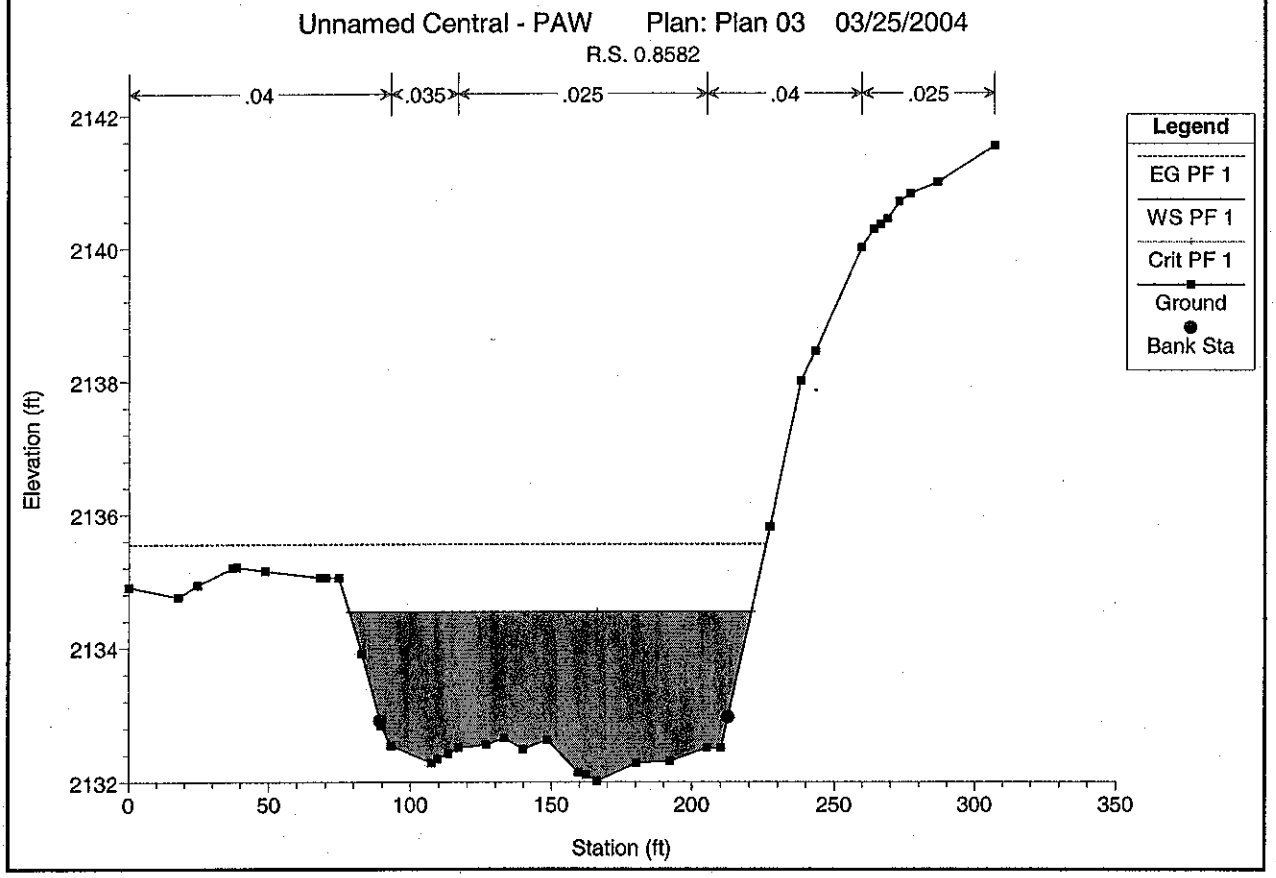
Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
			(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Main	0.1797	PF 1	2118.29	2117.97	0.31	2.14	0.00	489.19	4.81		179.75
Main	0.1569	PF 1	2115.77	2115.46	0.31	2.22	0.00	788.03	103.80	2.17	376.82
Main	0.1286	PF 1	2111.97	2111.66	0.31	0.68	0.01	688.59	179.81	25.60	362.44
Main	0.1177	PF 1	2110.53	2110.12	0.41	0.46	0.02	735.49	112.63	45.87	325.89
Main	0.1085	PF 1	2109.94	2109.60	0.34	0.48	0.01	497.03	129.38	267.59	303.51
Main	0.0990	PF 1	2108.00	2107.60	0.40	0.84	0.00	600.97	146.62	146.42	239.71
Main	0.0821	PF 1	2107.01	2106.59	0.42	0.60	0.00	381.80	241.67	270.52	229.55
Main	0.0712	PF 1	2104.95	2104.52	0.43	1.48	0.04	739.80	106.65	47.55	211.05
Main	0.0495	PF 1	2102.32	2102.02	0.30	1.76	0.01	580.53	148.71	164.76	408.83
Main	0.0241	PF 1	2099.26	2098.88	0.38			87.47	248.32	558.21	332.52

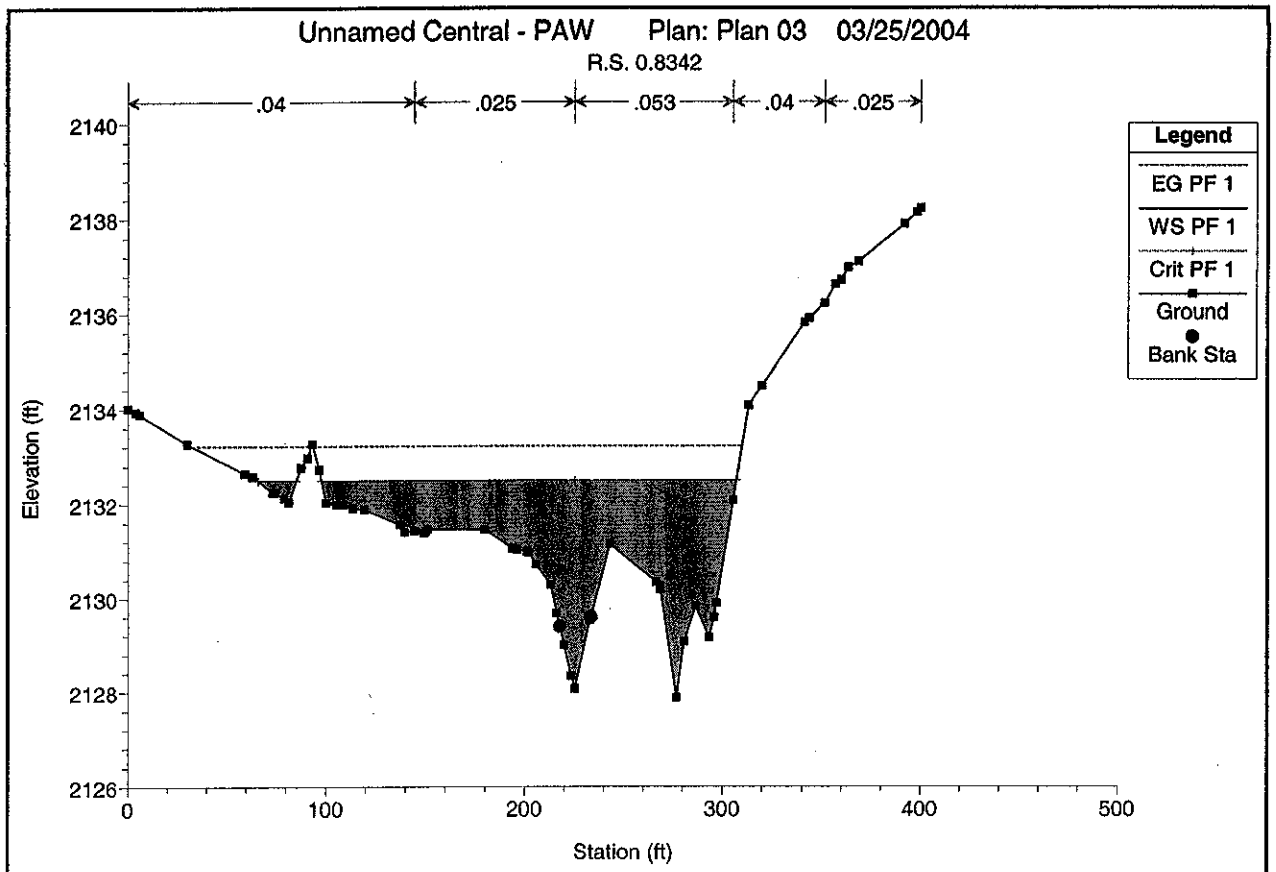
HEC-RAS Plan: Plan 01 River: UC-div Reach: Main Profile: PF 1

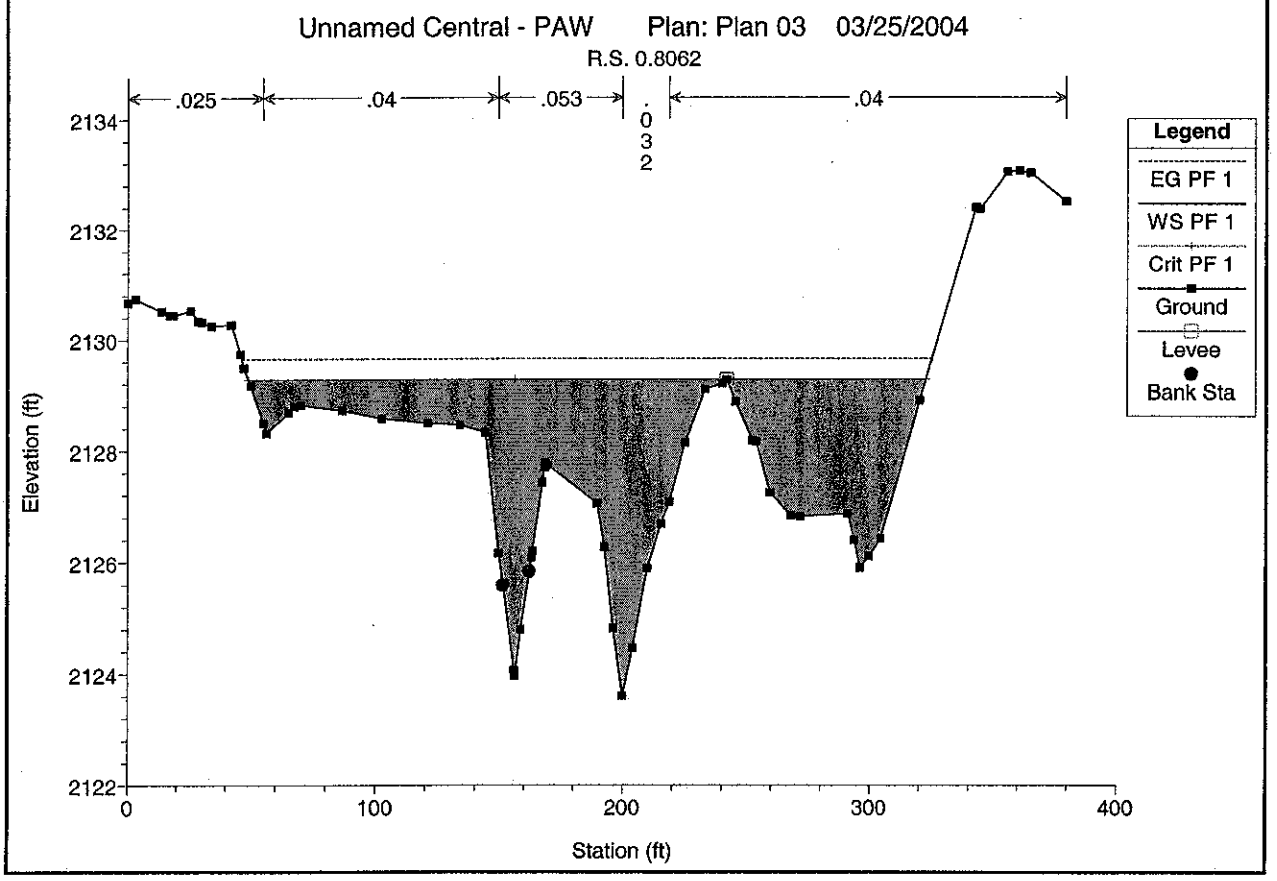
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Main	0.1797	PF 1	494.00	2117.67	2117.97	2117.97	2118.29	0.016682	2.17	110.53	179.75	0.98
Main	0.1569	PF 1	894.00	2114.73	2115.46	2115.46	2115.77	0.018575	4.05	200.35	376.82	1.00
Main	0.1286	PF 1	894.00	2110.68	2111.66	2111.66	2111.97	0.012655	4.50	201.97	362.44	0.89
Main	0.1177	PF 1	894.00	2107.40	2110.12	2110.12	2110.53	0.011014	7.58	181.89	325.89	0.92
Main	0.1085	PF 1	894.00	2106.38	2109.60	2109.60	2109.94	0.008152	6.52	203.69	303.51	0.68
Main	0.0990	PF 1	894.00	2105.05	2107.60	2107.60	2108.00	0.011192	6.71	190.45	239.71	0.78
Main	0.0821	PF 1	894.00	2103.00	2106.59	2106.59	2107.01	0.008057	7.28	206.22	229.55	0.70
Main	0.0712	PF 1	894.00	2101.92	2104.52	2104.52	2104.95	0.013976	6.92	173.32	211.05	0.85
Main	0.0495	PF 1	894.00	2099.52	2102.02	2102.02	2102.32	0.012037	6.82	223.94	408.83	0.81
Main	0.0241	PF 1	894.00	2097.24	2098.88	2098.88	2099.26	0.014364	5.75	186.30	332.52	0.86

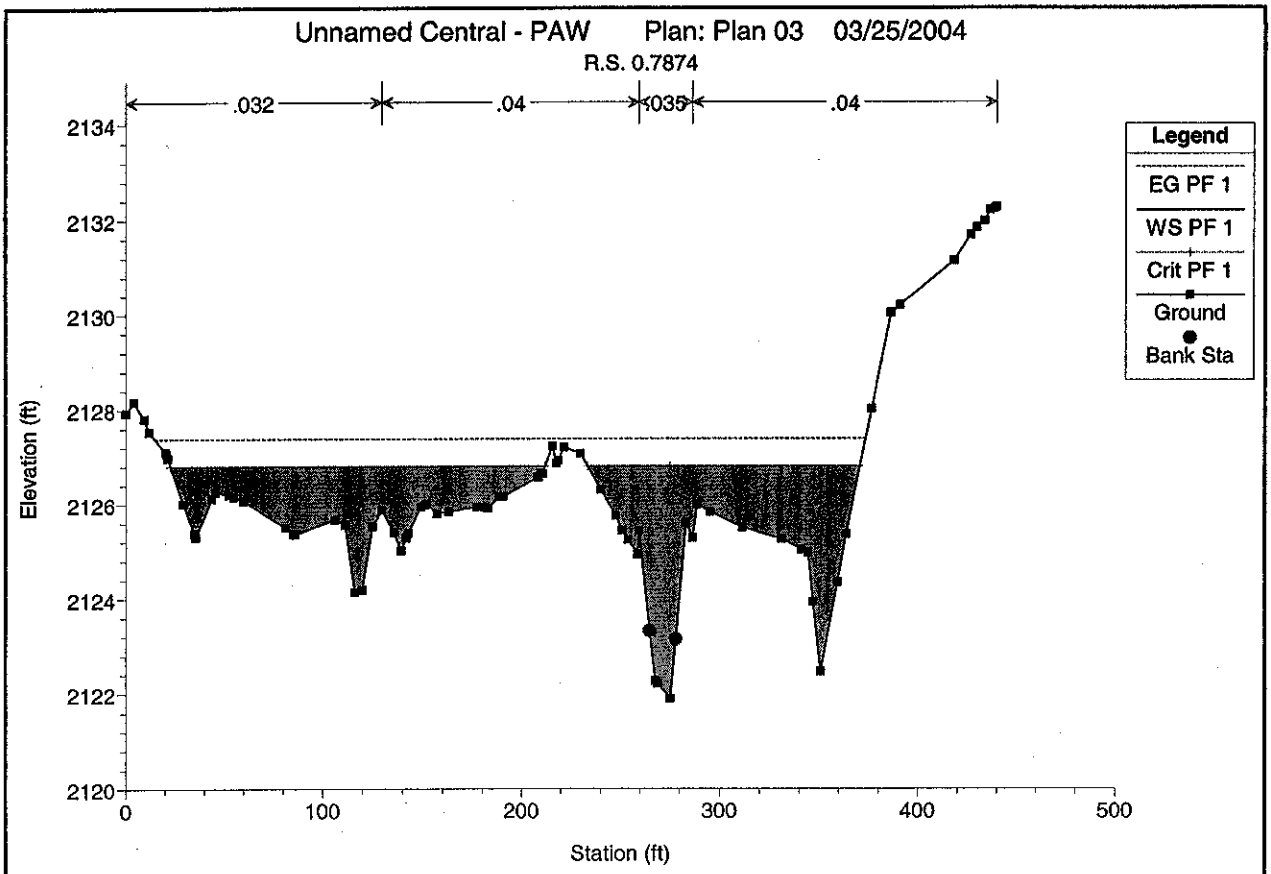
Unnamed Central Tributary to Cave Creek – North Branch

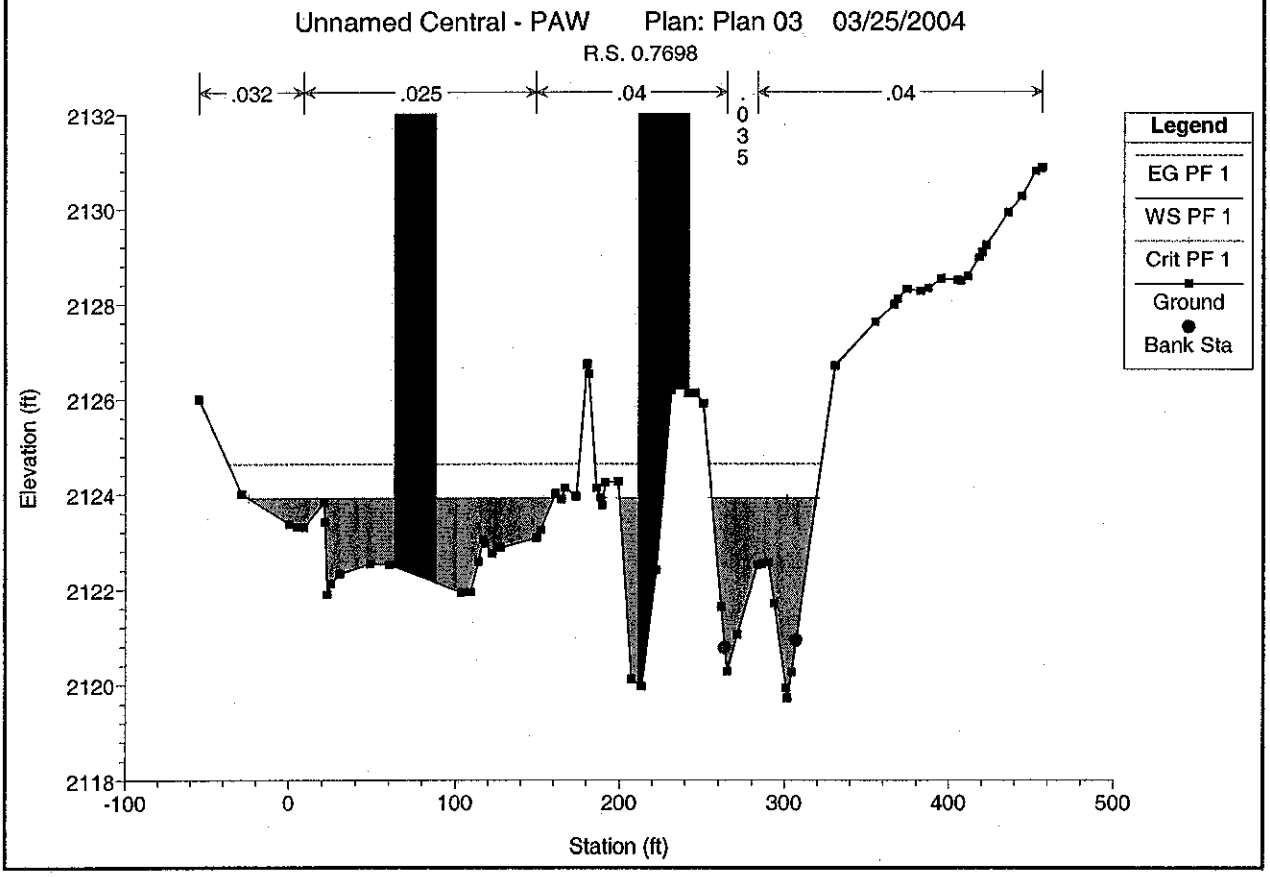

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.8848 - Imm. downstream Terravita Way
.04
.035
.04
.025
.04
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

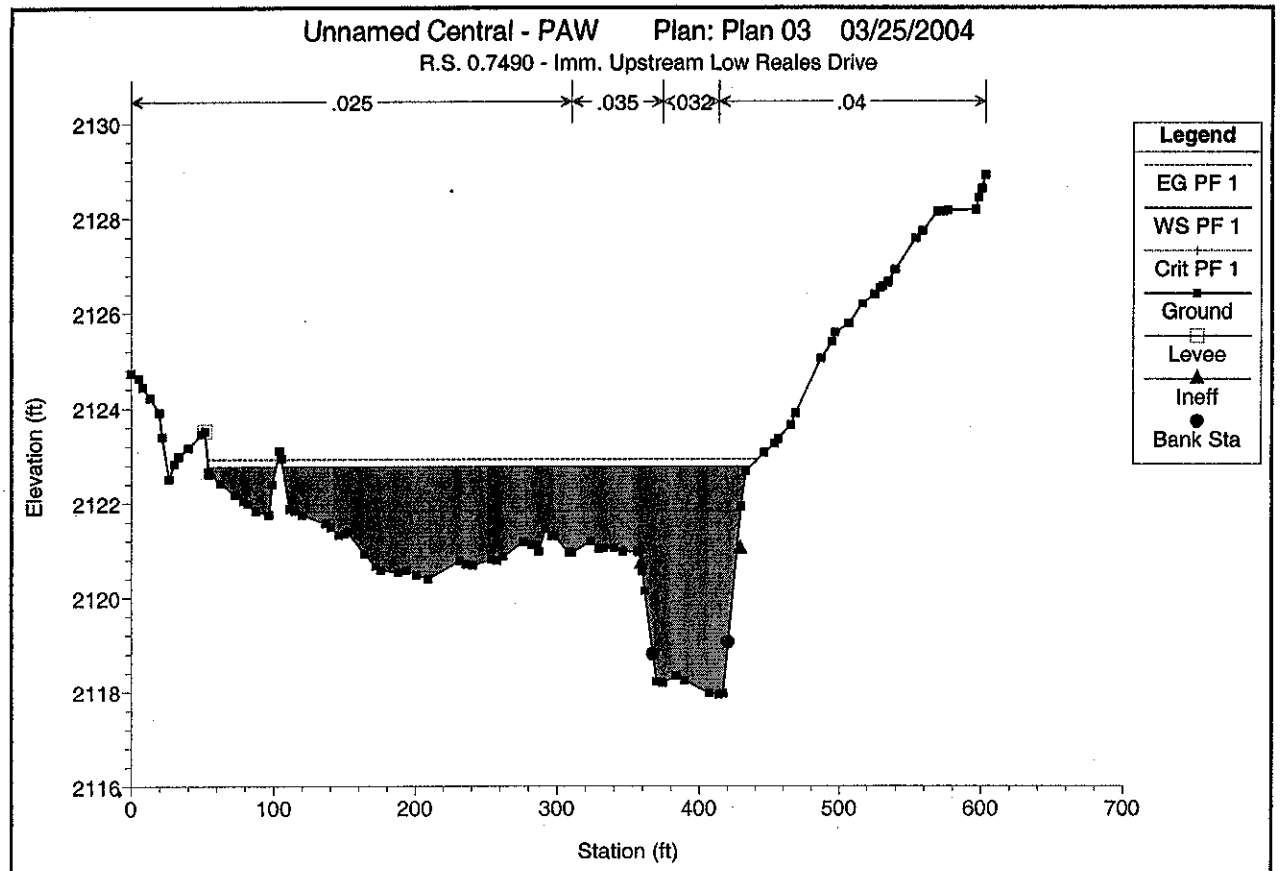

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.8582
.04
.035
.025
.04
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

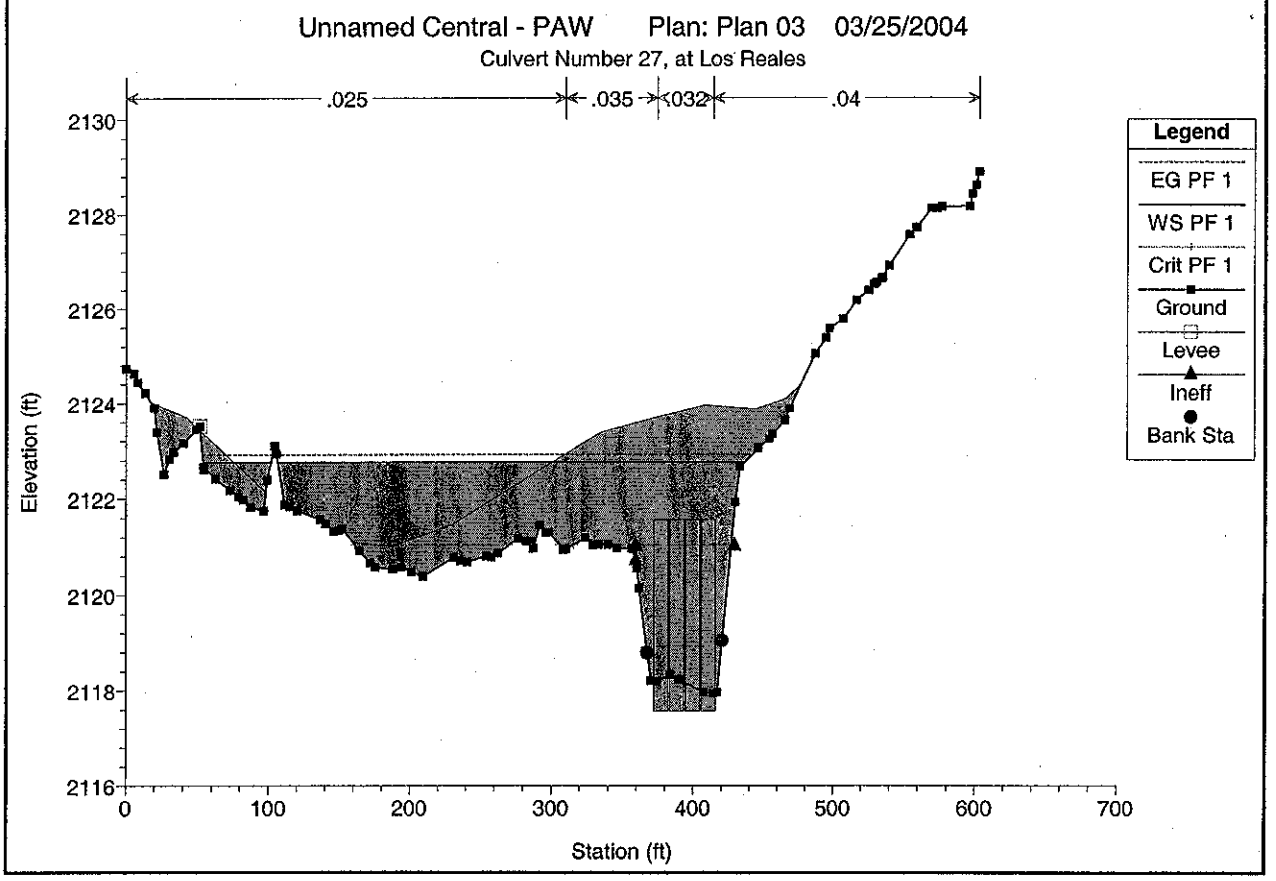

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.8342
.04
.025
.053
.04
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2140
2138
2136
2134
2132
2130
2128
2126
0
100
200
300
400
500
Station (ft)

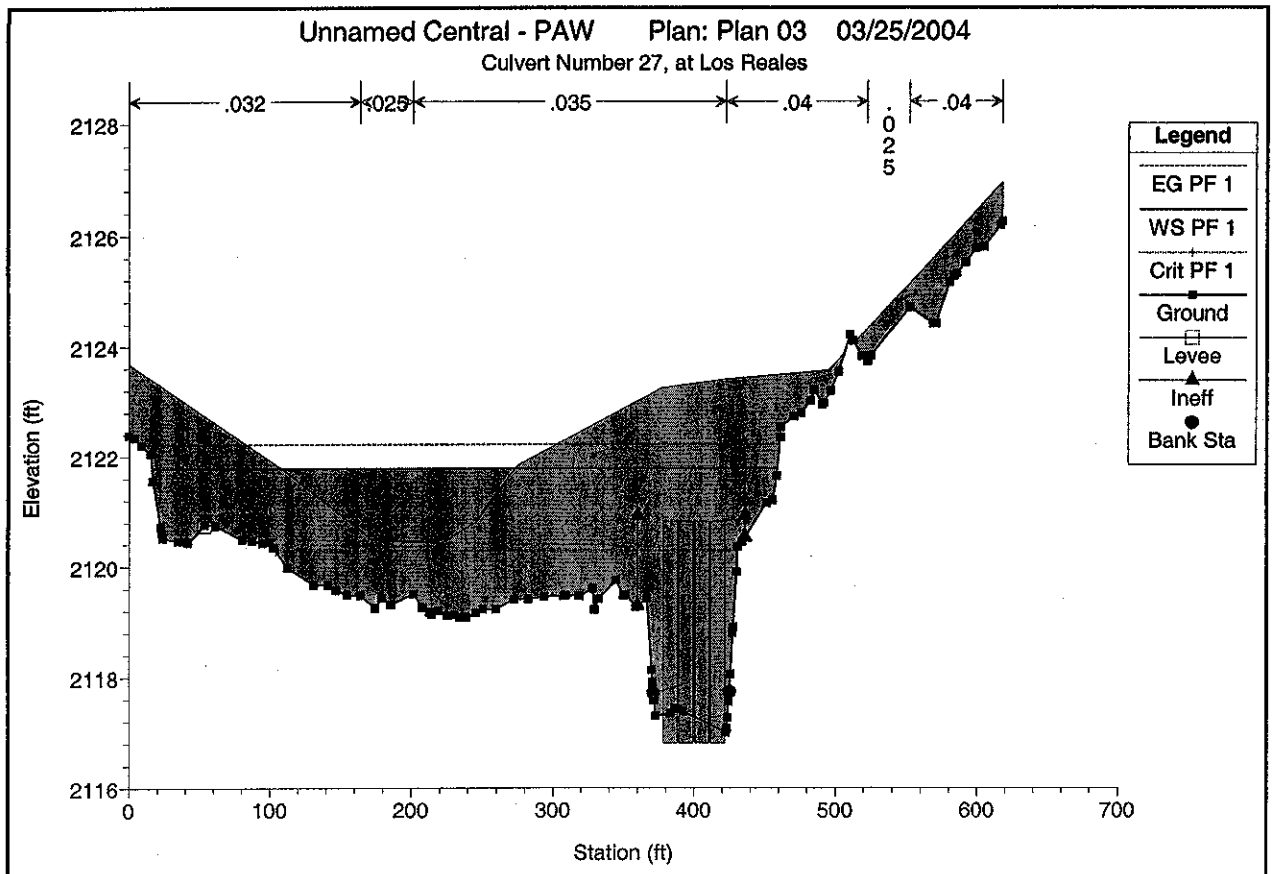

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.8062
.025
.04
.053
.032
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Elevation (ft)
2134
2132
2130
2128
2126
2124
2122
0
100
200
300
400
Station (ft)

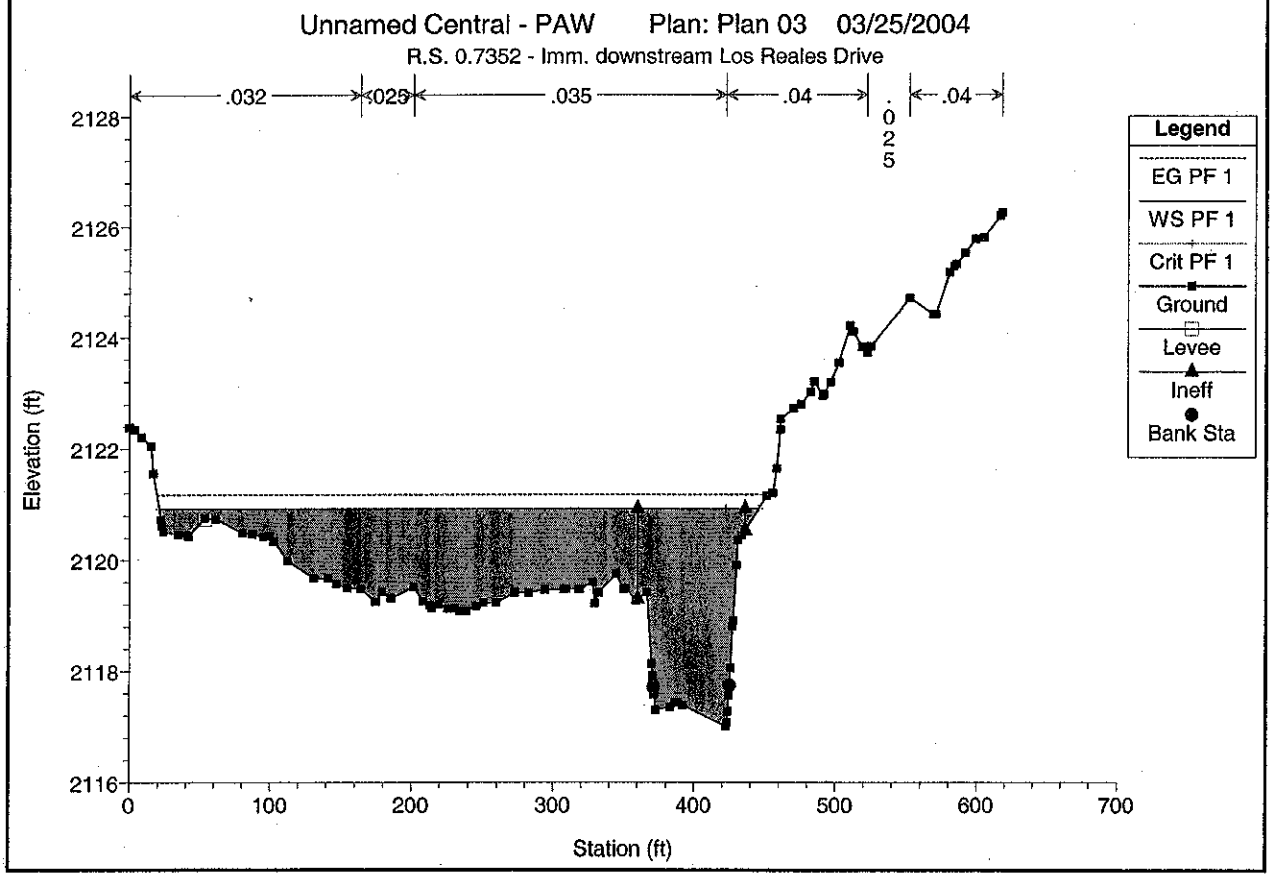

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.7874
.032
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

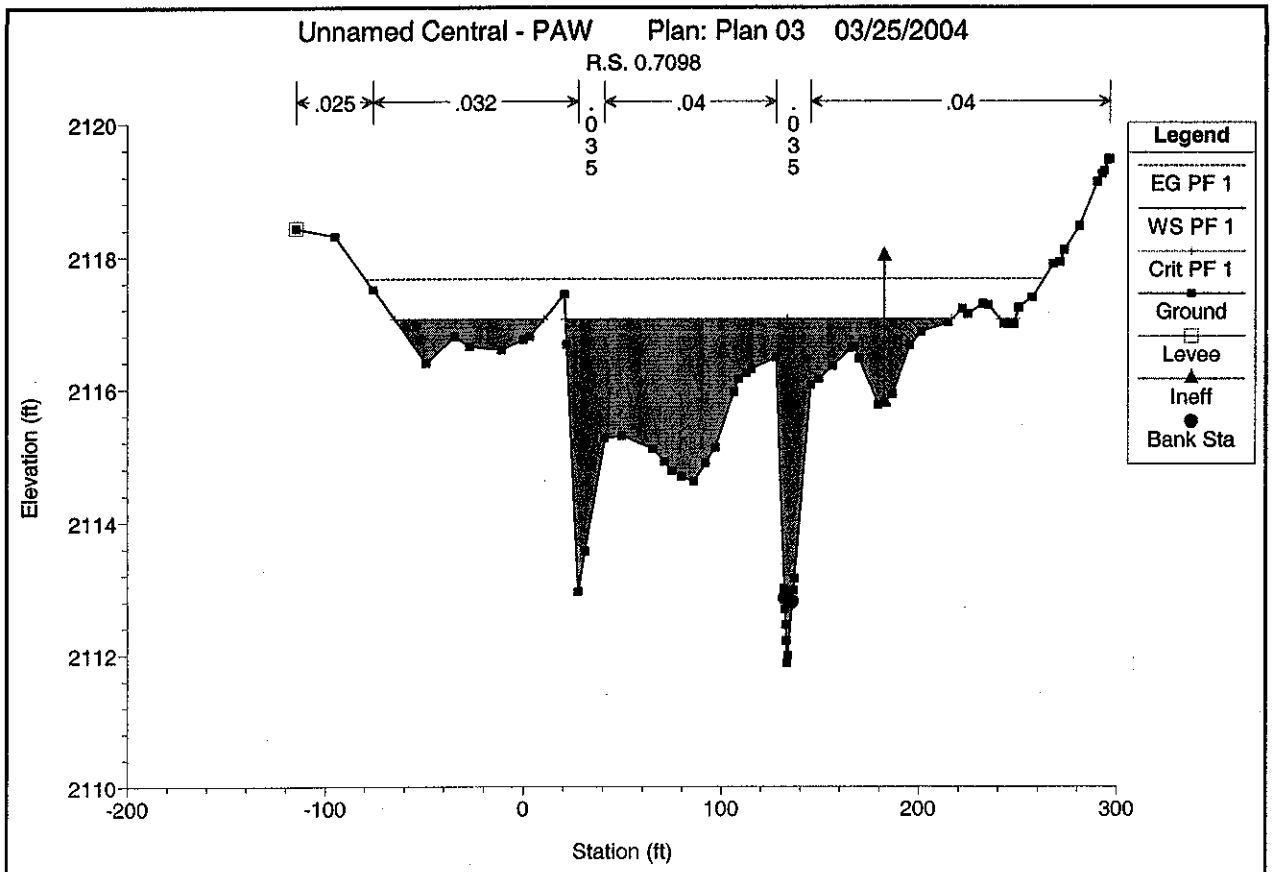

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.7698
.032
.025
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

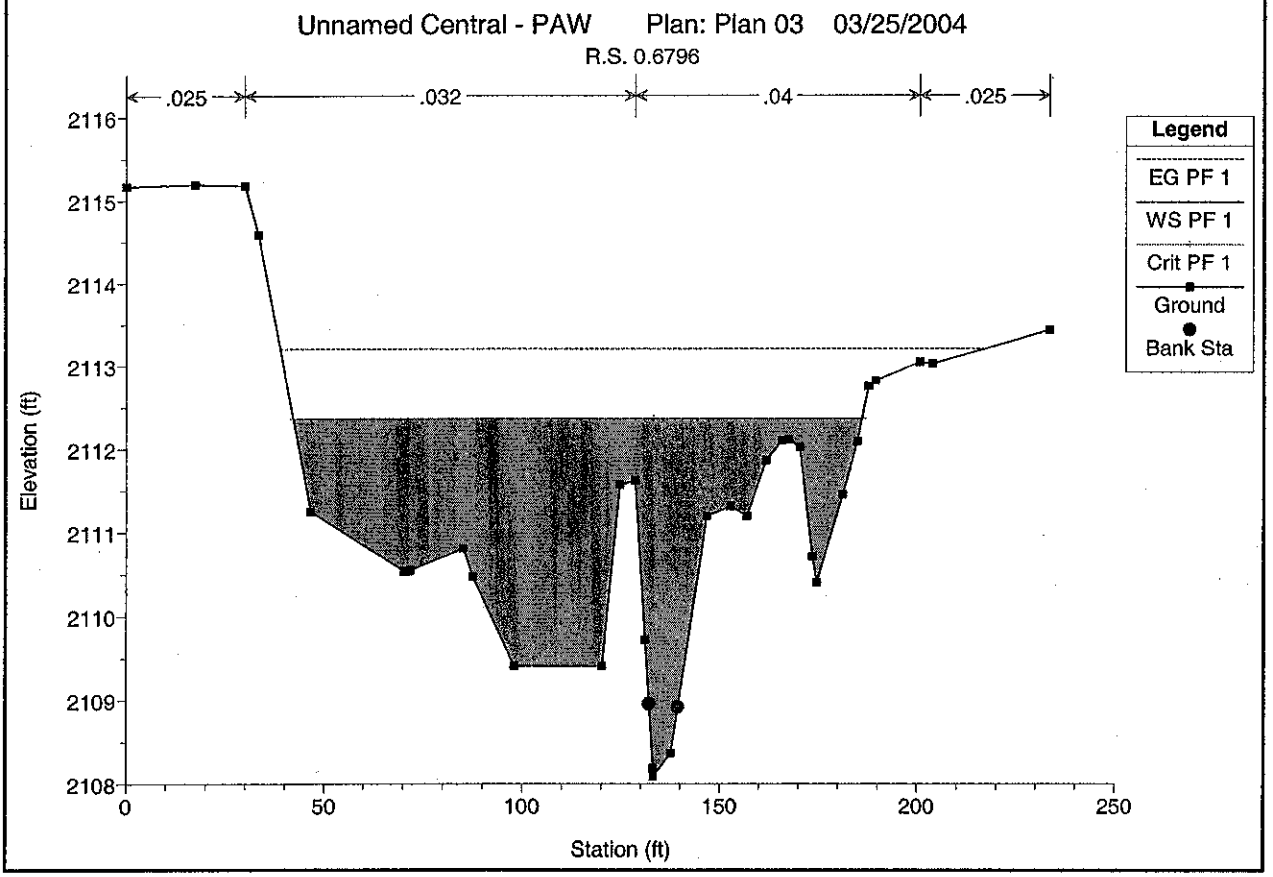

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.7490 - Imm. Upstream Low Reales Drive
.025
.035
.032
.04
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Ineff
Bank Sta

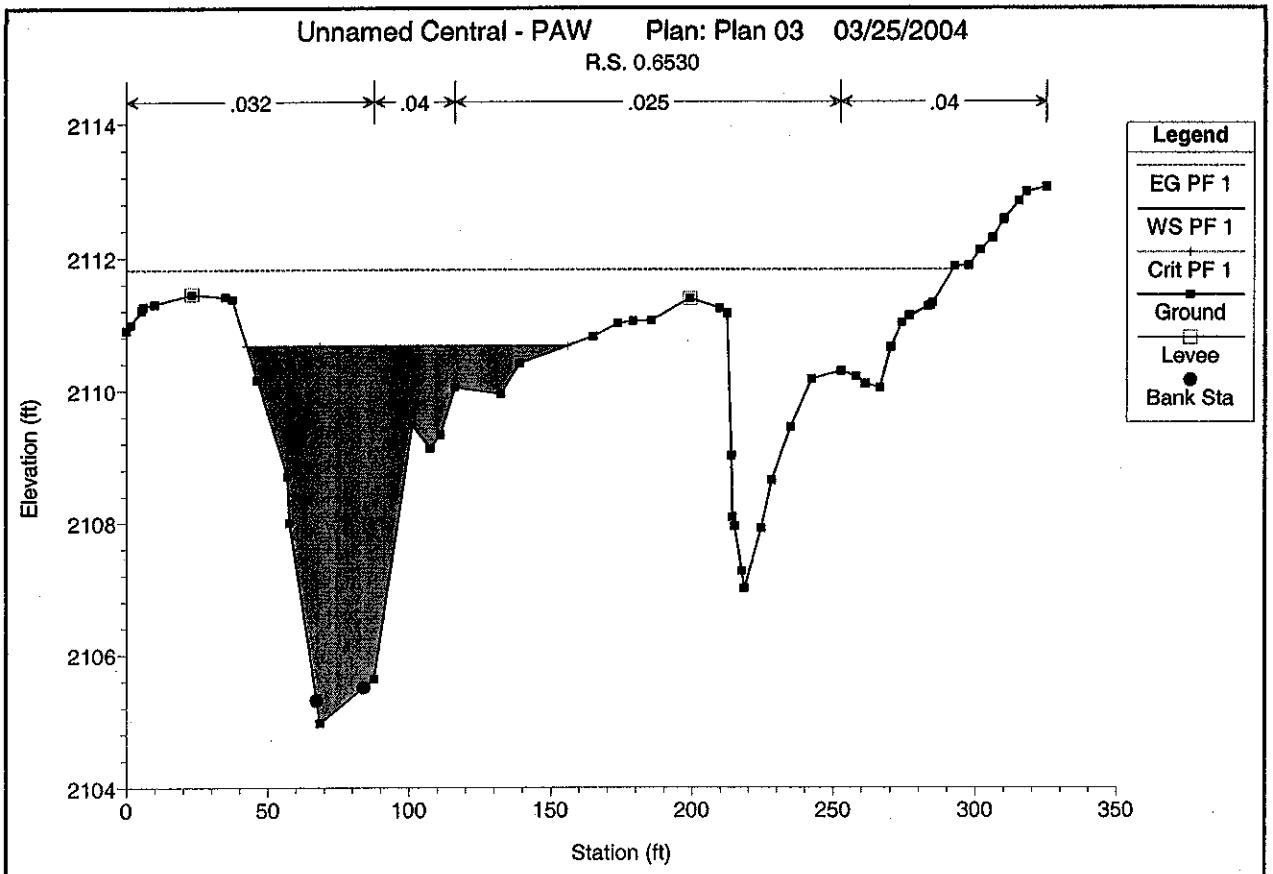

Unnamed Central - PAW Plan: Plan 03 03/25/2004
Culvert Number 27, at Los Reales
.025
.035
.032
.04
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Ineff
Bank Sta


Unnamed Central - PAW Plan: Plan 03 03/25/2004
Culvert Number 27, at Los Reales
.032
.025
.035
.04
.025
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)


Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.7352 - Imm. downstream Los Reales Drive
.032
.025
.035
.04
.025
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)


Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.7098
.025
.032
.035
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)
2120
2118
2116
2114
2112
2110
-200
-100
0
100
200
300


Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.6796
.025
.032
.04
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
2116
2115
2114
2113
2112
2111
2110
2109
2108
0
50
100
150
200
250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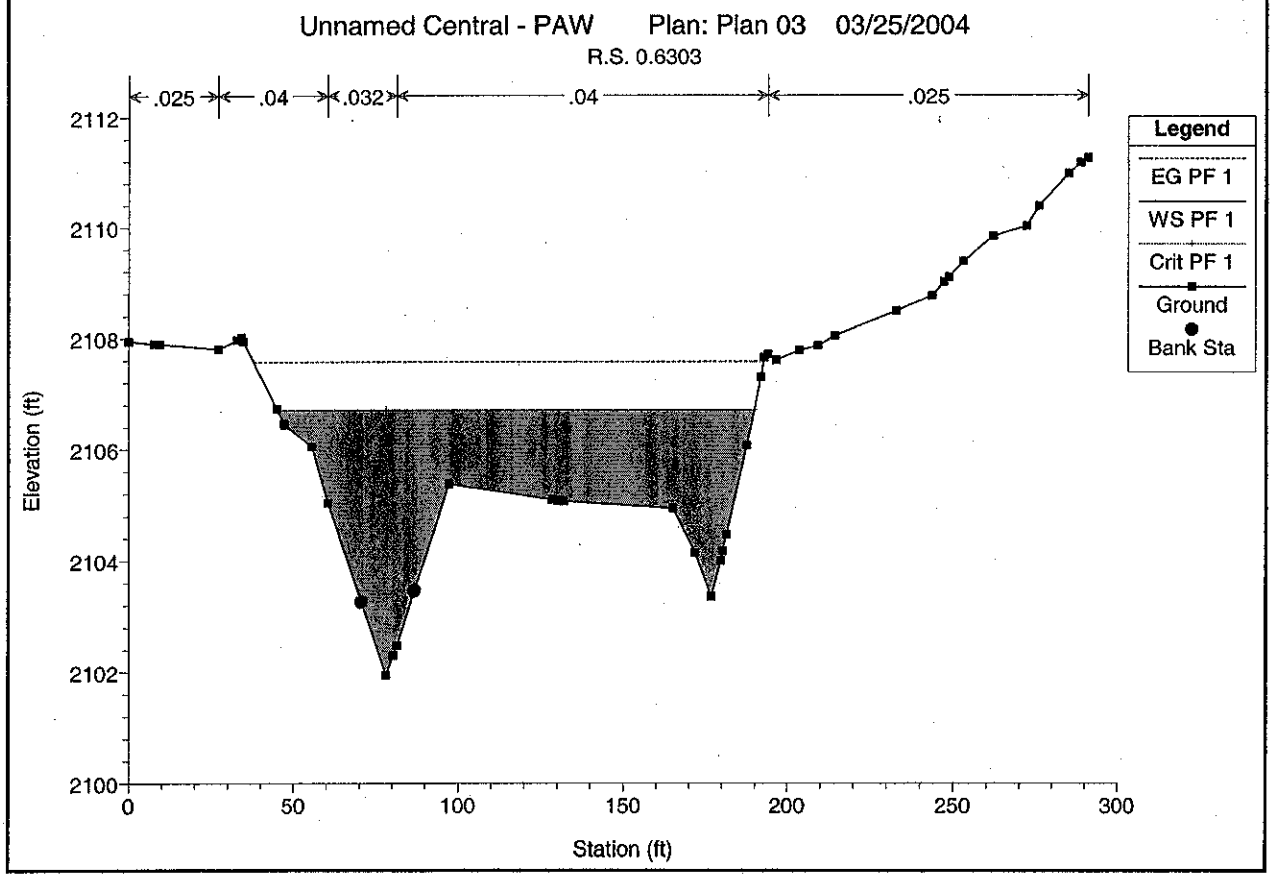
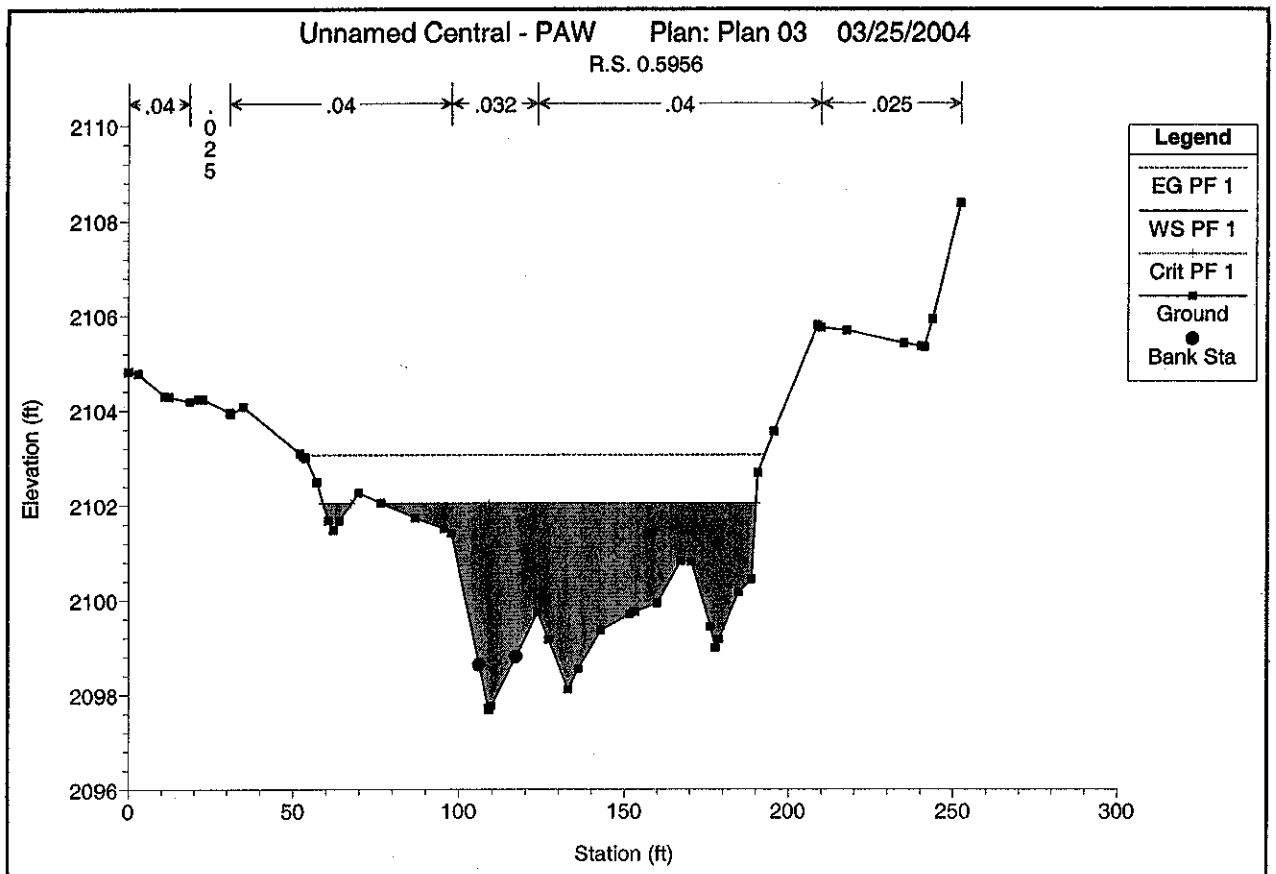
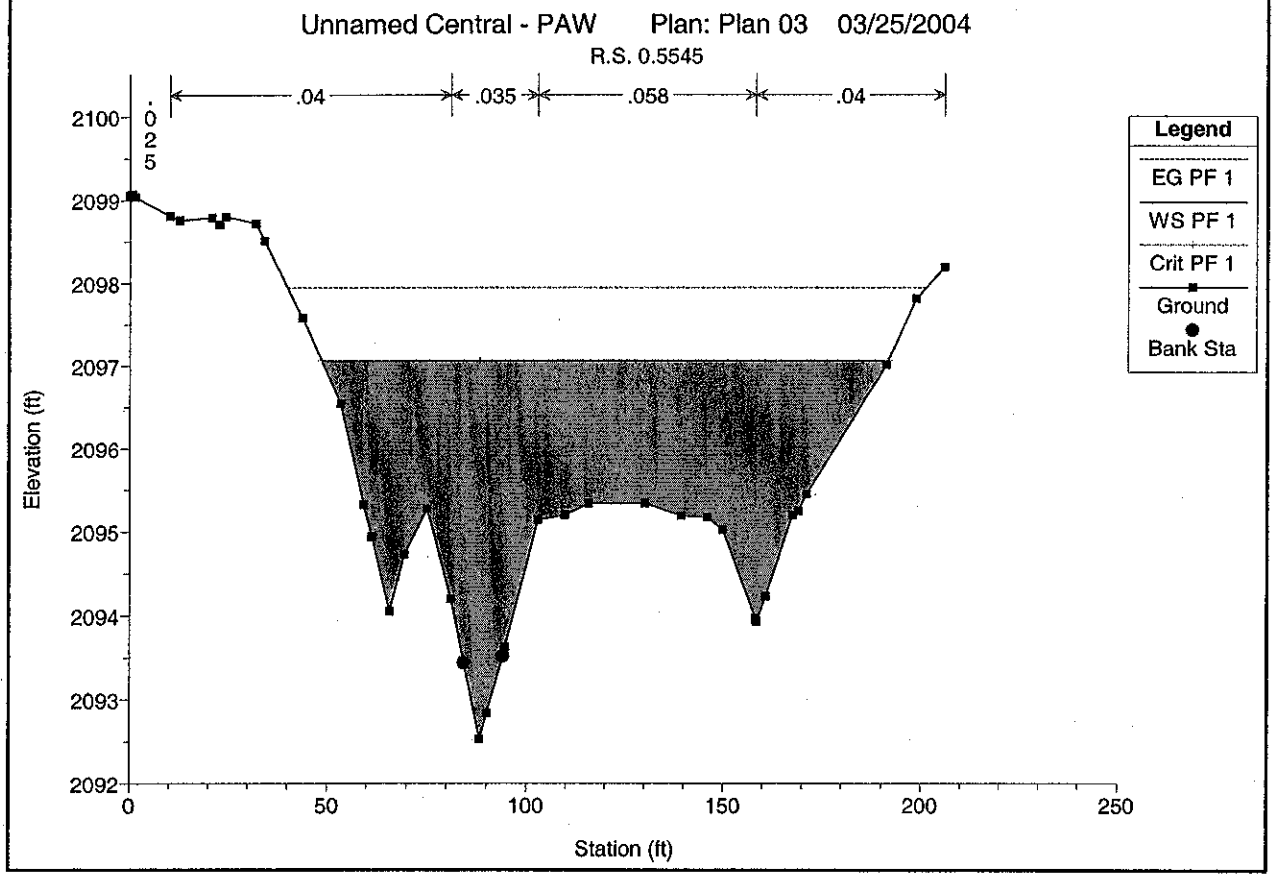
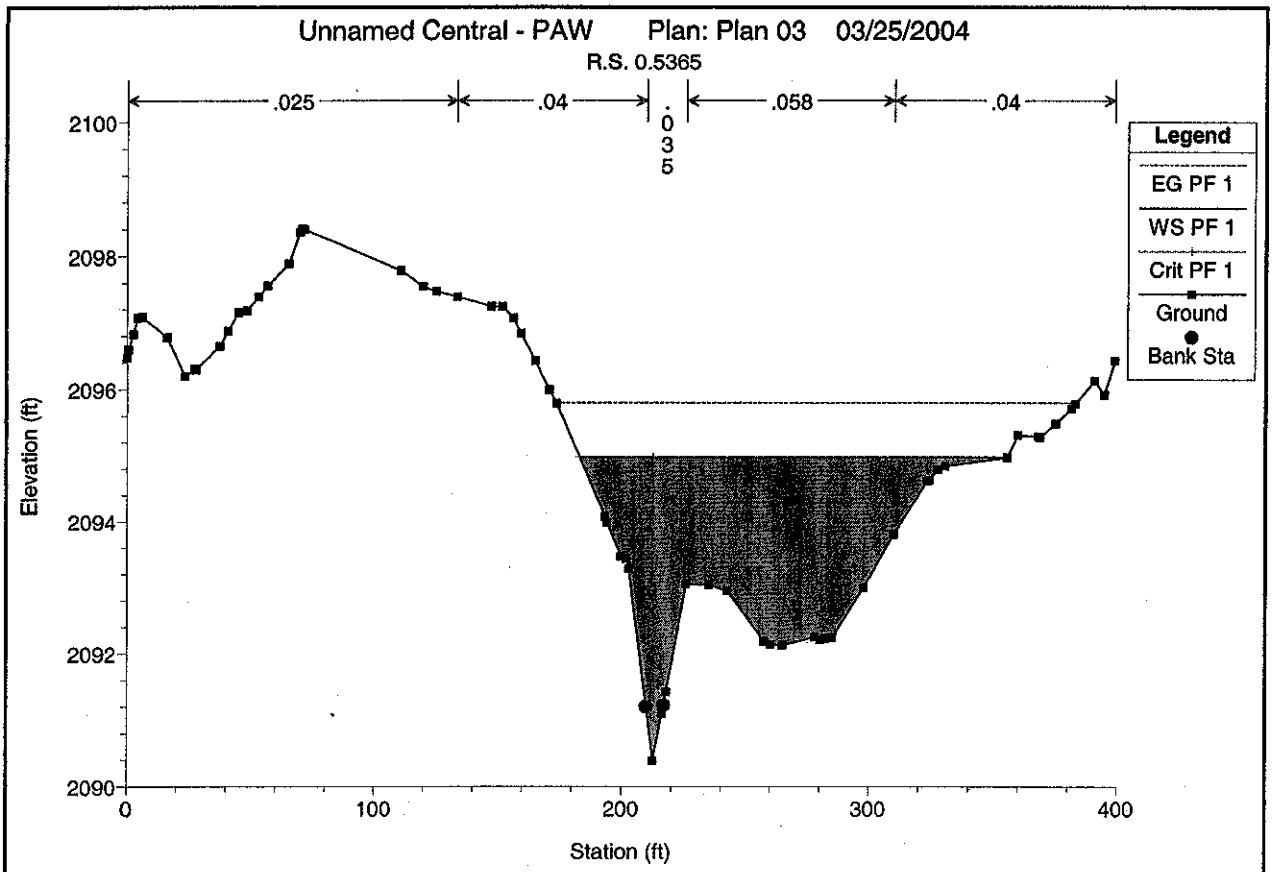
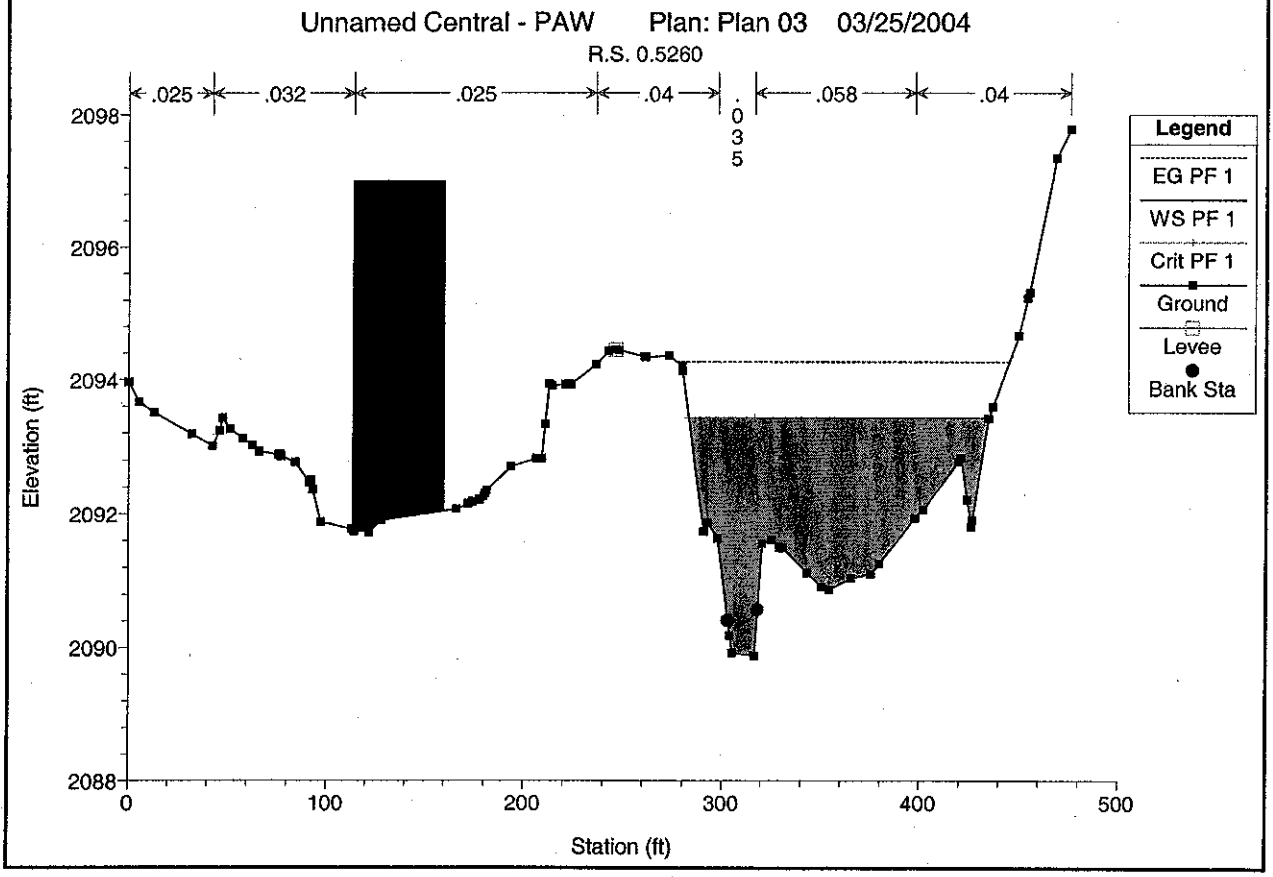
R.S. 0.6530
.032
.04
.025
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

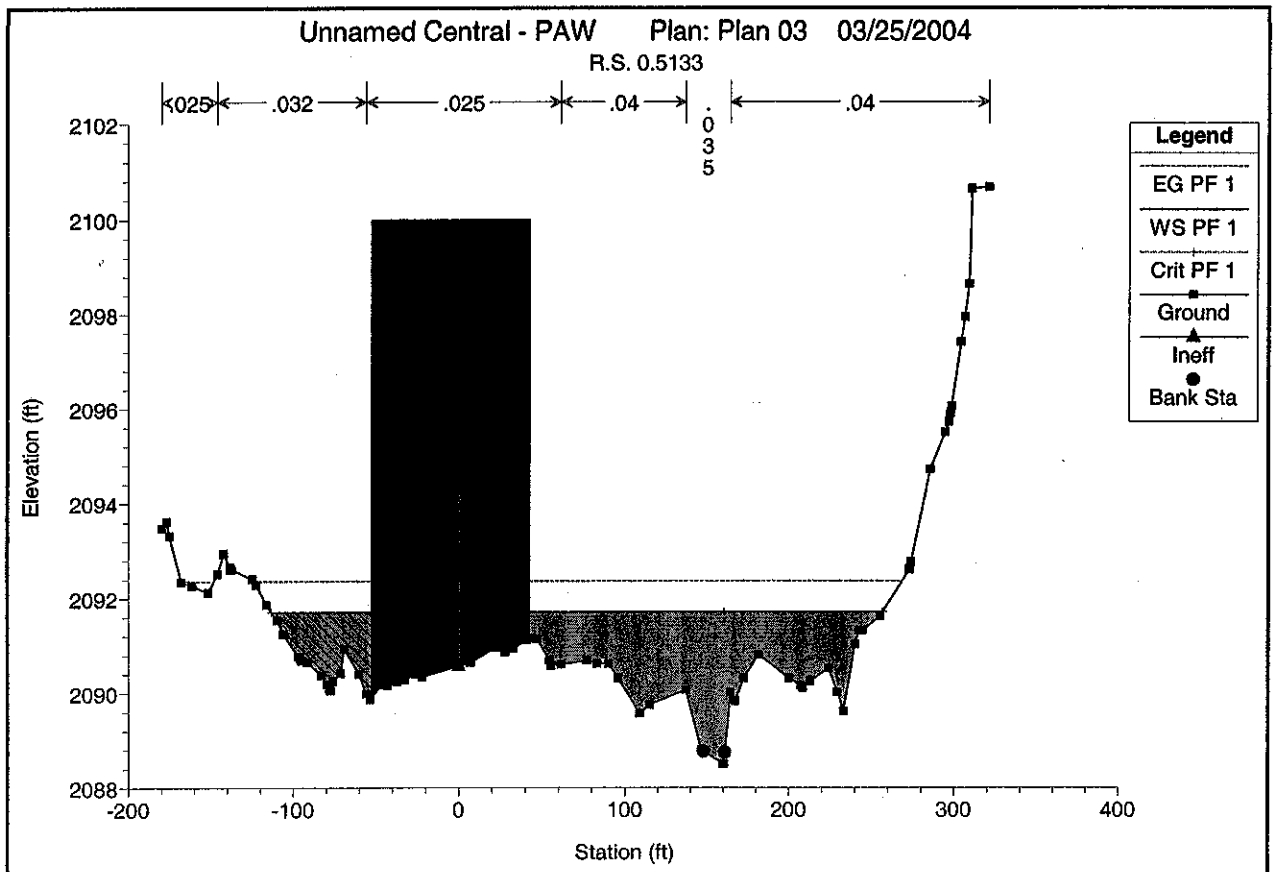

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.6303
.025
.04
.032
.04
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

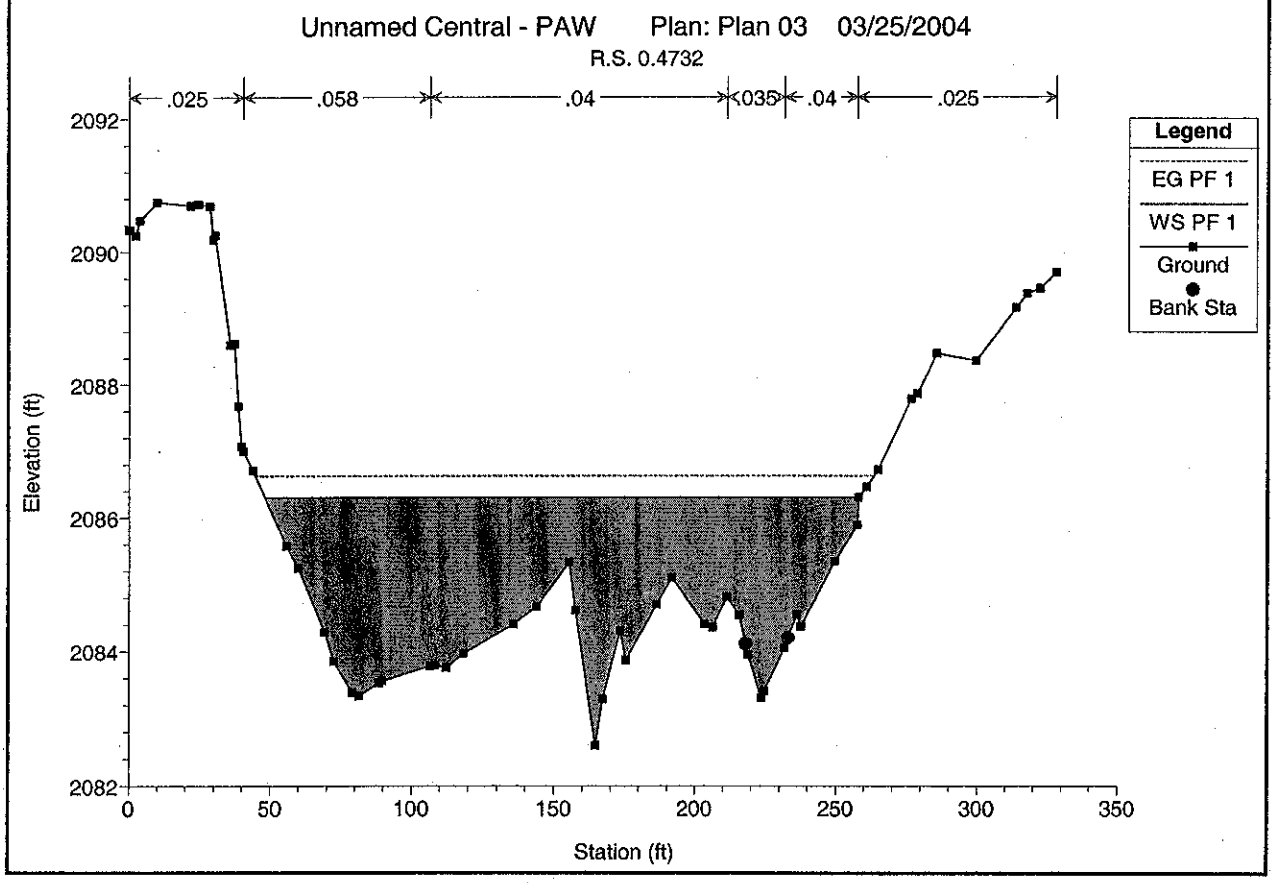

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.5956
.04
.025
.04
.032
.04
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

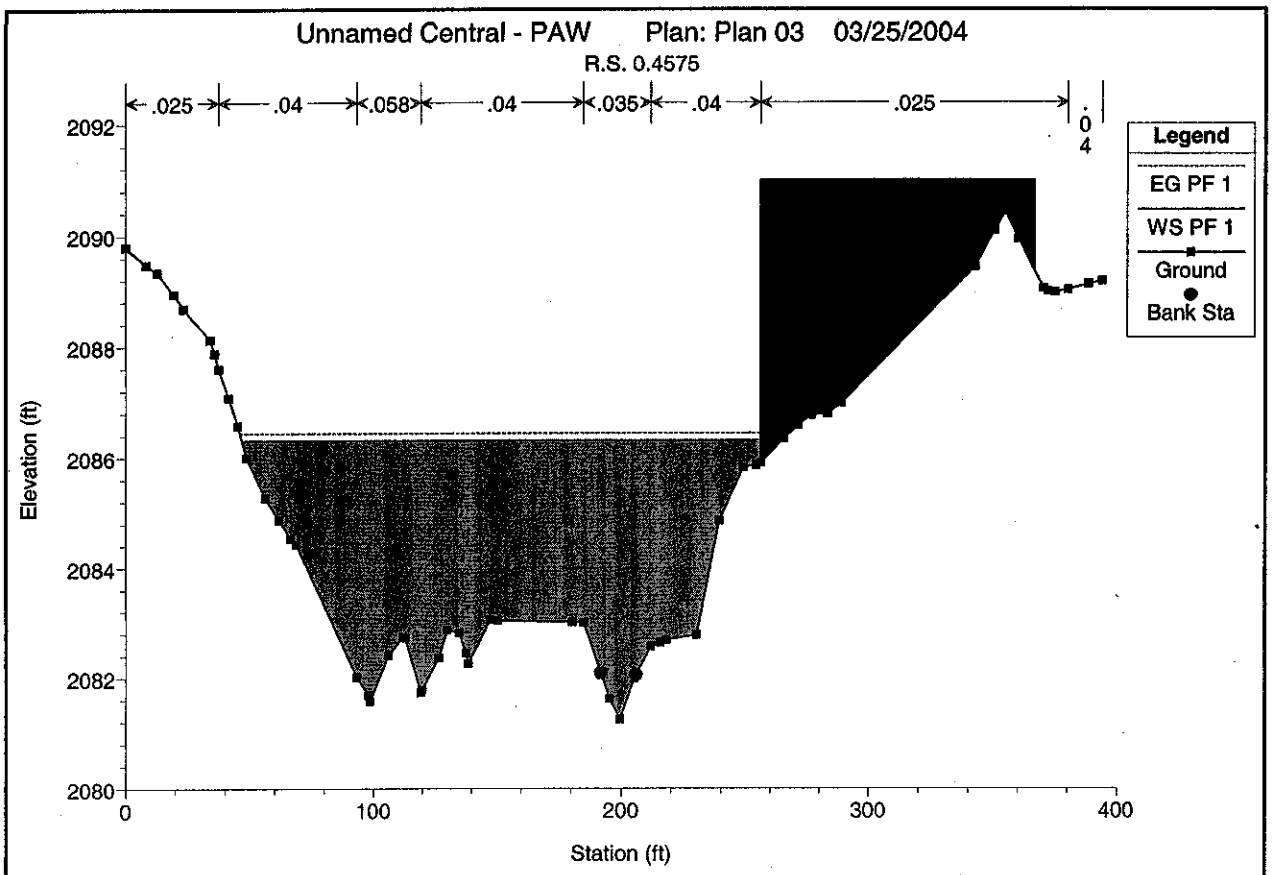

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.5545
.025
.04
.035
.058
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

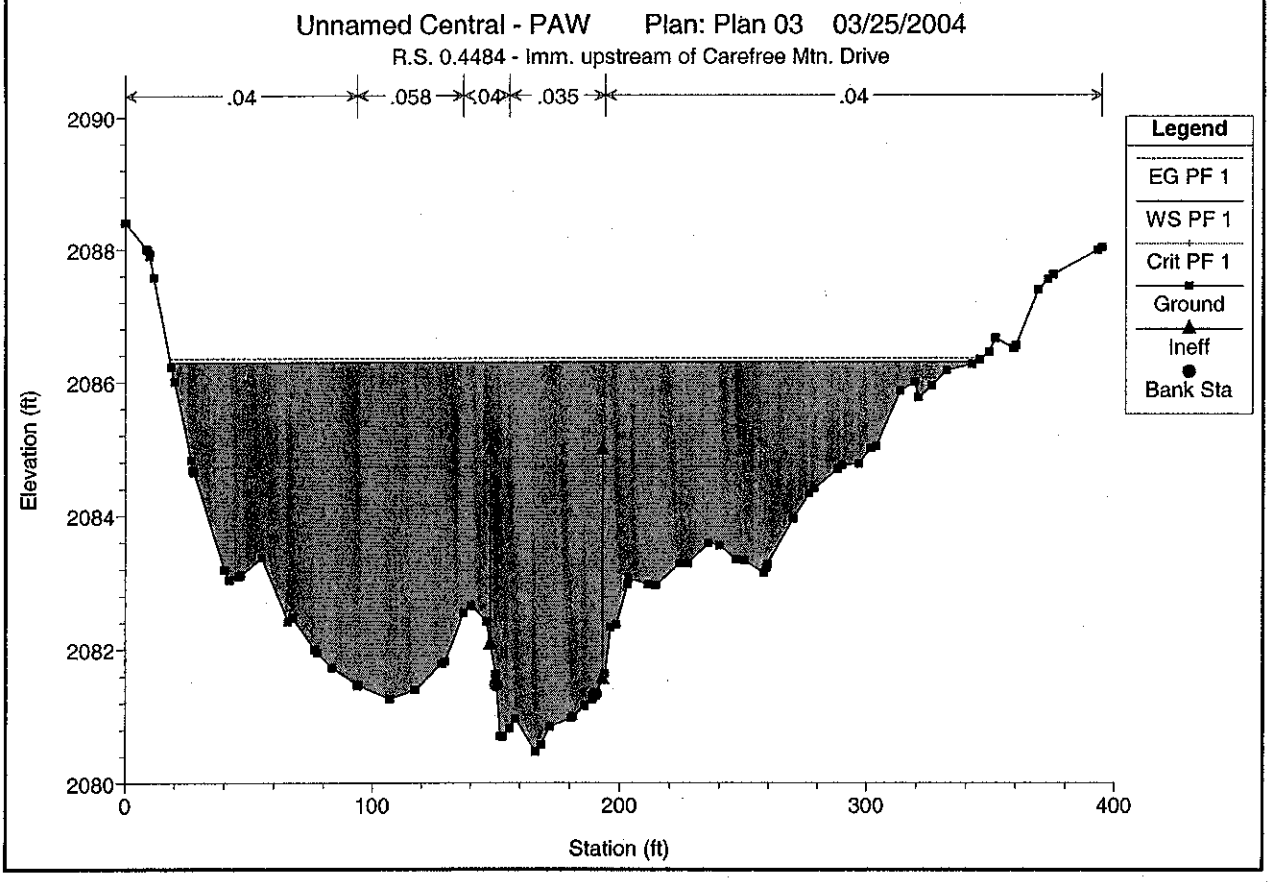

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.5365
.025
.04
.035
.058
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2100
2098
2096
2094
2092
2090
0
100
200
300
400
Station (ft)

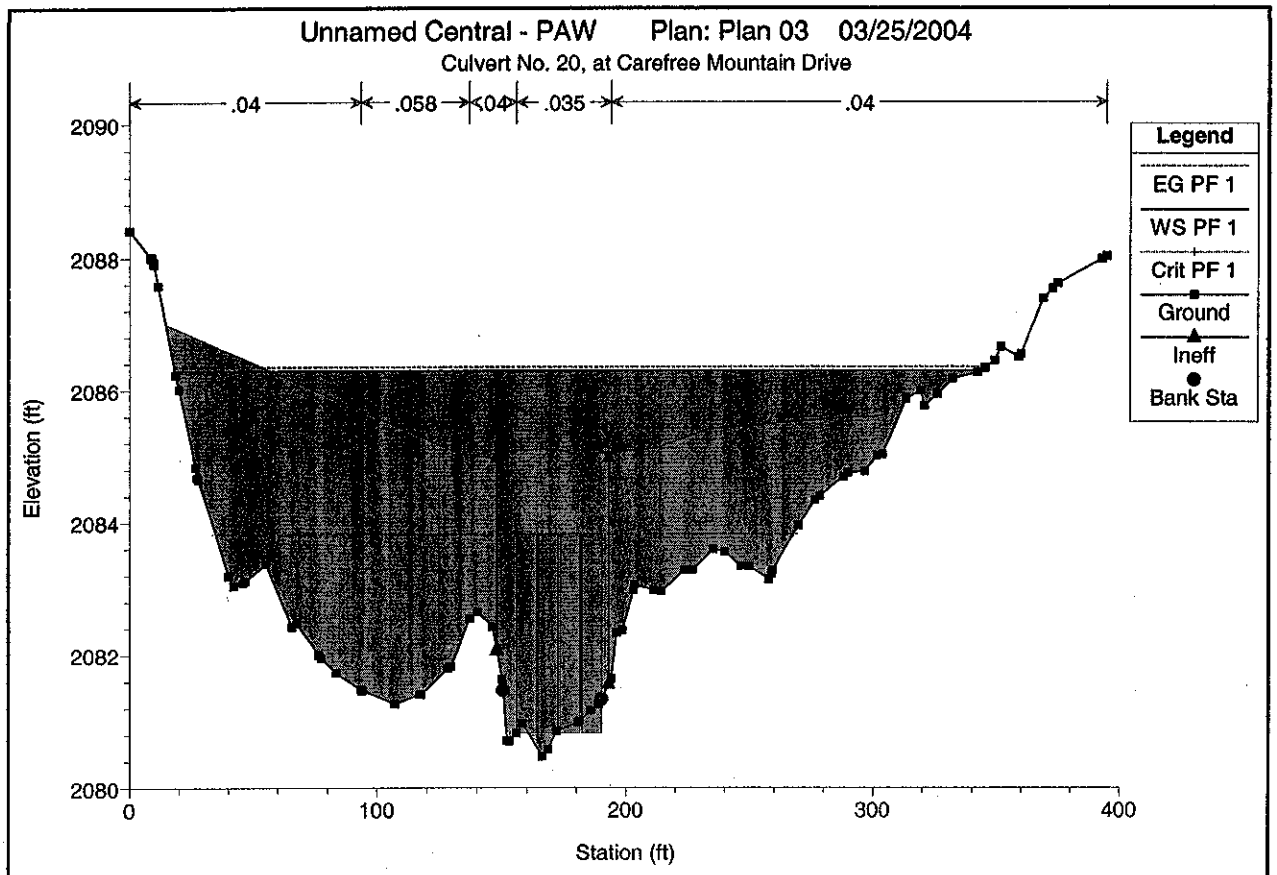

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.5260
.025
.032
.025
.04
.035
.058
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Elevation (ft)
2098
2096
2094
2092
2090
2088
0
100
200
300
400
500
Station (ft)

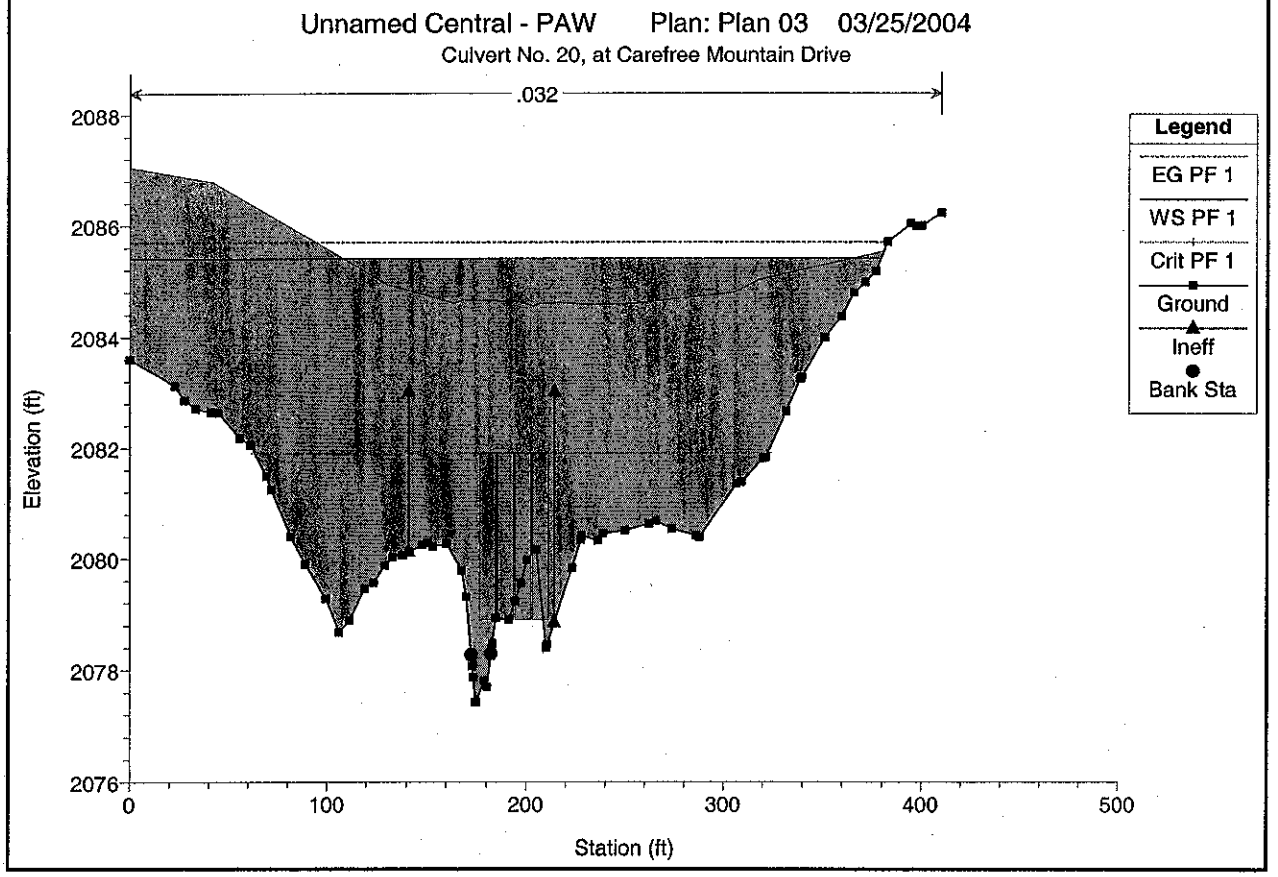

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.5133
.025
.032
.025
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

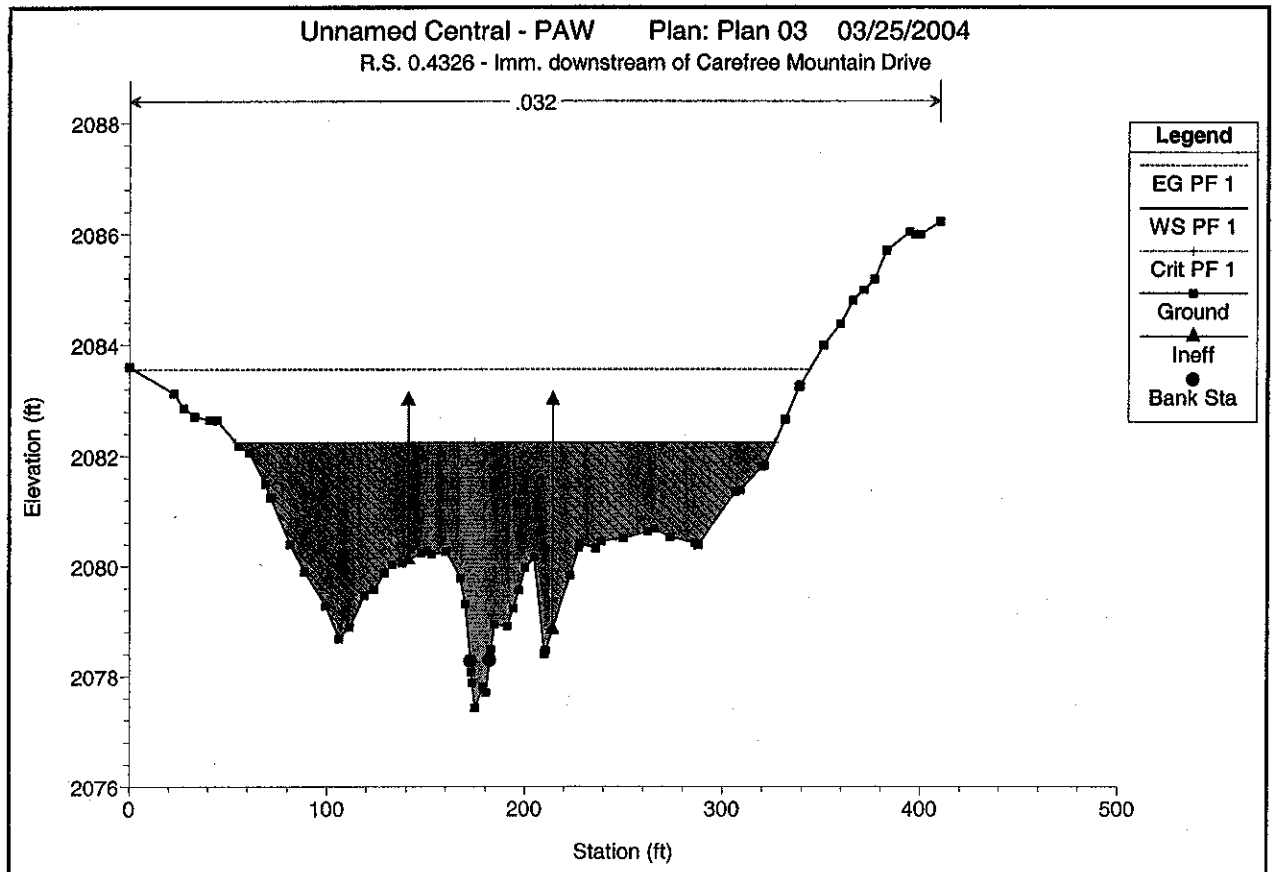

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.4732
.025
.058
.04
.035
.04
.025
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

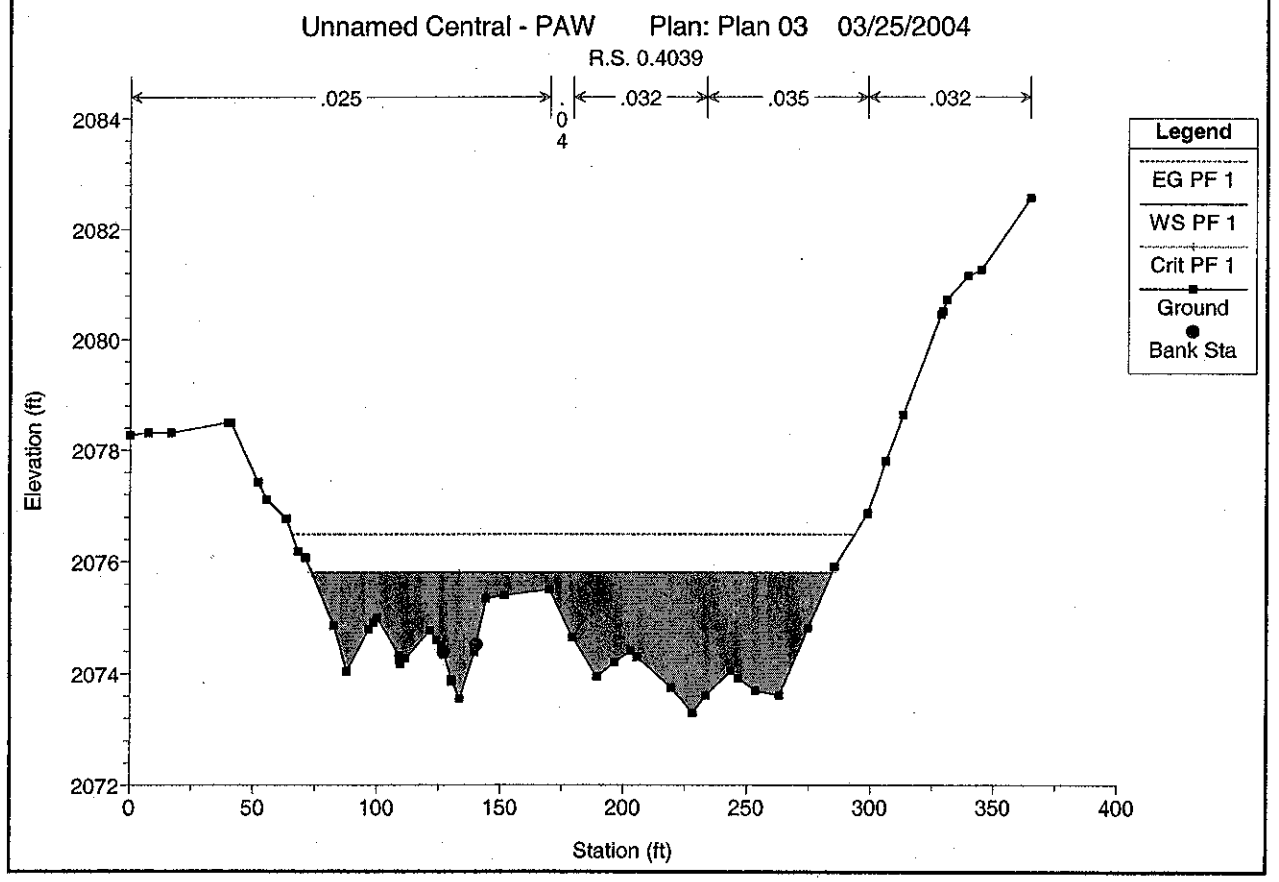

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.4575
.025
.04
.058
.04
.035
.04
.025
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
2092
2090
2088
2086
2084
2082
2080
0
100
200
300
400
Station (ft)

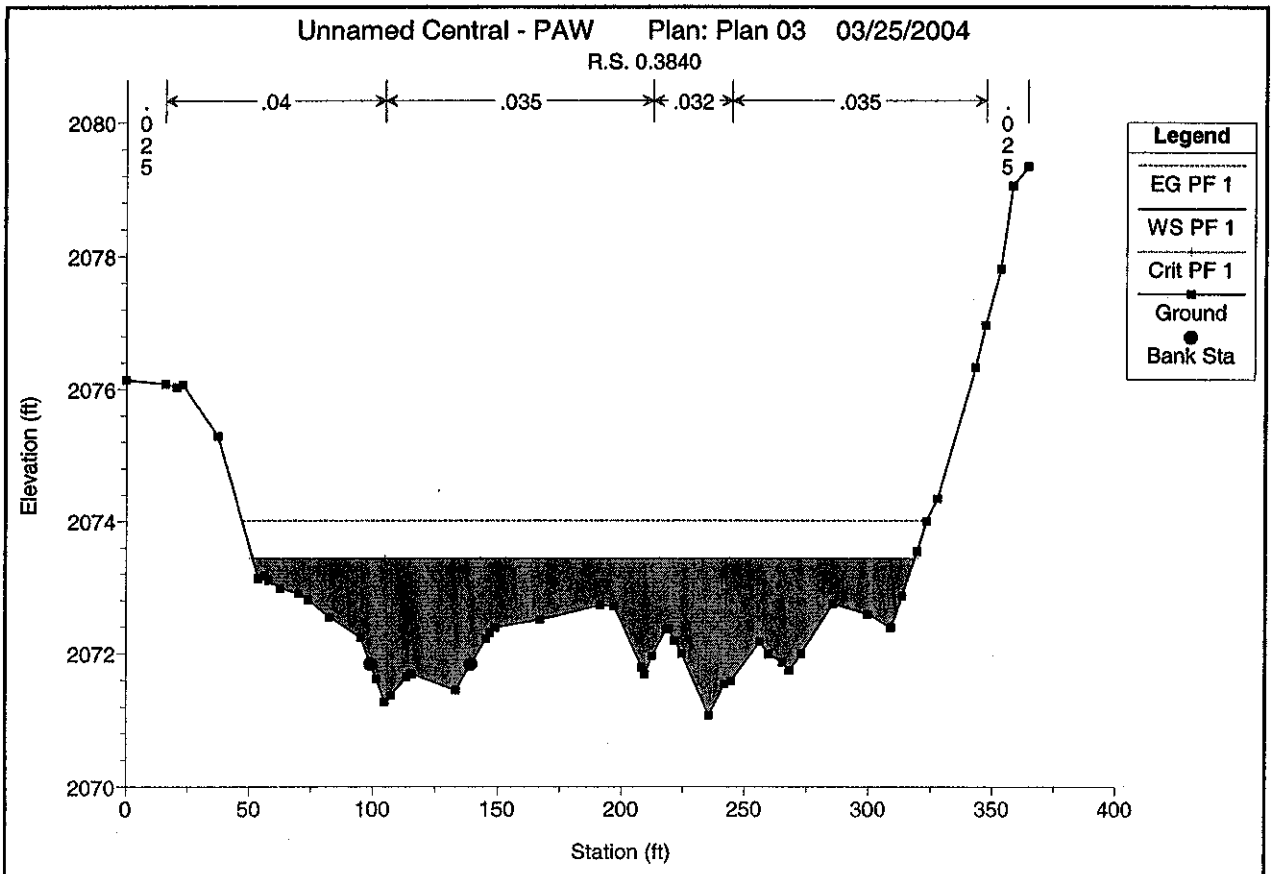

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.4484 - Imm. upstream of Carefree Mtn. Drive
.04
.058
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
2090
2088
2086
2084
2082
2080
0
100
200
300
400
Station (ft)

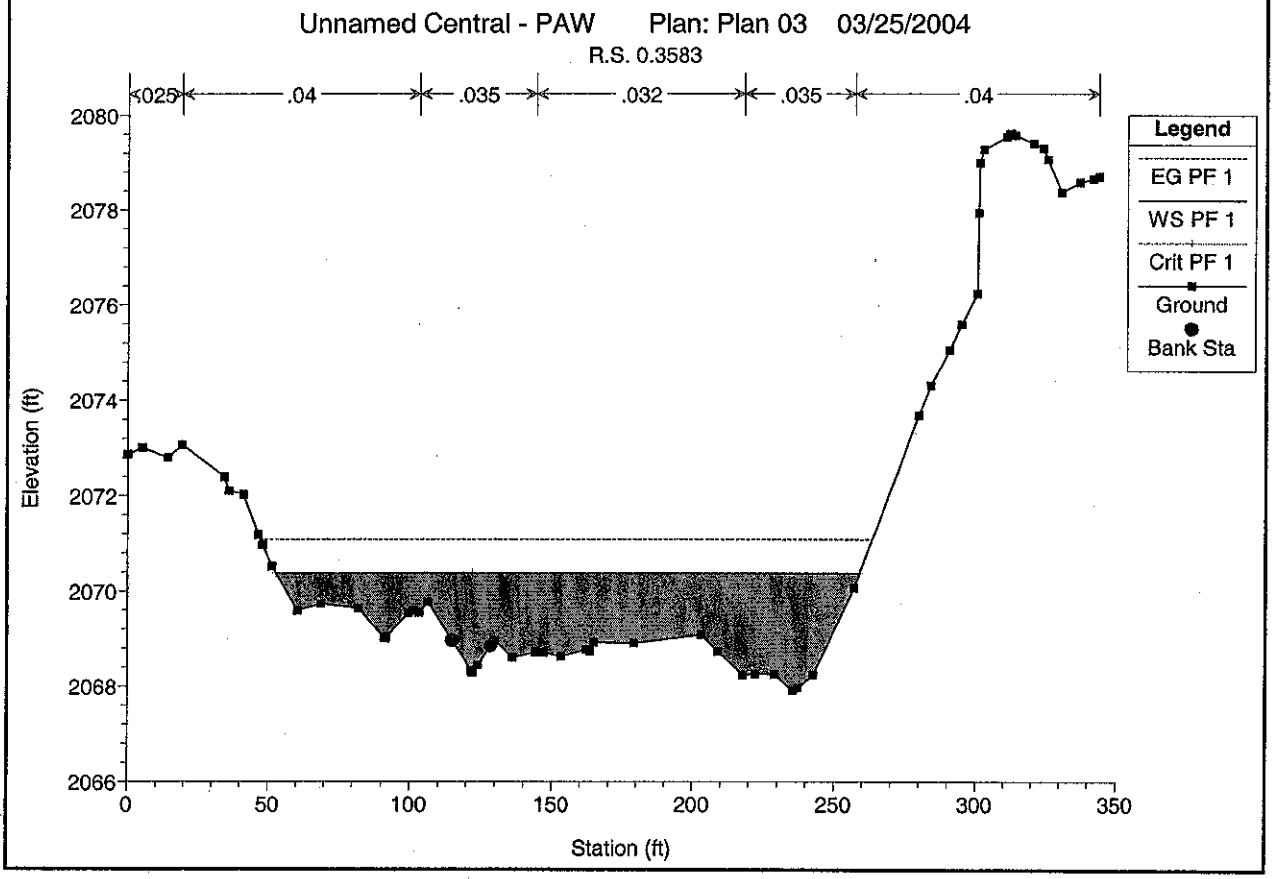

Unnamed Central - PAW Plan: Plan 03 03/25/2004
Culvert No. 20, at Carefree Mountain Drive
.04
.058
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
2090
2088
2086
2084
2082
2080
0
100
200
300
400
Station (ft)

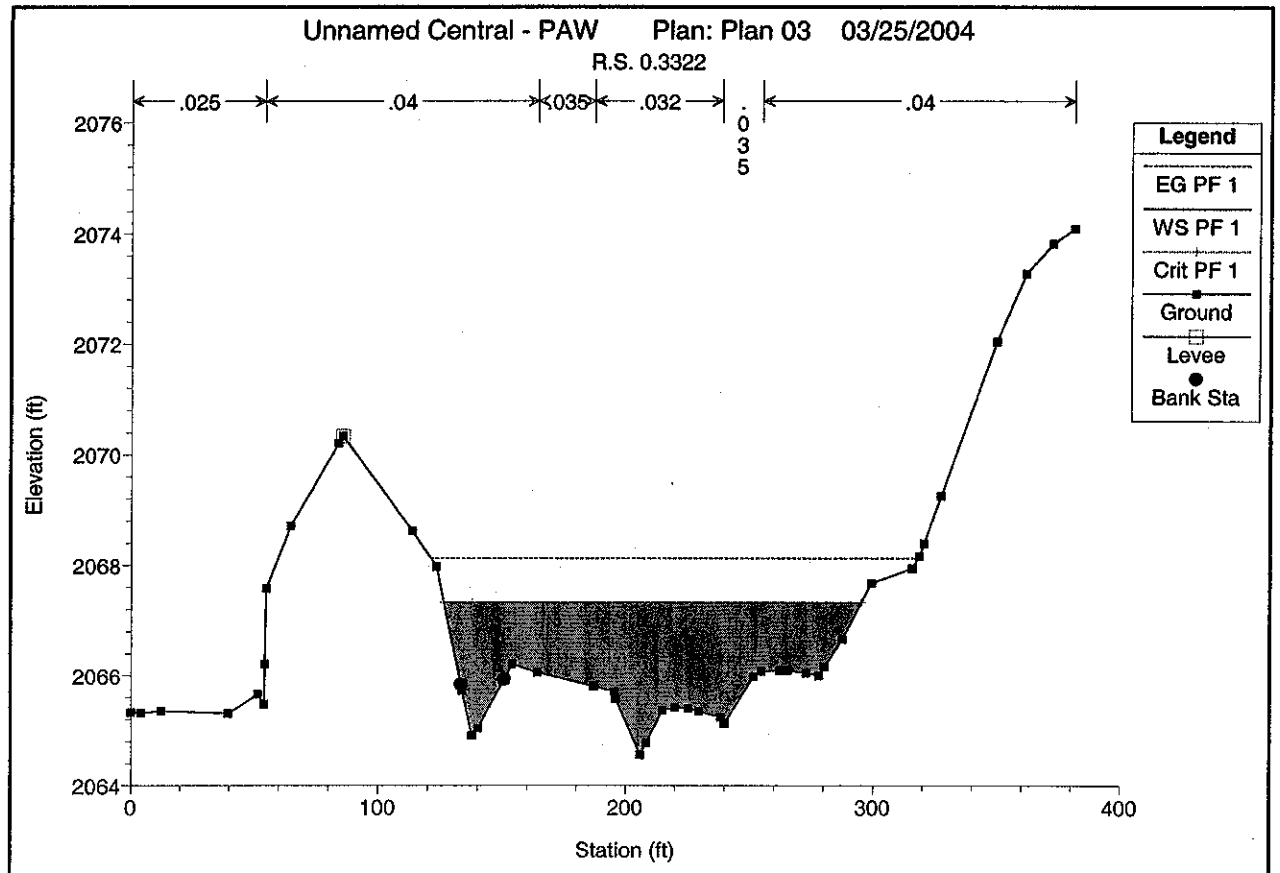

Unnamed Central - PAW Plan: Plan 03 03/25/2004
Culvert No. 20, at Carefree Mountain Drive
.032
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
2088
2086
2084
2082
2080
2078
2076
0
100
200
300
400
500
Station (ft)

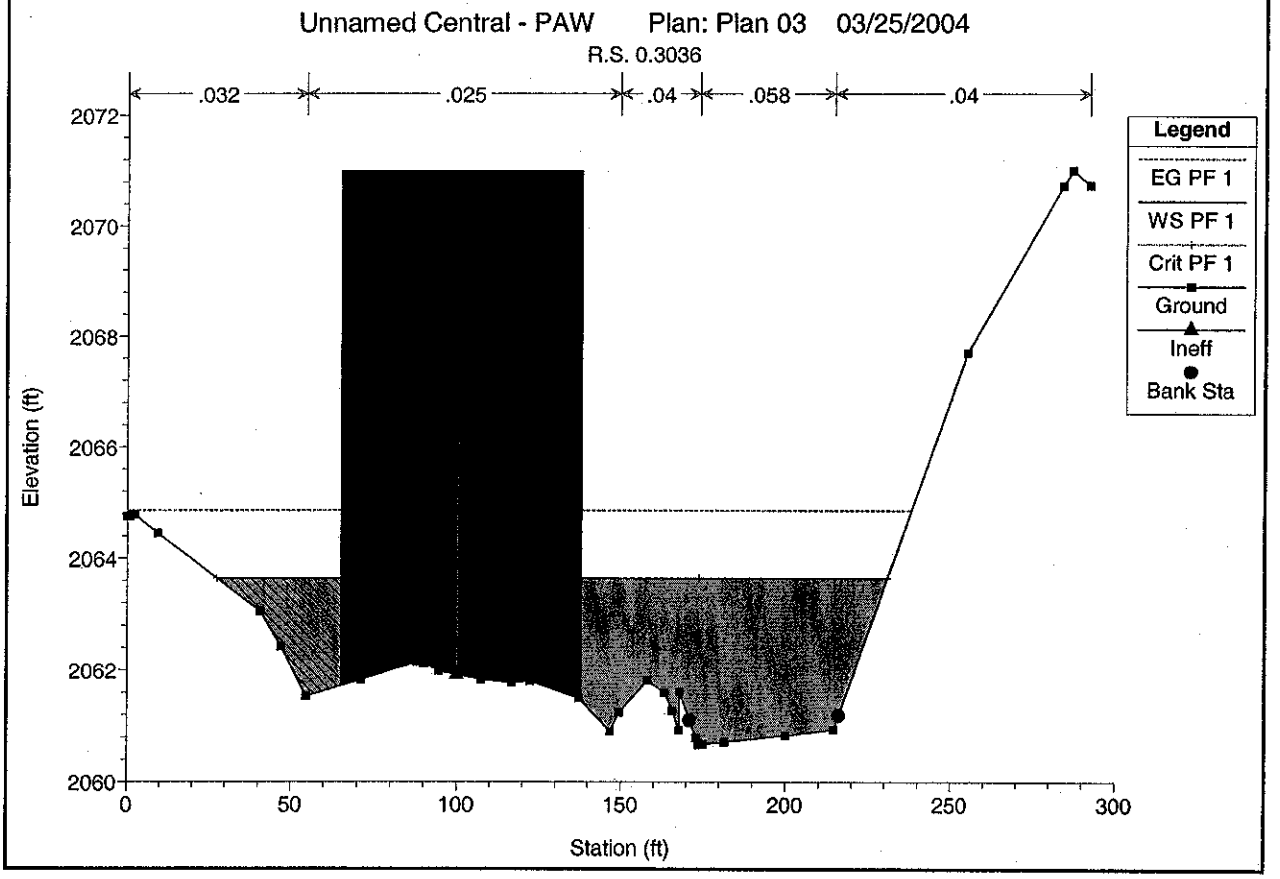

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.4326 - Imm. downstream of Carefree Mountain Drive
.032
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
2088
2086
2084
2082
2080
2078
2076
0
100
200
300
400
500
Station (ft)

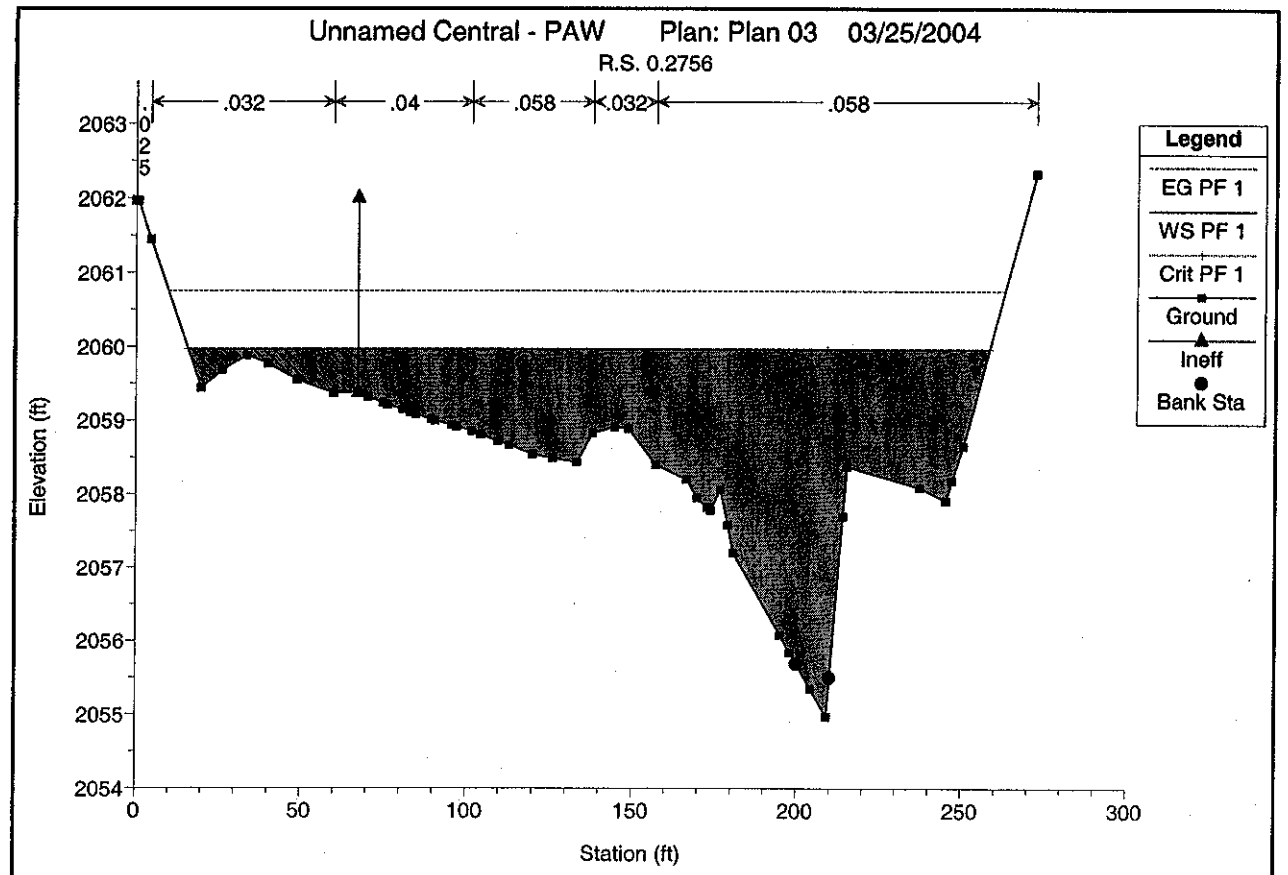

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.4039
.025
.0
4
.032
.035
.032
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2084
2082
2080
2078
2076
2074
2072
0
50
100
150
200
250
300
350
400
Station (ft)

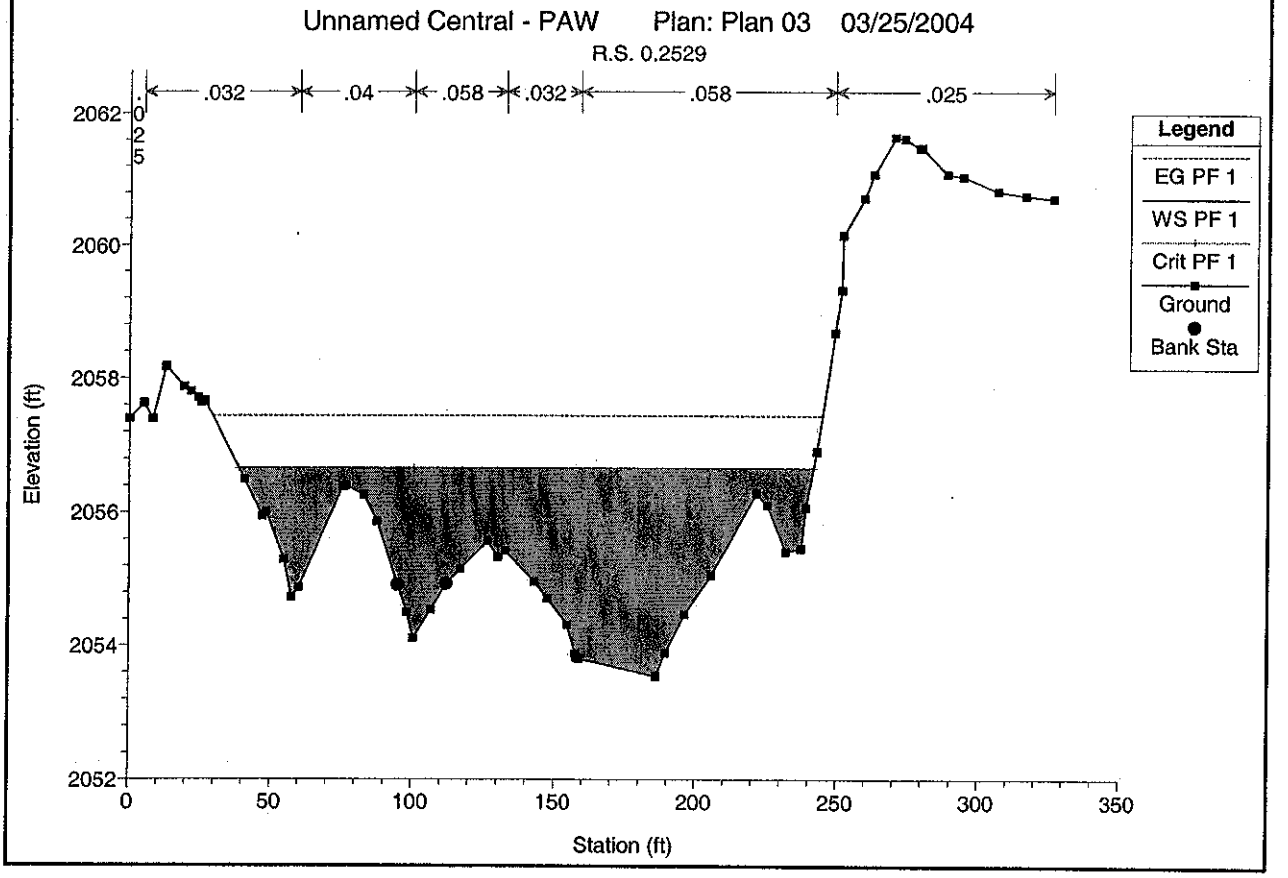

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.3840
.025
.04
.035
.032
.035
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2080
2078
2076
2074
2072
2070
0
50
100
150
200
250
300
350
400
Station (ft)

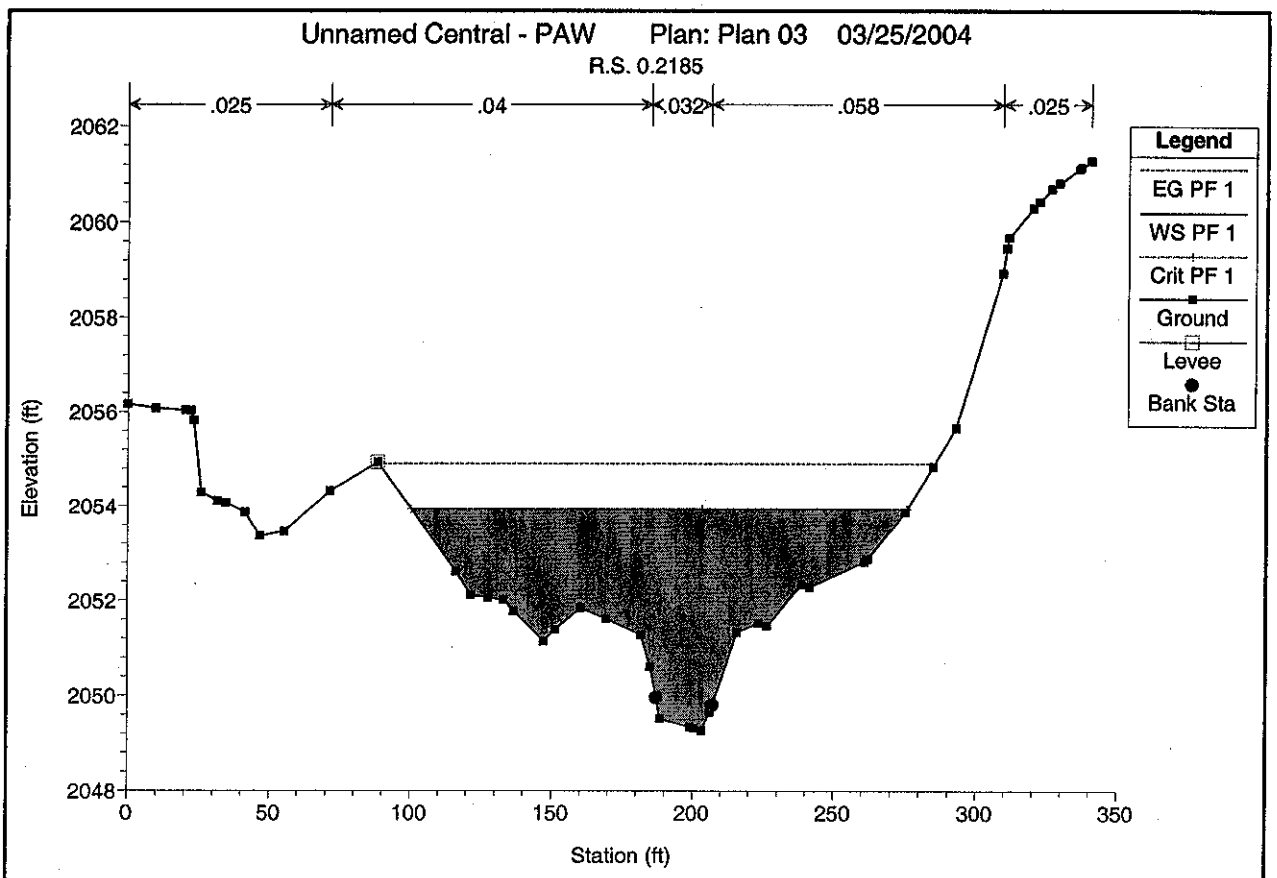

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.3583
.025
.04
.035
.032
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2080
2078
2076
2074
2072
2070
2068
2066
0
50
100
150
200
250
300
350
Station (ft)

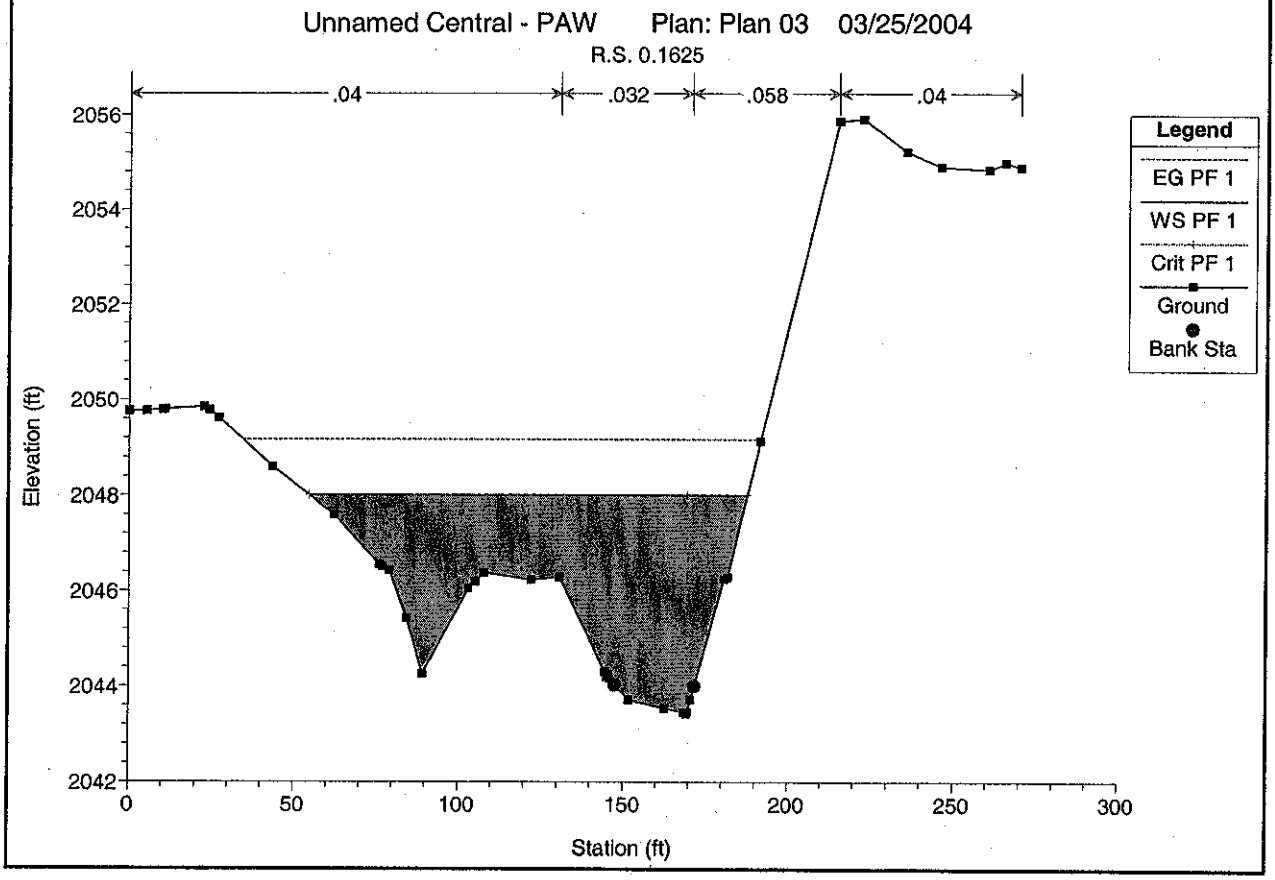

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.3322
.025
.04
.035
.032
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

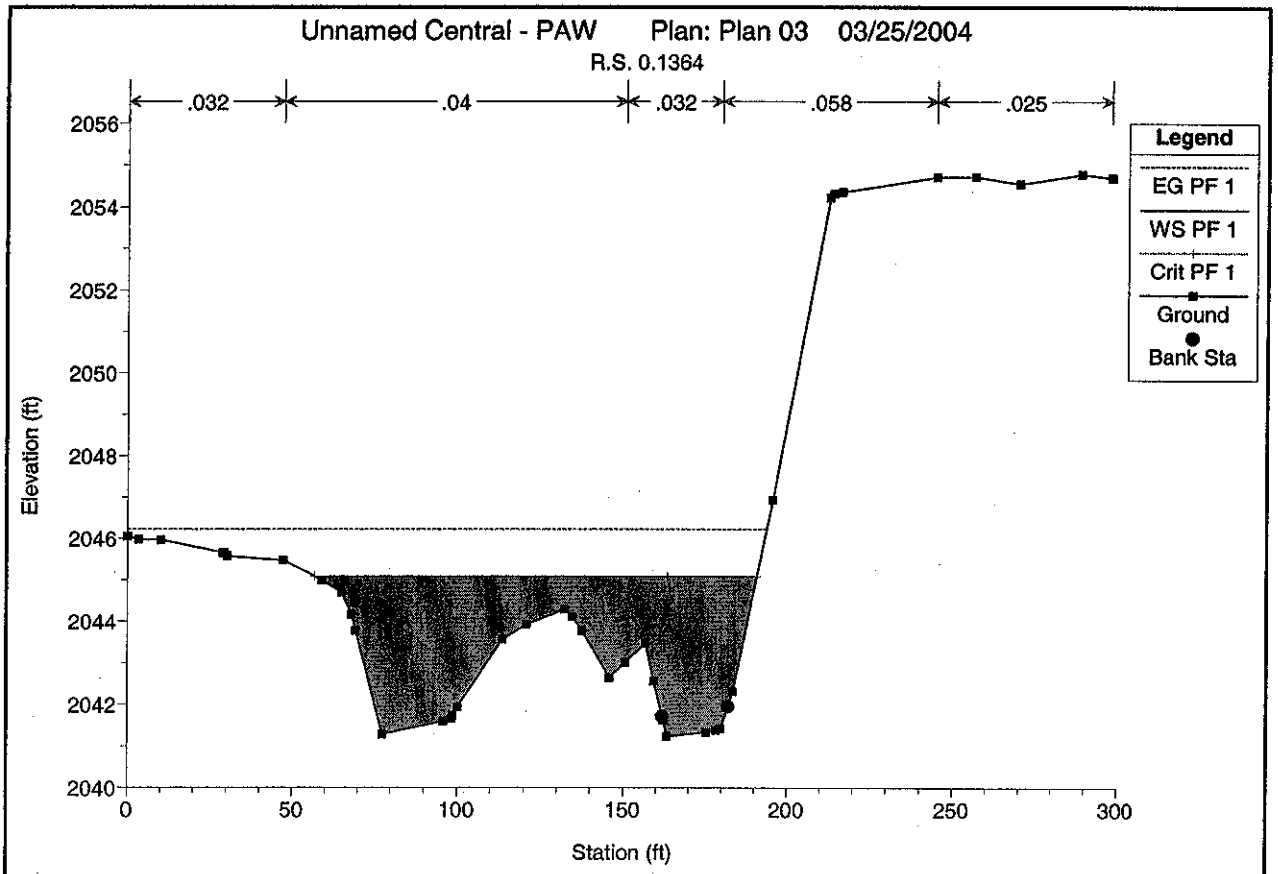

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.3036
.032
.025
.04
.058
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

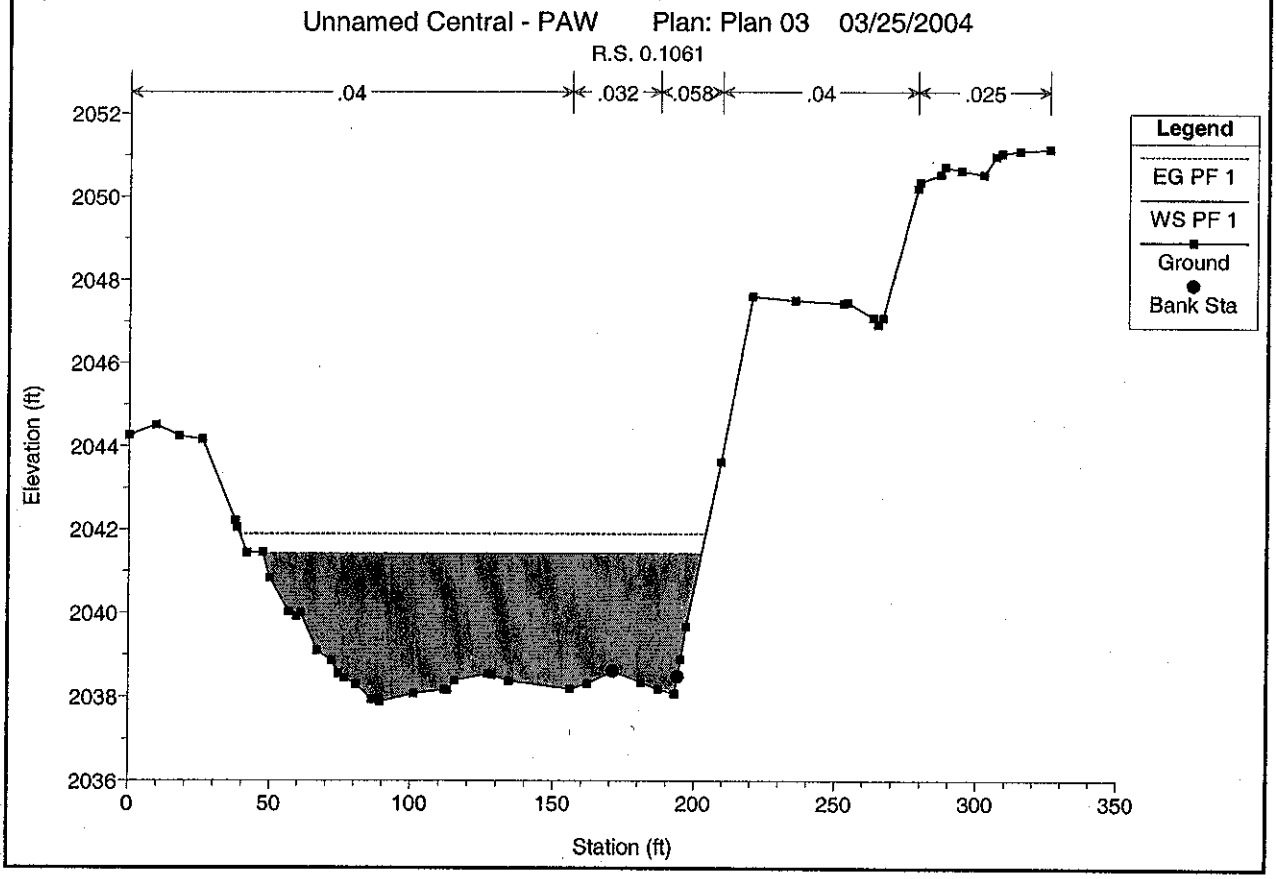

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.2756
.025
.032
.04
.058
.032
.058
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
2063
2062
2061
2060
2059
2058
2057
2056
2055
2054
0
50
100
150
200
250
300
Station (ft)

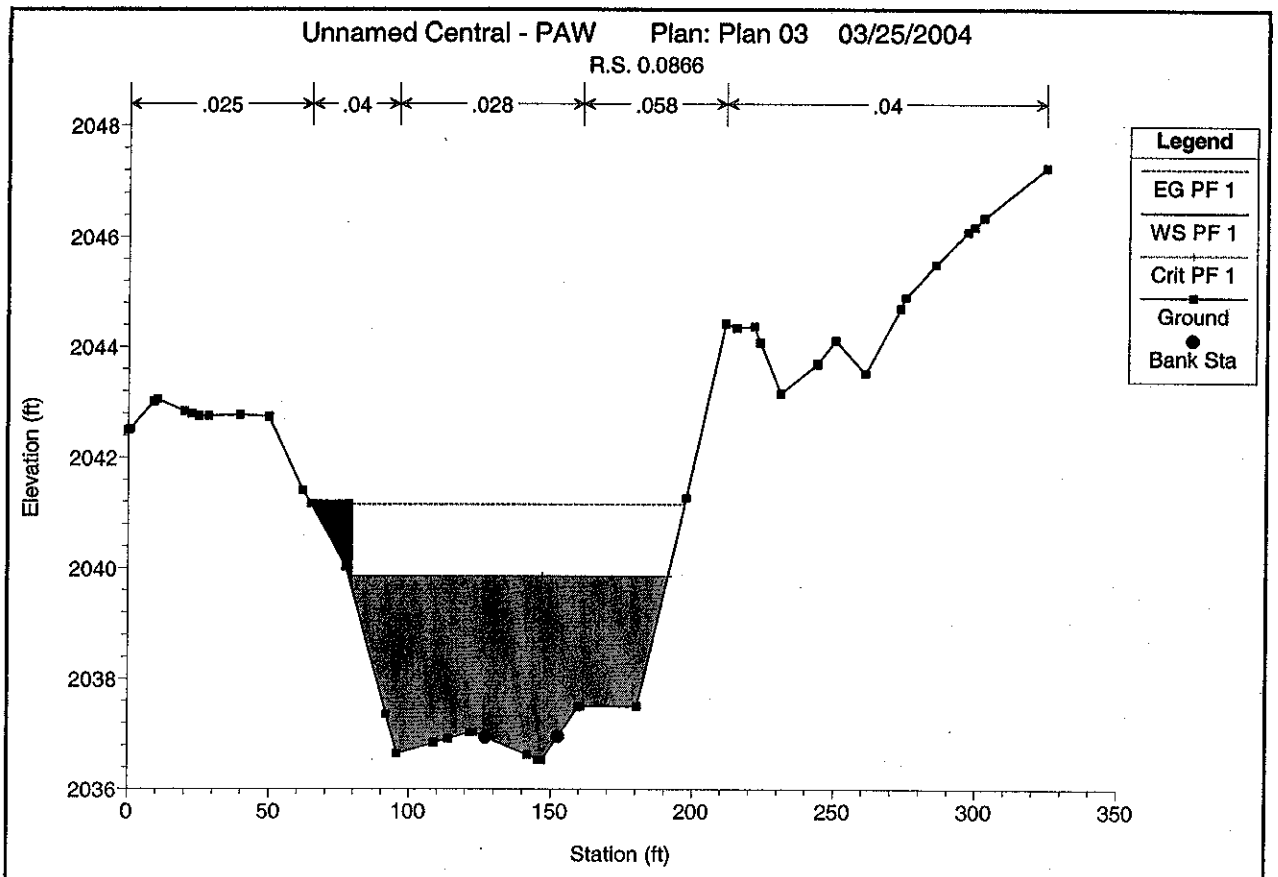

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.2529
.025
.032
.04
.058
.032
.058
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2062
2060
2058
2056
2054
2052
0
50
100
150
200
250
300
350
Station (ft)

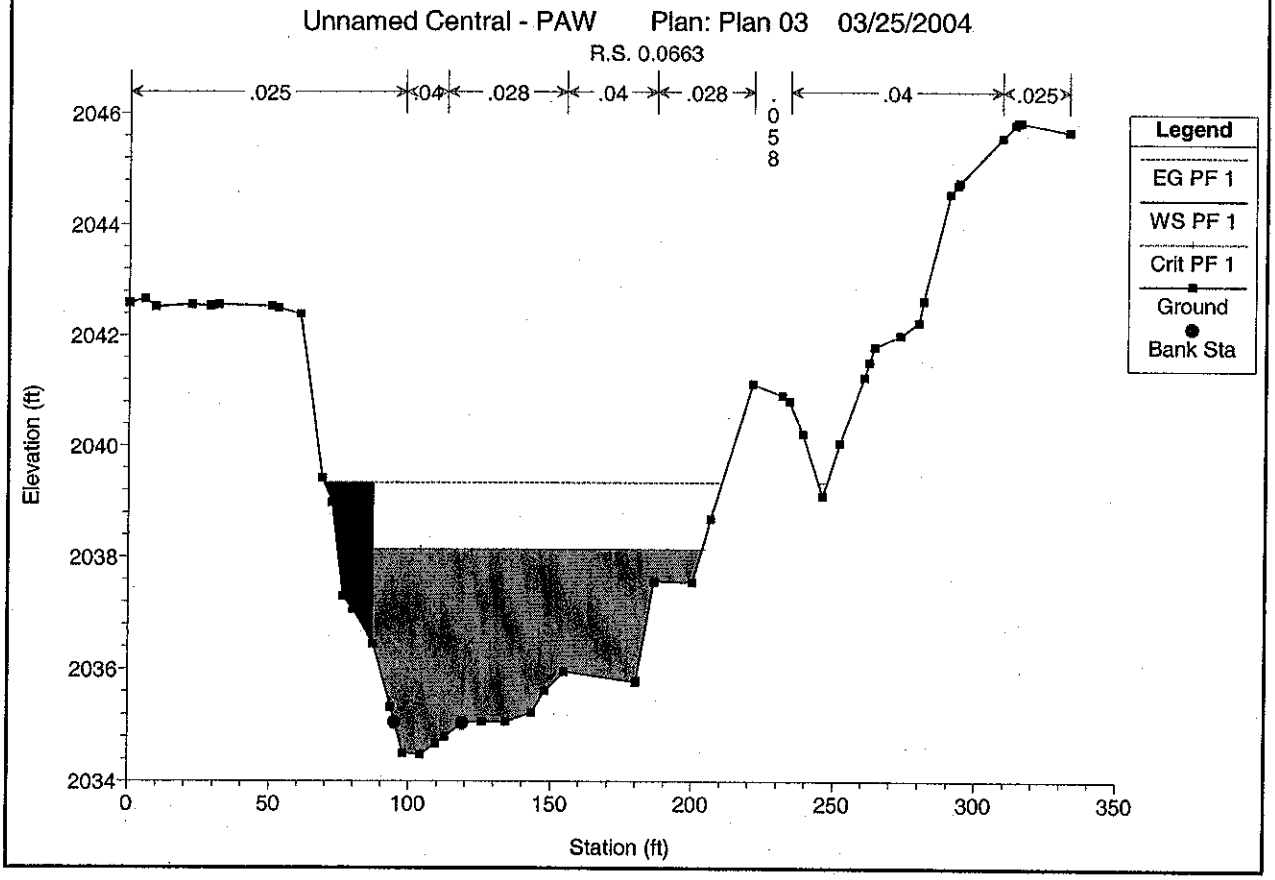

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.2185
.025
.04
.032
.058
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

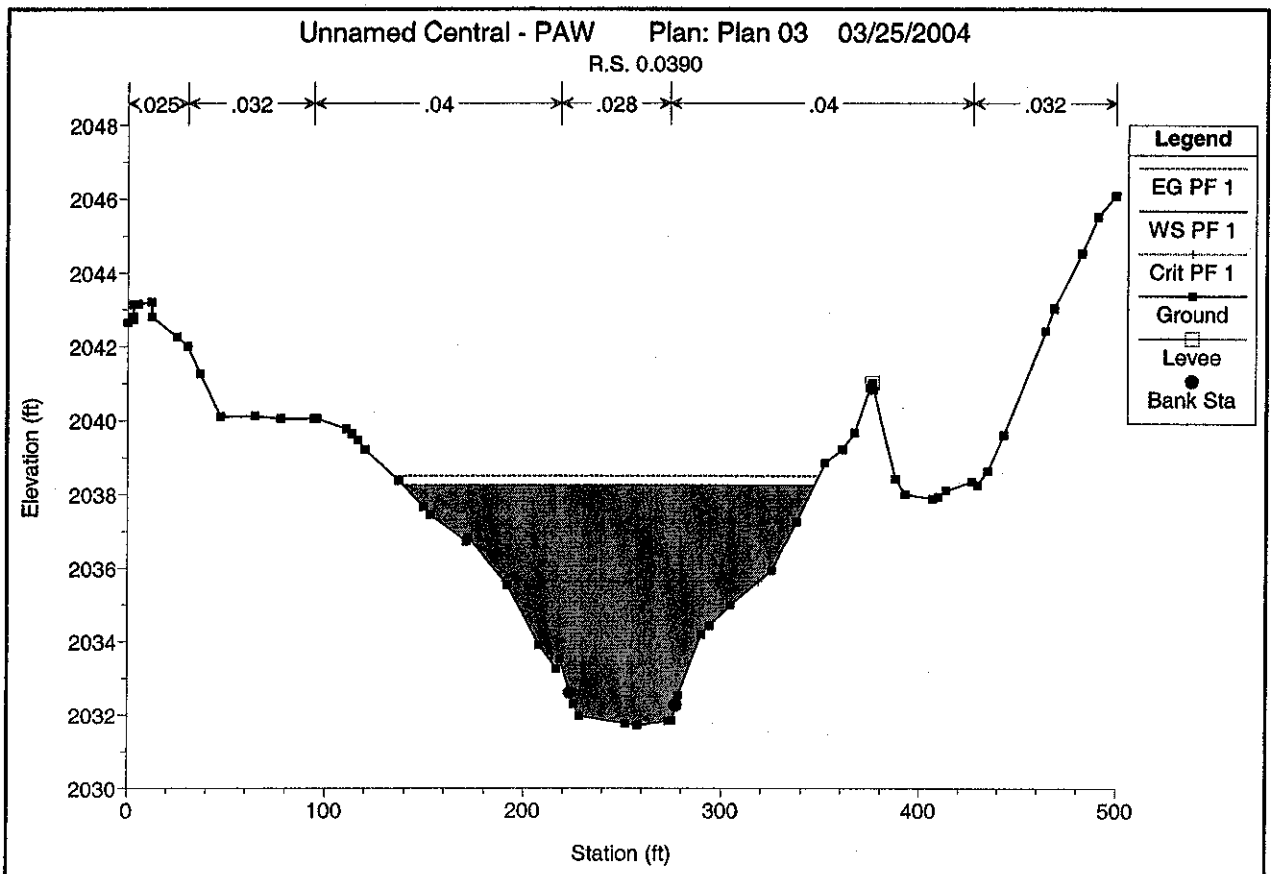

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.1625
.04
.032
.058
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

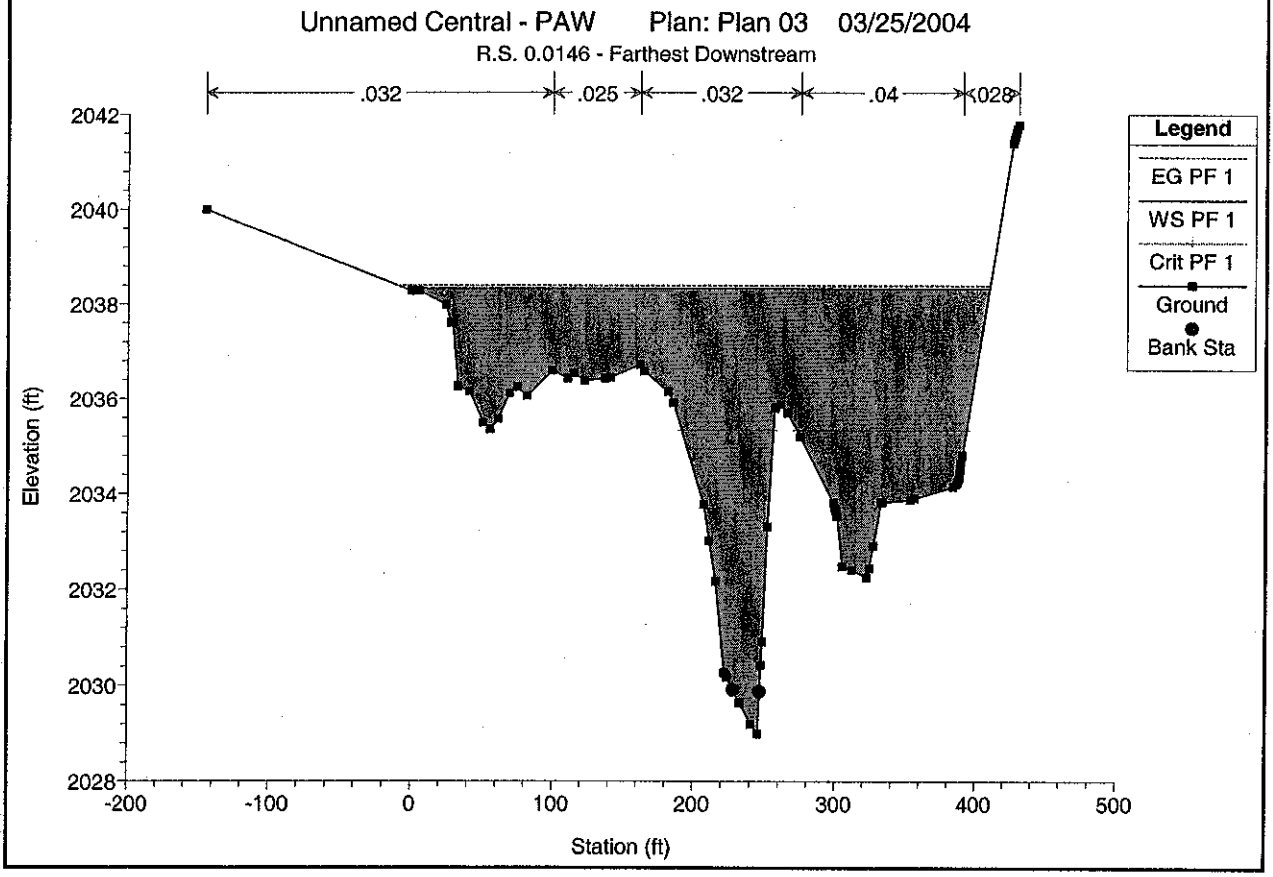

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.1364
.032
.04
.032
.058
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.1061
.04
.032
.058
.04
.025
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

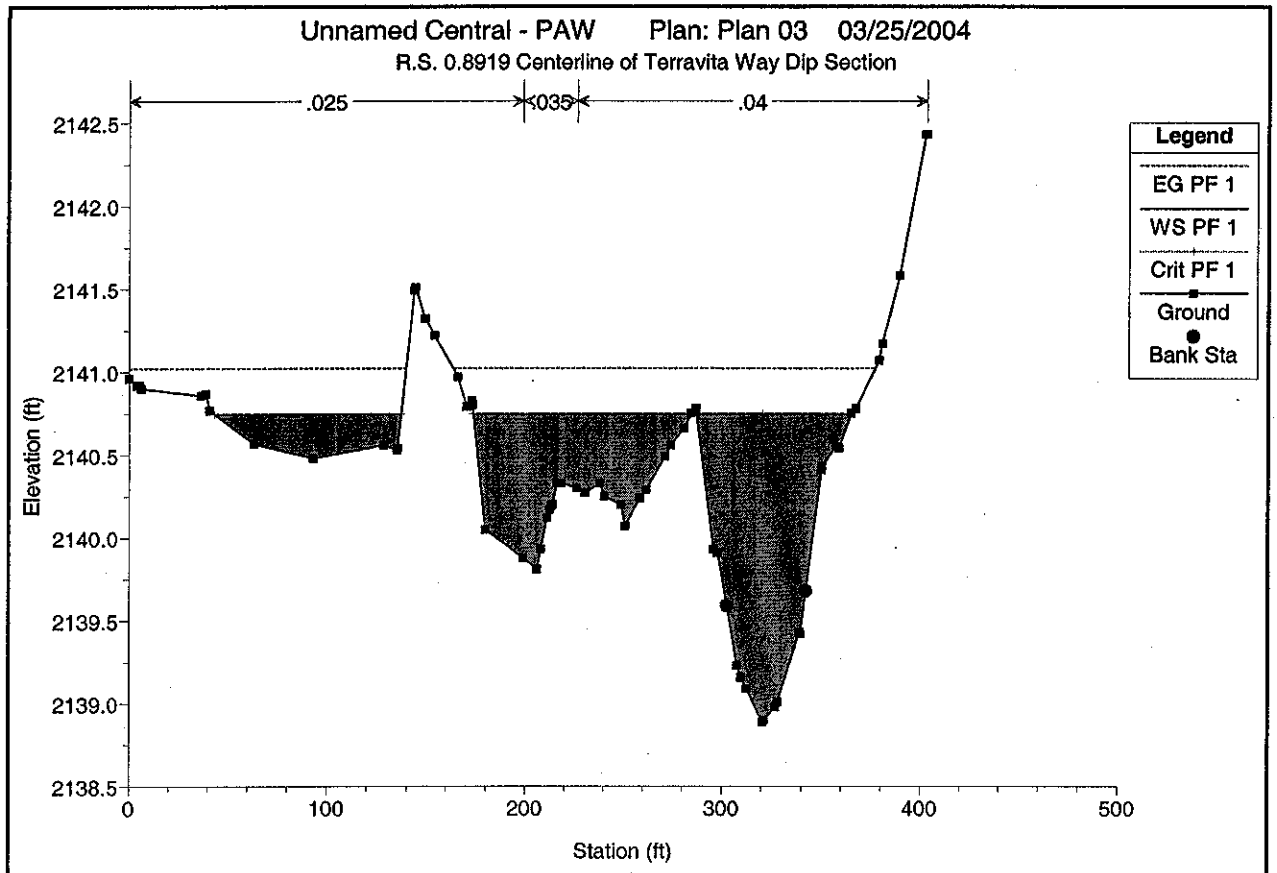

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.0866
.025
.04
.028
.058
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

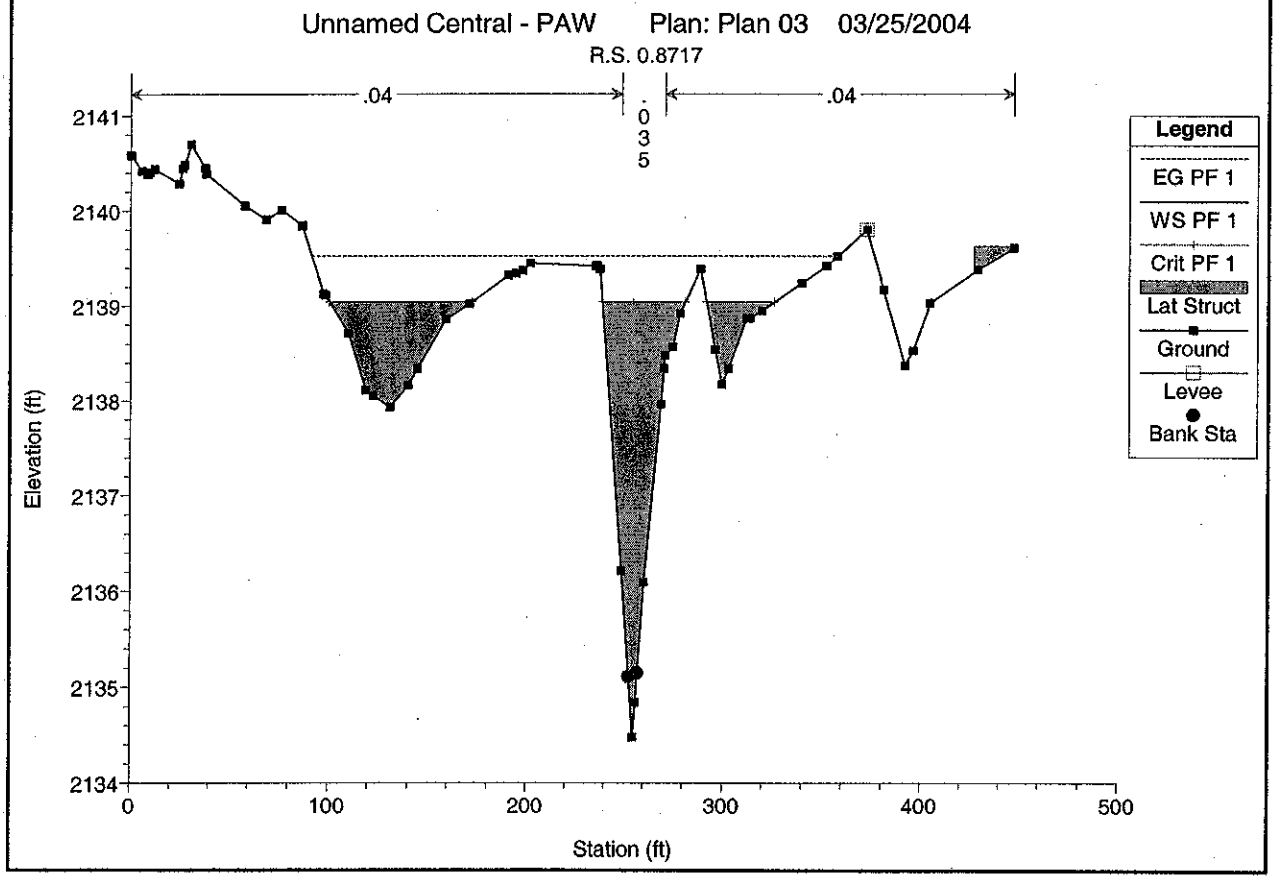

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.0663
.025
.04
.028
.04
.028
.058
.04
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

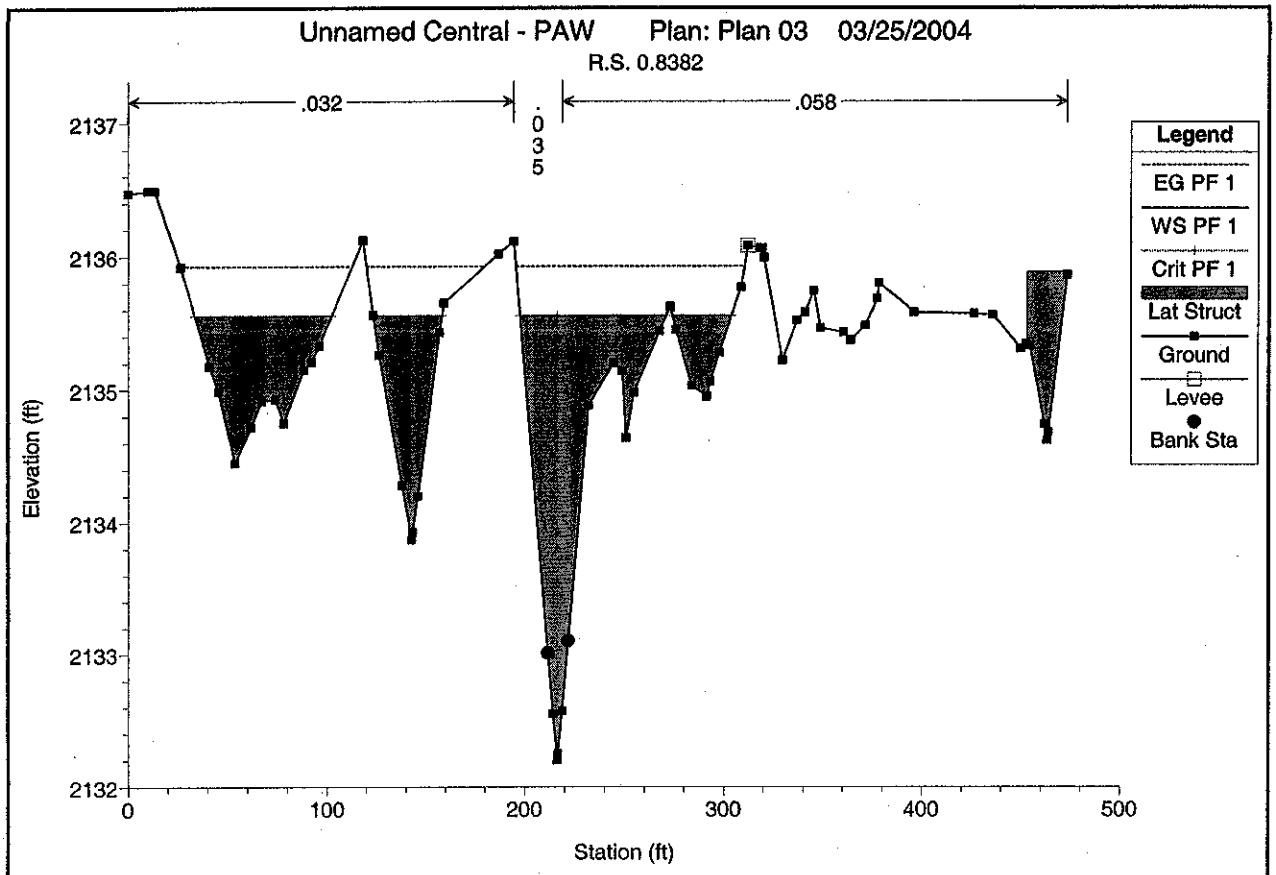

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.0390
.025
.032
.04
.028
.04
.032
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

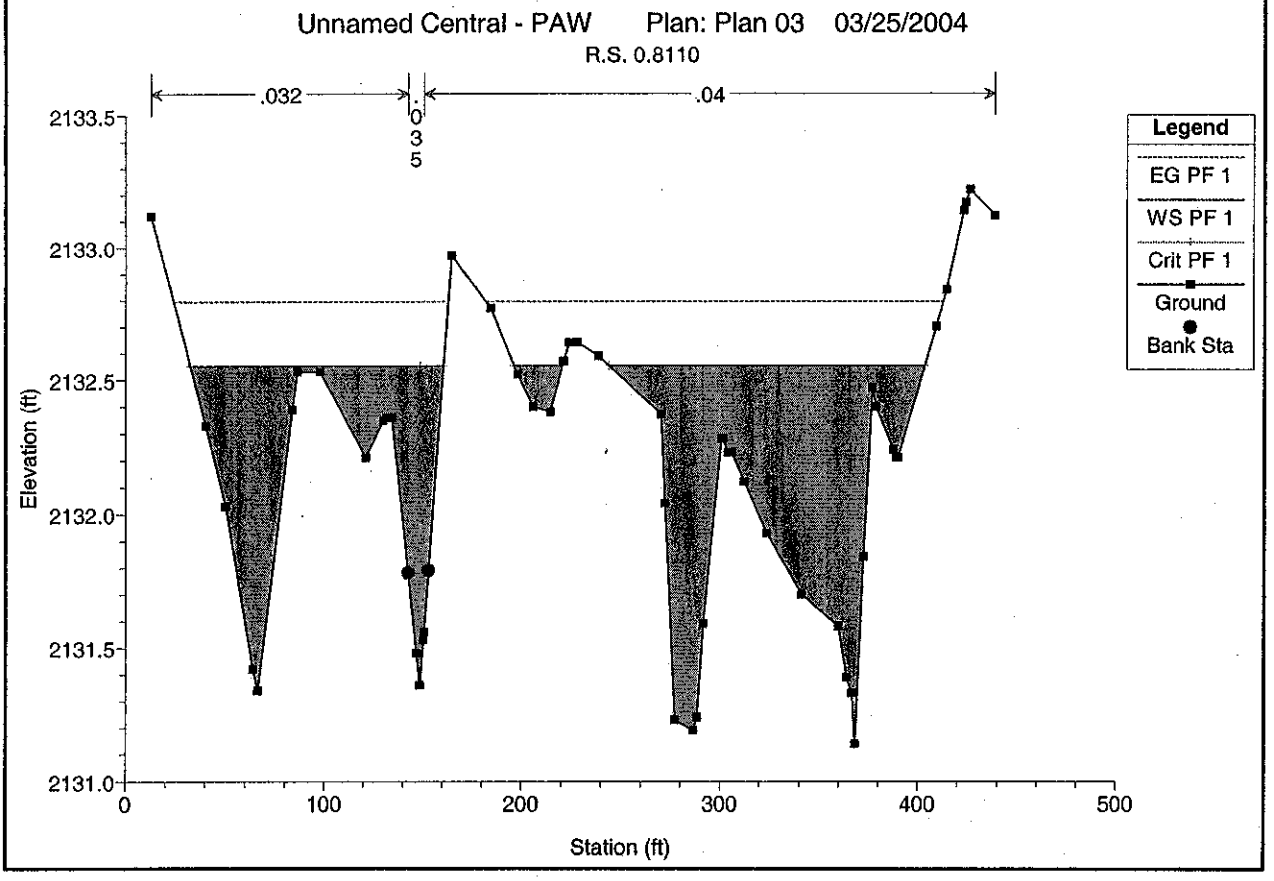

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.0146 - Farthest Downstream
.032
.025
.032
.04
.028
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

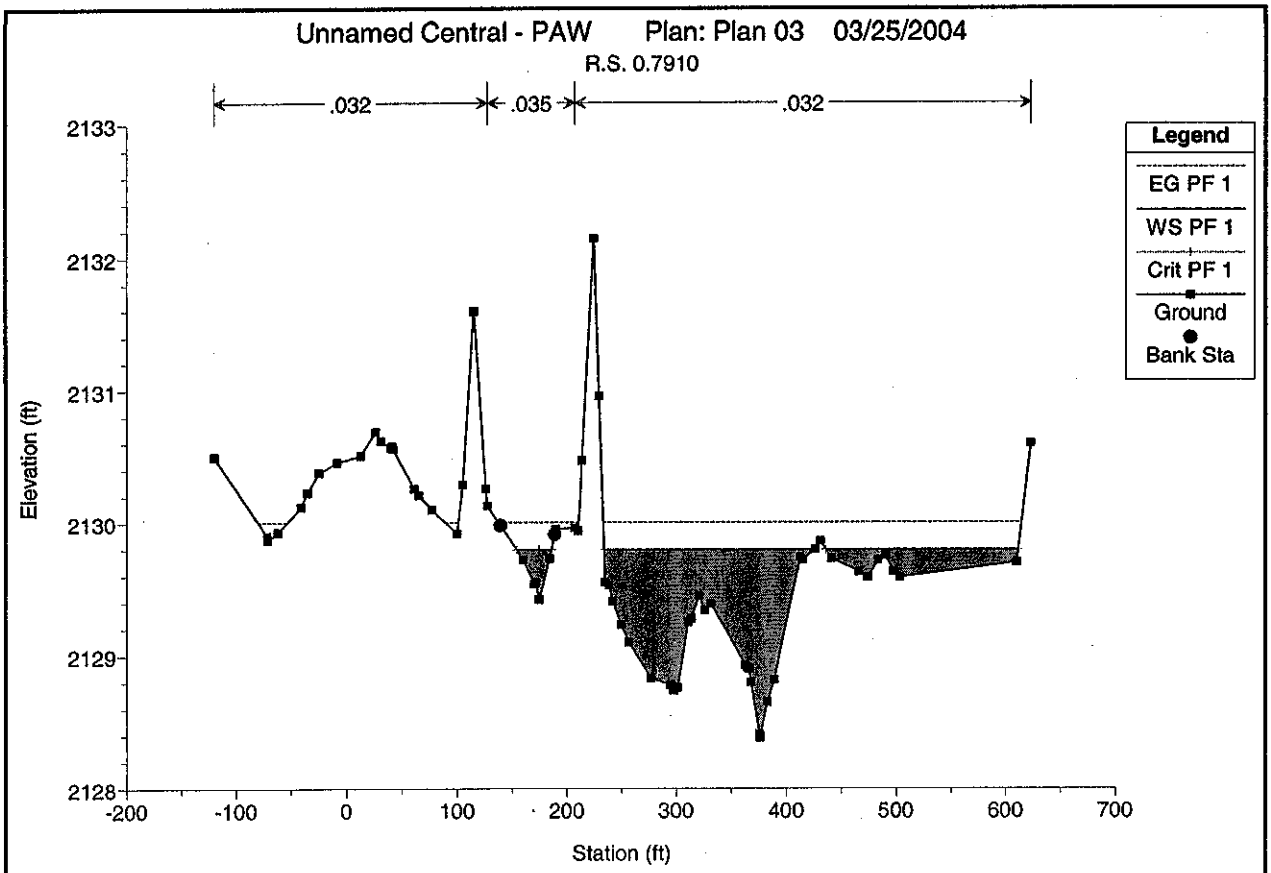
Unnamed Central Tributary to Cave Creek – South Branch

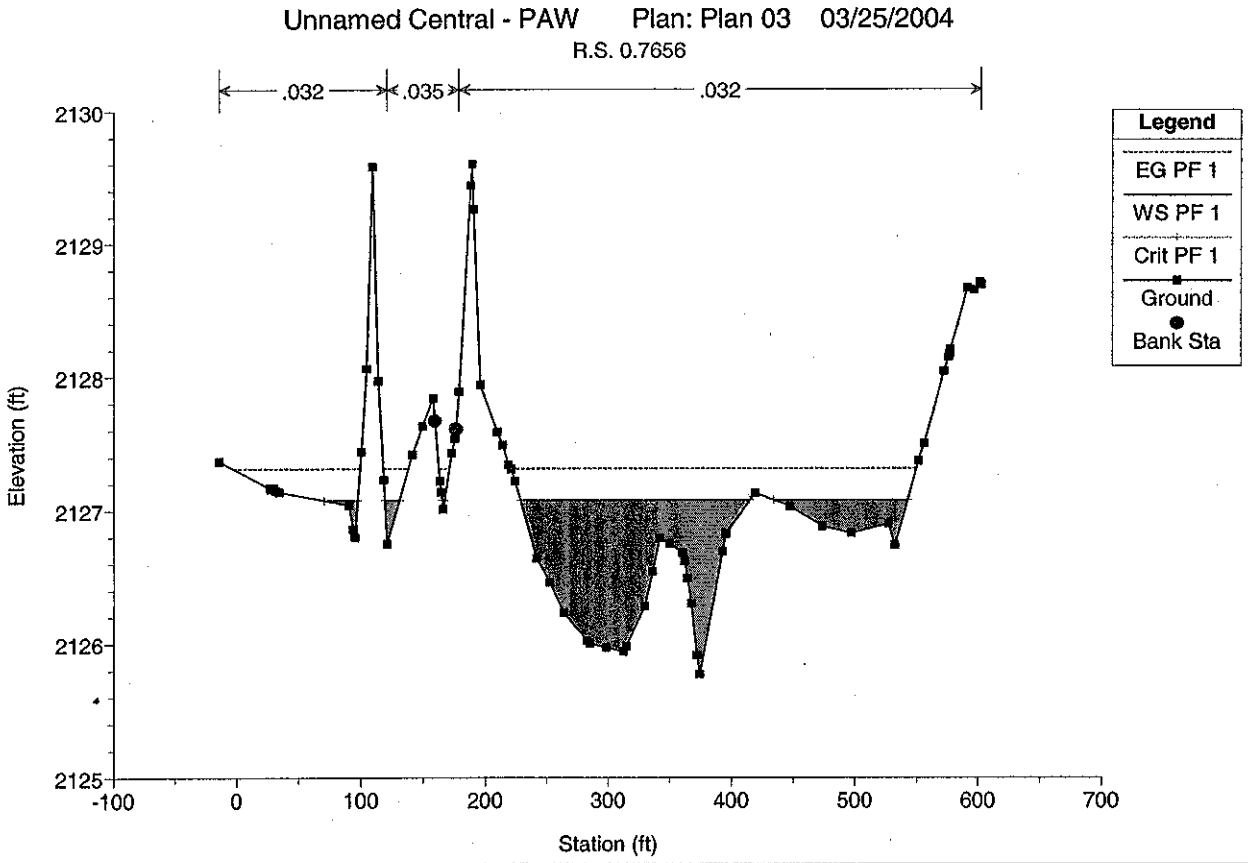

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.8919 Centerline of Terravita Way Dip Section
.025
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

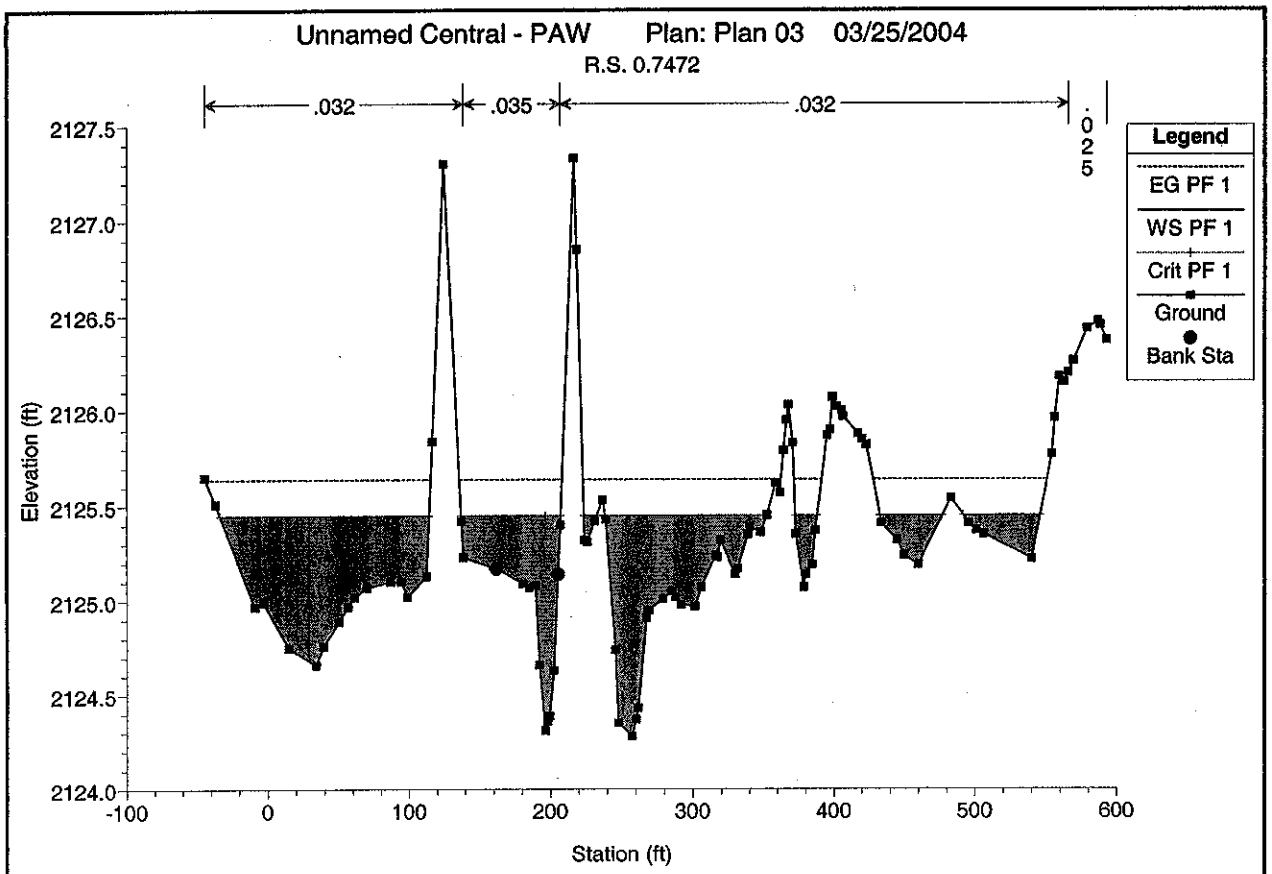

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.8717
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Lat Struct
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

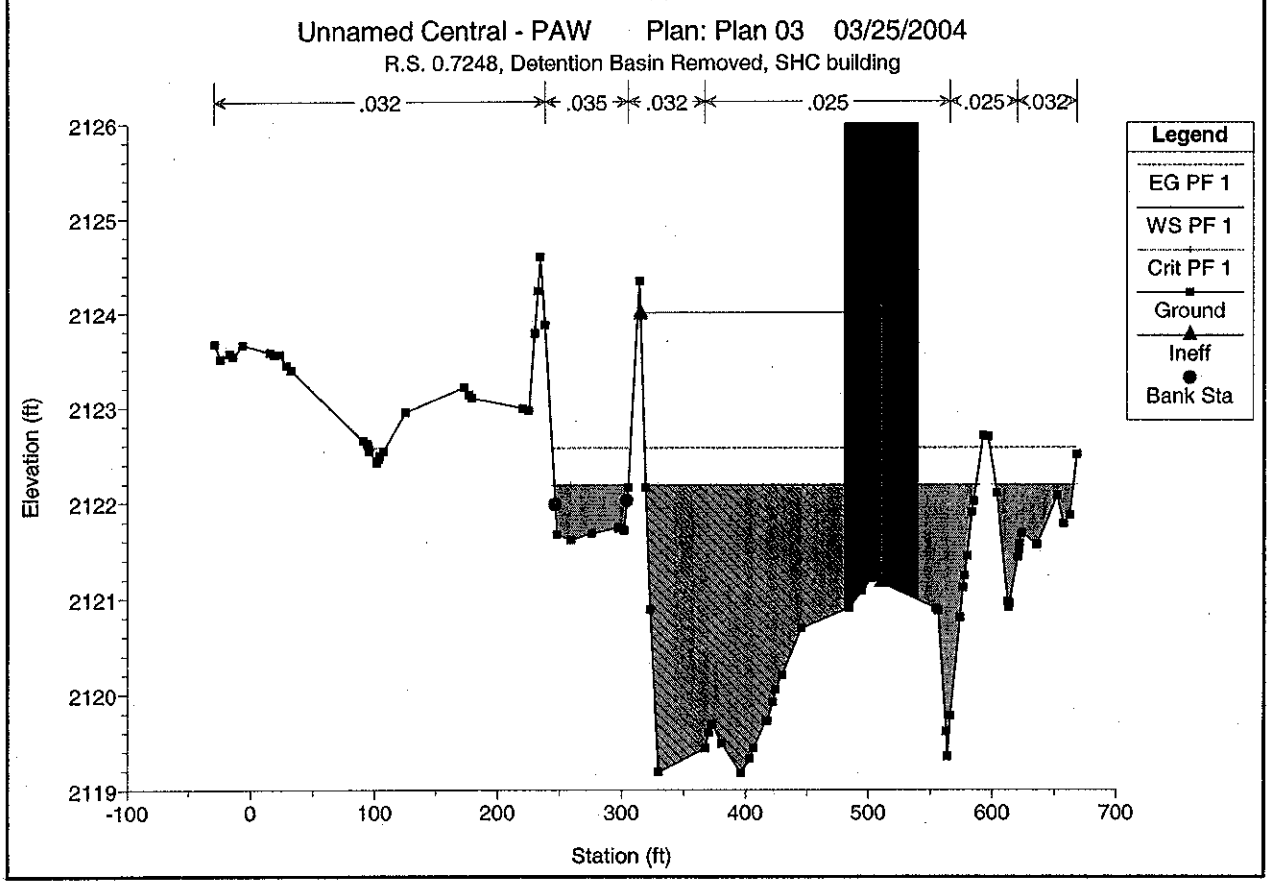

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.8382
.032
.035
.058
Legend
EG PF 1
WS PF 1
Crit PF 1
Lat Struct
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

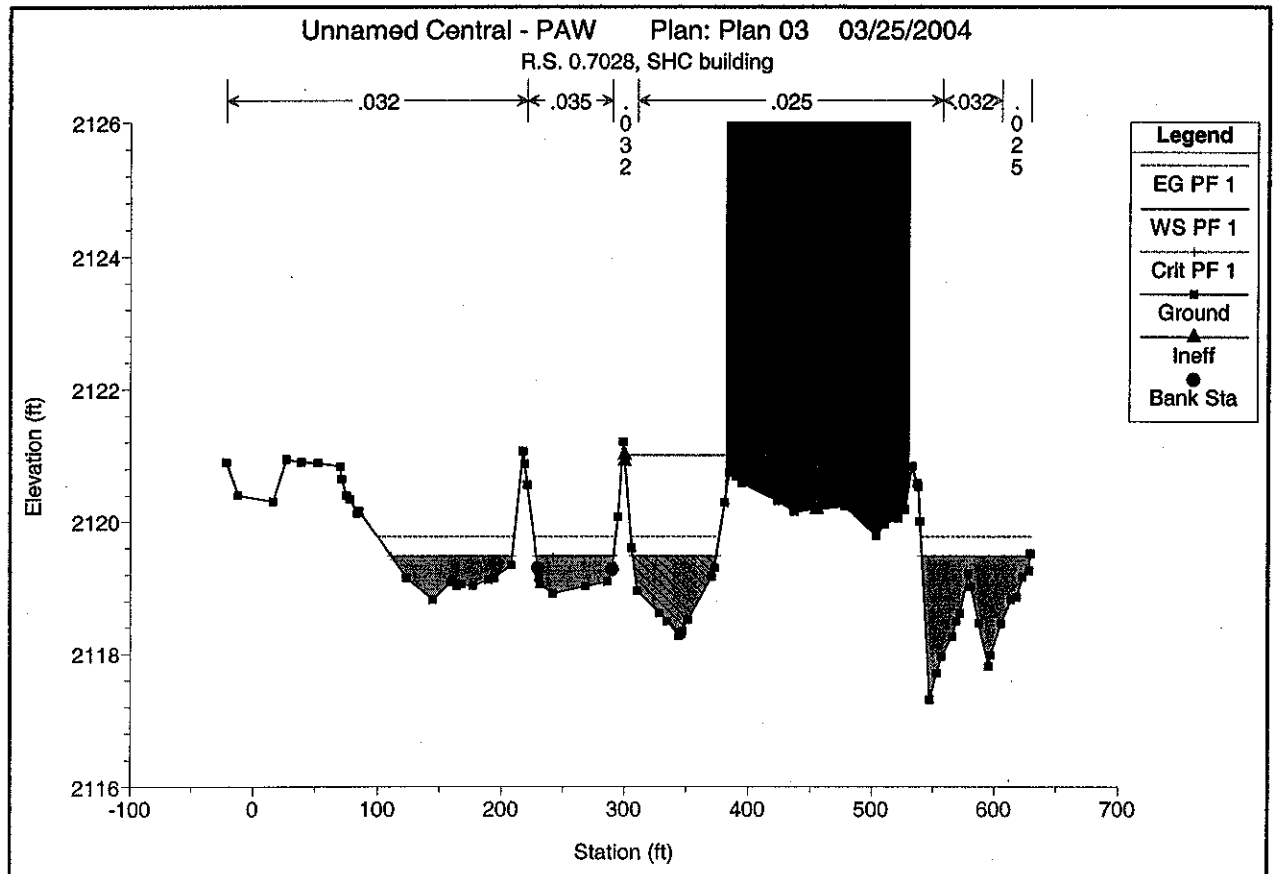

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.8110
.032
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

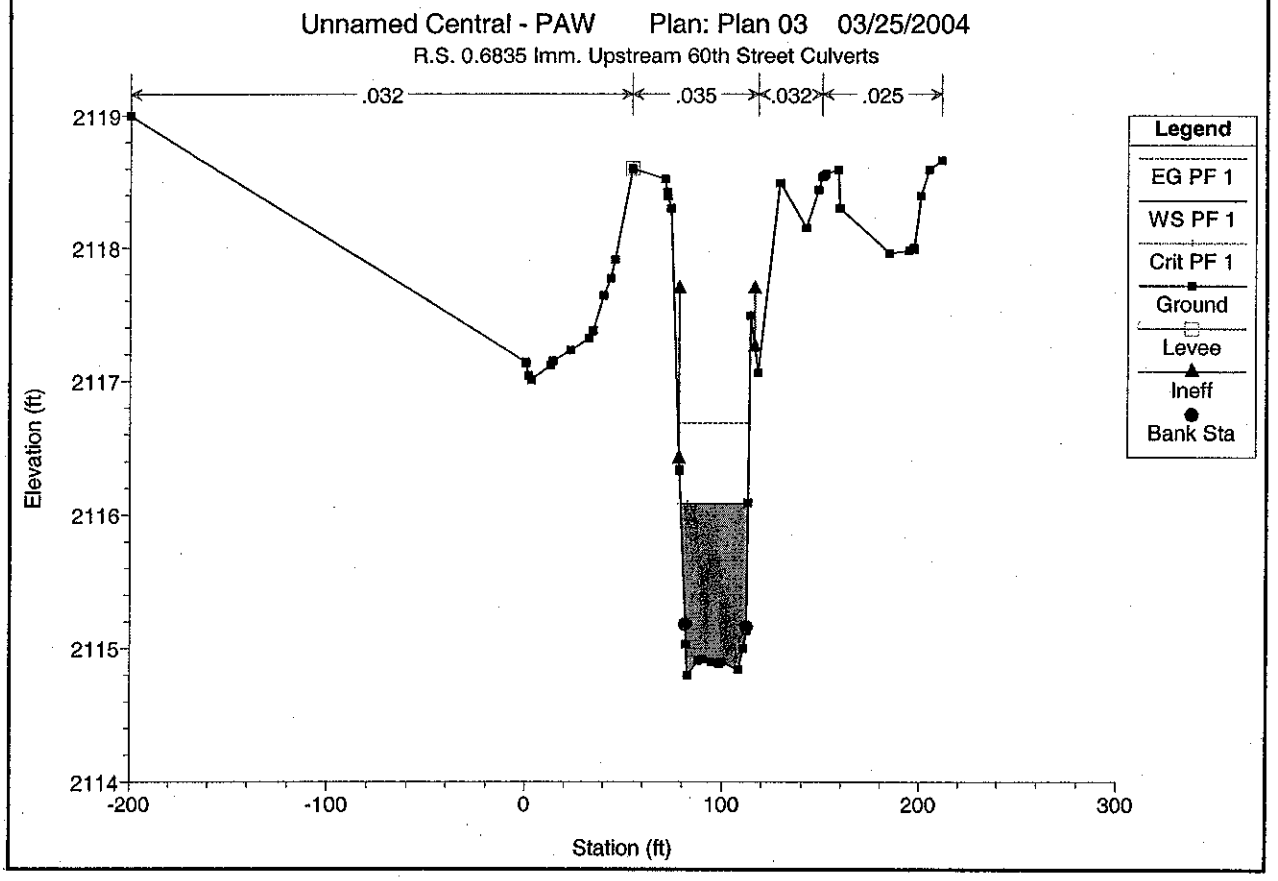

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.7910
.032
.035
.032
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2133
2132
2131
2130
2129
2128
-200
-100
0
100
200
300
400
500
600
700
Station (ft)

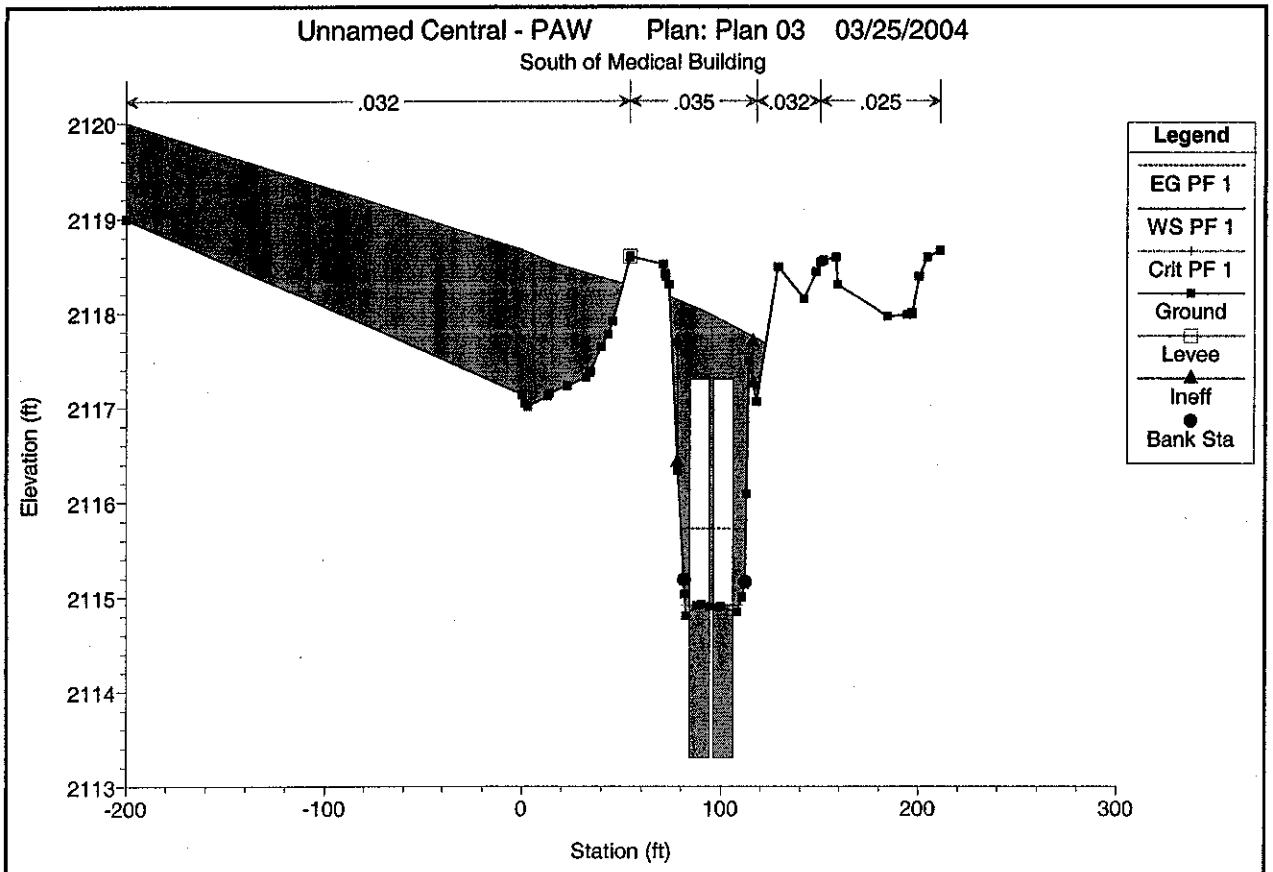

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.7656
.032
.035
.032
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2130
2129
2128
2127
2126
2125
-100
0
100
200
300
400
500
600
700
Station (ft)

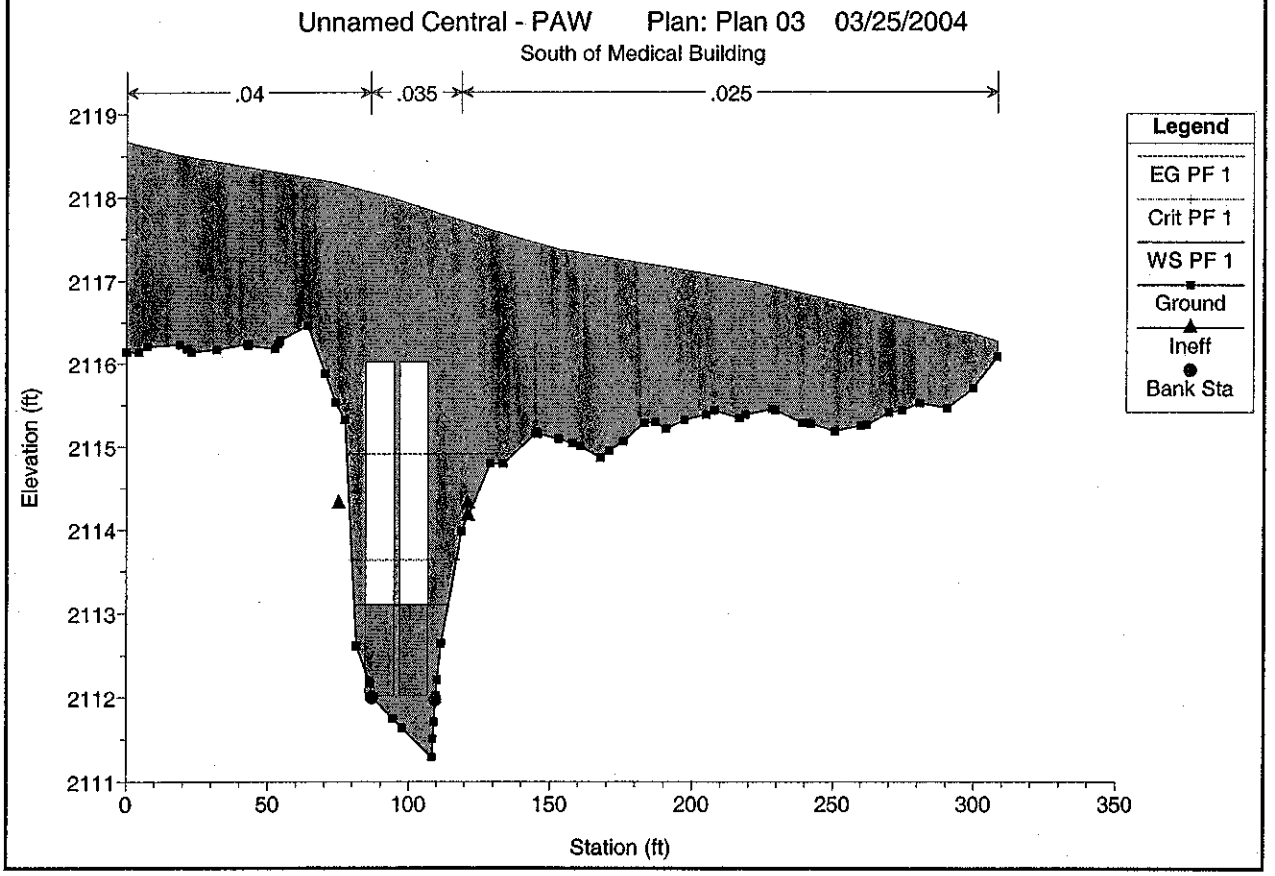

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.7472
.032
.035
.032
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

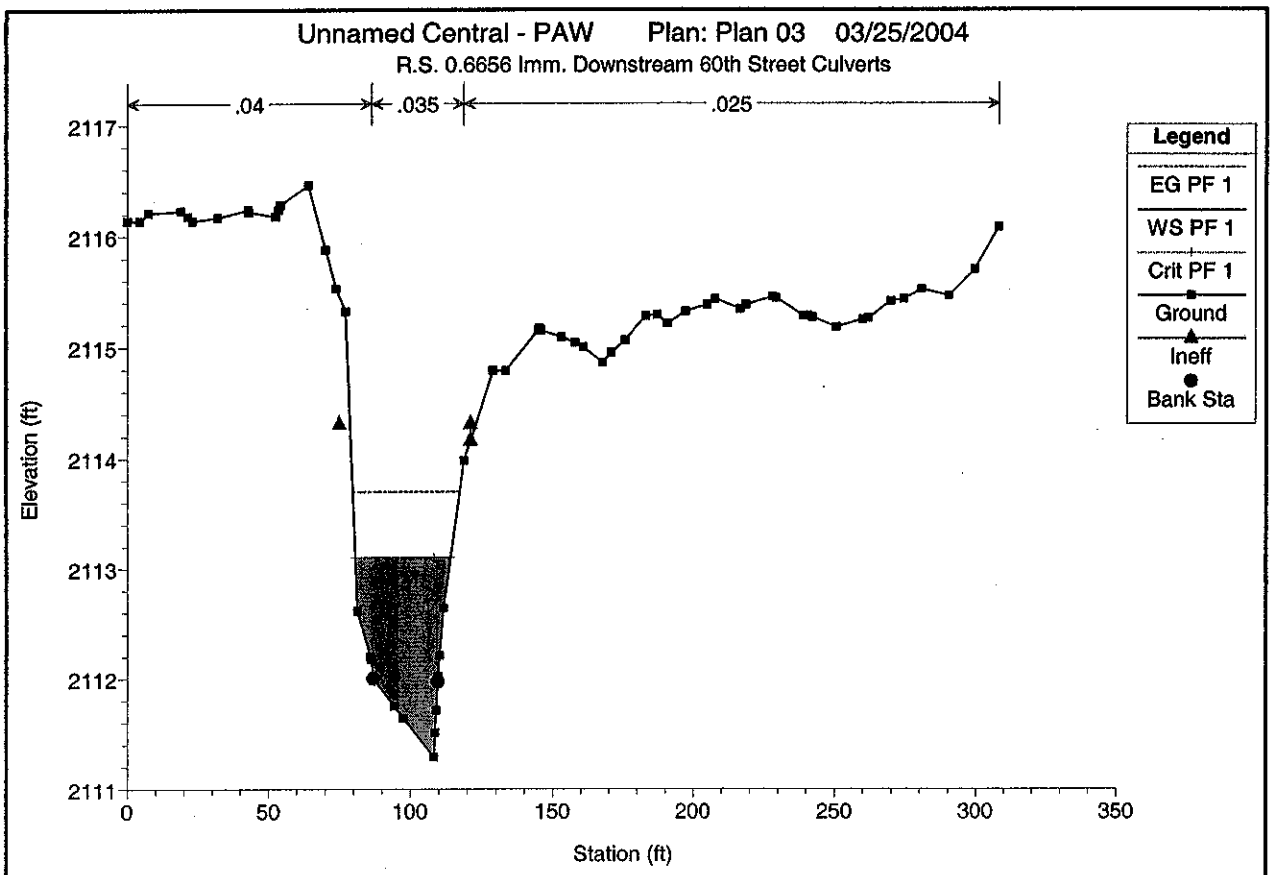

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.7248, Detention Basin Removed, SHC building
.032
.035
.032
.025
.025
.032
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

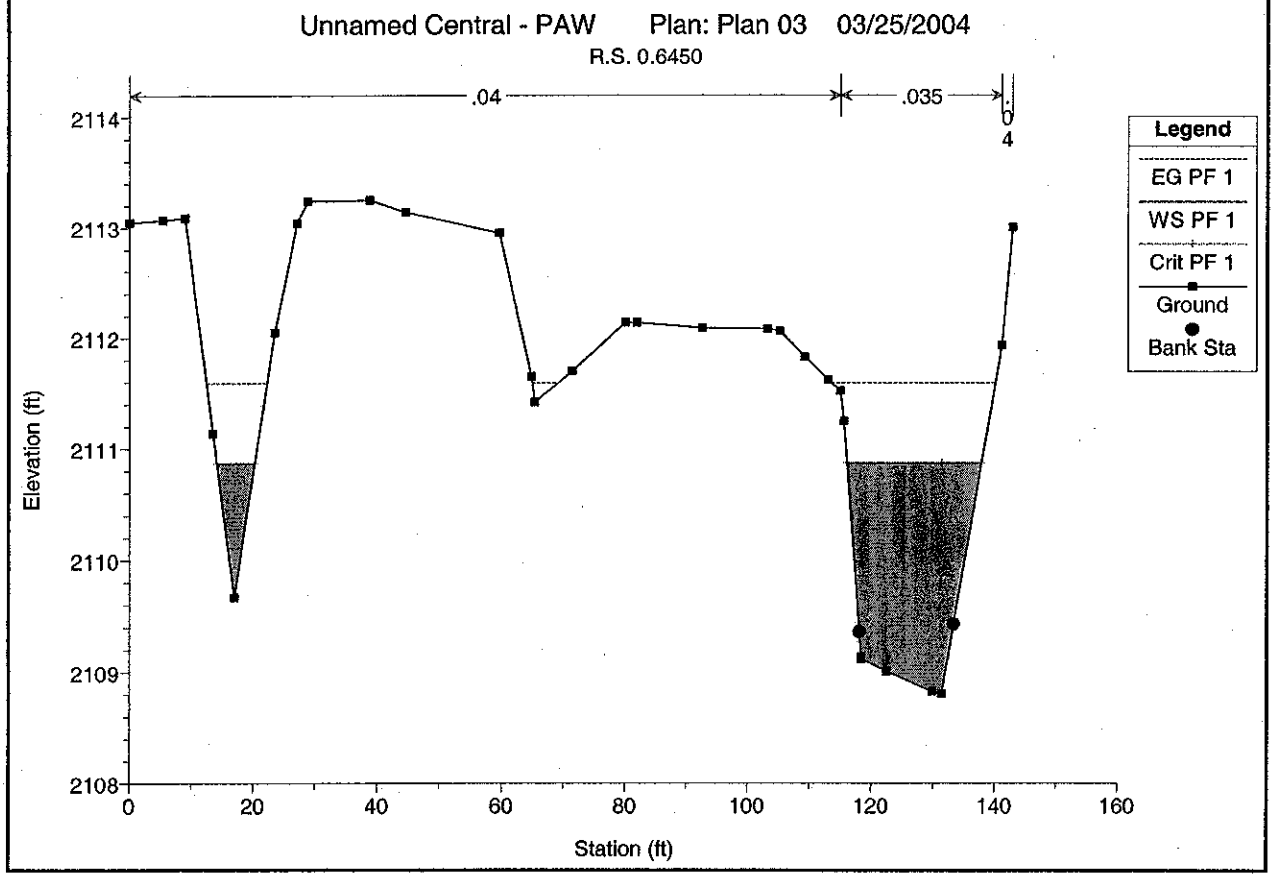

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.7028, SHC building
.032
.035
.032
.025
.032
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
2126
2124
2122
2120
2118
2116
-100
0
100
200
300
400
500
600
700

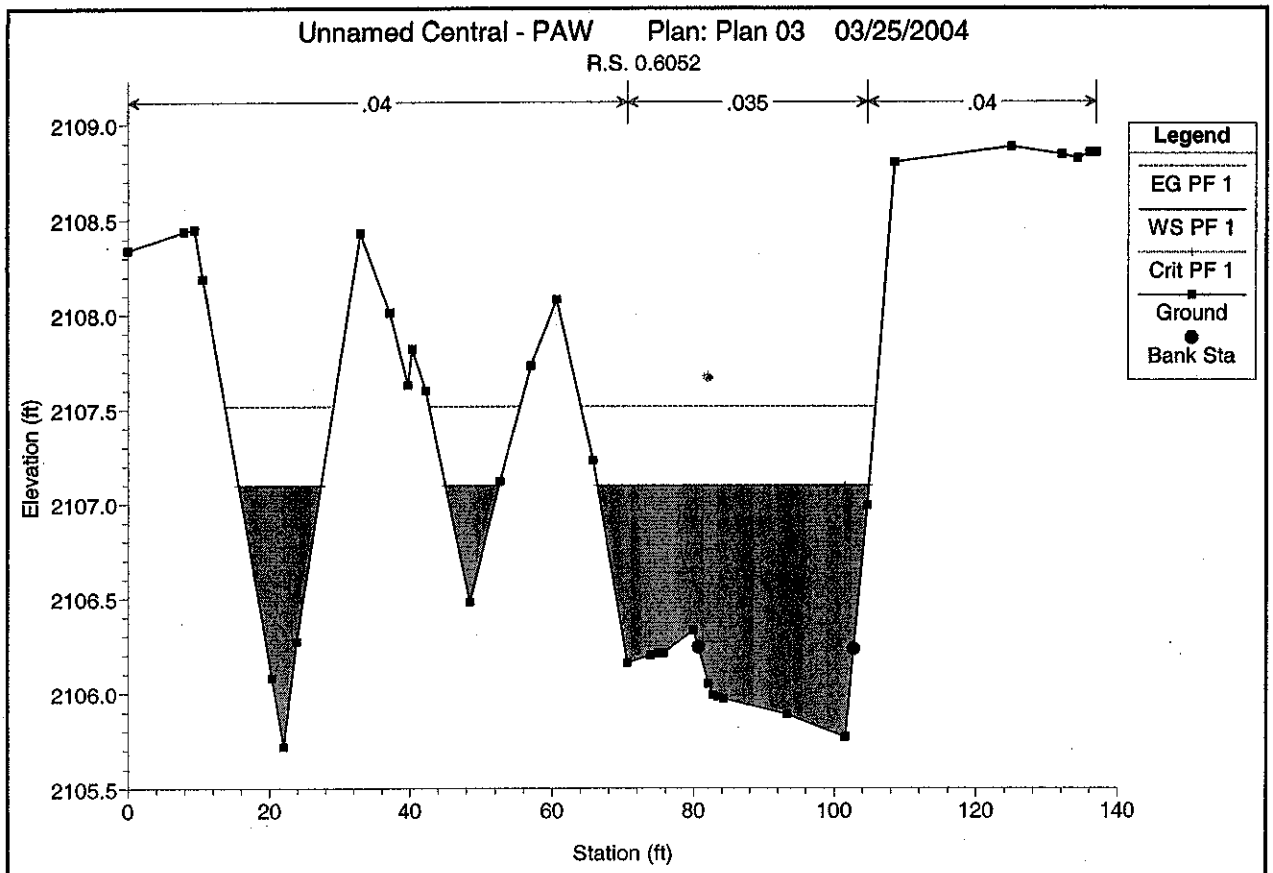

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.6835 Imm. Upstream 60th Street Culverts
.032
.035
.032
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)
2119
2118
2117
2116
2115
2114
-200
-100
0
100
200
300

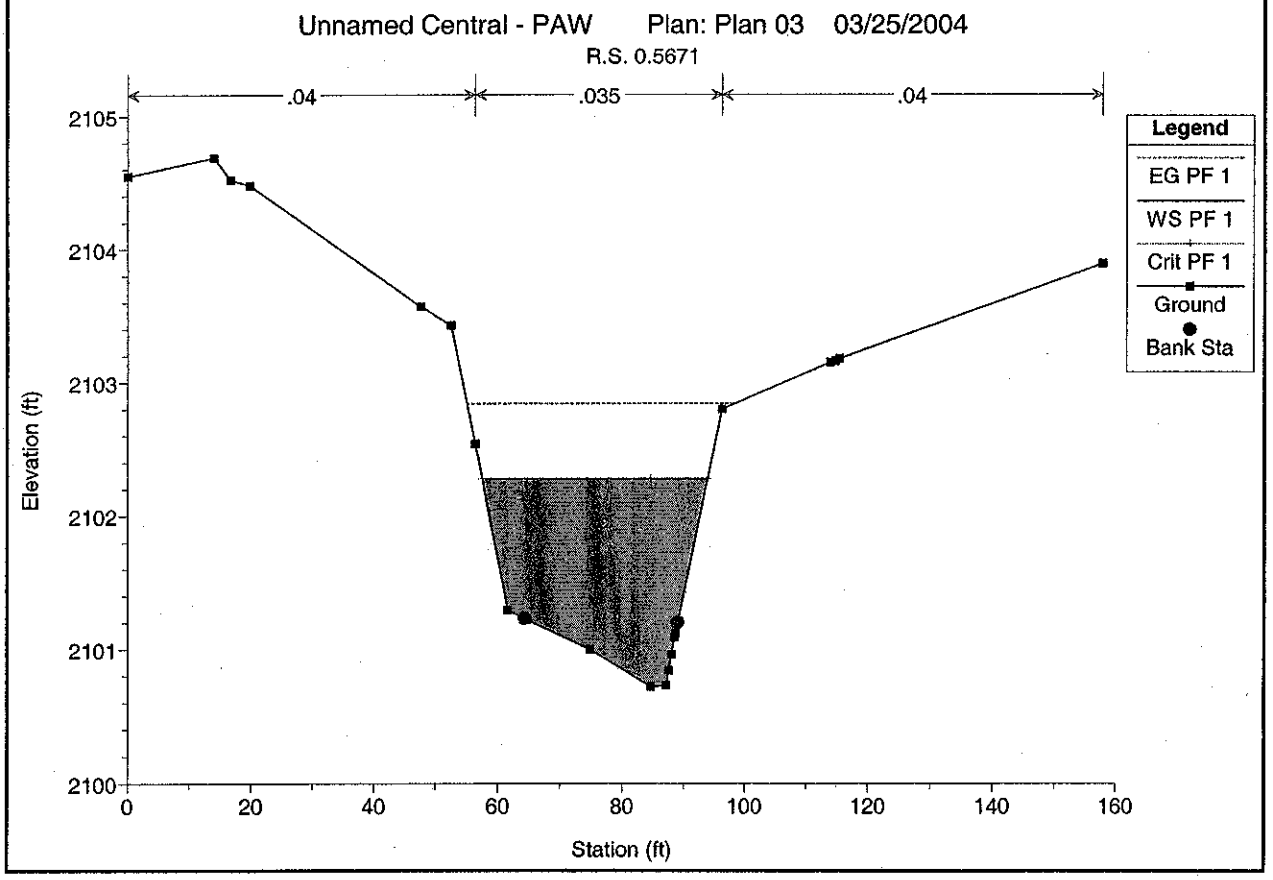

Unnamed Central - PAW Plan: Plan 03 03/25/2004
South of Medical Building
.032
.035
.032
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
2120
2119
2118
2117
2116
2115
2114
2113
-200
-100
0
100
200
300
Station (ft)

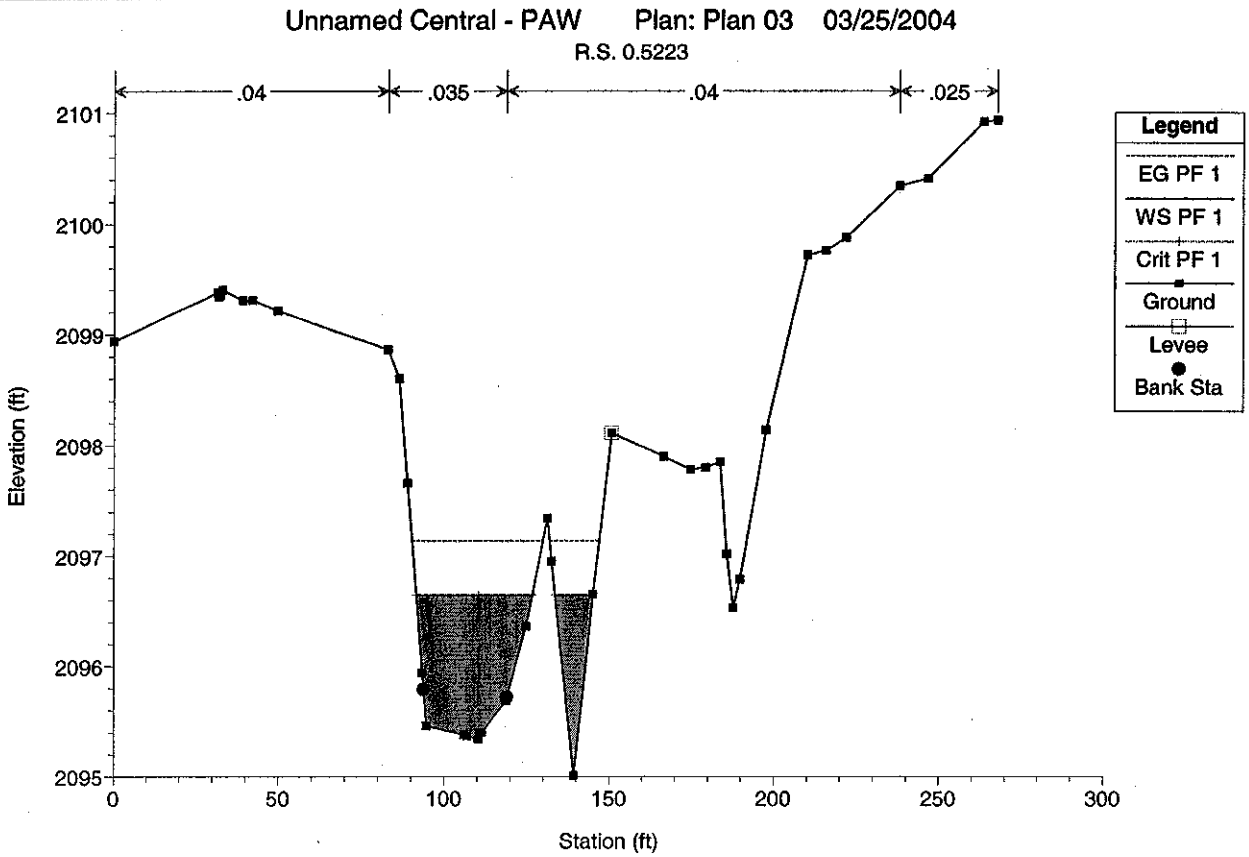

Unnamed Central - PAW Plan: Plan 03 03/25/2004
South of Medical Building
.04
.035
.025
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
2119
2118
2117
2116
2115
2114
2113
2112
2111
0
50
100
150
200
250
300
350
Station (ft)

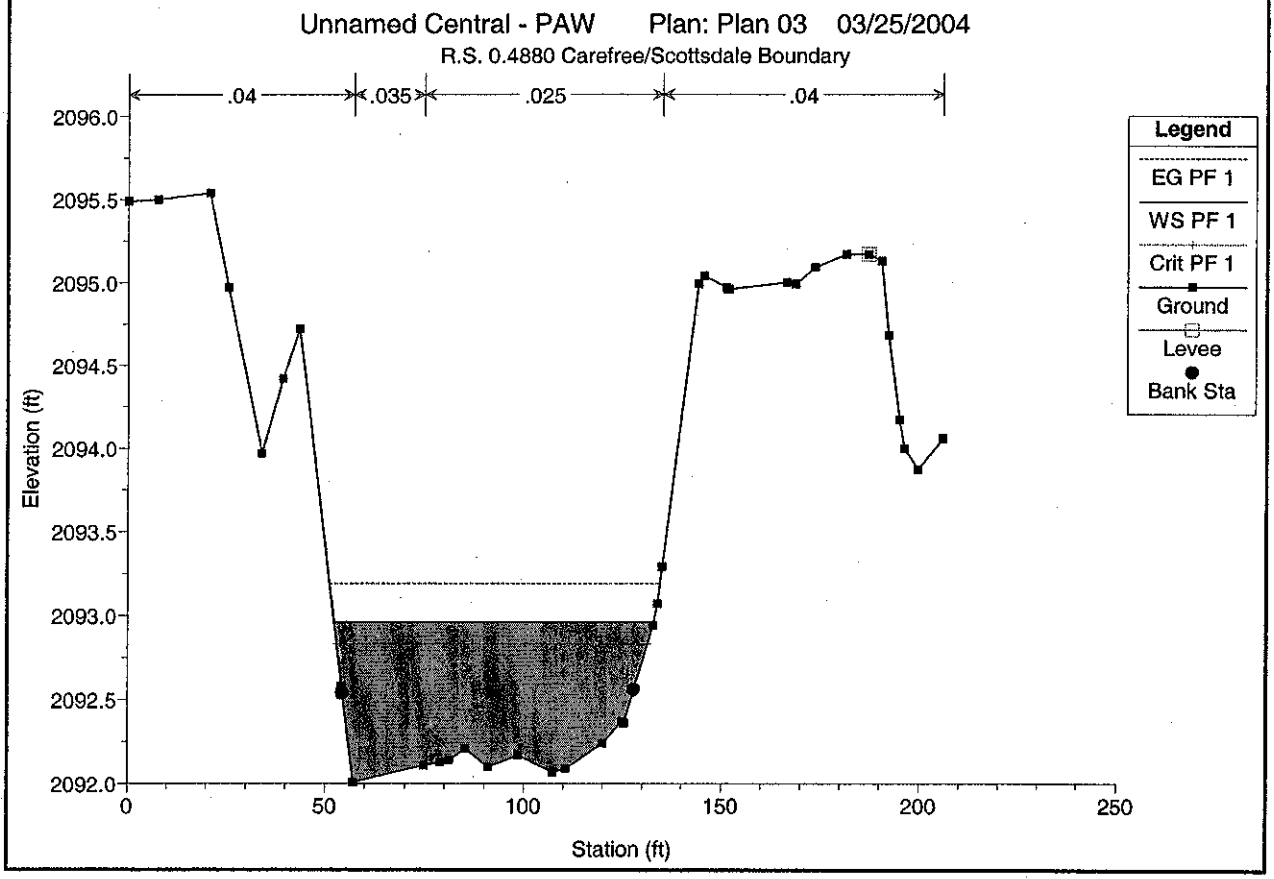

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.6656 Imm. Downstream 60th Street Culverts
.04
.035
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

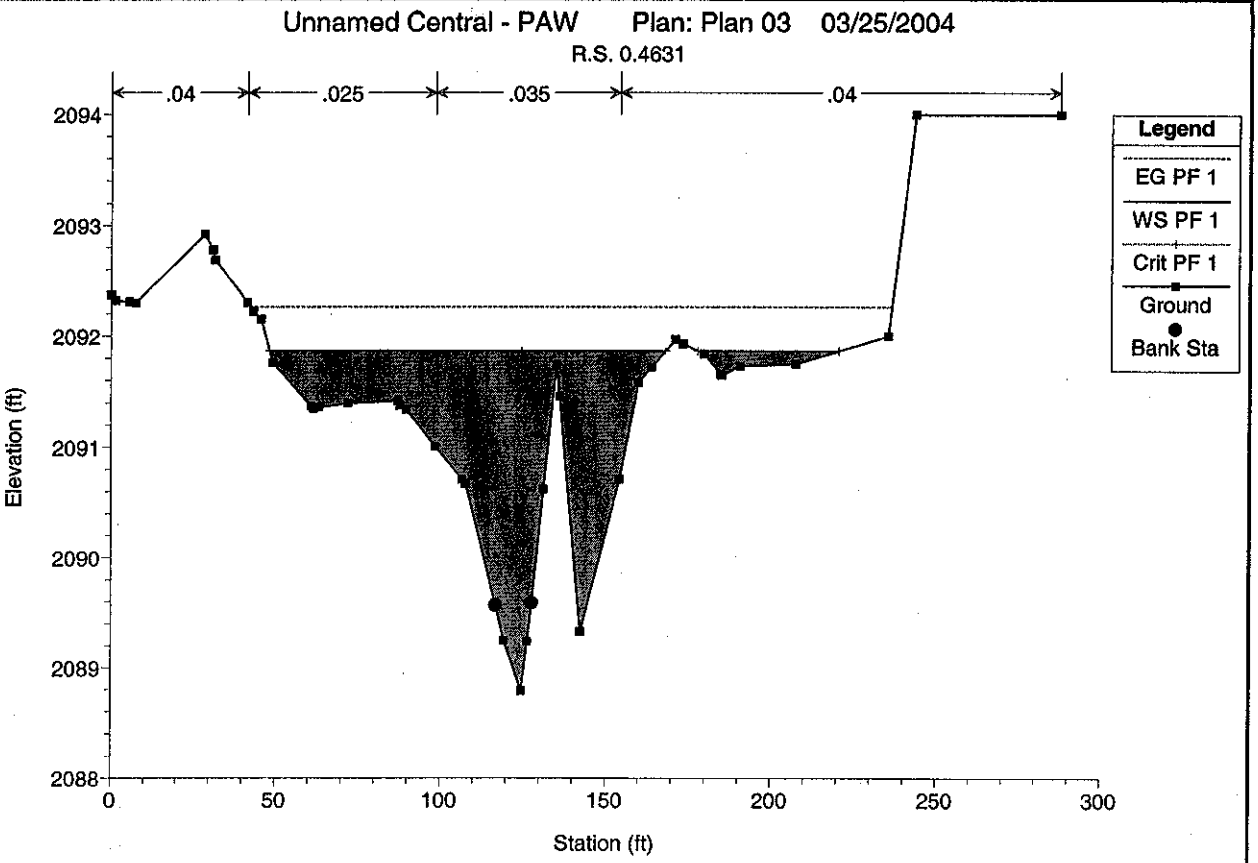

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.6450
.04
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

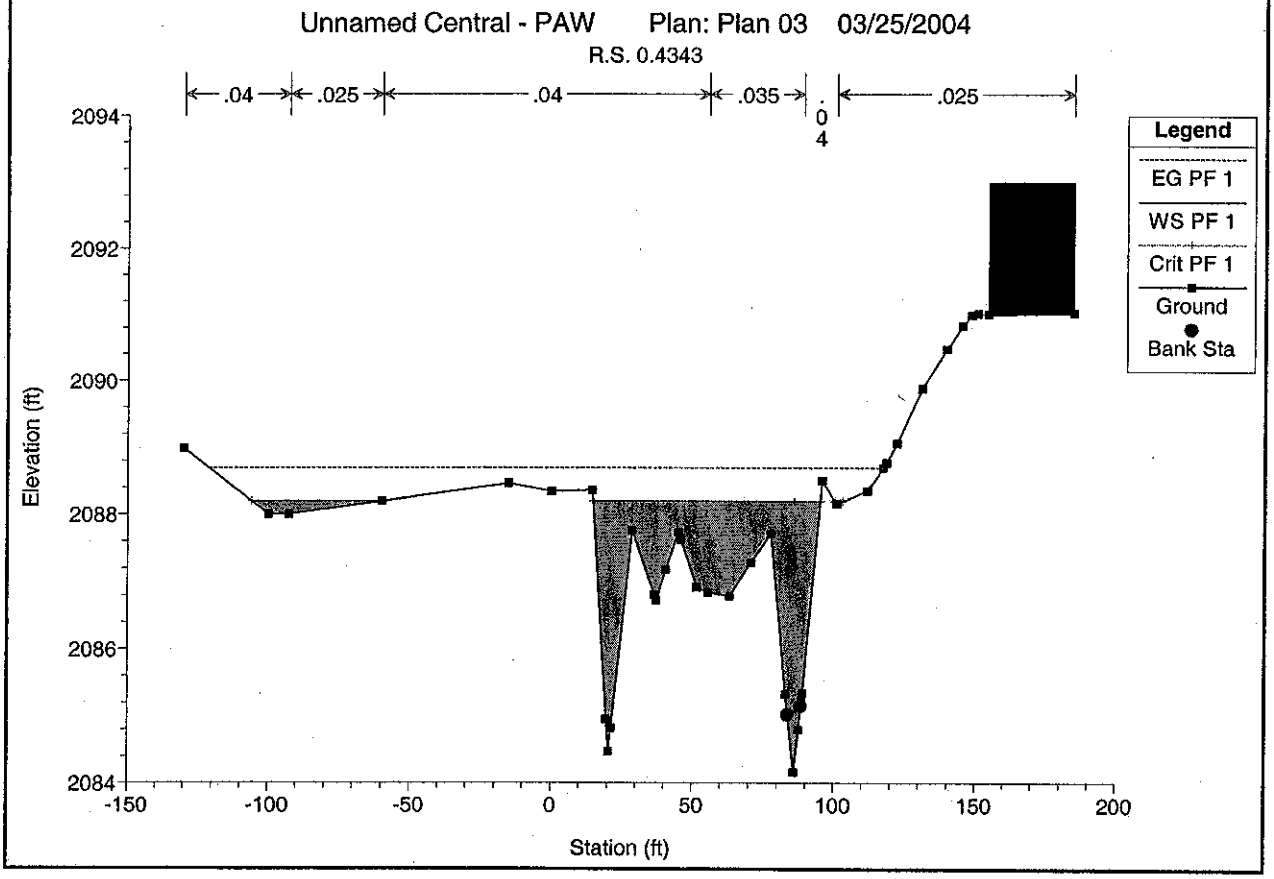

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.6052
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

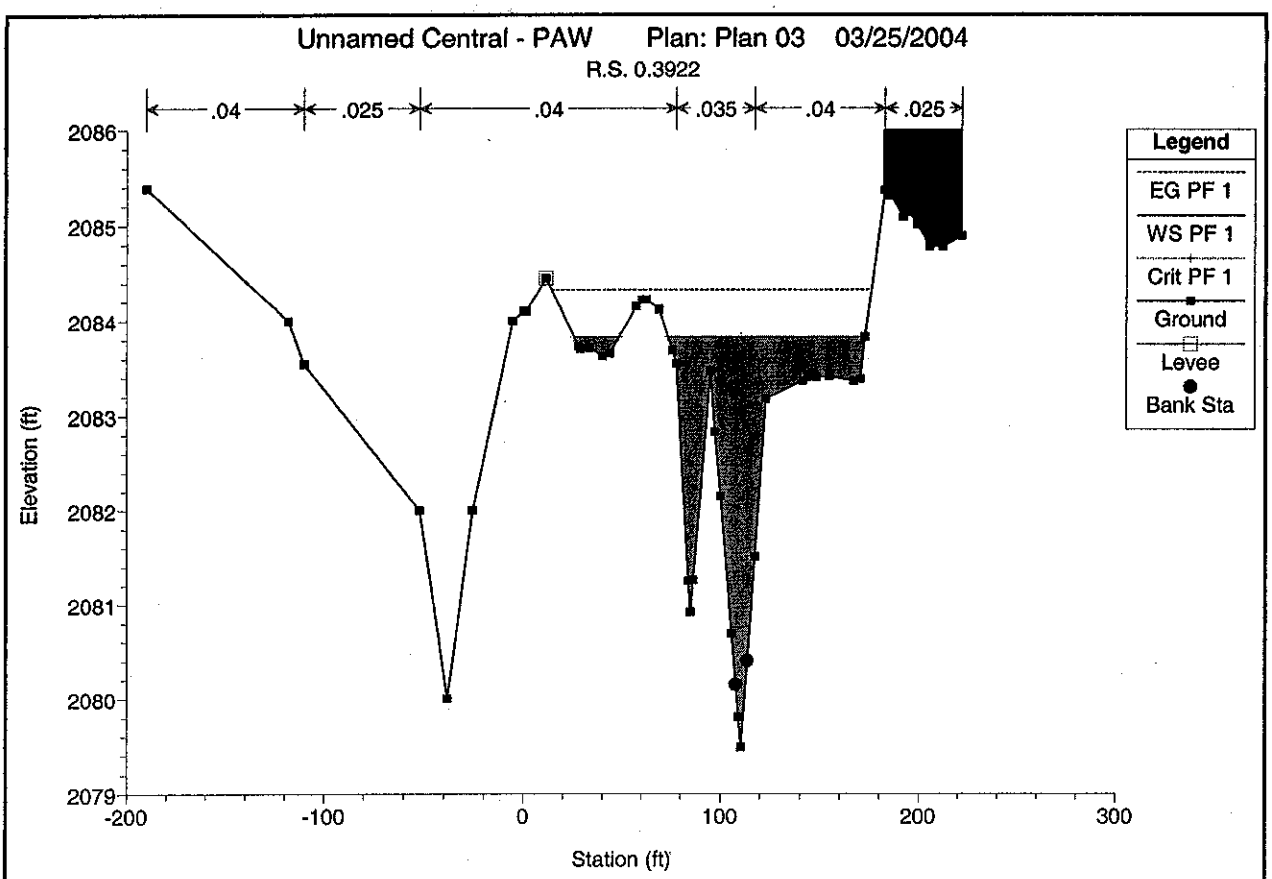

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.5671
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

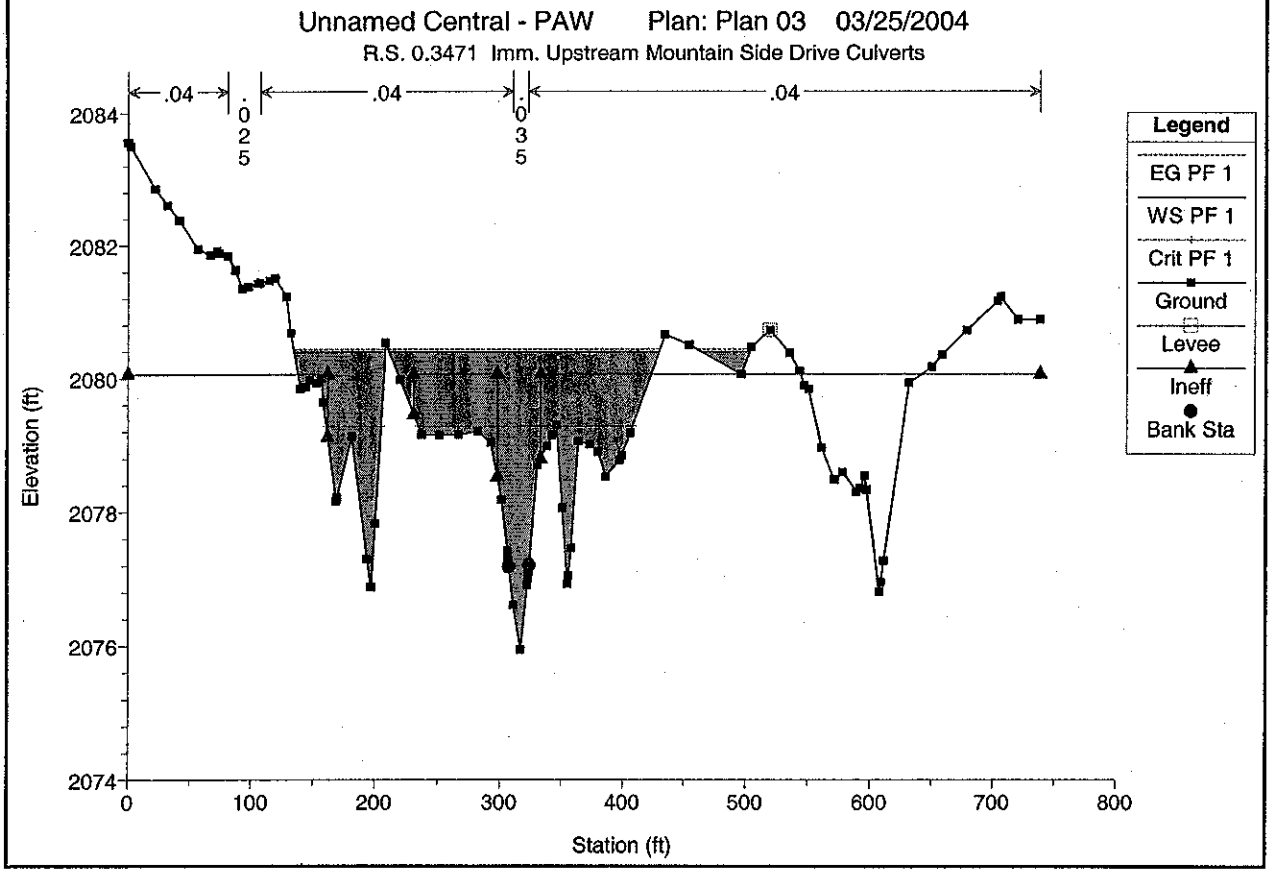

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.5223
.04
.035
.04
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

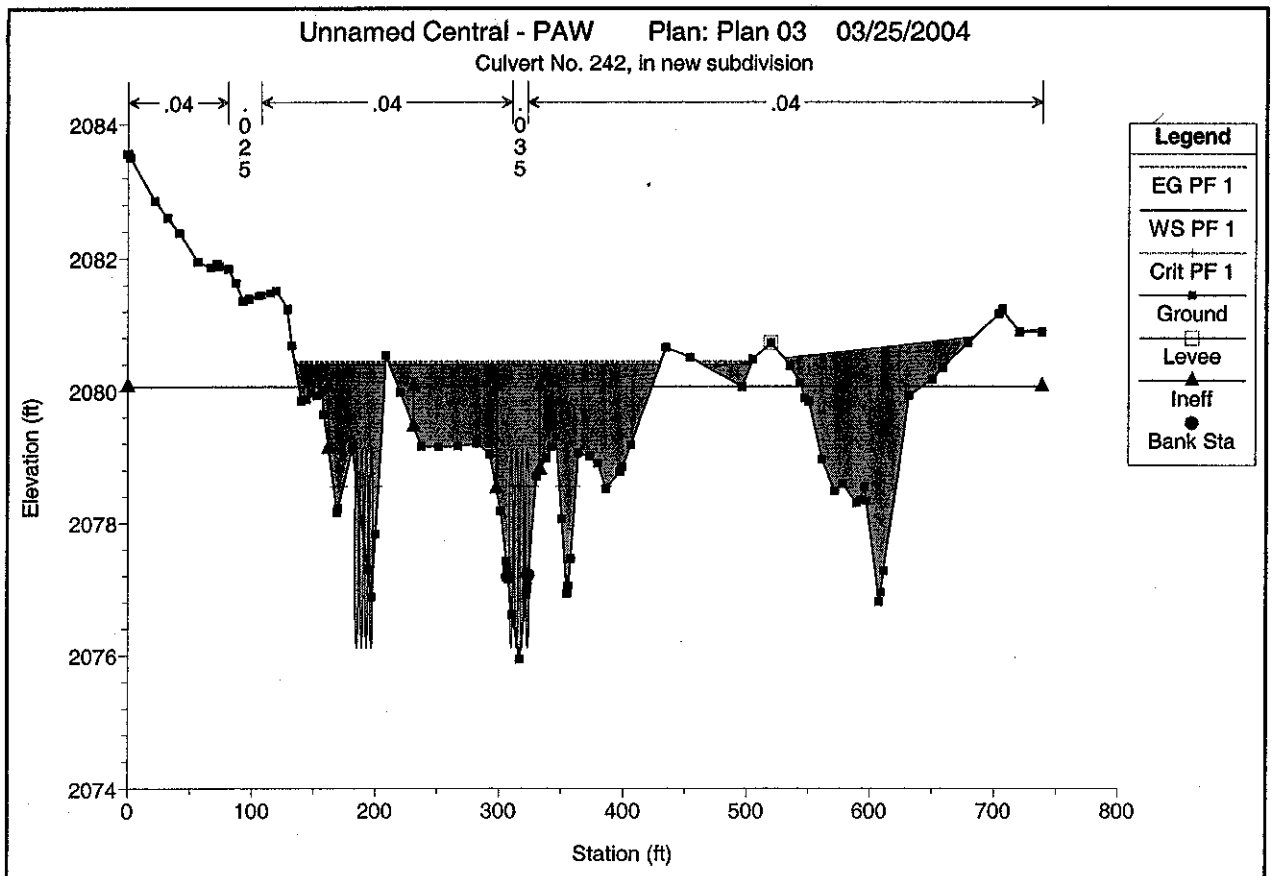

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.4880 Carefree/Scottsdale Boundary
.04
.035
.025
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

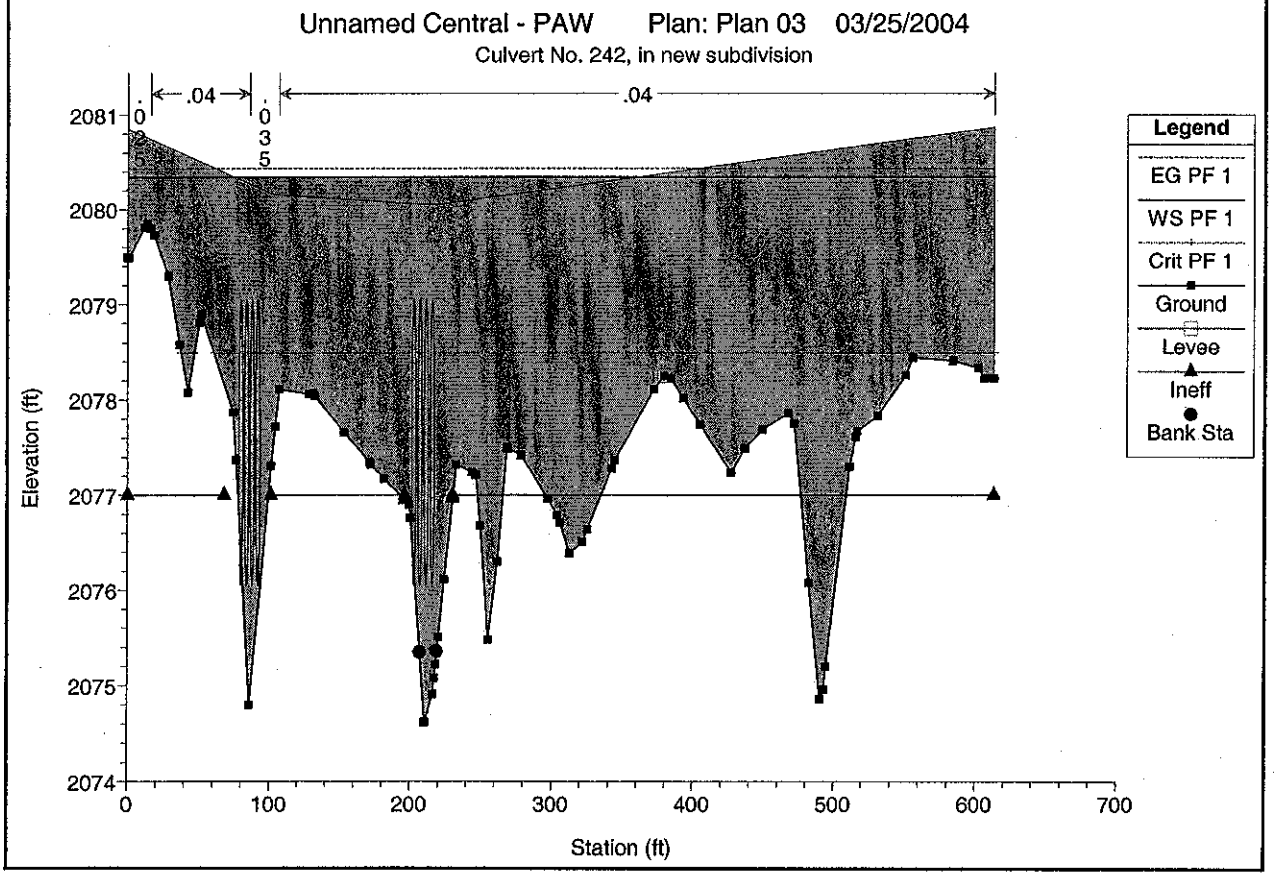

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.4631
.04
.025
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

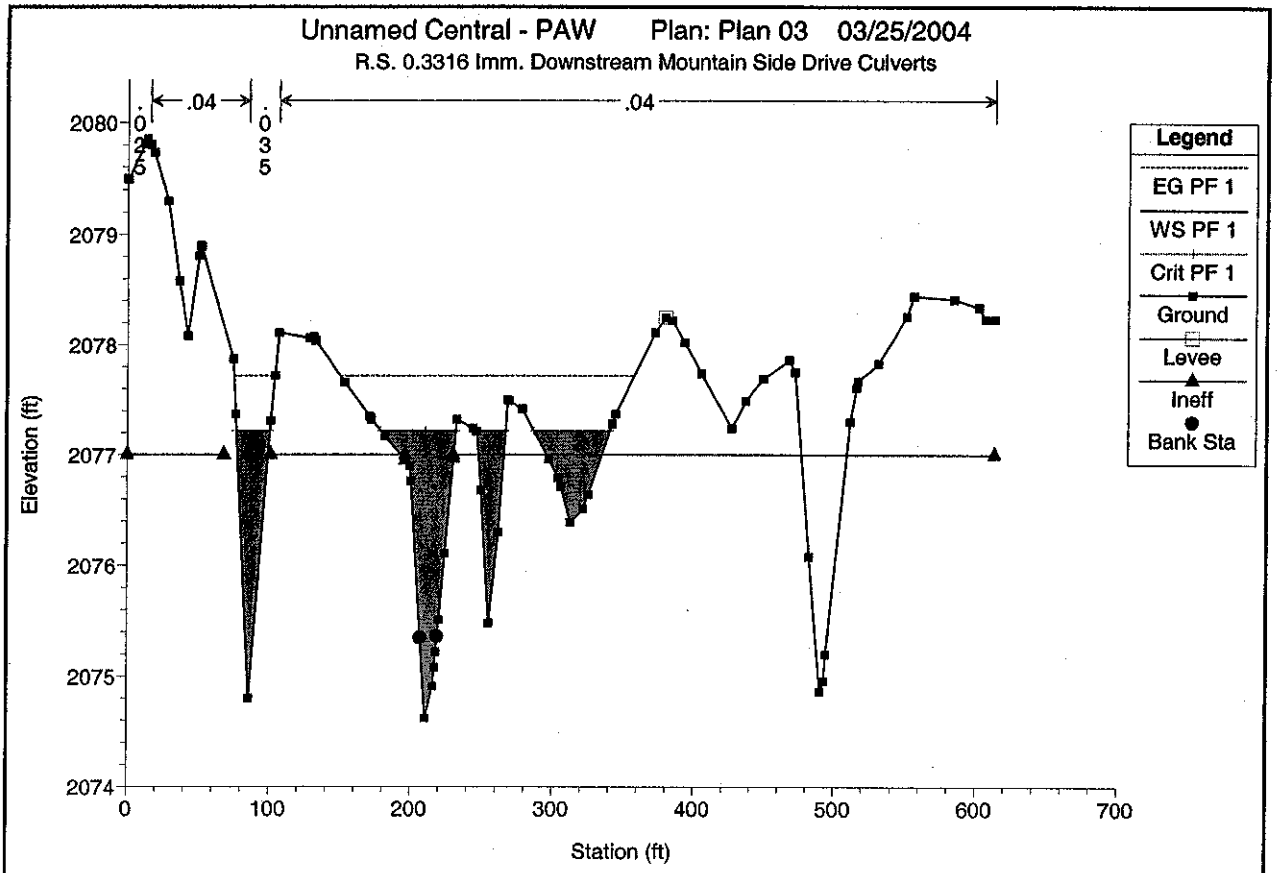

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.4343
.04
.025
.04
.035
.04
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

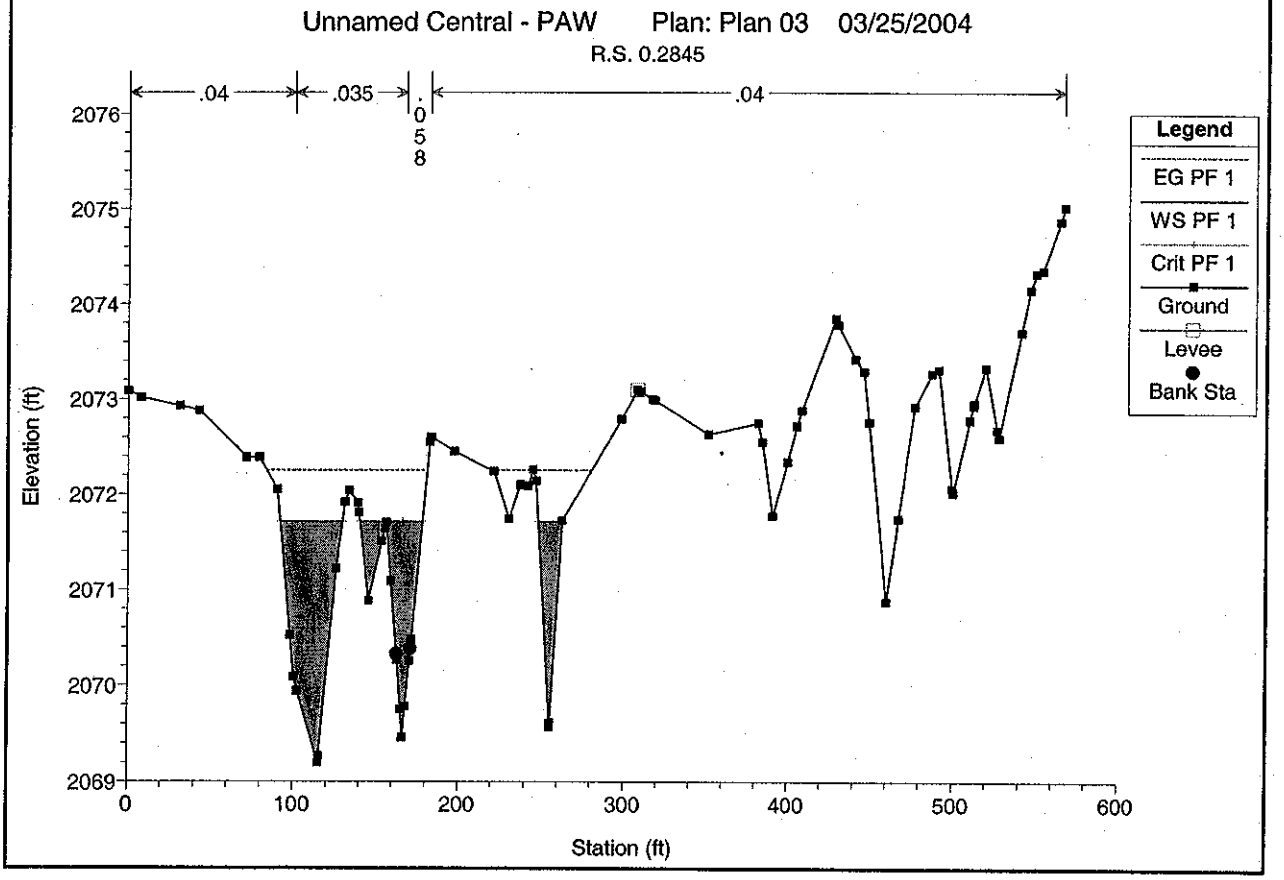

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.3922
.04
.025
.04
.035
.04
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

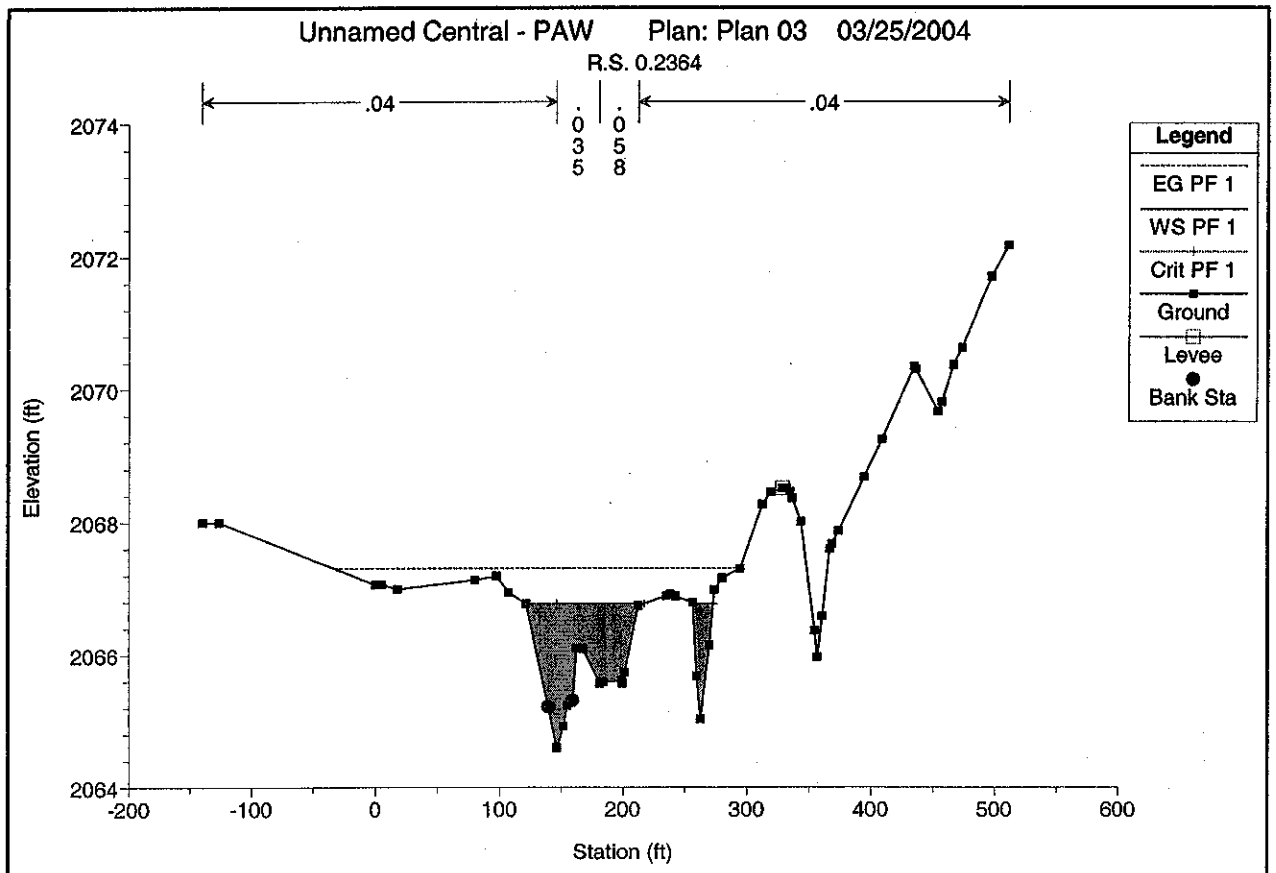

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.3471 Imm. Upstream Mountain Side Drive Culverts
.04
.025
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)

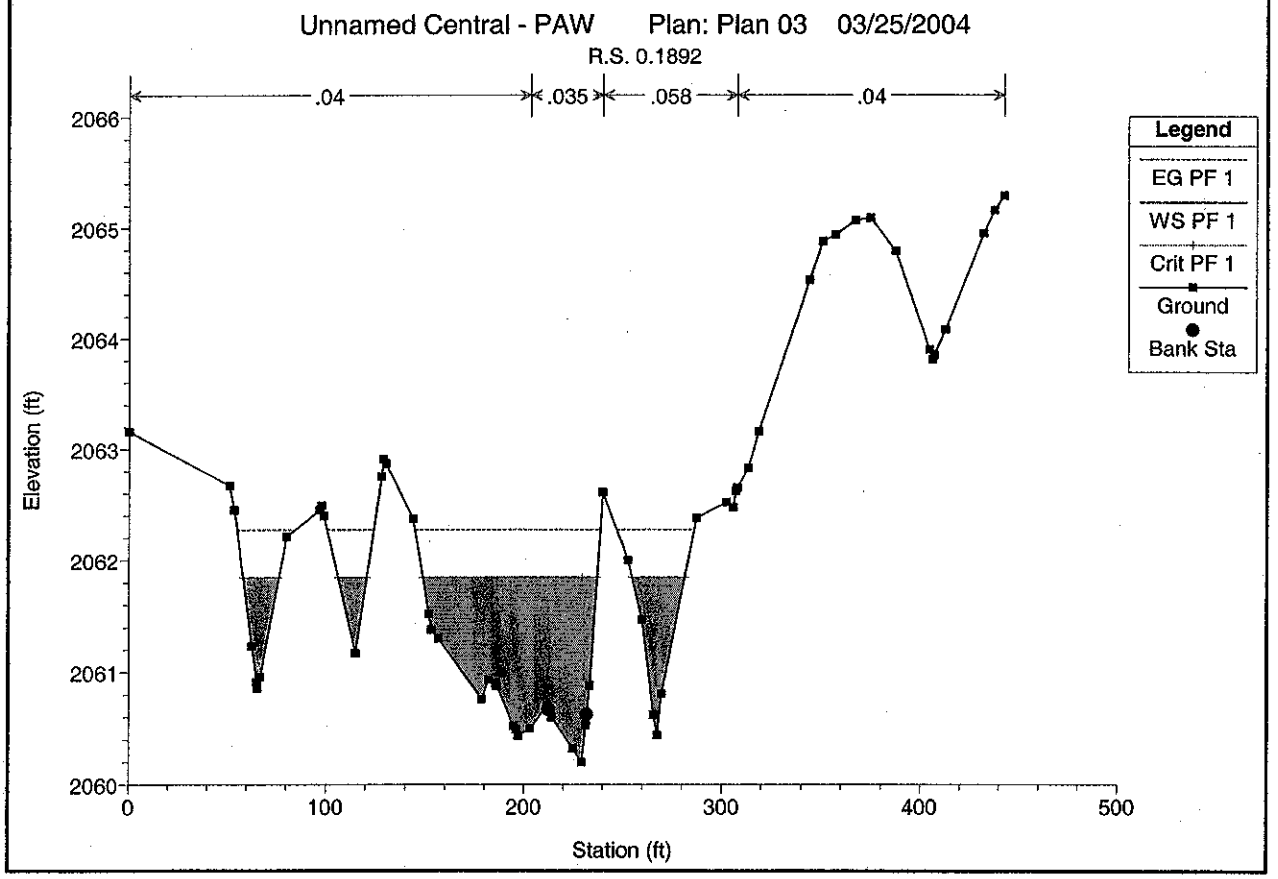

Unnamed Central - PAW Plan: Plan 03 03/25/2004
Culvert No. 242, in new subdivision
.04
.025
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
2084
2082
2080
2078
2076
2074
0
100
200
300
400
500
600
700
800
Station (ft)

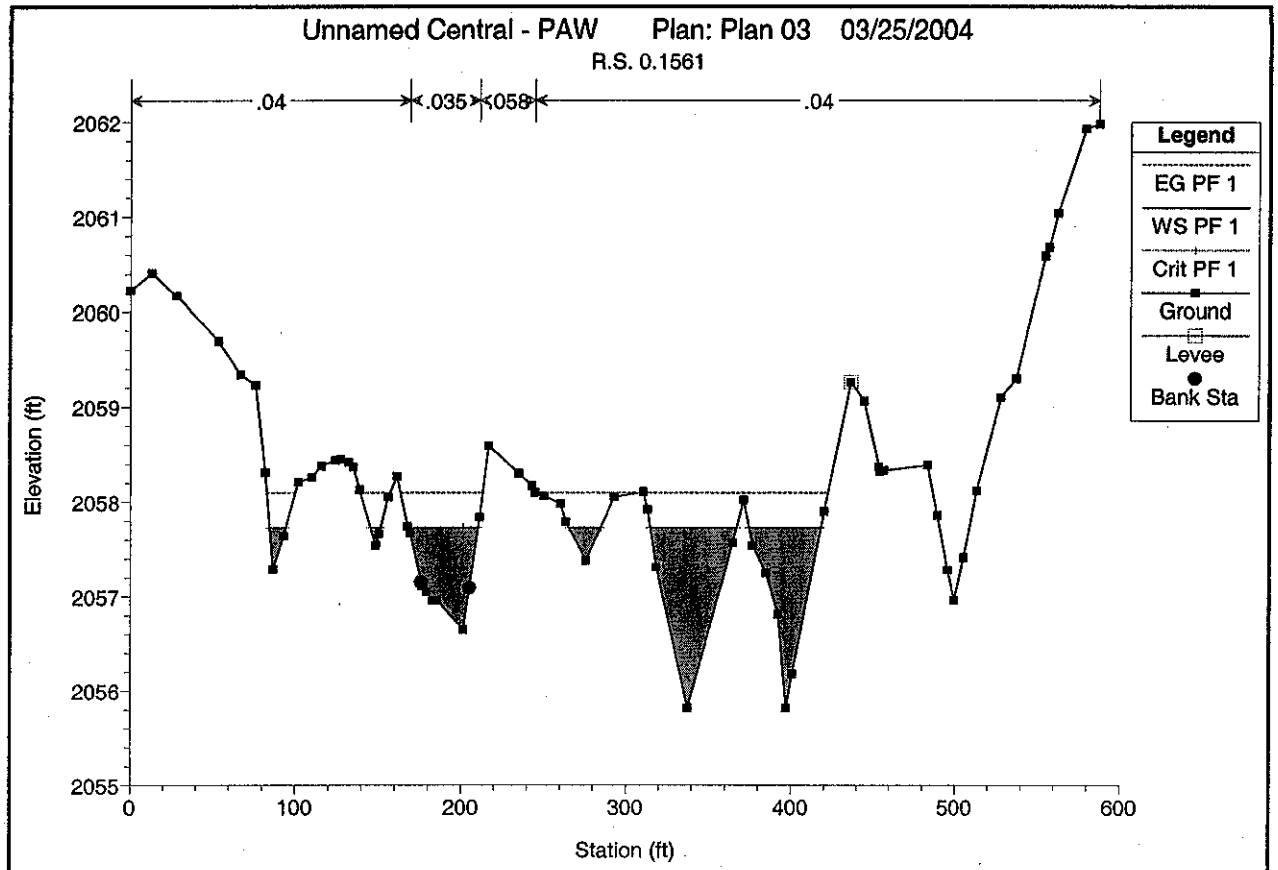

Unnamed Central - PAW Plan: Plan 03 03/25/2004
Culvert No. 242, in new subdivision
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
2081
2080
2079
2078
2077
2076
2075
2074
0
100
200
300
400
500
600
700
Station (ft)

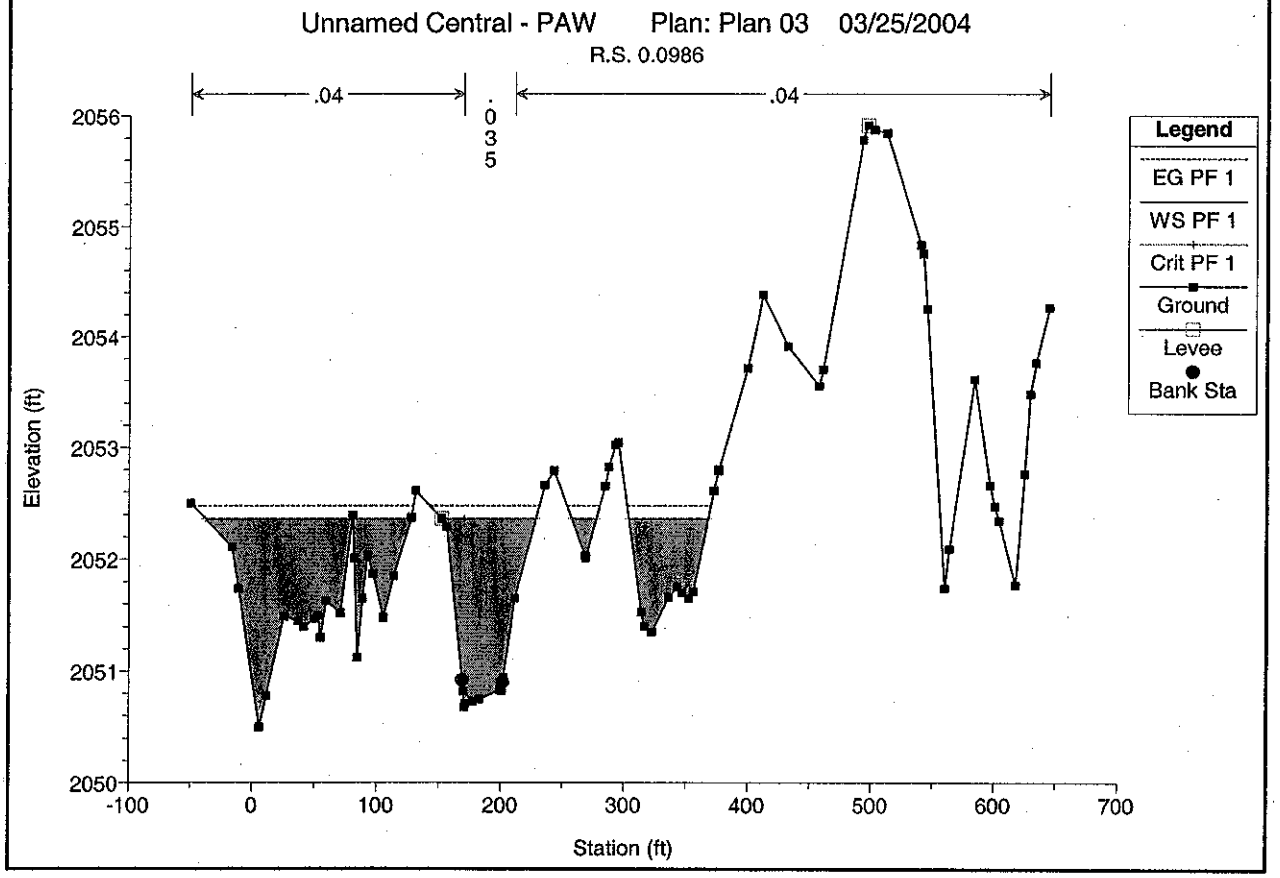

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.3316 Imm. Downstream Mountain Side Drive Culverts
.04
.025
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)

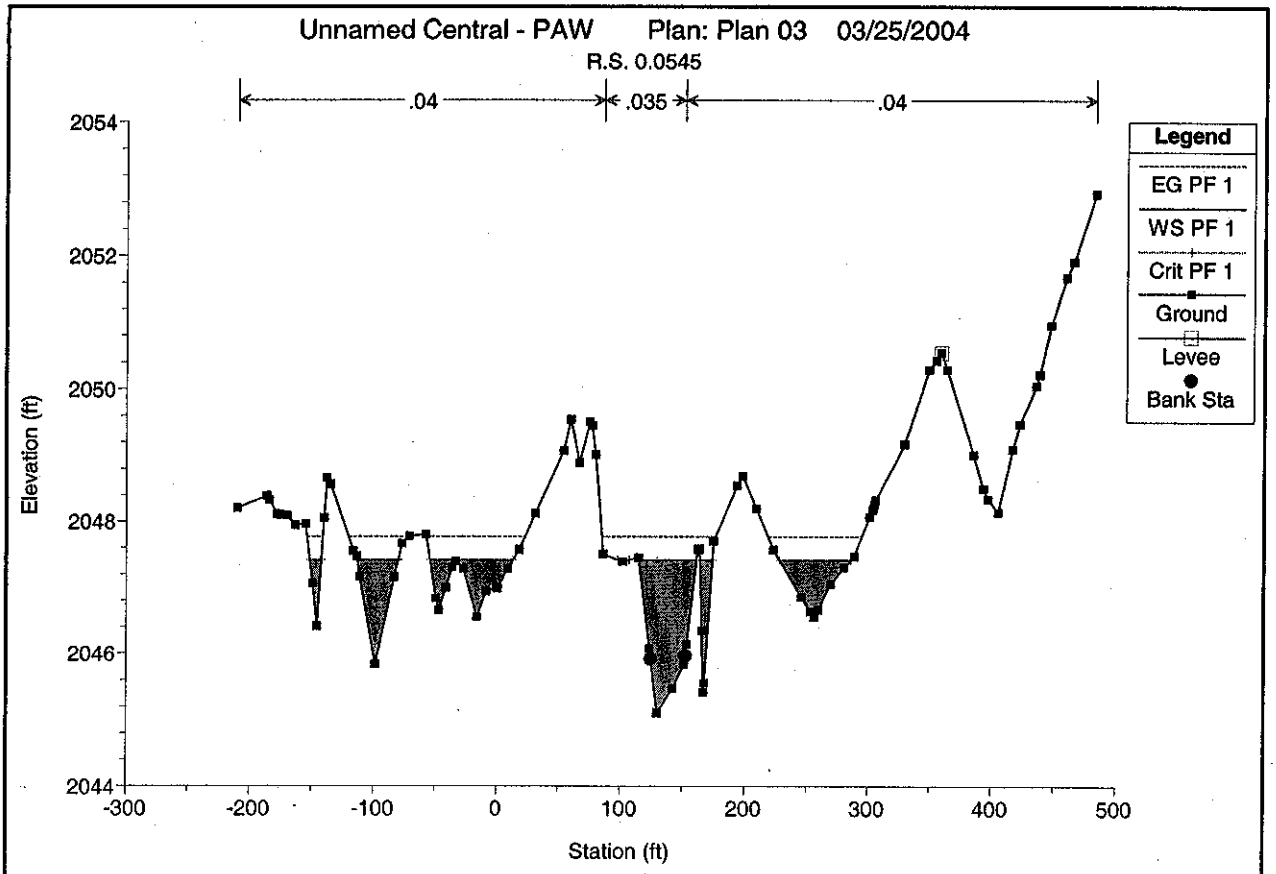

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.2845
.04
.035
.058
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

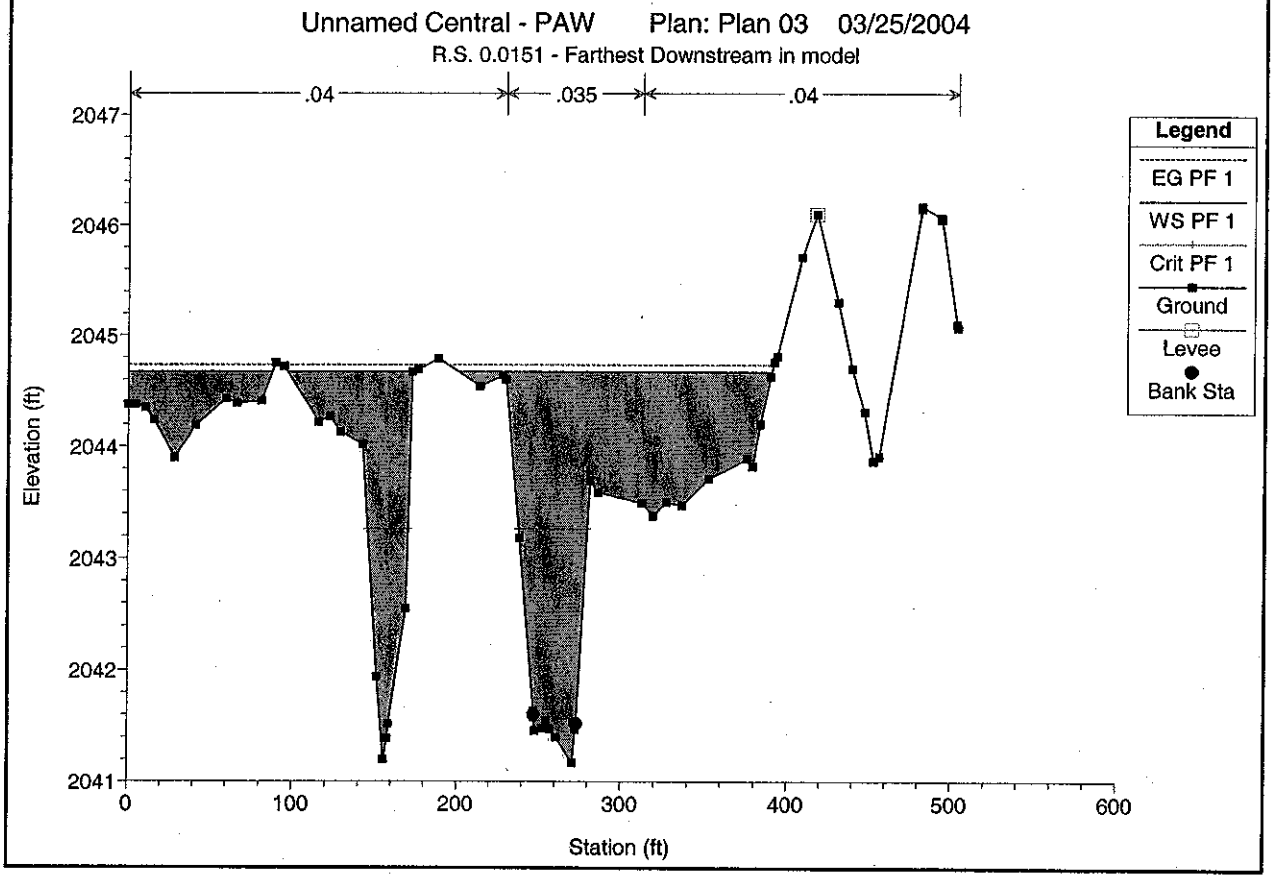

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.2364
.04
.035
.058
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)


Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.1892
.04
.035
.058
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

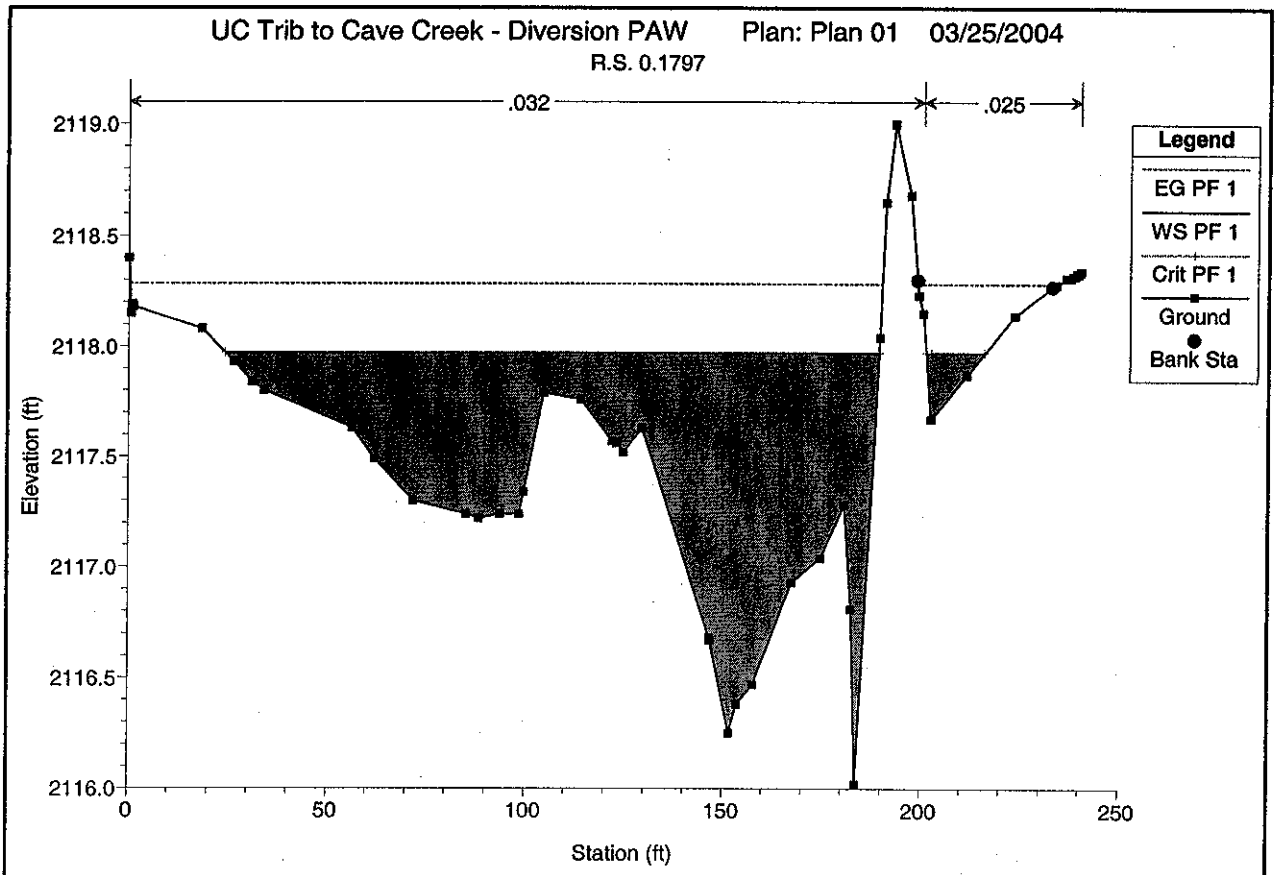

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.1561
.04
.035
058
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

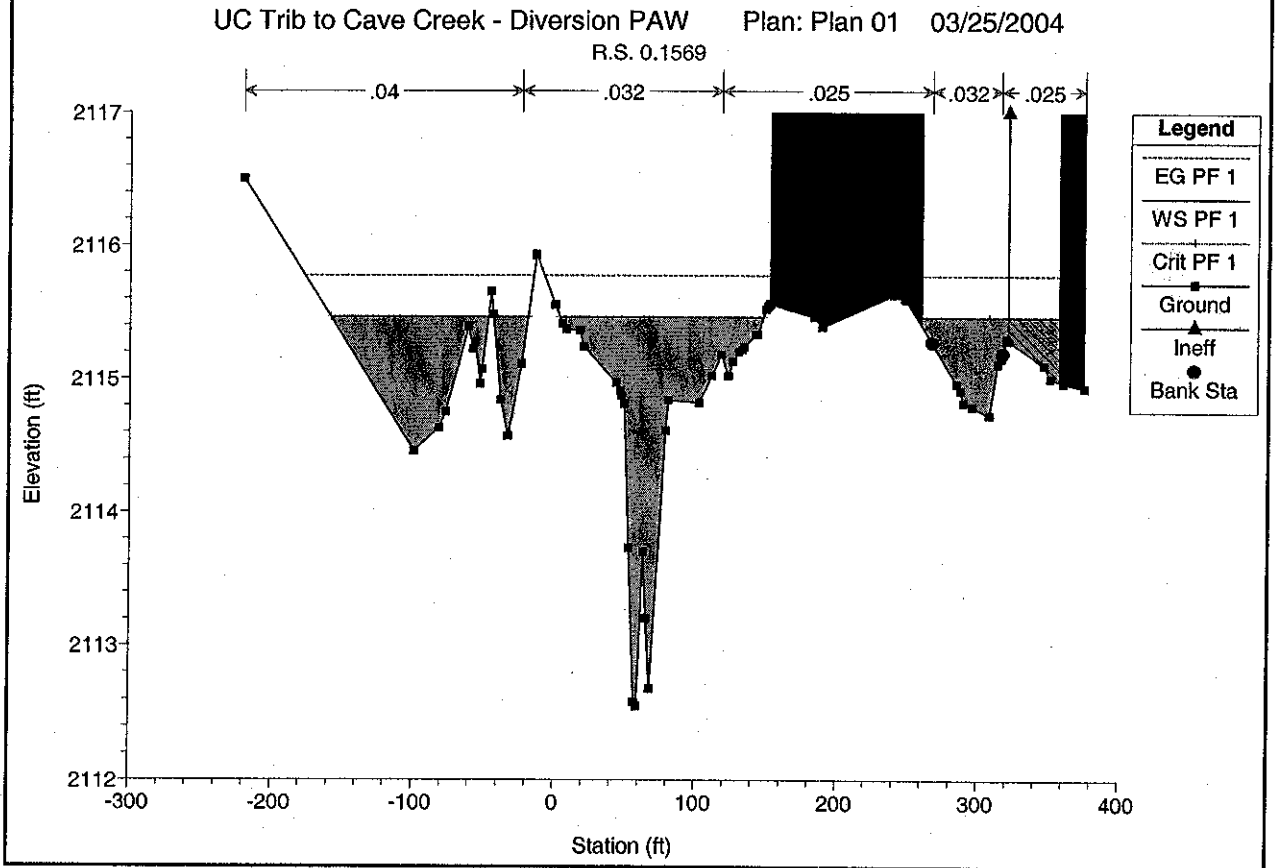

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.0986
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

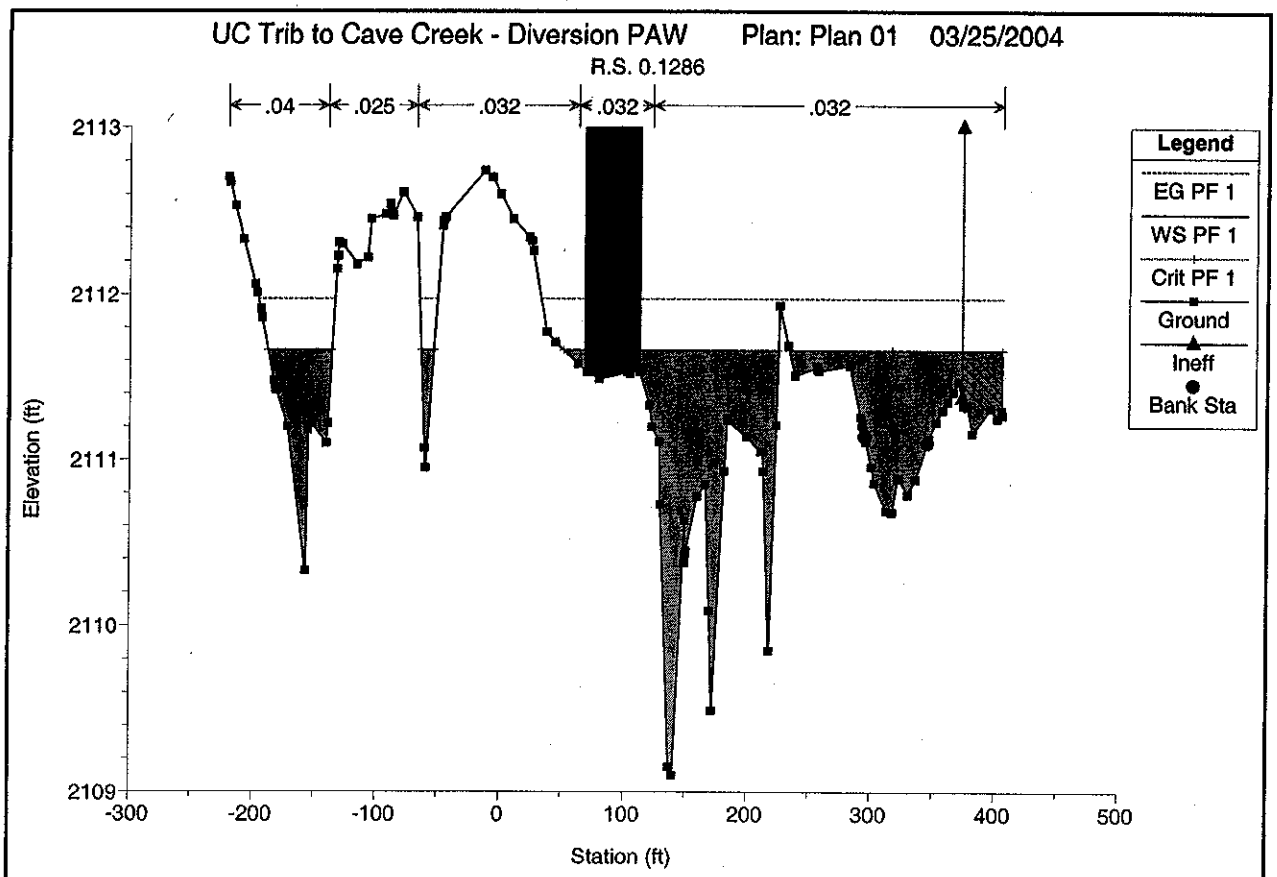

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.0545
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Elevation (ft)
2054
2052
2050
2048
2046
2044
-300
-200
-100
0
100
200
300
400
500
Station (ft)

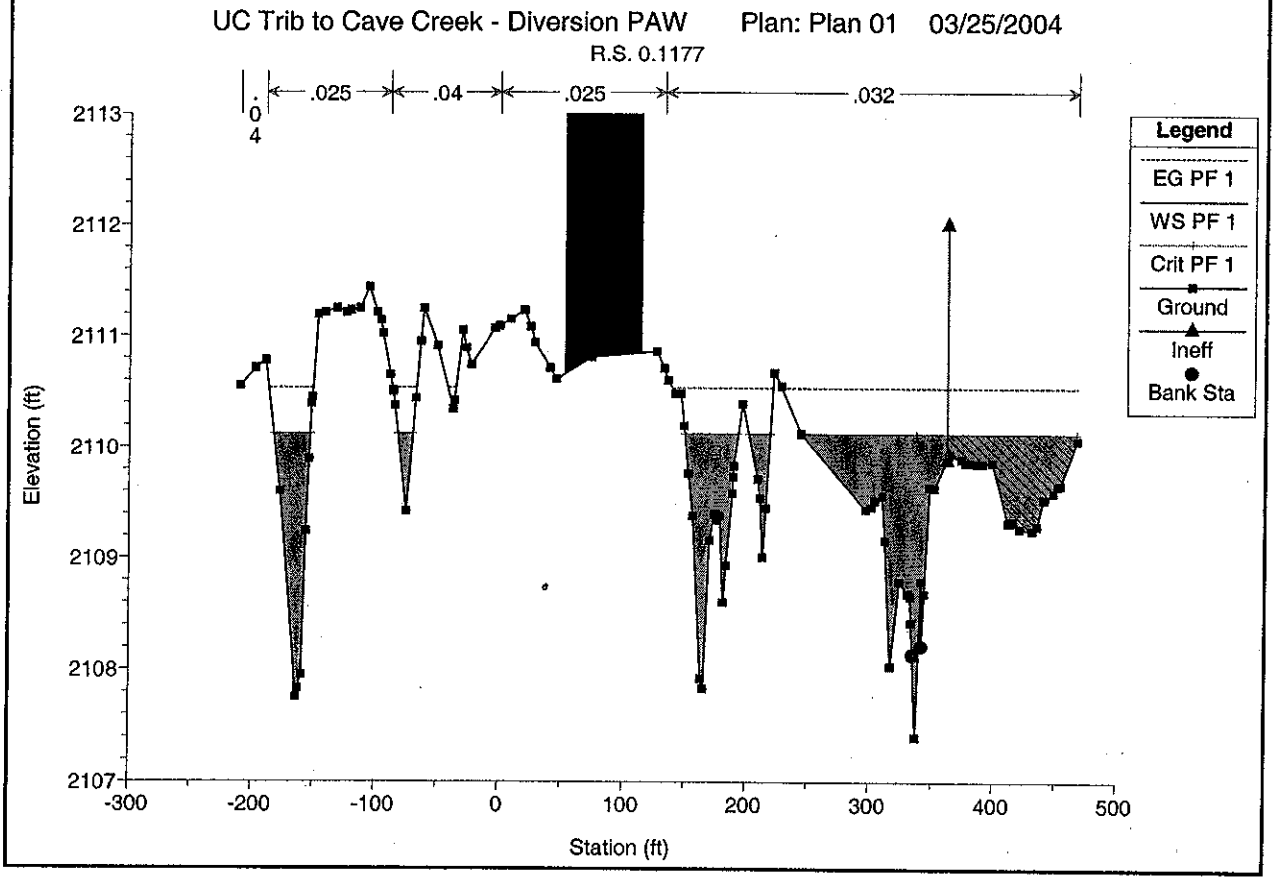

Unnamed Central - PAW Plan: Plan 03 03/25/2004
R.S. 0.0151 - Farthest Downstream in model
.04
.035
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Bank Sta
Elevation (ft)
2047
2046
2045
2044
2043
2042
2041
0
100
200
300
400
500
600
Station (ft)

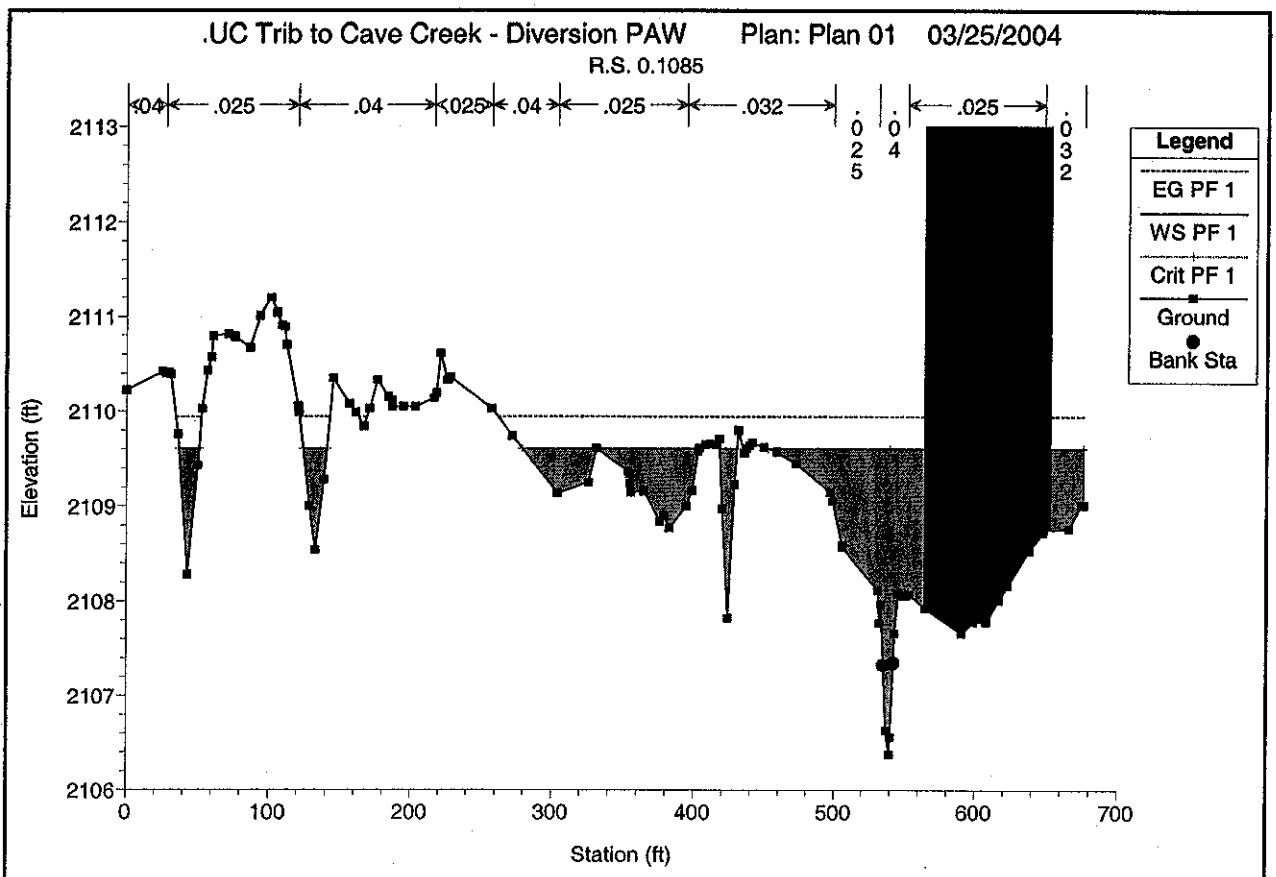
Unnamed Central Tributary to Cave Creek – Diversion Branch

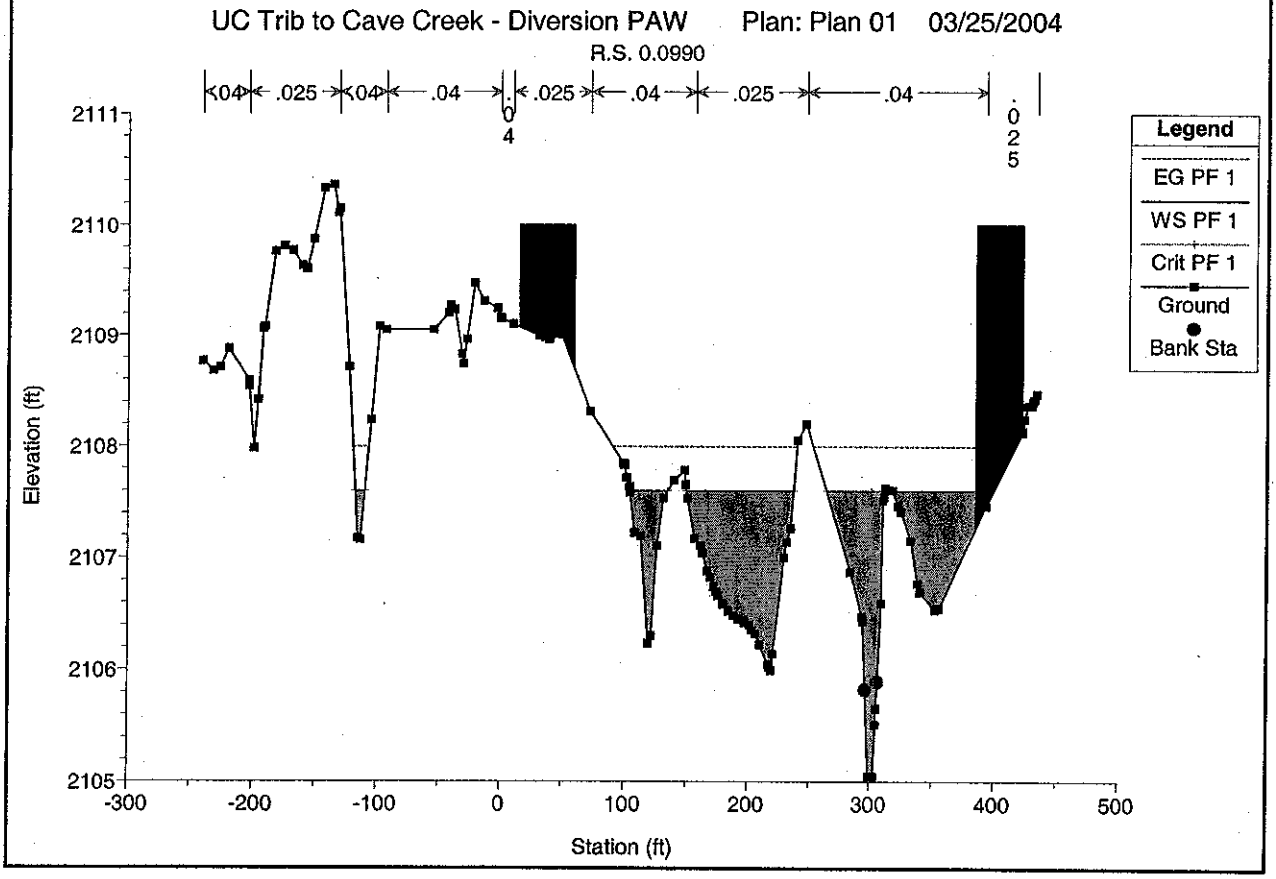

UC Trib to Cave Creek - Diversion PAW Plan: Plan 01 03/25/2004
R.S. 0.1797
.032
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2119.0
2118.5
2118.0
2117.5
2117.0
2116.5
2116.0
0
50
100
150
200
250
Station (ft)

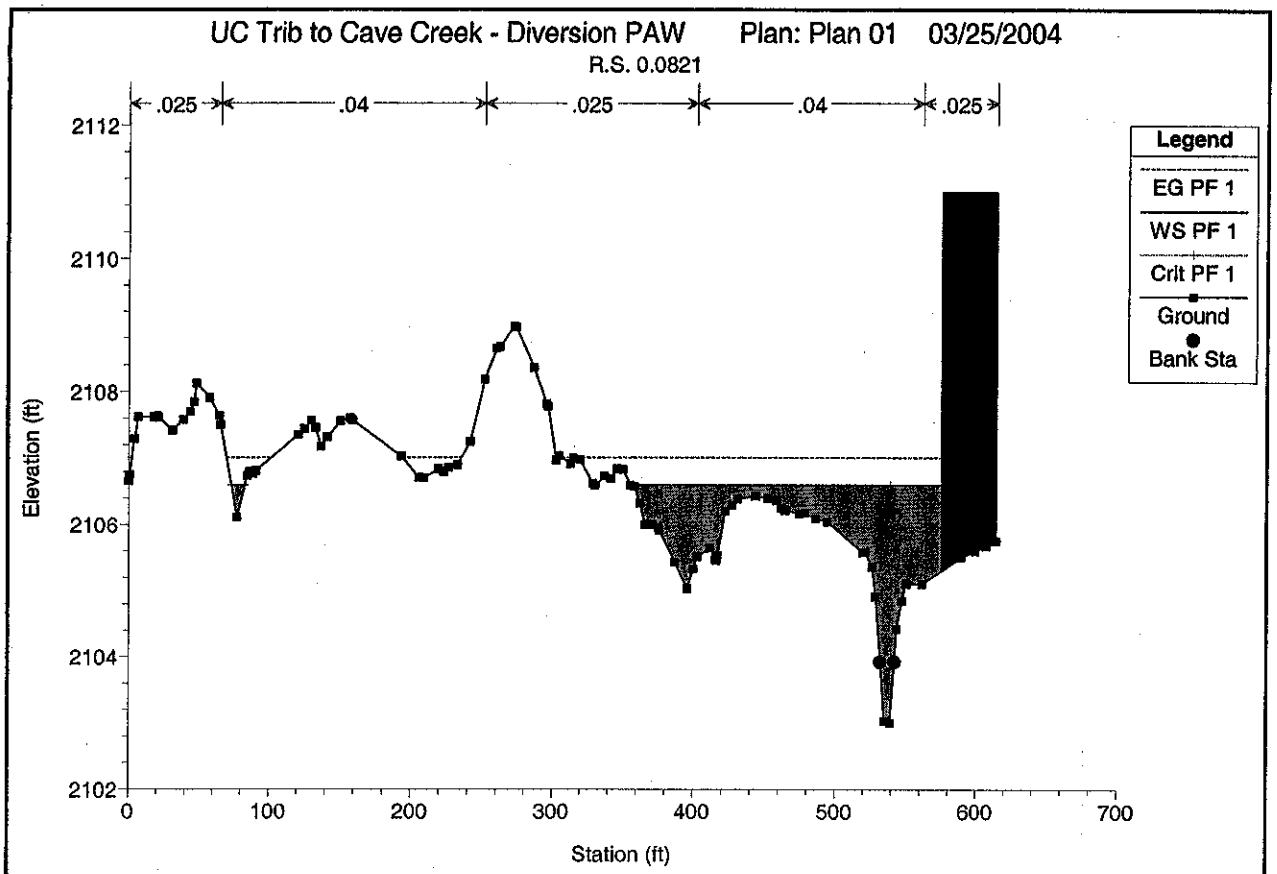

UC Trib to Cave Creek - Diversion PAW Plan: Plan 01 03/25/2004
R.S. 0.1569
.04
.032
.025
.032
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
2117
2116
2115
2114
2113
2112
-300
-200
-100
0
100
200
300
400
Station (ft)

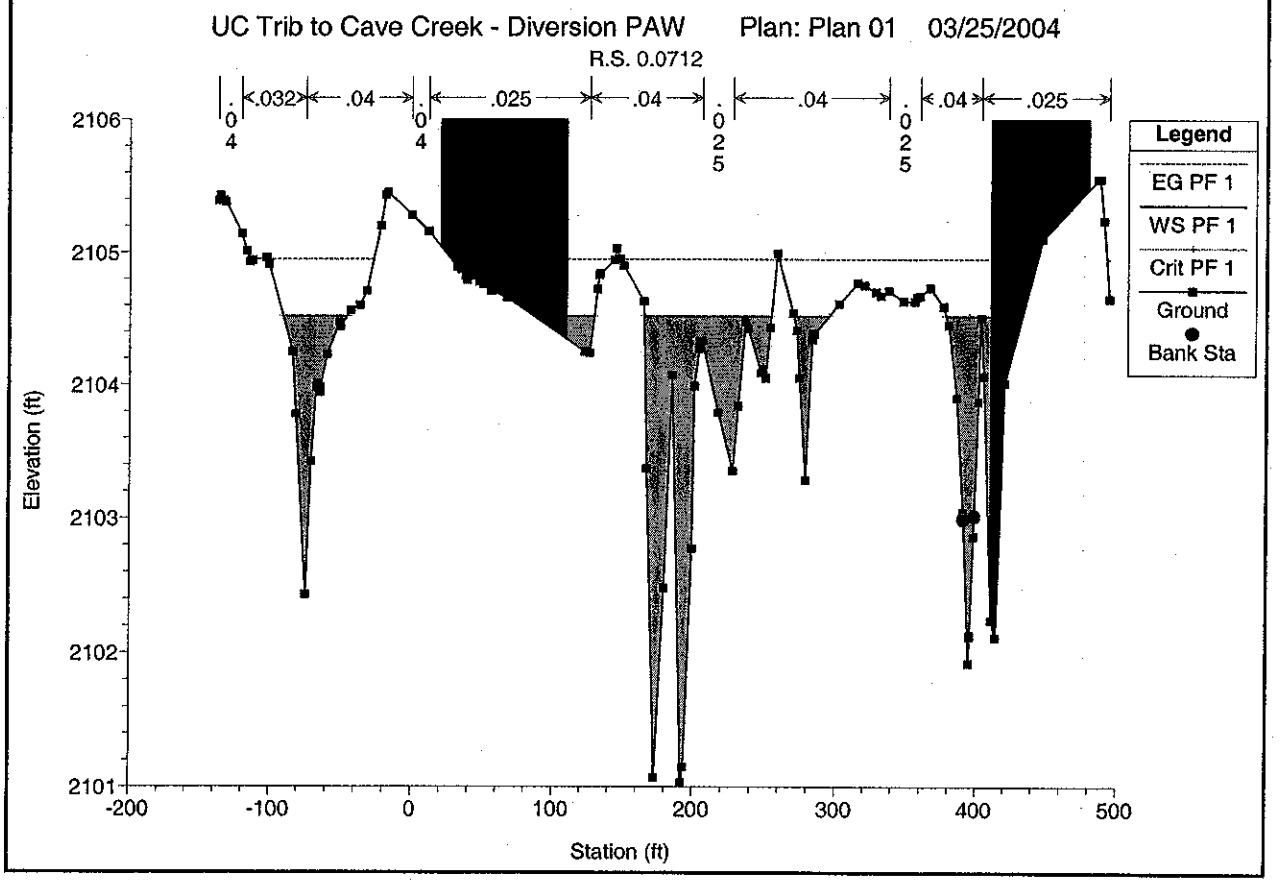

UC Trib to Cave Creek - Diversion PAW Plan: Plan 01 03/25/2004
R.S. 0.1286
.04
.025
.032
.032
.032
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
2113
2112
2111
2110
2109
-300
-200
-100
0
100
200
300
400
500
Station (ft)

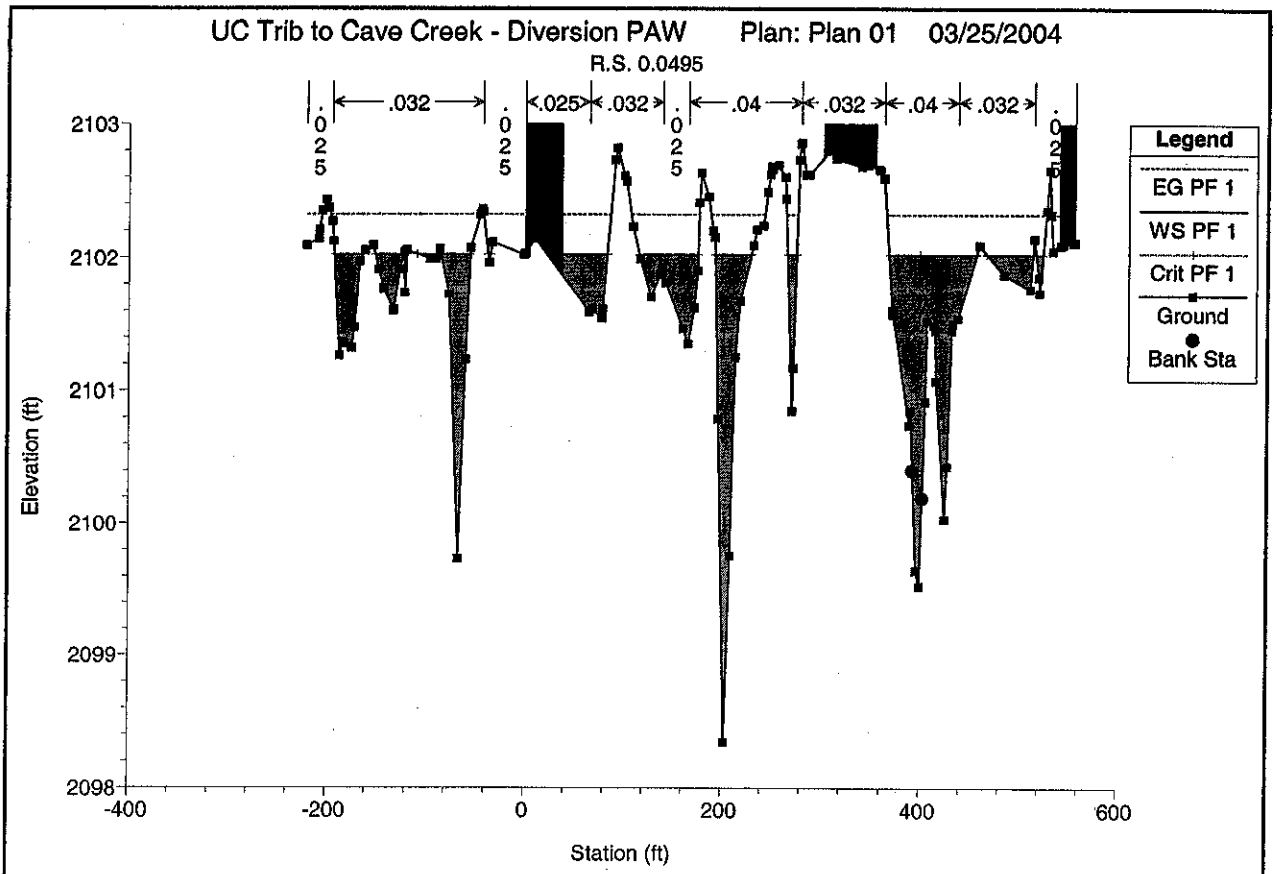

UC Trib to Cave Creek - Diversion PAW Plan: Plan 01 03/25/2004
R.S. 0.1177
.04
.025
.04
.025
.032
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
2113
2112
2111
2110
2109
2108
2107
-300
-200
-100
0
100
200
300
400
500
Station (ft)

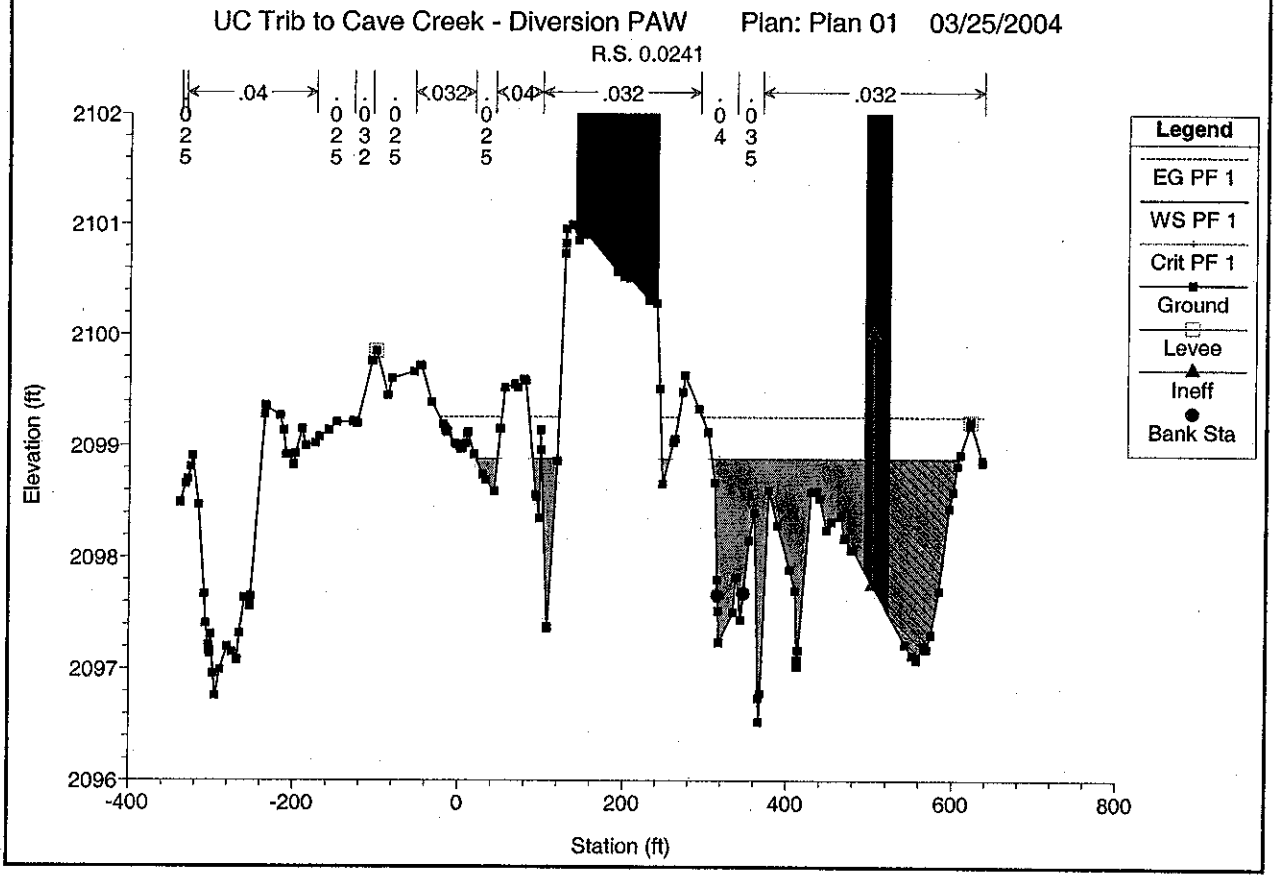

.UC Trib to Cave Creek - Diversion PAW Plan: Plan 01 03/25/2004
R.S. 0.1085
.04
.025
.04
.025
.04
.025
.032
.025
.04
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

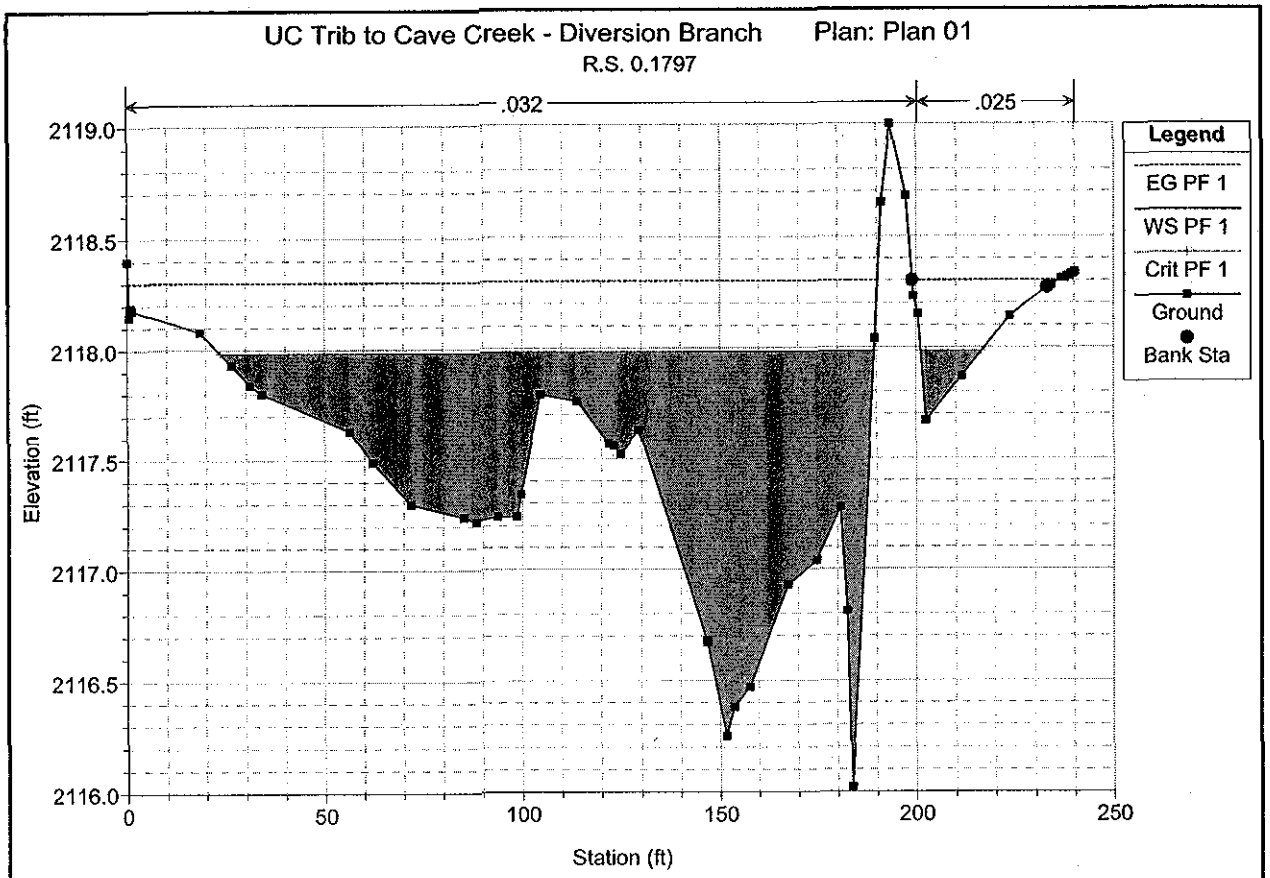

UC Trib to Cave Creek - Diversion PAW Plan: Plan 01 03/25/2004
R.S. 0.0990
.04
.025
.04
.04
.025
.04
.025
.04
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

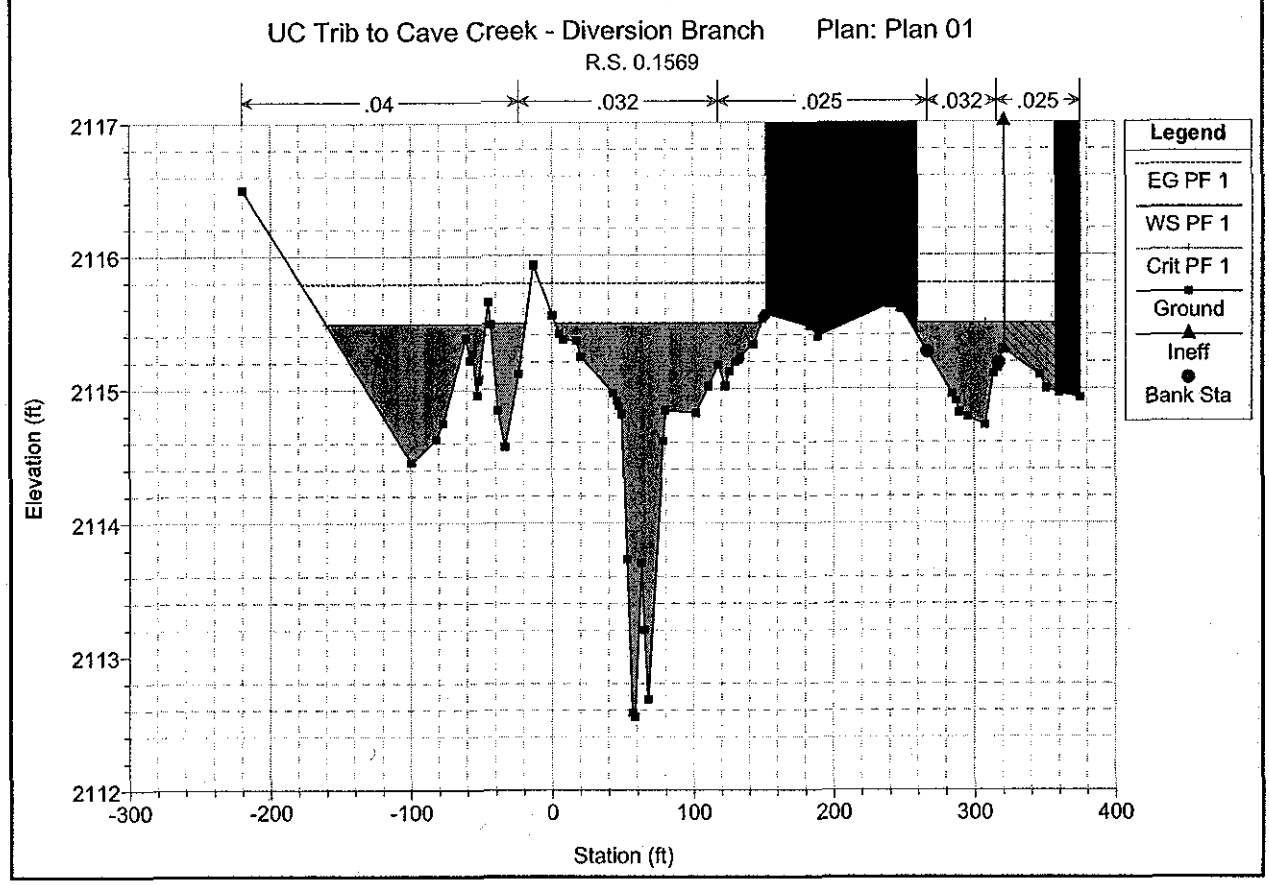

UC Trib to Cave Creek - Diversion PAW Plan: Plan 01 03/25/2004
R.S. 0.0821
.025
.04
.025
.04
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

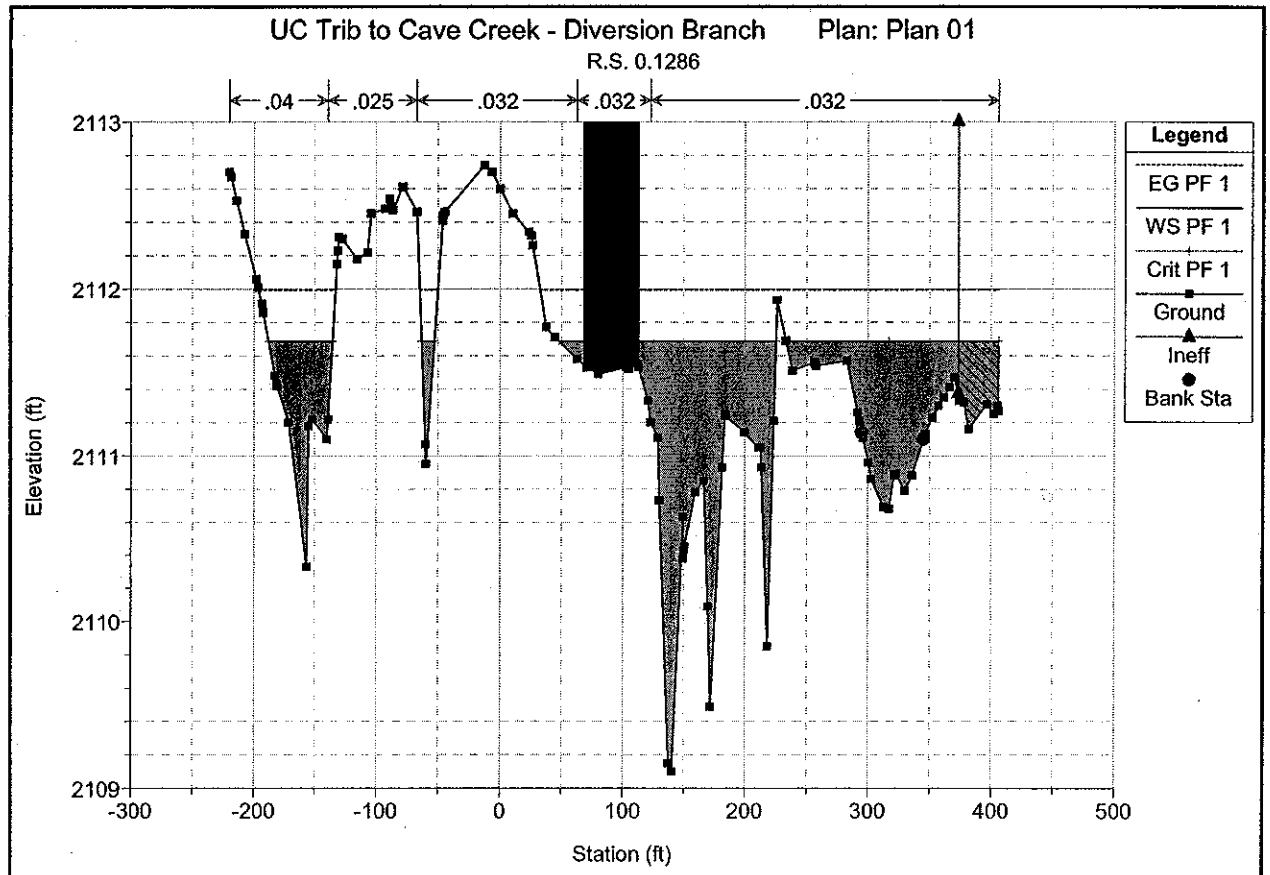

UC Trib to Cave Creek - Diversion PAW Plan: Plan 01 03/25/2004
R.S. 0.0712
.04
.032
.04
.04
.025
.04
.025
.04
.04
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

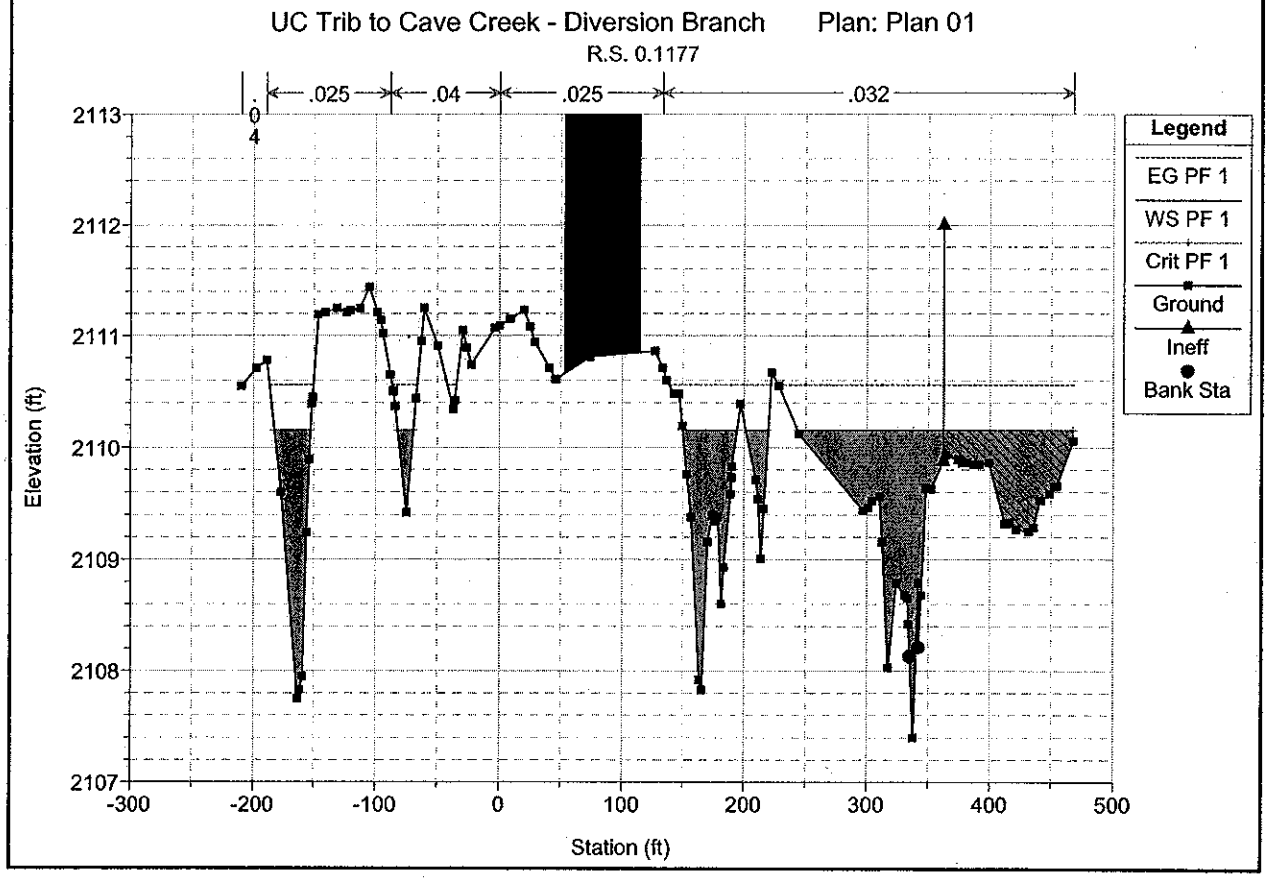

UC Trib to Cave Creek - Diversion PAW Plan: Plan 01 03/25/2004
R.S. 0.0495
.025
.032
.025
.025
.032
.025
.04
.032
.04
.032
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

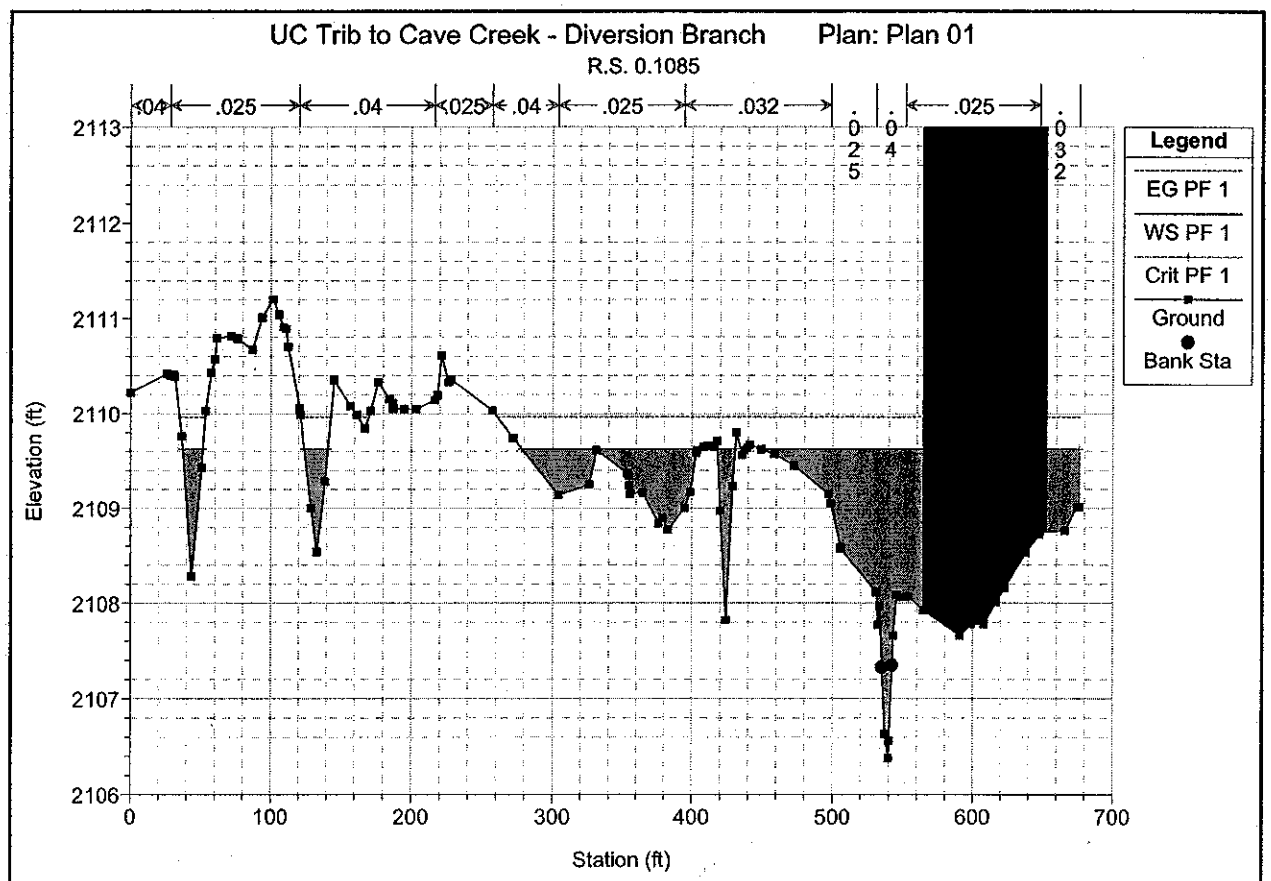

UC Trib to Cave Creek - Diversion PAW Plan: Plan 01 03/25/2004
R.S. 0.0241
.04
.025
.032
.025
.025
.032
.04
.032
.04
.035
.032
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)

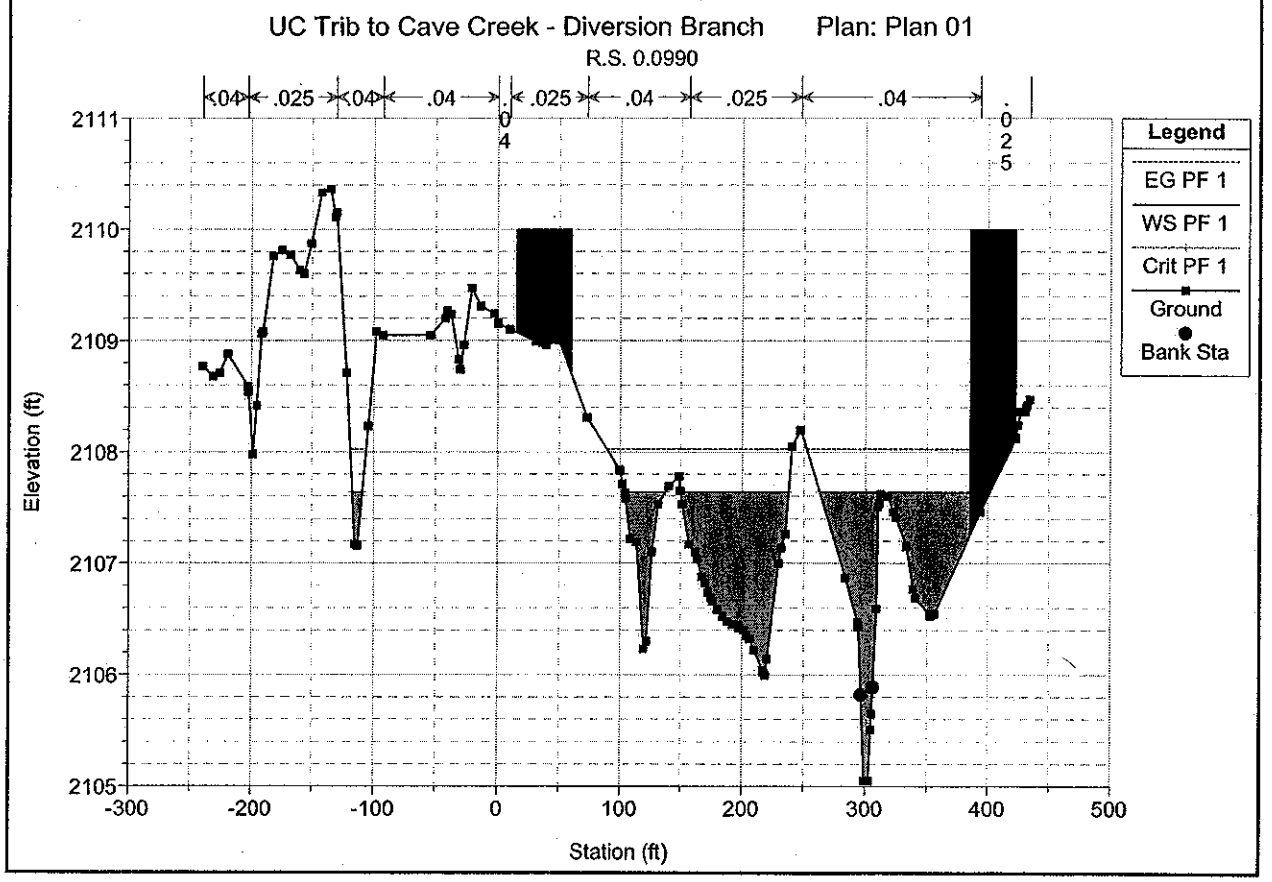

UC Trib to Cave Creek - Diversion Branch
Plan: Plan 01
R.S. 0.1797
.032
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2119.0
2118.5
2118.0
2117.5
2117.0
2116.5
2116.0
0
50
100
150
200
250
Station (ft)

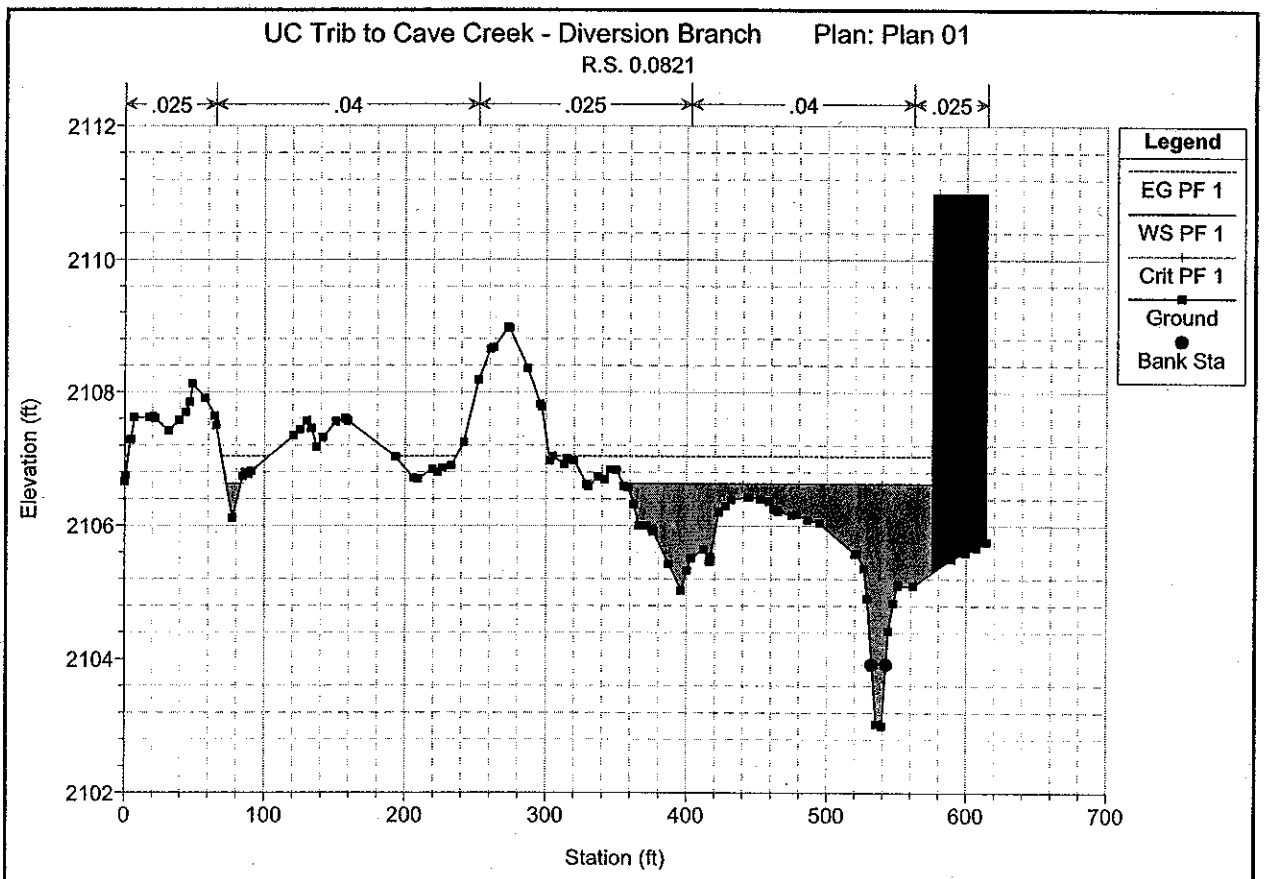

UC Trib to Cave Creek - Diversion Branch
Plan: Plan 01
R.S. 0.1569
.04
.032
.025
.032
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
2117
2116
2115
2114
2113
2112
-300
-200
-100
0
100
200
300
400
Station (ft)

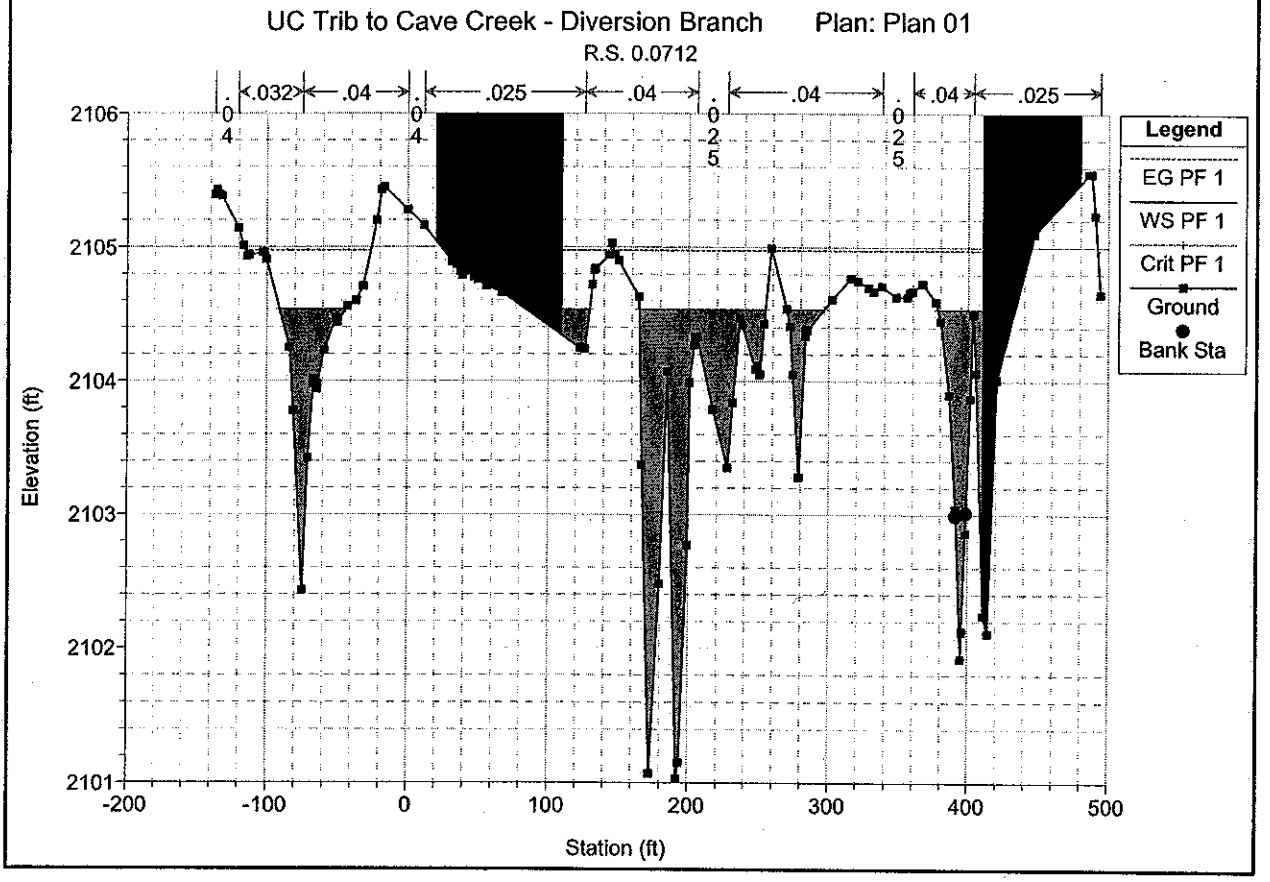

UC Trib to Cave Creek - Diversion Branch Plan: Plan 01
R.S. 0.1286
.04
.025
.032
.032
.032
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
2113
2112
2111
2110
2109
-300
-200
-100
0
100
200
300
400
500
Station (ft)

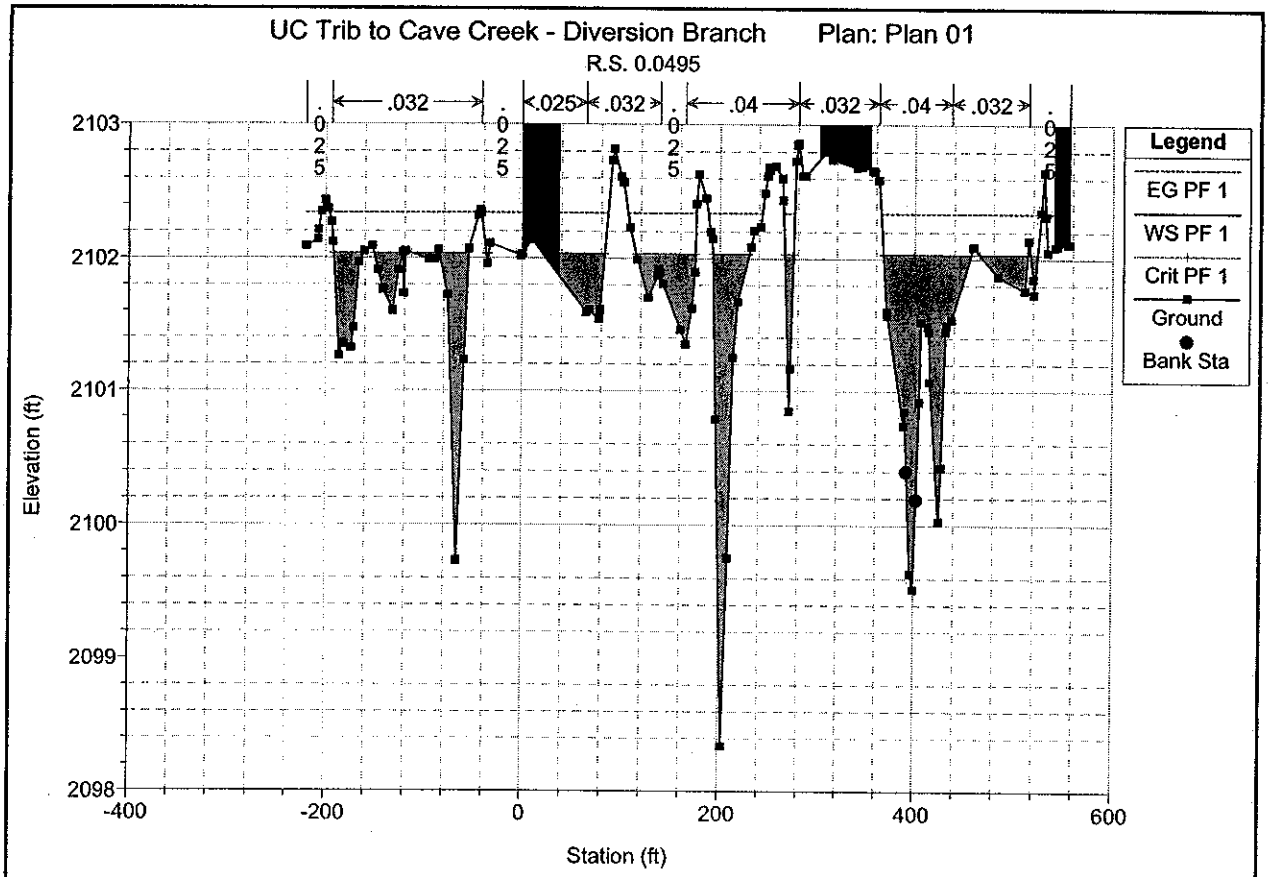

UC Trib to Cave Creek - Diversion Branch Plan: Plan 01
R.S. 0.1177
.04
.025
.04
.025
.032
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
2113
2112
2111
2110
2109
2108
2107
-300
-200
-100
0
100
200
300
400
500
Station (ft)

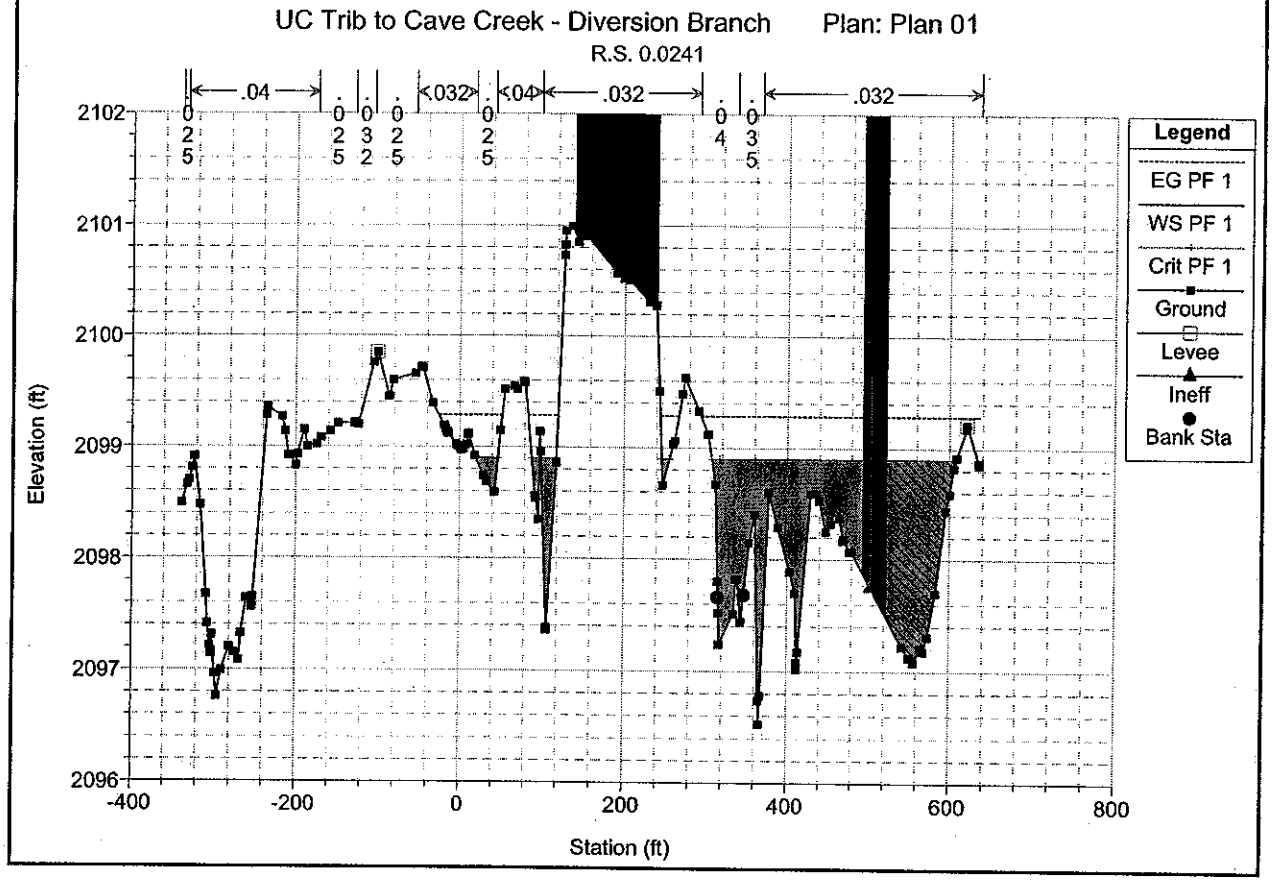

UC Trib to Cave Creek - Diversion Branch Plan: Plan 01
R.S. 0.1085
.04
.025
.04
.025
.04
.025
.032
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


UC Trib to Cave Creek - Diversion Branch Plan: Plan 01
R.S. 0.0990
.04
.025
.04
.04
.025
.04
.025
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


UC Trib to Cave Creek - Diversion Branch Plan: Plan 01
R.S. 0.0821
.025
.04
.025
.04
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


UC Trib to Cave Creek - Diversion Branch Plan: Plan 01
R.S. 0.0712
.032
.04
.025
.04
.04
.04
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


UC Trib to Cave Creek - Diversion Branch Plan: Plan 01
R.S. 0.0495
.025
.032
.025
.032
.025
.04
.032
.04
.032
.025
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


UC Trib to Cave Creek - Diversion Branch Plan: Plan 01
R.S. 0.0241
.04
.025
.025
.032
.025
.032
.025
.04
.032
.04
.035
.032
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)

CHECK-RAS:

Unnamed Central Tributary to Cave Creek

CHECK-RAS Program: NT Check
Manning's n Value and Transition Loss Coefficient Review

Project File: P:\162944\floodplain mapping\HEC-RAS files\Final\Addendum\Unnamed Central Tributary to Cave Creek \UC_Final.prj
Plan File: P:\162944\floodplain mapping\HEC-RAS files\Final\Addendum\Unnamed Central Tributary to Cave Creek \UC_Final.p02
Geometry File: P:\162944\floodplain mapping\HEC-RAS files\Final\Addendum\Unnamed Central Tributary to Cave Creek \UC_Final.g02
Flow File: P:\162944\floodplain mapping\HEC-RAS files\Final\Addendum\Unnamed Central Tributary to Cave Creek \UC_Final.f02
Report File: P:\162944\floodplain mapping\HEC-RAS files\Final\Addendum\Unnamed Central Tributary to Cave Creek \UC_Final.nt
Selected profiles: PF 1
Date: 06/03/2003
Time: 11:25:59 AM

SECNO	STRUCTURE	NLOB	NCHL	NROB	CNTR	EXP
Unnamed Central,North						
.8848		0.04	-----	-----	0.3	0.5
		0.035	-----	-----		
.8582		0.04	0.04	0.04	0.3	0.5
		-----	0.035	0.025		
		-----	0.025	-----		
		-----	0.04	-----		
.8342		0.04	0.025	0.053	0.1	0.3
		0.025	0.053	0.04		
		-----	-----	0.025		
.8062		0.025	-----	-----	0.1	0.3
		0.04	-----	-----		
		0.053	-----	-----		
.7874		0.032	-----	-----	0.1	0.3
		0.04	-----	-----		
		0.035	-----	-----		
.7698		0.032	0.04	-----	0.3	0.5
		0.025	0.035	-----		
		0.04	0.04	-----		
.749		0.025	0.035	-----	0.3	0.5
		0.035	0.032	-----		
		-----	0.04	-----		
.7415	Culvert-Up	0.025	0.035	-----	0.3	0.5
		0.035	0.032	-----		
		-----	0.04	-----		
.7415	Culvert-Dn	0.032	0.035	0.04	0.3	0.5
		0.025	0.04	0.025		
		0.035	-----	0.04		
.7352		0.032	0.035	0.04	0.3	0.5
		0.025	0.04	0.025		
		0.035	-----	0.04		
.7098		0.025	-----	-----	0.3	0.5
		0.032	-----	-----		
		0.035	-----	-----		
		0.04	-----	-----		
		0.035	-----	-----		
.6796		0.025	-----	-----	0.1	0.3
		0.032	-----	-----		
		0.04	-----	-----		
.653		0.032	-----	-----	0.1	0.3
.6303		0.025	0.032	0.04	0.1	0.3
		0.04	0.04	0.025		
		0.032	-----	-----		
.5956		0.04	-----	-----	0.1	0.3
		0.025	-----	-----		
		0.04	-----	-----		
		0.032	-----	-----		
.5545		0.025	-----	-----	0.1	0.3
		0.04	-----	-----		
		0.035	-----	-----		
.5365		0.025	0.035	0.035	0.1	0.3
		0.04	-----	0.058		
		-----	-----	0.04		
.526		0.025	0.035	0.058	0.1	0.3
		0.032	0.058	0.04		
		0.025	-----	-----		
		0.04	-----	-----		
		0.035	-----	-----		
		0.025	-----	-----	0.1	0.3
		0.032	-----	-----		
		0.025	-----	-----		
		0.04	-----	-----		
		0.035	-----	-----		
.4732		0.025	0.035	0.04	0.1	0.3
		0.058	0.04	0.025		
		0.04	-----	-----		
		0.035	-----	-----		
.4575		0.025	-----	-----	0.3	0.5

		0.04	-----	-----		
		0.058	-----	-----		
		0.04	-----	-----		
		0.035	-----	-----		
.4484		0.04	0.04	0.035	0.3	0.5
		0.058	0.035	0.04		
		0.04	-----	-----		
.4415	Culvert-Up	0.04	0.04	0.035	0.3	0.5
		0.058	0.035	0.04		
		0.04	-----	-----		
[illegible]	Culvert-Dn	0.032	-----	-----	0.3	0.5
.4326		0.032	-----	-----	0.3	0.5
.4039		0.025	-----	-----	0.3	0.5
.384		0.025	0.04	0.035	0.1	0.3
		0.04	0.035	0.032		
		-----	-----	0.035		
		-----	-----	0.025		
.3583		0.025	-----	-----	0.1	0.3
		0.04	-----	-----		
		0.035	-----	-----		
.3322		0.025	-----	-----	0.1	0.3
		0.04	-----	-----		
.3036		0.032	0.04	-----	0.1	0.3
		0.025	0.058	-----		
		0.04	0.04	-----		
.2756		0.025	-----	-----	0.1	0.3
		0.032	-----	-----		
		0.04	-----	-----		
		0.058	-----	-----		
		0.032	-----	-----		
		0.058	-----	-----		
.2529		0.025	0.04	0.058	0.1	0.3
		0.032	0.058	0.032		
		0.04	-----	0.058		
		-----	-----	0.025		
.2185		0.025	0.032	0.058	0.1	0.3
		0.04	0.058	0.025		
		0.032	-----	-----		
.1625		0.04	0.032	0.058	0.1	0.3
		0.032	0.058	0.04		
.1364		0.032	0.032	0.058	0.1	0.3
		0.04	0.058	0.025		
		0.032	-----	-----		
[illegible]		0.04	0.032	0.058	0.1	0.3
		0.032	0.058	0.04		
		-----	-----	0.025		
.0866		0.025	-----	-----	0.1	0.3
		0.04	-----	-----		
		0.028	-----	-----		
.0663		0.025	0.025	0.028	0.1	0.3
		-----	0.04	0.04		
		-----	0.028	0.028		
		-----	-----	0.058		
		-----	-----	0.04		
		-----	-----	0.025		
.039		0.025	0.028	0.04	0.1	0.3
		0.032	0.04	0.032		
		0.04	-----	-----		
		0.028	-----	-----		
Jnnamed Central,South						
.0146		0.032	-----	-----	0.1	0.3
		0.025	-----	-----		
		0.032	-----	-----		
.8919		0.025	-----	-----	0.1	0.3
		0.035	-----	-----		
		0.04	-----	-----		
0.88	Lateral Weirs					
.8717		0.04	-----	-----	0.1	0.3
		0.035	-----	-----		
.8382		0.032	0.035	-----	0.1	0.3
		0.035	0.058	-----		
.811		0.032	0.035	-----	0.1	0.3
		-----	0.04	-----		
.791		0.032	-----	-----	0.1	0.3
		0.035	-----	-----		
.7656		0.032	-----	-----	0.1	0.3
		0.035	-----	-----		
[illegible]		0.032	-----	-----	0.1	0.3
		0.035	-----	-----		
[illegible]		0.032	-----	-----	0.1	0.3
		0.035	-----	-----		
.7028		0.032	0.035	0.032	0.3	0.5
		0.035	0.032	0.025		
		-----	-----	0.032		
		-----	-----	0.025		
.6835		0.032	-----	-----	0.3	0.5
		0.035	-----	-----		
675	Culvert-Up	0.032	-----	-----	0.3	0.5

		0.035	-----	-----		
.675	Culvert-Dn	0.04	-----	-----	0.3	0.5
		0.035	-----	-----		
.6656		0.04	-----	-----	0.3	0.5
		0.035	-----	-----		
.645		0.04	-----	-----	0.3	0.5
		0.035	-----	-----		
.6052		0.04	-----	-----	0.1	0.3
		0.035	-----	-----		
[illegible]		0.04	-----	-----	0.1	0.3
		0.035	-----	-----		
.5223		0.04	0.035	0.04	0.1	0.3
		0.035	0.04	0.025		
.488		0.04	0.04	0.025	0.1	0.3
		-----	0.035	0.04		
		-----	0.025	-----		
.4631		0.04	-----	-----	0.1	0.3
		0.025	-----	-----		
		0.035	-----	-----		
.4343		0.04	-----	-----	0.1	0.3
		0.025	-----	-----		
		0.04	-----	-----		
		0.035	-----	-----		
.3922		0.04	-----	-----	0.3	0.5
		0.025	-----	-----		
		0.04	-----	-----		
		0.035	-----	-----		
.3471		0.04	0.04	-----	0.3	0.5
		0.025	0.035	-----		
		0.04	0.04	-----		
.3394	Culvert-Up	0.04	0.04	-----	0.3	0.5
		0.025	0.035	-----		
		0.04	0.04	-----		
.3394	Culvert-Dn	0.025	-----	-----	0.3	0.5
		0.04	-----	-----		
		0.035	-----	-----		
		0.04	-----	-----		
.3316		0.025	-----	-----	0.3	0.5
		0.04	-----	-----		
		0.035	-----	-----		
		0.04	-----	-----		
.2845		0.04	0.035	0.058	0.3	0.5
		0.035	0.058	0.04		
[illegible]		0.04	0.04	0.035	0.1	0.3
		-----	0.035	0.058		
		-----	-----	0.04		
.1892		0.04	-----	-----	0.1	0.3
		0.035	-----	-----		
.1561		0.04	-----	-----	0.1	0.3
		0.035	-----	-----		
.0986		0.04	0.04	0.035	0.1	0.3
		-----	0.035	0.04		
.0545		0.04	0.035	-----	0.1	0.3
		0.035	0.04	-----		
.0151		0.04	-----	0	0.1	0.3
		0.035	-----	0.04		

---Summary of Statistics---

	Minimum	Maximum
Left Overbank n Value:	0.025	0.058
Right Overbank n Value:	0	0.058
Channel n Value:	0.025	0.058
Contraction Coefficient:	0.1	0.3
Expansion Coefficient:	0.3	0.5

ROUGHNESS COEFFICIENT CHECK

RS: 0.653
NT RC 01 Left overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 0.4415
NT RC 01 Left overbank n value is less than 0.035
[illegible] The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 0.4326
NT RC 01 Left overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 0.4039
NT RC 01 Left overbank n value is less than 0.035

The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 0.0663
NT RC 01 Left overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 0.0146
NT [illegible]01 Left overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 0.811
NT RC 01 Left overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 0.7028
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

TRANSITION LOSS COEFFICIENT CHECK

RS: 0.8848
NT TL 02 Contraction and expansion loss coefficients are 0.3 and 0.5
respectively. However, this cross section is not at the structure.
They should be equal to 0.1 and 0.3.

RS: 0.8582
NT TL 02 Contraction and expansion loss coefficients are 0.3 and 0.5
respectively. However, this cross section is not at the structure.
They should be equal to 0.1 and 0.3.

RS: 0.7098
NT TL 02 Contraction and expansion loss coefficients are 0.3 and 0.5
respectively. However, this cross section is not at the structure.
They should be equal to 0.1 and 0.3.

RS: 0.4039
NT TL 02 Contraction and expansion loss coefficients are 0.3 and 0.5
respectively. However, this cross section is not at the structure.
They should be equal to 0.1 and 0.3.

RS: 0.645
NT TL 02 Contraction and expansion loss coefficients are 0.3 and 0.5
respectively. However, this cross section is not at the structure.
They should be equal to 0.1 and 0.3.

RS: 0.2845
NT TL 02 Contraction and expansion loss coefficients are 0.3 and 0.5
respectively. However, this cross section is not at the structure.
They should be equal to 0.1 and 0.3.

ROUGHNESS COEFFICIENT AT STRUCTURES

---END---

CHECK-RAS Program, XS Check
Cross Section Location and Alignment Review

Project File: P:\162944\floodplain mapping\HEC-RAS files\Final\Addendum\Unnamed Central Tributary to Cave Creek \UC_Final.prj
Plan File: P:\162944\floodplain mapping\HEC-RAS files\Final\Addendum\Unnamed Central Tributary to Cave Creek \UC_Final.p02
Geometry File: P:\162944\floodplain mapping\HEC-RAS files\Final\Addendum\Unnamed Central Tributary to Cave Creek \UC_Final.g02
Flow File: P:\162944\floodplain mapping\HEC-RAS files\Final\Addendum\Unnamed Central Tributary to Cave Creek \UC_Final.f02
Report File: P:\162944\floodplain mapping\HEC-RAS files\Final\Addendum\Unnamed Central Tributary to Cave Creek \UC_Final.xs
Selected profiles: PF 1
Date: 06/03/2003
Time: 11:26:00 AM

SECNO	Len Lob	Len Chl	Len Rob	TopWdthAct	Q Total	Flow Code
Unnamed Central,North						
0.8848	150	140.45	120	209.72	2270	D,C
0.8582	126.72	126.72	126.72	143.26	2331	C
0.8342	155	148.09	145	232.28	2331	D,C
0.8062	105	99.5	95	273.54	2331	C
0.7874	85	92.69	99	328.43	2331	D,C
0.7698	113	109.82	108	249.73	2407	D,C,B
0.749	72.86	72.86	72.86	383.26	2407	D
0.7415	Culvert #1-Up					
0.7415	Culvert #1-Dn					
0.7352	125	133.63	140	424.94	2407	C
0.7098	159.74	159.74	159.74	359.94	1918	C
0.6796	145	140.45	138	144.6	1918	C
0.653	122	119.86	118	249.04	1918	E,C
0.6303	183.22	183.22	183.22	145.76	1953	C
0.5956	210	217.01	230	127.44	1953	D,C
0.5545	102	94.94	90	145	1953	C
0.5365	60	55.5	52	175.47	1953	C
0.526	66	67.1	67	153.42	1953	C,B
0.5133	207	211.73	220	224.98	1953	C,B
0.4732	55	48.45	44	215.54	1953	
0.4575	76	82.8	88	210.41	1953	B
0.[illegible]4	83.42	83.42	83.42	332.59	1996	
0.[illegible]5	Culvert #1-Up					
0.4415	Culvert #1-Dn					
0.4326	155	151.54	150	310.76	1996	C
0.4039	105.07	105.07	105.07	211.73	1996	C
0.384	139	135.84	133	267.63	1996	C
0.3583	137.5	137.5	137.5	207.27	1996	C
0.3322	148	151.01	155	170.23	1996	E,C
0.3036	147.84	147.84	147.84	93.65	1996	C,B
0.2756	125	119.86	117	191.45	2428	C
0.2529	177	181.63	186	204.19	2428	C
0.2185	295.68	295.68	295.68	260.99	2428	C
0.1625	137.99	137.99	137.99	136.41	2573	C
0.1364	158	159.98	164	137.87	2573	C
0.1061	100	102.6	106	162.34	2573	
0.0866	107.32	107.32	107.32	112.39	2573	C,B
0.0663	146	144.46	142	117.15	2686	C,B
0.039	122	128.83	133	206.67	2686	
0.0146	0	0	0	413.75	2706	
Unnamed Central,South						
0.8919	101	106.73	110	293.55	663	D,C
0.88	Lateral Weirs					
0.8717	185	176.72	171	178.89	663	D,C
0.8382	144	143.65	142	215.47	663	D,C
0.811	105.88	105.88	105.88	315.2	602	D,C
0.791	138	133.85	130	401.63	602	D,C
0.7656	101	97.21	94	364.42	602	D,C
0.7472	112	118.09	127	461.19	602	D,C
0.7248	112	116.51	120	170.72	602	D,C,B
0.7028	101.92	101.92	101.92	249.92	602	D,C,B
0.6835	94.29	94.29	94.29	34.11	244	C
0.675	Culvert #1-Up					
0.675	Culvert #1-Dn					
0.6656	112	108.61	105	33.79	244	C
0.[illegible]5	200	210.22	222	28.4	244	D,C
0.[illegible]2	204	201.22	199	58.31	244	D,C
0.[illegible]1	236.61	236.61	236.61	36.75	244	C
0.5223	180.96	180.96	180.96	47.12	244	D,C
0.488	131.84	131.84	131.84	81.3	244	
0.4631	152.02	152.02	152.02	169.53	614	D,C
0.4343	222.33	222.33	222.33	143.48	614	D,C,B
0.3922	230	238.1	252	318.39	639	C,B
0.3471	84	81.84	80	346.81	645	D
0.3394	Culvert #1-Up					
0.3394	Culvert #1-Dn					

0.3316	255	248.3	244	194.77	645	D,C
0.2845	270	254.27	245	92.24	645	D,C
0.2364	245	249.01	255	235.21	652	D,C
0.1892	170	174.97	182	153.74	652	D,C
0.1561	330	303.5	280	189.79	658	D,C
0.0986	233.04	233.04	233.04	325.64	658	D,C
0.0545	200	207.66	220	273.88	658	D,C
0.0151	0	0	0	352.88	664	D,E

B=[redacted]ked obstruction XS SC 05
C=[redacted]ial depth XS SC 03
D=divided flow XS SC 01
E=cross section extended XS SC 02
K=known water-surface XS SC 04

DISTANCE CHECK

SPACING CHECK

INEFFECTIVE FLOW CHECK

RS: 0.8062
XS IF 01 Right Levee option is used at this river station
Please investigate whether the NFIP requirements
for levees are met.

RS: 0.749
XS IF 01 Left Levee option is used at this river station
Please investigate whether the NFIP requirements
for levees are met.

RS: 0.7352
XS IF 01 Left Levee option is used at this river station
Please investigate whether the NFIP requirements
for levees are met.

RS[redacted] 0.7098
XS[redacted]01 Left Levee option is used at this river station
Please investigate whether the NFIP requirements
for levees are met.

RS: 0.653
XS IF 01 Left Levee option is used at this river station
Please investigate whether the NFIP requirements
for levees are met.

RS: 0.653
XS IF 01 Right Levee option is used at this river station
Please investigate whether the NFIP requirements
for levees are met.

RS: 0.526
XS IF 01 Left Levee option is used at this river station
Please investigate whether the NFIP requirements
for levees are met.

RS: 0.3322
XS IF 01 Left Levee option is used at this river station
Please investigate whether the NFIP requirements
for levees are met.

RS: 0.2185
XS IF 01 Left Levee option is used at this river station
Please investigate whether the NFIP requirements
for levees are met.

RS: 0.039
XS IF 01 Right Levee option is used at this river station
Please investigate whether the NFIP requirements
for levees are met.

R[redacted] 0.8717
XS [redacted] 01 Right Levee option is used at this river station
Please investigate whether the NFIP requirements
for levees are met.

RS: 0.8382
XS IF 01 Right Levee option is used at this river station
Please investigate whether the NFIP requirements
for levees are met.

```
RS:       0.6835
XS IF 01 Left Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:       0.5223
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:       0.488
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:       0.3922
XS IF 01 Left Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:       0.3471
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:       0.3316
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:       0.2845
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:       0.2364
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:       0.1561
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:       0.0986
XS IF 01 Left Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:       0.0986
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:       0.0545
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:       0.0151
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.


DISCHARGE CHECK
---------------

RS:       0.7098
XS DC 01 Discharge decreases in the downstream direction.

RS:       0.811
XS DC 01 Discharge decreases in the downstream direction.

RS:       0.6835
XS DC 01 Discharge decreases in the downstream direction.


LOCATION CHECK
--------------

RS:       0.7098
XS LC 01 Lenchl Up/TopwdthAct Dn = 1.10
         MaxChlDpth Up/MaxChlDpth Dn = 1.41
         TopwdthAct Up/TopwdthAct Dn = 2.49
         This cross section is located too far upstream from the
         critical depth cross section
```

```
RS:       0.2185
CS LC 01 Lenchl Up/TopwdthAct Dn = 2.17
         MaxChlDpth Up/MaxChlDpth Dn = 1.20
         TopwdthAct Up/TopwdthAct Dn = 1.91
         This cross section is located too far upstream from the
         critical depth cross section.

RS:       0.7028
CS LC 01 Lenchl Up/TopwdthAct Dn = 2.99
         MaxChlDpth Up/MaxChlDpth Dn = 1.63
         TopwdthAct Up/TopwdthAct Dn = 7.33
         This cross section is located too far upstream from the
         critical depth cross section.

RS:       0.2364
CS LC 01 Lenchl Up/TopwdthAct Dn = 1.62
         MaxChlDpth Up/MaxChlDpth Dn = 1.44
         TopwdthAct Up/TopwdthAct Dn = 1.53
         This cross section is located too far upstream from the
         critical depth cross section.


BOUNDARY CONDITION CHECK
------------------------

CS BC 02 The name of the stream is Unnamed Central,North
         Known WS = 2038.33 is specified as the downstream boundary
         for profile PF 1

CS BC 02 The name of the stream is Unnamed Central,North
         Known WS = 2141.24 is specified as the upstream boundary
         for profile PF 1

CS BC 02 The name of the stream is Unnamed Central,South
         Known WS = 2044.67 is specified as the downstream boundary
         for profile PF 1

CS BC 02 The name of the stream is Unnamed Central,South
         Known WS = 2141.24 is specified as the upstream boundary
         for profile PF 1


LATERAL WEIRS CHECK
-------------------

---END---
```

CHECK-RAS Program: Structure Check

Project File: P:\162944\floodplain mapping\HEC-RAS files\Final\Addendum\Unnamed Central Tributary to Cave Creek \UC_Final.prj
Plan File: P:\162944\floodplain mapping\HEC-RAS files\Final\Addendum\Unnamed Central Tributary to Cave Creek \UC_Final.p02
Geometry File: P:\162944\floodplain mapping\HEC-RAS files\Final\Addendum\Unnamed Central Tributary to Cave Creek \UC_Final.g02
Flow File: P:\162944\floodplain mapping\HEC-RAS files\Final\Addendum\Unnamed Central Tributary to Cave Creek \UC_Final.f02
Report File: P:\162944\floodplain mapping\HEC-RAS files\Final\Addendum\Unnamed Central Tributary to Cave Creek \UC_Final.br
Selected profiles: PF 1
Date: 06/03/2003
Time: 11:26:02 AM

RS	MaxLoChord	MnTpRd	EGEL	WSEL	MinChEl	Structure
Unnamed Central,North						
0.8848			2139.03	2138.8	2133.03	
0.8582			2135.69	2134.63	2132.02	
0.8342			2133.32	2132.57	2128.07	
0.8062			2129.71	2129.28	2123.97	
0.7874			2127.46	2126.86	2121.89	
0.7698			2124.72	2124	2119.72	
0.749			2123.04	2122.88	2117.94	
0.7415	2121.57	2121.02	0	2121.57	2117.57	Culvert #1-Up
0.7415	2120.81	2120.43	0	2120.81	2116.81	Culvert #1-Dn
0.7352			2121.21	2120.93	2117	
0.7098			2118.22	2118.01	2111.87	
0.6796			2113.34	2112.44	2108.09	
0.653			2111.79	2111.38	2104.97	
0.6303			2107.7	2106.79	2101.95	
0.5956			2103.21	2102.16	2097.67	
0.5545			2098.08	2097.16	2092.53	
0.5365			2095.92	2095.1	2090.39	
0.526			2094.4	2093.52	2089.88	
0.5133			2092.65	2092.3	2088.49	
0.4732			2086.81	2086.5	2083.31	
0.4575			2086.64	2086.51	2081.25	
0.4484			2086.55	2086.49	2080.47	
0.4415	2083.82	2084.97	0	2083.82	2080.82	Culvert #1-Up
0.4415	2081.9	2084.55	0	2081.9	2078.9	Culvert #1-Dn
0.4376			2083.12	2083.01	2077.42	
0.4039			2076.59	2075.87	2073.55	
0.384			2074.1	2073.48	2071.27	
0.3583			2071.19	2070.45	2068.29	
0.3322			2068.24	2067.42	2064.91	
0.3036			2065.05	2063.8	2060.67	
0.2756			2060.87	2060.05	2054.97	
0.2529			2057.55	2056.73	2054.11	
0.2185			2055.34	2054.94	2049.27	
0.1625			2049.38	2048.15	2043.43	
0.1364			2046.43	2045.23	2041.24	
0.1061			2042.12	2041.63	2038.07	
0.0866			2041.38	2040.03	2036.53	
0.0663			2039.58	2038.29	2034.48	
0.039			2038.55	2038.23	2031.71	
0.0146			2038.41	2038.33	2029	
Unnamed Central,South						
0.8919			2141.1	2140.8	2138.89	
0.8717			2139.66	2139.2	2134.48	
0.88	Lateral Weirs					
0.8382			2136.03	2135.62	2132.2	
0.811			2132.82	2132.56	2131.36	
0.791			2130.02	2129.81	2129.42	
0.7656			2127.34	2127.1	2127.01	
0.7472			2125.66	2125.47	2124.31	
0.7248			2122.6	2122.23	2121.61	
0.7028			2119.79	2119.49	2118.91	
0.6835			2116.74	2116.14	2114.8	
0.675	2117.3	2117.73	0	2114.97	2113.3	Culvert #1-Up
0.675	2116.02	2116.26	0	2113.14	2112.02	Culvert #1-Dn
0.6656			2113.76	2113.15	2111.29	
0.645			2111.66	2110.92	2108.81	
0.6052			2107.56	2107.12	2105.77	
0.5671			2102.9	2102.32	2100.72	
0.5[illegible]3			2097.18	2096.68	2095.34	
0.[illegible]8			2093.23	2093.01	2092.01	
0.4631			2092.32	2091.9	2088.79	
0.4343			2088.75	2088.25	2084.16	
0.3922			2084.5	2084.46	2079.49	
0.3471			2080.53	2080.49	2075.94	
0.3394	2079.11	2080.05	0	2079.11	2076.11	Culvert #1-Up
0.3394	2079.05	2080.05	0	2078.51	2076.05	Culvert #1-Dn
0.3316			2077.82	2077.42	2074.62	
0.2845			2072.39	2071.75	2069.46	

0.2364	2067.45	2067.08	2064.59
0.1892	2062.38	2061.93	2060.2
0.1561	2058.2	2057.83	2056.65
0.0986	2052.51	2052.36	2050.68
0.0545	2047.89	2047.54	2045.1
0.0151	2044.76	2044.67	2041.17

RIVER REACH: Unnamed Central, North
RIVER STATION: 0.7415
TYPE OF STRUCTURE: Culvert

Description:	Culvert Number 27, at Los Reales
Distance from Upstream XS:	19.5
Deck/Roadway Width:	39.7
Weir Coefficient:	2.6
Maximum allowable submergence for weir flow:	0.95
Elevation at which weir flow begins:	2121.02
Weir crest shape:	Broad Crested

Sec	River Station	Length Channel	WSEL	Surch.	EGEL	TopWidth Actual	
4	0.7698	109.82	2124		2124.72	249.73	
3	0.749	72.86	2122.88		2123.04	383.26	
	0.7415	41.70	2121.57		0	0	Culvert #1-Up
	0.7415	12.66	2120.81		0	0	Culvert #1-Dn
2	0.7352	133.63	2120.93		2121.21	424.94	
1	0.7098	159.74	2118.01		2118.22	359.94	

	Ineffective Flow, Section 3			Ineffective Flow, Section 2		
	Sta L	Sta R	Elev	Sta L	Sta R	Elev
1	0	359	2121.02	0	360	2120.92
2	429	602.89	2121.02	436	617.84	2120.92

Opening Type	StagStaL	StagStaR	EncStaL	EncStaR	LIfStaS	RIfStaS	
Culvert Group					359	429	U
					360	436	D

CULVERT:
Culvert Name: Culvert #1
Shape: Box Rise: 4 Span: 10 Barrels: 4
FHWA Chart #: # 8 - flared wingwalls
FHWA Scale #: # 1 - Wingwall flared 30 to 75 deg.
Solution Crit:Highest U.S. EG

UpstrmDist:	18.5	Length:	41.7	n-Value:	0.013		
EntLossCoef:	0.4	ExtLossCoef:	1	CulvInvElU	2117.57	CulvInvElD	2116.81
LCntStaU:	377.1	RCntStaU:	410.7	LCntStaD	383.2	RCntStaD	416.8

Culvert Depth Blocked: 0

Culv Area:	160	CulvQ:	1511.41	MinTopRd:	2121.03	

	LAbutSt	RAbutSt	LMnTpRd	RMnTpRd	MnTpRd	MxLoCd	
Culvert #1	372.1	415.7	2121.02	2123.69	2121.02	2121.57	U
	378.2	421.8	2120.43	2123.24	2120.43	2120.81	D

Name	Q Total.	Q Struc	Q Weir	Selected Method	Flow Type
Culvert #1		1511.41	895.59	Highest U.S. EG	Pressure and Weir Flow

RIC CHECK

TYPE OF FLOW CHECK

RS: 0.7415 This is Culvert #1
CV PW 01 Type of flow is pressure and weir flow because,
1. EGEL 3 of 2123.04 is greater than MinTopRd of 2121.03.
2. CulvWSIn of 2121.57 is greater than or equal to MxLoCdU of 2121.57

3. CulvWSOut of 2120.81 is greater than or equal to MxLoCd0 of 2120.81.

DISTANCE CHECK

CULVERT COEFFICIENT CHECK

CULVERT CRITERIA CHECK

INEFFECTIVE FLOW CHECK

XS: 0.7098 This is Section 1
ST IF 07 Ineffective flow option was considered at this section.
However, it should be a fully expanded cross section.
Ineffective flow stations and elevations should be cleared from
this section, unless the ares beyond the ineffective flow stations
are not within the flow path of the stream.
This message should be ignored if this section is Section 3 of the downstream
structure.

RIVER/REACH: Unnamed Central, North
RIVER STATION: 0.4415
TYPE OF STRUCTURE: Culvert

Description:	Culvert No. 20, at Carefree Mountain Drive
Distance from Upstream XS:	7.7
Deck/Roadway Width:	58
Weir Coefficient:	2.6
Maximum allowable submergence for weir flow:	0.95
Elevation at which weir flow begins:	2083.57
Weir crest shape:	Broad Crested

Sec	River Station	Length Channel	WSEL	Surch.	EGEL	TopWidth Actual	
4	0.4575	82.80	2086.51		2086.64	210.41	
3	.4484	83.42	2086.49		2086.55	332.59	
	.4415	60.00	2083.82		0	0	Culvert #1-Up
	0.4415	16.72	2081.9		0	0	Culvert #1-Dn
2	0.4326	151.54	2083.01		2083.12	310.76	
1	0.4039	105.07	2075.87		2076.59	211.73	

	Ineffective Flow, Section 3			Ineffective Flow, Section 2		
	Sta L	Sta R	Elev	Sta L	Sta R	Elev
1	0	148	2084.97	0	141	2083
2	193	394.71	2084.97	214	409.82	2083

Opening Type	StagStaL	StagStaR	EncStaL	EncStaR	LIfStaS	RIfStaS	
Culvert Group					148	193	U
					141	214	D

CULVERT:
Culvert Name: Culvert #1
Shape: Box Rise: 3 Span: 8 Barrels: 4
FHWA Chart #: # 8 - flared wingwalls
FHWA Scale #: # 1 - Wingwall flared 30 to 75 deg.
Solution Crit:Highest U.S. EG

UpstrmDist:	6.7	Length:	60	n-Value:	0.013		
EntLossCoef:	0.4	ExtLossCoef:	1	CulvInvElU	2080.82	CulvInvElD	2078.9
LCntStaU:	159.9	RCntStaU:	186.3	LCntStaD	180.7	RCntStaD	207.1

Culvert Depth Blocked: 0

Area: 96 CulvQ: 1124.84 MinTopRd: 2084.98

	LAbutSt	RAbutSt	LMnTpRd	RMnTpRd	MnTpRd	MxLoCd	
Culvert #1	155.9	190.3	2084.97	2085.02	2084.97	2083.82	U
	176.7	211.1	2084.55	2084.55	2084.55	2081.9	D

Name	Q Total	Q Struc	Q Weir	Selected Method	Flow Type
Culvert #1		1124.84	871.16	Highest U.S. EG	Pressure and Weir Flow

GEOMETRIC CHECK

TYPE OF FLOW CHECK

RS: 0.4415 This is Culvert #1
CV PW 01 Type of flow is pressure and weir flow because,
1. EGEL 3 of 2086.55 is greater than MinTopRd of 2084.98.
2. CulvWSIn of 2083.82 is greater than or equal to MxLoCdU of 2083.82.
3. CulvWSOut of 2081.90 is greater than or equal to MxLoCdD of 2081.90.

DISTANCE CHECK

CULVERT COEFFICIENT CHECK

CULVERT CRITERIA CHECK

INEFFECTIVE FLOW CHECK

RIVER/REACH: Unnamed Central, South
RIVER STATION: 0.675
TYPE OF STRUCTURE: Culvert

Description:	South of Medical Building
Distance from Upstream XS:	20
Deck/Roadway Width:	45
Weir Coefficient:	2.6
Maximum allowable submergence for weir flow:	0.95
Elevation at which weir flow begins:	2114.81
Weir crest shape:	Broad Crested

Sec	River Station	Length Channel	WSEL	Surch.	EGEL	TopWidth Actual	
4	0.7028	101.92	2119.49		2119.79	249.92	
3	0.6835	94.29	2116.14		2116.74	34.11	
	0.675	76.00	2114.97		0	0	Culvert #1-Up
	0.675	9.29	2113.14		0	0	Culvert #1-Dn
2	0.6656	108.61	2113.15		2113.76	33.79	
1	0.645	210.22	2110.92		2111.66	28.4	

	Ineffective Flow, Section 3			Ineffective Flow, Section 2		
	Sta L	Sta R	Elev	Sta L	Sta R	Elev
1	-200	78	2117.69	0	75	2114.31
2	116	210.71	2117.69	121	308.09	2114.31

Opening Type	StagStaL	StagStaR	EncStaL	EncStaR	LIfStaS	RIfStaS	
Culvert Group					78	116	U
					75	121	D

CULVERT:
Culvert Name: Culvert #1
Shape: Box Rise: 4 Span: 10 Barrels: 2
FHWA Chart #: # 8 - flared wingwalls
FHWA Scale #: # 1 - Wingwall flared 30 to 75 deg.
Solution Crit:Highest U.S. EG

JpstrmDist:	9	Length:	76	n-Value:	0.015		
EntrLossCoef:	0.4	ExtLossCoef:	1	CulvInvElU	2113.3	CulvInvElD	2112.02
LCntStaU:	89.3	RCntStaU:	101.3	LCntStaD	89.7	RCntStaD	101.7

Culvert Depth Blocked: 0

Culv Area:	80	CulvQ:	244	MinTopRd:	2117.7	

LAbutSt	RAbutSt	LMnTpRd	RMnTpRd	MnTpRd	MxLoCd

Culvert #1	84.3	106.3	2117.93	2117.73	2117.73	2117.3	U
	84.7	106.7	2117.95	2116.26	2116.26	2116.02	D

Name	Q Total.	Q Struc	Q Weir	Selected Method	Flow Type
Culvert #1		244	0	Highest U.S. EG	Low Flow

GEOMETRIC CHECK

TYPE OF FLOW CHECK

RS: 0.675 This is Culvert #1
CV LF 01 Type of flow is low flow because,
1. EGEL 3 of 2116.74 is less than or equal to MinTopRd of 2117.70.
2. EGEL 3 of 2116.74 is less than MxLoCdU of 2117.30.

DISTANCE CHECK

CULVERT COEFFICIENT CHECK

CULVERT CRITERIA CHECK

INEFFECTIVE FLOW CHECK

RS: 0.7028 This is Section 4
ST IF 07 Ineffective flow option was considered at this section.
However, it should be a fully expanded cross section.
Ineffective flow stations and elevations should be cleared from
this section, unless the areas beyond the ineffective flow stations
are not within the flow path of the stream.
This message should be ignored if this section is Section 2 of
the upstream structure.

RIVER/REACH: Unnamed Central, South
RIVER STATION: 0.3394
TYPE OF STRUCTURE: Culvert

Description:	Culvert No. 242, in new subdivision
Distance from Upstream XS:	11.8
Deck/Roadway Width:	62
Weir Coefficient:	2.6
Maximum allowable submergence for weir flow:	0.95
Elevation at which weir flow begins:	2079.5
Weir crest shape:	Broad Crested

Sec	River Station	Length Channel	WSEL	Surch.	EGEL	TopWidth Actual	
4	0.3922	238.10	2084.46		2084.5	318.39	
3	0.3471	81.84	2080.49		2080.53	346.81	
	0.3394	64.00	2079.11		0	0	Culvert #1-Up
	0.3394	7.04	2078.51		0	0	Culvert #1-Dn
2	0.3316	248.30	2077.42		2077.82	194.77	
1	0.2845	254.27	2071.75		2072.39	92.24	

	Ineffective Flow, Section 3			Ineffective Flow, Section 2		
	Sta L	Sta R	Elev	Sta L	Sta R	Elev
1	0	162	2080.06	0	68	2077
2	231	298	2080.06	101	196	2077
3	333	738.46	2080.06	230	612.97	2077

Opening Type	StagStaL	StagStaR	EncStaL	EncStaR	LIfStaS	RIfStaS	
Culvert Group					298	231	U
					196	101	D

CULVERT:
Culvert Name: Culvert #1
Shape: Circular Rise: 3 Span: 0 Barrels: 8

FHWA Chart #: # 1 - Concrete Pipe Culvert
FHWA Scale #: # 2 - Groove end entrance with headwall
Solution Crit:Highest U.S. EG

UpstrmDist:	10.8	Length:	64	n-Value:	0.013		
EntLossCoef:	0.2	ExtLossCoef:	1	CulvInvElU	2076.11	CulvInvElD	2076.05
LCntStaU:	184.8	RCntStaU:	323	LCntStaD	79.9	RCntStaD	215.65

Culvert Depth Blocked: 0

Culv Area:	56.55	CulvQ:	461.97	MinTopRd:	2080.06

	LAbutSt	RAbutSt	LMnTpRd	RMnTpRd	MnTpRd	MxLoCd	
Culvert #1	183.3	324.5	2080.05	2080.05	2080.05	2079.11	U
	78.4	217.15	2080.05	2080.05	2080.05	2079.05	D

Name	Q Total.	Q Struc	Q Weir	Selected Method	Flow Type
Culvert #1		461.97	196.83	Highest U.S. EG	Pressure and Weir Flow

GEOMETRIC CHECK

TYPE OF FLOW CHECK

RS: 0.3394 This is Culvert #1
CV PW 01 Type of flow is pressure and weir flow because,
1. EGEL 3 of 2080.53 is greater than MinTopRd of 2080.06.
2. CulvWSIn of 2079.11 is greater than or equal to MxLoCdU of 2079.11.
3. CulvWSOut of 2078.51 is less than MxLoCdD of 2079.05.
4. Q/AD^0.5 of 4.72 is greater than or equal to 4.0.

DISTANCE CHECK

CULVERT COEFFICIENT CHECK

CULVERT CRITERIA CHECK

INEFFECTIVE FLOW CHECK

RS: 0.3471 This is Section 3.
ST IF 05 Weir flow occurs at Culvert Group 1
The left ineffective flow station of 298 is greater than
the left abutment station of 183.30
The left ineffective flow station should be adjusted

RS: 0.3471 This is Section 3.
ST IF 05 Weir flow occurs at Culvert Group 1
The right ineffective flow station of 231 is less than
the right abutment station of 324.50
The right ineffective flow station should be adjusted.

RS: 0.3316 This is Section 2.
ST IF 05 Weir flow occurs at Culvert Group 1
The left ineffective flow station of 196 is greater than
the left abutment station of 78.40
The left ineffective flow station should be adjusted.

RS: 0.3316 This is Section 2.
ST IF 05 Weir flow occurs at Culvert Group 1
The right ineffective flow station of 101 is less than
the right abutment station of 217.15
The right ineffective flow station should be adjusted.

---END

Unnamed Central Tributary to Cave Creek CHECK RAS Message Explanations

TO: Tony Bokich

COPIES: File

FROM: Rob Lyons

DATE: March 20, 2003

ROUGHNESS COEFFIECIENT CHECK

NT RC 01

This message was disregarded for all cross sections due to the nature of the channel being modeled. The washes in Carefree are desert washes and sometimes have barren land on the overbanks resulting in lower Manning's n values than the 0.035.

TRANSITION LOSS COEFFICIENT CHECK

NT TL 02

The results of this check were reviewed for each message. The expansion and contraction coefficients for the cross sections in question were purposefully increased to account for rapid expansion and contraction that was predicted based on the local topographic features.

INEFFECTIVE FLOW CHECK

XS IF 01

This message was disregarded for all cross sections due to the nature of the channel being modeled. The levee option was used often in the model to represent the hydraulic conditions of the braided channel geometry.

DISCHARGE CHECK

XS DC 01

This wash has several diversions or flow splits. Refer to the Floodplain Workmaps and Summery of Flows worksheet in the Technical Data Notebook (TDN).

LOCATION CHECK

XS LC 01

Due to the steep and irregular terrain of the study area, project specific checks were performed to analyze the need for additional cross sections. Refer to Section 5 of the TDN. Changes in energy, head loss, top width, Q[L], Q[C], and Q[R] were all reviewed from cross section to cross section. Cross sections were added where the change was significant. In

locations where the top width changed by more than 150% from one cross section to the next, the contraction and expansion coefficients were increased to 0.3 and 0.5, respectively. The Flood Control District's experience is that additional cross sections would result in negligible changes in flood water surface elevations.

BOUNDARY CONDITION CHECK

XS BC 02

HEC-RAS is run assuming that the flow condition is supercritical or a mixed flow regime. Where the wash enters another wash, the water surface elevation for the same event is known and the delineation project contract number is referenced on the floodplain work maps. All other boundary conditions are documented in the TDN.

INEFFECTIVE FLOW CHECK

RS: 0.7098

ST IF 07

The ineffective flow at this location is not related to the culvert crossing. There is an existing house immediately upstream of the right overbank.

INEFFECTIVE FLOW CHECK

RS: 0.7028

ST IF 07

The ineffective flow at this location is not related to the culvert crossing. There is an existing detention basin represented by the cross section that needed to be removed from the effective channel area..

INEFFECTIVE FLOW CHECK

RS: 0.3471

RS: 0.3316

ST IF 05

This location has two sets of multiple barrel culverts separated by approximately 100 feet. This check is inappropriately assessing the ineffective area in between culvert openings.

CHECK-RAS:

Unnamed Central Tributary to Cave Creek – Diversion Branch

CHECK-RAS Program: NT Check

Manning's n Value and Transition Loss Coefficient Review

Project File: P:\162944\floodplain mapping\HEC-RAS files\CHECK-RAS\UCdiv051903.prj
Plan File: P:\162944\floodplain mapping\HEC-RAS files\CHECK-RAS\UCdiv051903.p01
Geometry File: P:\162944\floodplain mapping\HEC-RAS files\CHECK-RAS\UCdiv051903.g01
Flow File: P:\162944\floodplain mapping\HEC-RAS files\CHECK-RAS\UCdiv051903.f01
Report File: P:\162944\floodplain mapping\HEC-RAS files\CHECK-RAS\UCdiv051903.nt
Selected profiles: PF 1
Da[illegible]05/19/2003
Ti[illegible]7:54:57 AM

SECNO	STRUCTURE	NLOB	NCHL	NROB	CNTR	EXP
UC-div,Main						
.1797		0.032	0.032	-----	0.1	0.3
		-----	0.025	-----		
.1569		0.04	0.032	-----	0.1	0.3
		0.032	0.025	-----		
		0.025	-----	-----		
.1286		0.04	-----	-----	0.1	0.3
		0.025	-----	-----		
		0.032	-----	-----		
		0.032	-----	-----		
		0.032	-----	-----		
.1177		0.04	-----	-----	0.1	0.3
		0.025	-----	-----		
		0.04	-----	-----		
		0.025	-----	-----		
		0.032	-----	-----		
.1085		0.04	-----	-----	0.1	0.3
		0.025	-----	-----		
		0.04	-----	-----		
		0.025	-----	-----		
		0.04	-----	-----		
		0.025	-----	-----		
		0.032	-----	-----		
		0.025	-----	-----		
		0.04	-----	-----		
.099		0.04	-----	-----	0.1	0.3
		0.025	-----	-----		
		0.04	-----	-----		
		0.04	-----	-----		
		0.04	-----	-----		
		0.025	-----	-----		
		0.04	-----	-----		
		0.025	-----	-----		
		0.04	-----	-----		
.0821		0.025	-----	-----	0.1	0.3
		0.04	-----	-----		
		0.025	-----	-----		
		0.04	-----	-----		
.0712		0.04	-----	-----	0.1	0.3
		0.032	-----	-----		
		0.04	-----	-----		
		0.04	-----	-----		
		0.025	-----	-----		
		0.04	-----	-----		
		0.025	-----	-----		
		0.04	-----	-----		
		0.025	-----	-----		
		0.04	-----	-----		
.0495		0.025	-----	-----	0.1	0.3
		0.032	-----	-----		
		0.025	-----	-----		
		0.025	-----	-----		
		0.032	-----	-----		
		0.025	-----	-----		
		0.04	-----	-----		
		0.032	-----	-----		
		0.04	-----	-----		
.0241		0.025	0.04	0.035	0.1	0.3
		0.04	0.035	0.032		
		0.025	-----	-----		
		0.032	-----	-----		
		0.025	-----	-----		
		0.032	-----	-----		
		0.025	-----	-----		
		0.04	-----	-----		
		0.032	-----	-----		
		0.04	-----	-----		

---Summary of Statistics---

	Minimum	Maximum
Left Overbank n Value:	0.025	0.04
Right Overbank n Value:	0.032	0.035

Channel n Value:	0.025	0.04
Contraction Coefficient:	0.1	0.1
Expansion Coefficient:	0.3	0.3

ROUGHNESS COEFFICIENT CHECK

RS 0.1797
NT 01 Left overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

TRANSITION LOSS COEFFICIENT CHECK

ROUGHNESS COEFFICIENT AT STRUCTURES

---END---

CHECK-RAS Program, XS Check
Cross Section Location and Alignment Review

Project File: P:\162944\floodplain mapping\HEC-RAS files\CHECK-RAS\UCdiv051903.prj
Plan File: P:\162944\floodplain mapping\HEC-RAS files\CHECK-RAS\UCdiv051903.p01
Geometry File: P:\162944\floodplain mapping\HEC-RAS files\CHECK-RAS\UCdiv051903.g01
Flow File: P:\162944\floodplain mapping\HEC-RAS files\CHECK-RAS\UCdiv051903.f01
Report File: P:\162944\floodplain mapping\HEC-RAS files\CHECK-RAS\UCdiv051903.xs
Selected profiles: PF 1
Date: 05/19/2003
Time: 7:54:59 AM

SECNO	Len Lob	Len Chl	Len Rob	TopWdthAct	Q Total	Flow Code
UC-div,Main						
0.1797	119.95	119.95	119.95	181.09	508	D,C
0.1569	145	149.51	155	345.58	926	D,E,C,B
0.1286	57.44	57.44	57.44	335.01	926	D,E,C,B
0.1177	48.5	48.5	48.5	224.4	926	D,E,C,B
0.1085	50.3	50.3	50.3	313.17	926	D,E,C,B
0.099	89	89	89	251.69	926	D,C,B
0.0821	57.96	57.96	57.96	234.61	926	D,E,C,B
0.0712	114.65	114.65	114.65	215.3	926	D,C,B
0.0495	134.21	134.21	134.21	424.82	926	D,C,B
0.0241	0	0	0	250.88	926	D,E,C,B

B=blocked obstruction XS SC 05
C=critial depth XS SC 03
D=divided flow XS SC 01
E=cross section extended XS SC 02
K=known water-surface XS SC 04

DISTANCE CHECK

SPACING CHECK

INEFFECTIVE FLOW CHECK

RS: 0.0241
XS IF 01 Left Levee option is used at this river station
Please investigate whether the NFIP requirements
for levees are met.

RS: 0.0241
XS IF 01 Right Levee option is used at this river station
Please investigate whether the NFIP requirements
for levees are met.

DISCHARGE CHECK

LOCATION CHECK

BOUNDARY CONDITION CHECK

XS BC 02 The name of the stream is UC-div,Main
Critical is specified as the downstream boundary
for profile PF 1

XS BC 02 The name of the stream is UC-div,Main
Critical is specified as the upstream boundary
for profile PF 1

LATERAL WEIRS CHECK

---END---

Unnamed Central Tributary to Cave Creek - Diversion Branch CHECK RAS Message Explanations

TO: Tony Bokich

COPIES: File

FROM: Rob Lyons

DATE: May 3, 2004

ROUGHNESS COEFFIECIENT CHECK

NT RC 01

This message was disregarded for all cross sections due to the nature of the channel being modeled. The washes in Carefree are desert washes and sometimes have barren land on the overbanks resulting in lower Manning's n values than the 0.035.

INEFFECTIVE FLOW CHECK

XS IF 01

This message was disregarded for all cross sections due to the nature of the channel being modeled. The levee option was used often in the model to represent the hydraulic conditions of the braided channel geometry.

BOUNDARY CONDITION CHECK

XS BC 02

HEC-RAS is run assuming that the flow condition is supercritical or a mixed flow regime. Where the wash enters another wash, the water surface elevation for the same event is known and the delineation project contract number is referenced on the floodplain work maps. The upstream and downstream boundary conditions are based on critical depth as the majority of cross sections within the UC and Ucdiv models default to critical depth when run in the subcritical regime.